



Faculty
of Business
and Economics

Svatopluk Kapounek
Veronika Kočíš Krůtilová (eds.)

21st ANNUAL
INTERNATIONAL CONFERENCE

**ENTERPRISE
AND COMPETITIVE
ENVIRONMENT**



**MARCH 22–23, 2018
MENDEL UNIVERSITY IN BRNO**

CONFERENCE PROCEEDINGS

Mendel
University
in Brno



**Mendel University in Brno
Faculty of Business and Economics**

**Svatopluk Kapounek
Veronika Kočíš Krůtilová (eds.)**

21st Annual International Conference

**ENTERPRISE
AND COMPETITIVE
ENVIRONMENT**

Conference Proceedings

**March 22-23, 2018
Mendel University in Brno
Czech Republic**

Responsible Editors:

Svatopluk Kapounek
Veronika Kočiš Krůtilová

Scientific conference board:

František Dařena (Mendel University in Brno, Czech Republic)
Radim Farana (Mendel University in Brno, Czech Republic)
Jarko Fidrmuc (Zeppelin University of Friedrichshafen, Germany)
Roman Horváth (Charles University, Czech Republic)
Peter Huber (Austrian Institute of Economic Research, Austria)
Jitka Janová (Mendel University in Brno, Czech Republic)
Svatopluk Kapounek (Mendel University in Brno, Czech Republic)
Luděk Kouba (Mendel University in Brno, Czech Republic)
Zuzana Kučerová (Mendel University in Brno, Czech Republic)
Martin Kvizda (Masaryk University, Czech Republic)
Martin Macháček (VSB-Technical University of Ostrava, Czech Republic)
Danuše Nerudová (Mendel University in Brno, Czech Republic)
David Procházka (Mendel University in Brno, Czech Republic)
Jana Stávková (Mendel University in Brno, Czech Republic)
Pavel Žufan (Mendel University in Brno, Czech Republic)

Technical Editor:

Jan Přichystal

Table of Contents

| | |
|---|-----|
| Svatopluk Kapounek and Veronika Kočíš Krůtilová: Editorial..... | 7 |
| Eva Abramuszkinová Pavlíková, Gretchen Lina Schaupp: Giving Feedback in the Age of Agile Work and Millennial Employees | 8 |
| Martha Amoako and Nahanga Verter: The role of institutions in influencing maternal and children under-five health care in Ghana..... | 19 |
| Marek Angowski: Factors Shaping the Choice of Purchasing Places on the Food Market. Intergenerational Comparison of Consumers Behaviors | 31 |
| Daniel Badulescu, Alina Badulescu and Sebastian Sipos-Gug: Knowledge Intensive Business Services and the Entrepreneurial Dynamics. An EU Analysis..... | 41 |
| Patrycja Bąk, Marta Sukiennik, Barbara Kowal: Selected issues of corporate culture in the enterprise from energy industry | 51 |
| Christina Bauer: Are the Qualifications and Skills of Consumer Good Product Managers different from those of Mechanical Engineering Product Managers? A Job Advertisement Analysis | 59 |
| Monika Bédiová, Jakub Šácha, Pavel Žiaran: Understanding why Czech late workers envisage retirement. Evidence from the SHARE database..... | 67 |
| Agnieszka Bem, Paweł Prędkiewicz, Paulina Ucieklak-Jeż and Rafał Siedlecki: Outpatient spending and healthcare system's efficiency. A key to achieve better outcomes? | 75 |
| Anna Bluszcz: What if not Gross Domestic Product per capita? | 83 |
| Alexander L. Bobkov, Igor V. Denisov, Oksana V. Kuchmaeva, Emil Velinov and Oksana V. Savchina: The organizational structure patterns of educational institutions in the Czech Republic..... | 92 |
| Nina Bockova, Tomas Meluzin, Tomas Polacek: The role of R&D spending in medium-sized firms..... | 103 |
| Hana Bohušová, Patrik Svoboda and Lucie Semerádová: Deferred Tax Information For External Users – Case Of Czech Agricultural Companies | 111 |
| Ivars Brivers, Bary Mavlutov and Inese Mavlutova: The Construction Industry and its Impact on the Financial Position of Enterprises: Case of Latvia | 120 |
| Rafał Buła: Modified method of area division – comparative analysis using Lévy stable motions..... | 129 |
| Radosław Bulat, Lukasz Poplawski: Protection Of Intellectual Property As An Example Of The Ownership Law On The Example Of Computer Games..... | 139 |
| Jiří Čerkasov, Jan Huml, Lucie Vokáčová and Klára Margarisová: Corporate Social Responsibility and Green Marketing as a Part of Firm's Philosophy | 146 |
| Radosław Ciukaj and Krzysztof Kil: Adequacy of the financial stability indicators in the European Union countries | 156 |
| Andrzej Cwynar, Wiktor Cwynar, Przemysław Szuba, Kelvin Leong, Anna Yuk Man Sung, Anna Ostrowska-Dankiewicz, Paulino Manuel Leite da Silva, Volodymyr Martynyuk: Academic Integrity and Debt Literacy of Finance Students: A Cross-national Study | 167 |
| Eugenia Czernyszewicz: The behaviors and the attitudes of consumers towards the novelty assortment on fruit market in the aspect of neophobia phenomenon | 177 |

| | |
|--|-----|
| Karolina Daszyńska-Żygadło, Jakub Marszałek: Green Bonds – Sustainable Finance Instruments | 187 |
| Mateusz Folwarski: Development of FinTech financial innovation sector – an opportunity or a threat to people employed in banking? | 199 |
| Sylvie Formánková, Oldřich Trenz, Oldřich Faldík and Jan Kolomazník: Factors influencing decision making in sustainable, responsible and impact investing..... | 209 |
| Barbara Fura, Alina Szewc-Rogalska: Application of DuPont model in a rentability assessment of manufacturing companies located in Poland..... | 220 |
| Alexandra Gschwendtner: How the pharmaceutical industry can generate new sales fields by using complementary medicine. Shown by means of homeopathy..... | 230 |
| Patrycja Hąbek: Does reporting obligation affect credibility of information disclosed in corporate social responsibility reports? | 241 |
| Josef Jablonský, Petra Zýková: A goal programming approach to measuring efficiency in two-stage DEA models..... | 252 |
| Jakub Ječmínek, Lukáš Moravec, Gabriela Kukalová and Dana Bína Filipová: Tax Freedom Day of EU-28 Trend | 260 |
| Aleksandra Jurkowska: The Costs of State Intervention in the EU's Financial Sector – Lessons from the Global Economic Crisis | 267 |
| Tomasz Bartosz Kalinowski, Grażyna Wieteska, Agata Rudnicka, Anna Wronka, Adrian Solomon, Antonio Diglio, Carmela Piccolo, Giuseppe Bruno, S.C. Lenny Koh and Andrea Genovese: An analysis of CO2 hotspots in supply chains – a European case study..... | 278 |
| Hana Kelblová, Jana Mikušová: ECJ case law in matters of geographical indications and its influence on changes and interpretation of secondary European law | 289 |
| Michael D. Koehler: The importance of CSR for recruiting skilled workers in the German healthcare system | 300 |
| Andrea Kolková: Comparison of trading systems based on technical analysis using real and random data | 310 |
| Agnieszka Komor, Dariusz Perło and Dorota Perło: Level Of Bioeconomic Entrepreneurship's Development In Poland | 321 |
| David Kosina: Cross-cultural management in the context of EU policies | 331 |
| Aleksandra Kowalska, Jarosław Kowalski: Administrative Liability related to Food Fraud. A case of Poland | 339 |
| Aneta Krejčová and Pavel Žiaran: Factors influencing the early retirement decision-making process..... | 351 |
| Jaroslava Kubátová: The Phenomenon of Conscious Business – Which is Ahead – Practice or Academia? A Literature Review..... | 361 |
| Libor Kyncl: Private and Public Instruments in Pensioners' Income Assurance and their Legal Regulation..... | 370 |
| Benjamin Maier: Facing the growing competition through the formation of strategic alliances – Taking into account the specific characteristics of the recycling industry | 381 |
| Katarzyna Maj-Waśniowska, Agnieszka Wałęga: Material deprivation of older people in European Union countries in the context of the ageing society..... | 391 |

| | |
|---|-----|
| Petra Manová, Monika Oberreitrová, Milena Otavová, Jana Gläserová: The Impact of the Amendment to the Accounting Act on the Financial Reporting of Micro Enterprises | 404 |
| Anna Manowska: Practical application of selected panel data techniques in analyzing sales capabilities of coal assortments..... | 415 |
| Petroula Mavrikiou, Jolanta Pivoriene, Merita Xhumari: The impact of pension systems on working life in Albania, Cyprus and Lithuania | 424 |
| Karel Marekand, Martin Janků: Credit Contract and Lending Contract in the Context of the New Czech Civil Code – Selected Issues..... | 434 |
| Jitka Matějková, Dana Zapletalová and Bohumil Vítek: Rhetorical skills..... | 445 |
| Jens Nebel: The Effectiveness of Privacy Policies and What it Can Mean for the GDPR..... | 453 |
| Danuše Nerudová, Veronika Solilová and Marian Dobranschi: Research on profit shifting techniques | 461 |
| Katarzyna Owsiak: An Assessment of the Effectiveness of the Debt Rule in Poland’s Territorial Government Entities..... | 472 |
| Anna Pamula: Shift of Enterprise Software to Cloud Computing in Polish manufacturing companies..... | 481 |
| Marzena Piszczek: The Financial Condition of Polish Self-Government units..... | 490 |
| Piotr Podsiadło: State aid to promote risk capital investments and its impact on the economic growth of the EU Member States..... | 499 |
| Lukasz Poplawski: Selected problems of life quality on protected areas of the Swietokrzyskie voivodeship in Poland | 510 |
| Lenka Procházková, Marek Záboj: Key Success Factors of Small and Medium-sized Enterprises..... | 518 |
| Martina Rašticová, Pavel Žiaran, Jakub Šácha, Clary Krekula: Extension of working lives: gender perspective of retirement timing in the Czech Republic and Sweden. Preliminary results..... | 529 |
| Janusz Reichel and Błażej Socha: Do students of management and economics consider choosing jobs in social economy organizations?..... | 538 |
| Tina Rönnerberg: German Consumer Expectations in the field of Digital Kitchen | 550 |
| Agata Rudnicka: The role of NGOs in making supply chains more transparent and sustainable | 562 |
| Saumyaranjan Sahoo and Sudhir Yadav: Sustaining competitiveness through Lean manufacturing – Evidences from Small-Medium Sized Enterprises | 571 |
| Elena Daniela Sarau: The Economic Sanctions of the EU against Russia and Their Impact on the Defense Industry | 582 |
| Daniel Scire: MiFID “Gold-plating”: Divergences in the EU’s Capital Markets Union | 591 |
| David Schubert, Oldřich Trenz: Implementation of the fully fluid responsive layout..... | 600 |
| Rafał Siedlecki, Agnieszka Bem, Paweł Prędkiewicz, Paulina Ucieklak-Jeż: Hospitals’ debt and profitability. Does a form of activity make a difference?..... | 610 |
| Piotr Sołtyk: Procedures of internal audit in local government units – selected empirical research results..... | 619 |

| | |
|---|-----|
| Marta Sukiennik, Barbara Kowal, Patrycja Bąk: Human resources as a part of corporate culture | 626 |
| Krzysztof Surówka: Causes and Limits of Local Government Indebtedness in Poland | 635 |
| Paulina Ucieklak-Jeż, Agnieszka Bem Paweł Prędkiewicz and Rafał Siedlecki: Regional distribution of health care non-financial resources in Poland | 646 |
| Tereza Vaňkátová: Deterrence without sanctions: the influence of behavioural law and economics on prevention of anticompetitive conduct | 656 |
| Jolan Velencei: Making decision makers' thinking processes transparent | 667 |
| Lukáš Vodička: A note on the impact of financial development on economic growth | 673 |
| Lucie Vokáčová, Klára Margarisová, Jan Huml and Jiří Čerkasov: Sustainable Development Small and Medium-Sized Enterprises Innovation Activities Potential in the Czech Republic | 683 |
| Agnieszka Wałęga and Grzegorz Wałęga: Living on the edge: over-indebted households in Poland | 694 |
| Grażyna Wieteska: The influence of SI on the flexibility of relationships with suppliers – research framework | 704 |
| Wioletta Wróblewska, Dawid Olewnicki and Joanna Pawlak: The purchasing behaviour and attitudes of students and retirees towards fruit and vegetables as convenience food ... | 717 |
| Anna Wronka: The Multi-Dimensionality Of The Safety Of The Production Process | 727 |
| Pavel Žiaran, Eva Ludvíková: Harmful Tax Competition in the EU and Anti-Tax Avoidance Directive | 737 |

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Editorial

Svatopluk Kapounek and Veronika Kočíš Krůtilová

Dear readers,

We are honoured to present you with the Conference Proceedings we are publishing as the one of the outputs of the 21st year of the International Conference Enterprise and Competitive Environment (ECE 2018) that we organised in March 22–23, 2018. The conference traditionally takes place in the campus of the Faculty of Business and Economics, Mendel University in Brno, Czech Republic and provides a productive background for the development of new ideas not only for senior but also for young researchers. Therefore, we believe that the conference papers presented in these Proceedings will help you to find something new to make the world a better place.

We welcomed more than 200 researchers with 186 presentations from all over the world (Albania, Algeria, Austria, the Czech Republic, Hungary, Germany, India, Latvia, Lithuania, Pakistan, Poland, Romania and Slovakia) who also served as the discussants of the papers and helped to improve the quality of the research results presented during both conference days.

Moreover, we hosted two distinguished well-known speakers who contributed to the conference programme with their speeches. Prof Julius Horvath (Central European University) gave a speech on a Historical Review of Economics and Other Social Science Disciplines. Prof Evžen Kočenda (Charles University) contributed to the discussion on the topic of Institutions and Determinants of Firm Survival in European Emerging Markets.

In the presented Proceedings you find 75 papers which were selected on the basis of a peer-review process.

We follow new trends in economics and build bridges between many research fields, especially accounting and taxes, ageing, bioeconomics, business economics, consumer behaviour and life quality, financial markets, law, management, marketing and welfare economics.

Finally, we would like to thank to all the participants in the conference for their inspiring contributions. Furthermore, we are grateful to all the reviewers and the members of the scientific committee for their contribution to the organisation of this high-level scientific conference.

We would also like to thank the members of the organising team for their support and hard work which contributed to the successful organisation of the conference.

Assoc. Prof Svatopluk Kapounek, Ph.D.
Vice-dean for Research
Faculty of Business and Economics
Mendel University in Brno

Veronika Kočíš Krůtilová, Ph.D.
Head of Research Centre
Faculty of Business and Economics
Mendel University in Brno

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Giving Feedback in the Age of Agile Work and Millennial Employees

Eva Abramuszkinová Pavlíková¹, Gretchen Lina Schaupp²

*¹Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: eva.pavlikova@mendelu.cz*

*²EBC Hochschule, Campus Berlin, Hauptstraße 27, 10827 Berlin, Germany,
e-mail: schaupp.gretchen@ebc-hochschule.de*

Abstract

One of the most important functions of leadership is to provide employees with performance feedback. The primary source of employee feedback has traditionally been one's direct supervisor. However, as “Millennials” take up a larger portion of the workforce and agile work methods are implemented by today's organizations, traditional methods of employee evaluation and feedback are becoming less effective for both supervisors and employees. In response to these workforce changes, new methods and sources of employee feedback are suggested. In this theoretical study, the authors redefine the role of the supervisor in performance management and suggest new feedback sources. These sources are argued to both better correspond with millennials' life and work values and also require less direct input from supervisors than traditional performance feedback methods.

Keywords: performance feedback, millennials, agile work methods

JEL Code: J11, M12, O35

1. Introduction

The working environment is changing rapidly in the age of digitalisation and it is forcing organizations to consider new methods of carrying out leadership roles. As agile work methods collide with a job market consisting of employees from several generations with different values and attitudes towards work, new opportunities for performance feedback present themselves.

This theoretical paper begins with a literature review of the leadership function of performance management and leadership in the digitalisation age with a focus on Millennial employees and agile work methods. Following the review, new tools for providing feedback in this work environment are discussed. Recommendations are formulated to suggest effective cooperation with Millennials in an agile work environment.

2. Literature Review

2.1. Performance management as a function of leadership

According to Aguinis and Pierce (2008), performance management is “an organization-wide system whereby managers integrate the activities of goal setting, monitoring and evaluating, providing feedback and coaching, and rewarding employees on a continuous basis.” In recent years, traditional performance management systems have been strongly criticized for their complexity and the exorbitant amount of time required by managers to carry them out (Buckingham and Goodall, 2015).

One of the most costly elements of performance management is that of the annual performance review, which requires managers to assess the past performance of each individual employee and to give feedback to each employee regarding his or her individual or collective performance (Kinicki and Fugate, 2012).

2.2. Leadership in the age of digitalisation

In response to digitalisation, which analysts at the for-profit research company *Gartner* describe as “the process of moving to a digital business and the use of digital technologies to change business models and value-producing opportunities” (Papegaaij, Cole, Mello; 2017), leaders are faced with the operational aspects of digital leadership. They are not only learning to come to terms with new kinds of business strategies and enterprise platforms, but also with the need for a different kind of people mind set and skill set as well as a completely different kind of workplace (El Sawy, Kraemmergaard, Amsinck & Vinther, 2016). For example, younger employees who were “born digital” will have different expectations of the workplace in terms of flexibility regarding their location and working hours, the sophistication of mobile online access, and resources (El Sawy, et al., 2016).

2.2.1. Millennials

The differences in values and attitudes between generations and genders has been confirmed in many studies. As societies are ageing, seniors are becoming an important segment both in society as well as on the job market. People from Baby Boom generation are present on the job market with the aim to increase the level of life standard as well as social needs (Abramuszkinová Pavlíková, Šmídová, 2017; Rašticová, Kubíčková, Bédiová, 2016; Cogin, 2012; Twenge, 2010). The continued presence of older generations on the job market coupled with the influx of Millennials can result in value based differences and problematic issues connected with the cooperation of older and younger workers.

Members of each generation declare typical values which form their view on life but also represent work values needed for everyday work life. Values are considered as important factors which determine behaviour and shape attitudes towards work (Maslow, 1943, Rokeach, 1973). Values are important for making individual decisions but they are resistant to changes. Work values are formed by wishes of people related to the aim of their participation in the working process. These values shape attitudes, behaviour and decision making at work. One of the concepts explaining variations in work values are based on the difference of extrinsic and intrinsic values. Extrinsic values are focused on the results such as wage, financial compensation, opportunities for development and status. On the other hand, intrinsic values are related to the process of work, nonmaterial rewards, educational potential and opportunity to be creative. Other work values include

the opportunity to have influence, decision autonomy, stability, altruistic rewards, social rewards, free time or freedom (Twenge, Campbell, Hoffman, Lance, 2010). Longitudinal studies of work mobility show that a typical young worker will change during the first 10 working years of his/her career from 3 to 7 organisations. Comparative studies between different cultures show that the generational differences are more important than cultural ones (Cogin, 2012).

People experiencing different historical events in life might have various expectations and preferences related to work. Nowadays generation on the market consists of people from four generations. Silent Generation or Traditionalists are people born around 1925–1945, followed by Baby Boomers born around 1946–1964. Generation X, Baby Busters, Post Boomers or even Slackers are names used for people born around 1965–1980. People born around 1981–1999 are known as Generation Me, Generation Y, Millennials, nGen, IGen, Entitlement Generation and later generation as Generation Z or Post-Millennials (Cogin, 2012; Gursoy, Maier, Chi, 2008).

For the purpose of this paper, the term *Millennials* describes the generation born in the 1980s or 1990s, although the defining characteristics may be valid also for later generation of Post-Millennials. In general, this generation is described as tolerant, self-confident, open, ambitious but also too individualistic, narcissistic and hedonistic. As for the working environment, the work-life balance and adequate wage are at the centre of their interest. The importance of work and work ethics as a value for Millennials, in comparison with Baby Boomers, is decreasing, whereas the importance of free time is rising. Millennials were born into “high-tech” and optimistic times. They are technologically equipped, learn fast, but have a tendency to be impatient. Work does is not necessarily a source of identity for them (Twenge, 2010; Twenge, Campbell, Hoffman, Lance, 2010). Millennials have a tendency to question authority. They have a job mainly to provide them with resources needed for fulfilment of their personal wishes and free time activities. On the job, they are less loyal, expect immediate recognition or praise, promotions or salary increases. They believe in team work and are optimistic about the future (Gursoy, Maier, Chi, 2008).

2.2.2. Agile work methods and performance management

The basic premise of agile work is that less initial planning of outcomes (i.e. products, services, behaviours) is better than extensive preparation and planning, and that an evolutionary process of development that incorporates end-users’ feedback is more efficient (Dybå and Dingsøy, 2008). Agile methods are iterative and incremental, meaning that the desired product or outcome is redesigned and modified several times in response to repeat user feedback (Serrador and Pinto, 2015). In an effort to avoid the use of standard design or development approaches (such as the “waterfall” approach), agile work emphasizes continuous design, flexible scope, the freezing of design features as late as possible, the uncertainty of the market, as well as intense customer interaction (Serrador and Pinto, 2015). The rapid and iterative feedback and the intense interaction with customers is made more feasible via developments in technology and digital sources in recent years.

The impact of agile methods can also be seen in performance management. Buckingham and Goodall (2015) report on the agile changes made in the performance management system at Deloitte Services LP, based in New York. In particular, changes made to the performance appraisal process involved the following: more objective measures of the employees’ performance with the intention of limiting bias, frequent (weekly) discussions of performance with employees, a focus on future performance rather than past results, turnover of responsibility for the initiation of the weekly discussion from the team

leader to the employee, and the use of a self-assessment tool that allows individual employees to assess their own performance and share information on their strengths (insights, achievements, and impacts) with others in the organization (Buckingham and Goodall, 2015). These changes not only allowed Deloitte to become more agile in motivating employees and helping them improve their performance, but it allowed them to save valuable time while re-orienting the process away from past performance and towards future results (Buckingham and Goodall, 2015).

3. Methodology

This study adopts a literature review methodology in an effort to inform managers, human resource practitioners, and management researchers of the theoretical potential for using agile methods to assist in performance management and employee development – especially with respect to Millennials. A systematic procedure for retrieving and selecting the reviewed articles was applied. Business One Source was used as the main search engine, which enabled us to access several business relevant databases including Emerald, ScienceDirect, EBSCOhost, and ABI/Inform. The search string terms “agile leadership”, “agile method”, “performance management”, “Millennials”, “civic groups”, “self-development and journaling”, “video-self monitoring”, and “crowdsourced feedback” were used. The search was directed at all parts of the article texts, not limiting the search by title of journal or article. Our search was supplemented by Google Scholar, and we included both peer-reviewed journal articles, professional websites, and periodicals in our search. The inclusion of professional websites and periodicals was deemed necessary given the very recent application of agile methods in employee development. We checked the relevance of the articles based on their titles and keywords. Information was extracted from the articles and documented in the literature review below if it fulfilled the following criteria: it explained how the use of a particular tool (i.e. crowdsourcing) could be beneficial in collecting performance relevant information, the described tool fulfilled the basic premises for agile methods, and the information provided support for use and understanding of the tool being particularly beneficial to Millennial employees.

4. Theoretical Arguments. New tools for providing feedback

As the work environment changes, leaders are facing many challenges, and the role of the leader is changing. With regard to performance management, leaders' assessments are no longer the only source of feedback data. With access to both organizational internal and external (i.e. shared and social media) digital tools, and in light of mobile work arrangements in which the leader has less direct contact with reports, it is imperative that performance feedback sources and methods be adapted.

This theoretical paper provides an overview of several different and creative feedback sources that would allow individuals to personally collect performance feedback on a regular basis from sources beyond their direct supervisor. The role of the supervisor would become one of coordination and coaching on the basis of this collected feedback. The variety of sources, many of which are digital and therefore especially familiar to the

millennial generation, and the ease with which data can be collected in increments of time that correspond to agile methods, will be highlighted.

4.1. Internal digital resources

Video self-monitoring

Growing up as “digital natives”, Millennials are comparably more comfortable video-recording and posting footage of themselves and their everyday activities than other generations before them. Along with the photographed “selfie”, short video clips of one’s activities are everyday elements of communication for Millennials.

This lends support to the idea that Millennials would especially benefit from skill development via video self-monitoring (VSM). Video-self monitoring is an instructional approach based on the theory of observational learning (Woolfolk, 2010). Using the self as a model, it allows individuals to observe themselves engaged in certain behaviours, such as presenting in front of an audience or leading a meeting. When using VSM as a learning tool, video recorded segments of the activity are edited to present the desired skill with few or no errors (Prater, Carter, Hitchcock & Dowrick, 2011). The edited video is then shown to the individual. The video content acts as feedback that can then be self-assessed and used to modify behaviours. Although the large majority of research on VSM has been carried out in educational settings, the results of these studies support its use across a variety of skills and with a range of ages (Prater, et al., 2011). VSM has been shown to effectively decrease general disruptive classroom behaviours (e.g., Possell, Kehle, McLoughlin, & Bray, 1999), as well as increase positive classroom participation (Hartley, Kehle, & Bray, 2002) and on-task behaviour (Clare, Jenson, Kehle, & Bray, 2000).

With the rapid technological development and accessibility of the tools available for both video recording and editing, it is not surprising that video recording is also being used to help professionals learn and improve on-the-job skills like presenting, negotiating, and conflict management (Avsar, Cansever, Acemoglu, Avsar, Khan, & Cayir, 2015; Gitomer, 2010; Tschannen, Keenan, Aebersold, Kocan, Lundy, & Averhart, 2011).

The direct and unfiltered feedback that video-recordings can provide to employees as well as the ease with which ideal behavioural examples can be produced via editing, lend to its adoption as a source of feedback and a learning tool in the workplace. Given what would be considered “confidential” organizational content in the recordings, it is recommended that this tool only be used in conjunction with internal development programs.

4.2. External human resources

Civic groups & roundtables

Millennials are often criticized for characteristics that are believed to result from their comfort within and their dependency upon a digital environment. These characteristics, which tend to collectively define the generation, include a lack of a need for live social contact and “lower levels of empathy” in comparison to other generations (Abramuszkinová Pavlíková & Šmídová, 2017). Whether or not the research on these characteristics is accurate, it is interesting to note that millennials’ do indeed have limited involvement in both civic and political groups in comparison to earlier generations (Twenge, Campbell & Freeman, 2012; Not turning out, 2017). Civic groups are a category of non-profit organizations to which such globally represented groups like *Lions*, *Rotary*,

Ladies Circle, Boy Scouts, Habitat for Humanity, or Toastmasters belong. Although the official main objective of such civic groups is formally defined as philanthropic service, other common benefits to membership include prestigious social networks, cultural experiences, and learning how to conduct oneself professionally.

Research shows that a linkage between voluntary civic service activities and employee career development exists (Bartsch, 2012; Booth, Park & Glomb, 2017; Gyton, 2017). Volunteering in civic service projects can also help individuals to gain experience in areas in which they have limited experience, but would like to work in the future (Clark, 2017).

Some civic groups exist with the main goal of assisting members with professional development. Toastmasters, for example, is a civic group dedicated to helping its members practice public speaking in front of a crowd (Gravois, 2011). Especially in light of the example of Toastmasters, it is evident that career development can also happen through participation in activities outside of one's place of work. Given millennials limited involvement in such activities and their need for multiple sources of feedback, it makes sense for supervisors to support, recommend, and follow-up on millennial employees' involvement in such civic organizations.

4.3. External digital resources

Self-reflection and journaling

The employee's own reflection of his performance and development is also considered a source of direct feedback. Learning journals or reflective journals are a common tool used to increase the practice of self-reflection due to the ease of implementation and the depth of personal feedback that can be achieved (Roberts, 2008). Reflection is a process that has been shown to integrate theory with practice, to facilitate insight, and to stimulate self-discovery (Mezirow, 1998).

Past studies, which have focused on leadership education, have found that reflective learning requires individuals to intensely consider the dynamics that underpin leadership theory in line with their professional pursuits while also questioning basic assumptions and practices (Jefferson, Martin, & Owens, 2014). When reflection does not take place, there is a risk of making poor decisions and judgments (Brookfield, 1994).

Commonly used in university teaching environments, journaling allows students to reflect on theory in comparison to theirs and others' actions as well as integrate readings, discussions, or other resources (Roberts, 2008). More recent studies carried out with "millennial" students also support the use of journaling (Jefferson, Martin, & Owens, 2014; Stanton & Stanton, 2017; Walters, Charles & Bingham, 2017). For example, Stanton and Stanton (2017) found that the use of journaling improved students' academic performance, increased their writing abilities, led to increased time spent reading topic-relevant materials, and improved critical thinking about the course content.

"Bullet journaling", a recent and trendy phenomenon, is also growing in favour by working professionals, and they are particularly popular with millennials (Campbell, 2017). Bullet journaling involves creating a hand-written collection of tasks and topics which is updated by an individual daily. Advocates of the method, which can assist with anything from monitoring daily productivity to reflecting on one's own career and personal goals, agree that the method has advantages in the digital age. Bullet-journaling is reported to help its users to focus and to reflect on tasks and motivations and to get to know one's work habits better (Raptopoulos, 2018).

Many digital forms of the bullet journal now exist as smart phone apps, like *Trello* or *Todoist*. However, advocates of paper journals argue that writing by hand forces one to slow down and approach reflective thoughts with more mindfulness (Wong, 2018).

This is not to say that journaling should simply be carried out by employees at random intervals when time is available and the mood strikes. Ligon & Hunter (2010) argue that journaling should occur throughout the course of the learning period rather than happening once objectives have been achieved. This “planful” approach is believed to facilitate active analysis (Denston & Gray, 2001). In an employment setting, this would suggest that the journaling practice be expected by the supervisor or mentor at regular work intervals (i.e. daily) and that reflective discussions between the supervisor and employee regarding the results of journaling – thoughts, questions, or lessons learned by the employee – be scheduled periodically (i.e. monthly).

Crowdsourced feedback via network internet platforms

Just as Millennials are comfortable contributing personal information to public information pools or “social networks”, they are also familiar and comfortable with the retrieval of information from these sources. Network platforms include a class of information technologies, commonly known as social media, which support interpersonal communication and collaboration using Internet-based platforms (Kane, Alvavi, Labianca, & Borgatti, 2014). Among the best known of these tools are sites such as *Facebook*, *LinkedIn*, and *Twitter*, but various media publishing tools like *Youtube*, *Instagram*, *Pinterest*, *Tumblr*, and *Soundcloud* also facilitate social interactions by allowing viewers or visitors to give instant feedback.

In some cases, especially teens have been known to specifically use digital spaces such as YouTube to receive immediate feedback on their appearance (Rossie, 2015), on hobbies and interests (Courtois, Mechant, & De Marez, 2011), and to simply gauge the general feedback they receive as they try out different identities and communicate their tastes and preferences (Valkenburg, Schouten, & Peter, 2005). This process is known as “crowdsourcing”, or the outsourcing of tasks to a crowd of people via an open call for contributions (Howe, 2006).

Given the ease with which organizations can collect information using such sources, it is not surprising that many have started to collect feedback on multiple topics from their employees. For example, in an effort to increase engagement and give employees a voice in work processes, one organization used cloud-based software to crowdsource employee’s ideas for improving clinical information system work-flows (Olson, 2017). The information was used to make decisions that resulted in cutting the time spent on clinical workflow in half (Olson, 2017).

Crowdsourced feedback has also created new possibilities for performance reviews. As remote work arrangements increase and managers’ are given less opportunity to directly observe employee feedback, single-source performance reviews become less valid. By adopting a system that is similar to current social media platforms, employees are enabled to provide meaningful feedback on their co-workers’ performance in near real time (Mosley, 2013). This process “crowdsources” the performance review and gives both the manager and the employee more detail in the feedback detailing their performance, which addresses the top cause of employee dissatisfaction with performance appraisals: the sense that single-source reviews by one manager are not true indicators of performance (Mosley, 2013). The tool can also be used to collect feedback from beyond the organization, questioning those individuals who work with the employee as customers, suppliers, or other business partners. Given Millennials’ familiarity with such crowdsourced tools

and the remote working arrangements that will accompany many jobs in the future, we expect Millennials to be particularly accepting of crowdsourced performance reviews.

5. Recommendations

In an agile work environment, the following recommendations are relevant for providing Millennials with feedback regarding their career-relevant skill performance and development:

- A. Direct supervisors should no longer be relied upon as the main source of direct feedback about performance. Rather, they should take on a role of coordination and coaching on the basis of feedback collected by the individual employee.
- B. The use of video recordings of job-relevant behaviours (i.e. presentations, negotiations) is an effective method for providing valuable feedback.
- C. Participation in civic organizations will allow Millennials access to situations that provide valuable feedback.
- D. Regular reflective journaling – via digital app or via paper journal – is an effective method of providing valuable feedback.
- E. Crowdsourced performance reviews via internet platforms allow Millennials access to valuable feedback from colleagues and business partners.

6. Conclusions

The theoretical arguments put forth in this paper focus on the importance of giving feedback to Millennials in the age of agile work. The theoretical background focused on studies and research results published by international academics.

Given the technical savvy of Millennials and the limited time that managers can afford to dedicate to performance reviews, creative and better fitting sources for performance feedback were introduced. These are considered a better fit a digital environment, which entails a requirement for quick and frequent feedback data using agile methods.

This theoretical study provides a starting point for researchers to conduct a number of future studies involving primary data collections.

- For example, based on the potential use of open source tools as agile methods in performance management, there is a need to: Understand how leaders from older generations are dealing with agile work methods and tools.
- Show evidence of the use of these suggested tools in the actual development of employees.
- Better understand the feasibility of use and ideal frequency of measurement of the tools.
- Assess managers' response to and use of the additional information in coaching and employee development.
- Test the reliability and validity of the different tools with the purpose of performance management.
- Assess the added value of the tools as defined by the employee in comparison to the employer and managers.

The major limitations of this study lie in the methods used to collect the information from the existing literature. A future revision of the study should allow for a more thorough and systematic review of the literature, which is not limited by the authors' preconceived value placed on the particular tools highlighted in this paper. A formal collection method and coding method should be adopted. In addition, existing human resources, organizational behaviour and sociological theories could be incorporated into the review of the literature.

References

- ABRAMUSZKINOVÁ PAVLÍKOVÁ, E., ŠMÍDOVÁ, M. 2017. Do we know the attitudes of future managers and other professions? In: Kapounek, S., Krůtilová, V. (eds.), Proceedings from 20th International Scientific Conference "Enterprise and Competitive Environment". Brno. Czech Republic. Mendel University in Brno.
- AGUINIS, H. and PIERCE, C. 2008. Enhancing the relevance of organizational behavior by embracing performance management research. *Journal of Organizational Behavior*, 139–145.
- AVSAR, U. Z., CANESEVER, Z., ACEMOGLU, H., KHAN, A. S., & CAYIR, Y. 2015. Self-assessment through videotaping compared with peer and trainer feedback. *Journal of the College of Physicians and Surgeons – Pakistan*, 25(1).
- BARTSCH, G. 2012. Emotional learning: Managerial development by corporate volunteering. *Journal of Management Development*, 31(3), 253–262.
- BROOKFIELD, S. 1994. Tales from the dark side: A phenomenography of adult critical reflection. *International Journal of Lifelong Education*, 13(3), 203–216.
- BUCKINGHAM, M., & GOODALL, A. 2015. Reinventing performance management. *Harvard Business Review*. April 2015.
- CAMPBELL, L. 2017. What the hell is a "bullet journal" and why are people using them? [Online]. In *Huffingtonpost.com*. [Retrieved February 25, 2018, from http://www.huffingtonpost.com.au/2017/02/07/what-the-hell-is-a-bullet-journal-and-why-are-people-using-the_a_21709186/].
- CLARE, S. K., JENSON, W. R., KEHLE, T. J., & BRAY, M. A. 2000. Self-modeling as a treatment for increasing on-task behavior. *Psychology in the Schools*, 37, 517–522.
- COGIN, J. 2012. Are generational differences in work values fact or fiction? Multi-country evidence and implications. In: *The International Journal of Human Resource Management*, [Online]. Volume 23, Issue 11: 2268–2294. [Retrieved February 20, 2018, from <http://www.tandfonline.com/doi/full/10.1080/09585192.2011.610967>].
- COURTOIS, C., MECHANT, P., OSTYN, V., & De MAREZ, L. 2013. Uploaders' definition of the networked public on YouTube and their feedback preferences: a multi-method approach. *Behavior & Information Technology*, 32(6), 612–624.
- DENSEN, I., & GRAY, J. 2001. Leadership development and reflection: What is the connection? *The International Journal of Educational Management*, 15(3), 119–124.
- DYBA, T., DINGSOYR, T., 2008. Empirical studies of agile software development: a systematic review. *Information Software Technology* 50 (9), 833–859.

- EL SAWY, O. A., AMSINCK, H., KRAEMMERGAARD, P., & VINTHER, A. L. 2016. How LEGO built the foundations and enterprise capabilities for digital leadership . *MIS Quarterly Executive*, 15(2).
- GARTON, E., & NOBLE, A. 2017. How to make agile work for the c-suite. *Harvard Business Review*, 2-5.
- GITOMER, J. 2010. Lousy presentation skills doom ability to grow business. *Njbiz*, 23(4).
- GRAVOIS, J. 2011. The Lions of Lagos, the Rotarians of Rawalpindi. *Washington Monthly*, 43(7/8).
- GURSOY, D., MAIER, Th. A., ChI, Ch. G. 2008. Generational differences: An examination of work values and generational gaps in the hospitality workforce. [Online]. In: *International Journal of Hospitality Management*. Volume 27, Issue 3: 448-458. [Retrieved February 19, 2018, from <https://www.sciencedirect.com/science/article/pii/S0278431907001223>].
- GYTON, G. 2017. What volunteering did for me: HR professionals share their experiences of giving back. *People Management*, 12–13.
- HARTLEY, E. T., KEHLE, T. J., & BRAY, M. A. 2002. Increasing student classroom participation through self-modeling. *Journal of Applied School Psychology*, 19, 51–63.
- HOWE, J. 2006. The rise of crowdsourcing. *Wired*, June 2006.
- JEFFERSON, J. K., MARTIN, I. H., & OWENS, J. 2014. Leader development through reading and reflection. *Journal of Leadership Studies*, 8(2), 67–75. doi:10.1002/jls.
- KANE, G. C., ALAVI, M., LABIANCA, G., & BORGATTI, S. P. 2014. What's different about social media networks? A framework and research agenda. *MIS Quarterly*, 38(1), 275–304.
- KINICKI, A. J., & FUGATE, M. 2012. *Organizational behavior: key concepts, skills & best practices*. New York, NY: McGraw-Hill/Irwin.
- MASLOW, A.H. 1943. A theory of human motivation. *Psychological Review*, 50: 370–396.
- MEZIROU, J. 1998 . On critical reflection. *Adult Education Quarterly*, 48 (3), 185–199.
- MOSLEY, E. 2014. The power of the crowdsourced performance review. *Compensation & Benefits Review*, 45(6), 320–323.
- Not turning out. 2017. *Economist*, 422(9026), 49–50.
- OLSON, J. 2017. Give employees a say to keep them engaged. *Workforce*, 30. January 2017.
- PAPEGAAIJ, B., COLE, J., MELLO, A. 2017. Leadership in the digital age: A Gartner trend insight report. [Online]. [Retrieved from: <https://www.gartner.com/doc/3731617?srcId=1-7726521352>].
- PRATER, M. A., CARTER, N., HITCHCOCK, C., & DOWRICK, P. 2011. Video self-modeling to improve academic performance: A literature review. *Psychology in the Schools*, 49(1). doi:10.1002/pits.20617.
- POSSELL, L. E., KEHLE, T. J., McLOUGHLIN, C. S., & BRAY, M. A. 1999. Self-modeling as an intervention to reduce inappropriate classroom behavior. *Cognitive and Behavioral Practice*, 6, 99–105.

- RAPTOPOULOS, L. 2018. Why I started a bullet journal – and so should you. In *Financial Times*. [Online]. [Retrieved February 25, 2018, from <https://www.ft.com/content/c3afd924-0293-11e8-9650-9c0ad2d7c5b5>]. February 4th, 2018.
- RAŠTICOVÁ, M., KUBÍČKOVÁ, L., BÉDIOVÁ, M., ANTOŠOVÁ, V., BIRČIAKOVÁ, N., ABRA-MUSZKINOVÁ PAVLÍKOVÁ, E. 2016. Analysis of the standards of seniors' living: Case study of the Czech Republic. *Knowledge for Market Use 2016: Our Interconnected and Divided World*, 405–409.
- ROBERTS, C. 2008. Developing future leaders: The role of reflection in the classroom. *Journal of Leadership Education*, 7(1), 116–130.
- ROKEACH, M. 1973. *The nature of human values*. New York: Free Press.
- ROSSIE, A. 2015. Moving beyond “Am I pretty or ugly?": Disciplining girls through YouTube feedback. *Journal of Media & Cultural Studies*, 29 (2), 230–240.
- SERRADOR, P., & PINTO, J. K. 2015. Does agile work? – A quantitative analysis of agile project success. *International Journal of Project Management*, 33(5), 1040–1051. doi:10.1016/j.ijproman.2015.01.006.
- STANTON, A., & STANTON, W. W. 2017. Using journaling to enhance learning and critical thinking in a retailing course. *Journal for Advancement of Marketing Education*, 25, 32–36.
- TSCHANNEN, D., KEENAN, G., AEBERSOLD, M., KOCAN, M. J., LUNDY, F., & AVERHART, V. 2011. Implications of nurse-physician relations: report of a successful intervention. . *Nursing Economics*, 29 (3), 127–135.
- TWENGE, J.M. 2010. A Review of the Empirical Evidence on Generational Differences in Work Attitudes. [Online]. In: *Journal of Business and Psychology*. June 2010, Volume 25, Issue 2:201–210. [Retrieved February 1, 2018, from <https://doi.org/10.1007/s10869-010-9165-6>].
- TWENGE, J. M., CAMPBELL, W. K., & FREEMAN, E. C. 2012. Generational differences in young adults' life goals, concern for others, and civic orientation: 1966 – 2009. *Journal of Personality and Social Psychology*, 102, 1045–1062.
- TWENGE, J.M., CAMPBELL, S.M., HOFFMAN, B.J., LANCE, Ch. E. 2010. Generational Differences in Work Values: Leisure and Extrinsic Values Increasing, Social and Intrinsic Values Decreasing. [Online]. In: *Journal of Management*. Vol. 36 No. 5, str. 1117 – 1142. [Retrieved February 20, 2018, from <http://journals.sagepub.com/doi/abs/10.1177/0149206309352246>].
- VALKENBURG, P., SCHOUTEN, A., & PETER, J. 2005. Adolescents' identity experiments on the internet. *New Media & Society*, 7, 383–402.
- WALTERS, C., CHARLES, J., & BINGHAM, S. 2017. Impact of short-term study abroad experiences on transformative learning: A comparison of programs at 6 weeks. *Journal of Transformative Education*, 15(2), 103–121.
- WONG, K. 2018. The case for using a paper planner. In *New York Times*. [Online]. [Retrieved February 25, 2018, from <https://www.nytimes.com/2018/01/04/smarter-living/paper-planner-guide.html>.] February 4th, 2018.
- WOOLFOLK, A. 2010. *Educational psychology*. Boston: Allyn & Bacon.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The role of institutions in influencing maternal and children under-five health care in Ghana

Martha Amoako¹ and Nahanga Verter²

*¹Department of Public and Social, Faculty of Social Science, Charles University in Prague,
Ovocný trh 3-5 Prague 1, 116 36, Czech Republic
e-mail: mamaoko24@gmail.com/10836079@fsv.cuni.cz*

*²Faculty of Regional and International Development, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: nahanga.verter@mendelu.cz*

Abstract

Strong pre-natal and post-natal healthcare are key indicators of the development level of every nation. This paper explores the role of institutional structures and how they influence the maternal and under-five (0-59month old) healthcare in Ghana. Drawing on multidisciplinary approach, this study made use of both qualitative – semi-structural interviews with officials from the GHS and selected hospitals in Ghana. The study shows that institutions play out to have some negative effect on maternal and child health care policy implementations but positively influence the health policy decision process and agenda settings. There is a need to put in place comprehensive policy and effective institutional system that will not only make decisions but monitor and assess policy intervention that aim at reducing maternal and under-five mortality in Ghana.

Keywords: Maternal and Under-five healthcare, health policy and institution, Ghana

JEL Code: I18, I130, I19

1. Introduction

Reproductive health still remains a key global health priority. The global community has seen some positive trends in maternal and child healthcare, particularly after the Millennium Development Goals era, however, this progress was not without challenges (UNICEF, 2017). Sub-Saharan Africa still lags behind in terms of effective healthcare systems and delivery. The region leads the maternal and child mortality globally (UNICEF, 2017; WHO, 2016; Kayode et al., 2016; Koduah et al., 2015). Even though the available indicators show positive trends in reproductive health, maternal and under-five healthcare, which has not improved in certain regions, still remain a top priority for global

health governance (Rudan et al., 2011). The Sustainable Development Goals – Goal 3: Ensure healthy lives and promote well being for all at all ages – further bring into the spotlight the importance of health as a key driver to development. It also seeks to end preventable deaths of newborn and under-five children by 2030 (UNICEF, 2017).

Over the past 20 years, Ghana has recorded impressive improvement in its health outcomes, making it one of the best performing countries according to the WHO. The West African country has made much progress in reducing maternal mortality and complications related to birth (UNICEF, 2017; WHO, 2016). The ratio reduced from 467 per 100,000 live births in 2000 to 319 per 100,000 in 2015. Also, the under-five mortality rate reduced from 100 deaths per 1,000 live births in 2000 to 61 deaths per 1,000 live births in 2015 and neonatal mortality rate (per 1000 live births) decreases from 36.4 in 2000 to 28 in 2015 (UNICEF, 2017; Bliss and Streifel, 2014; GHS, 2015).

However, evidence shows that most of these maternal and child deaths were caused by preventative diseases and cases, such as haemorrhage, pneumonia, diarrhea and malaria (UNICEF, 2017; GHS, 2015). Despite the positive progress, WHO (2016) noted that the rate of reduction of these mortalities have been very slow and the number of cases still remain high in Ghana. Koduah et al., (2015) argue that the positive progress towards maternal and under-five healthcare was due to the healthcare policies and organisational structures putting in place by the political administrative system, targeted specifically mothers and their babies.

No nation can achieve the goal of economic transformation without effective health institutions in place (AfDB, 2017; World Bank, 2015). An effective public health system underlies the basis of disease prevention and promotion of human development (Koduah et al., 2015; Bloom et al., 2003).

This study explores the roles of institutions, political administration and how they influence health care outcomes with respect to mothers and children under-five in Ghana, who are often the most vulnerable of the population. It identifies the impact and challenges of maternal and neonatal health policies and intervention programmes implemented, using three of the six building blocks of health system to evaluate the performance of the institutions: (1) finance, (2) human resource and (3) leadership. This leads to the main research questions: (1) to what extent has health care institution impacted the maternal and U5 health outcome? (2) Why do existing health-related policies established by the institutions not delivering on what they promise?

1.1. The Institutional structure of Ghana's health system

Institutions do not just ensure the successful run of the health sector, they also set the rules that guide the policies, actors and the interaction between them (Potucek et. al, 2016, Gilson, 2012, Knoepfel et al., 2011). The issue of institutions that govern the public health sector in Ghana is worth exploring if we need to improve maternal and under-five healthcare outcomes, particularly among pregnant women and children under five. Institutional role as the 'rule of the game' as well as the implementer of the healthcare policy that has the political support and commitment are likely to be a success (Gilson, 2012; Knoepfel et al., 2011). In other words, political-administrative arrangement and programmes are key in ensuring maternal and child health in Ghana.

The Ministry of Health (MoH), under Act 525 passed in 1996 and part of the 1992 Constitution of Ghana, has the mandate for the provision of general government policy direction, resource mobilization, monitoring and evaluation, as well as supporting the

minister administratively. Ghana Health Service (GHS) has a sole role of health care service delivery. However, public Teaching hospitals have equal responsibility of delivering healthcare services and serves as referral hospitals, but do not fall under the mandate of the GHS, which has a sole responsibility of regulating health care service delivery to the population. Simply put, they are autonomous. Through this reform other health sector bodies such as quasi-government institution, private medical services, and non-government providers; civil society; and community groups were also established.

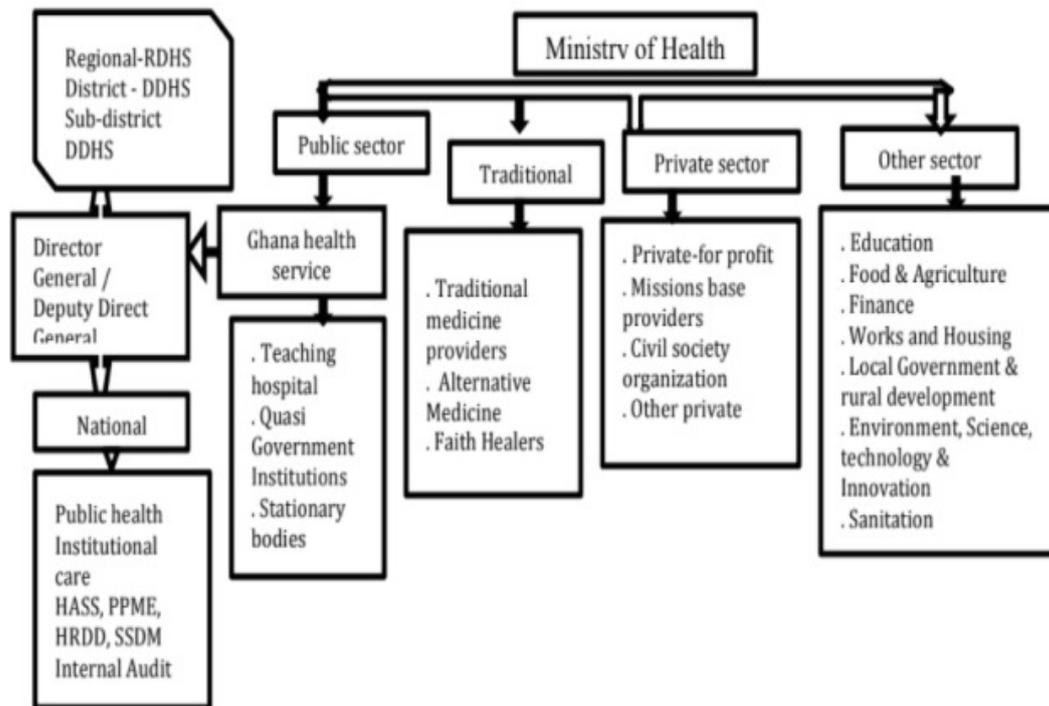


Figure 1: Provides the overview of the Organisation of Ghana's Health System

Source: Adapted from MoH, 2016

As shown in Figure 2, three factors combine to leverage an effective access to maternal and under-five health care, hence ensuring positive health outcomes: (1) Financial resource availability (2) leadership/management (political administrative arrangement) and (3) Healthcare services (human resource, & accessibility).

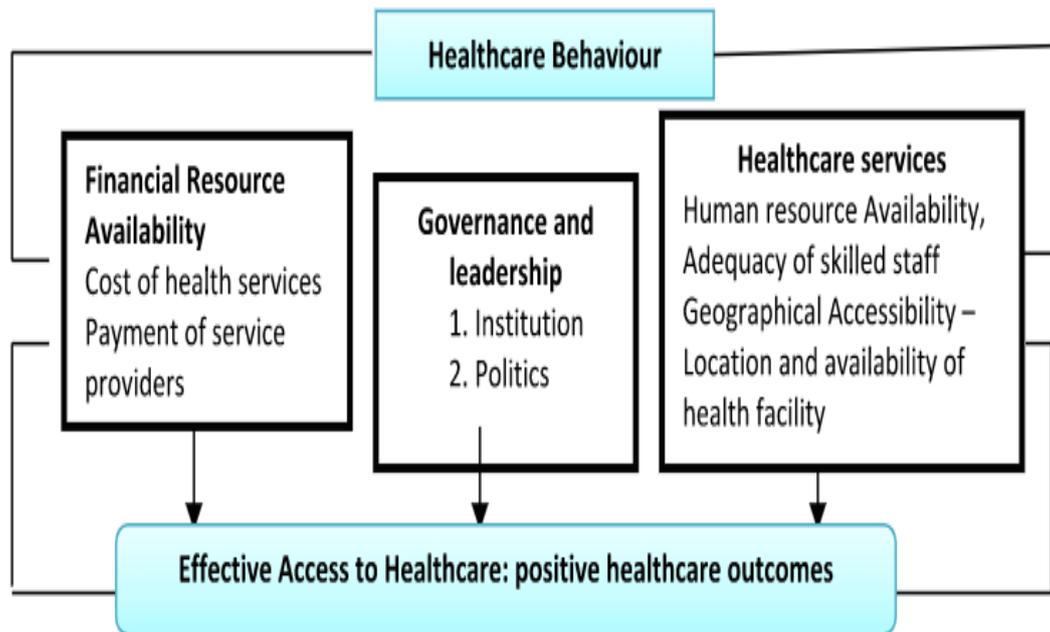


Figure 2: Conceptual Framework Functioning health care institutions
Source: Researchers own work, 2017

Financial resource availability is concerned with the ability of individuals to afford the costs of accessing health care. With geographical accessibility, health facilities should be located within the reach of users for easy access. The availability of skilled health professionals operating with a good health facility such as hospital beds and medication is critical to a functioning health institution. For example, doctor and nurse to patient ratio is an important indicator in measuring the quality of care users will get a particular health facility. Governance or leadership is the ability for a competent institutions (political-administrative system) to mobilized all the resources – Human, finance and physical and regulates the rules that will enhance a better service delivery to mothers and their babies (Knoepfel, 1995).

Kerber et al. (2007) posit that financial constraints, further distances, poor transport, and poor quality care in health facilities are barriers impeding the effective access to health care for users who need it most. Likewise Knoepfel et al. (2011) noted, well-structured and strong institutions (political-administrative arrangement) have the ability to implement interventions that will bring changes (outcome).

2. Methodology and Data

Drawing upon a multidisciplinary approach, this study made used of both qualitative and quantitative data – adopted the political economy framework, to examine how institutional mechanisms drive policy developments in Ghana's health care systems and the consequent impact on health outcomes among mothers and their babies. This allowed us to look into the dynamics layers institutional structure and the many actors involved in ensuring better maternal and under-five healthcare (DIFD, 2009).

The research undertook semi-structured interviews. The interviews were conducted with officials from the Ministry of Health, Ghana Health Services and selected hospitals in Ghana. A total number of 28 respondents were interviewed at the capital of Ghana. 8 key

respondents made up of current and former ministers of state (politicians), and senior health administrators at the Ghana's MoH and GHS and 20 public health professionals – made up of health workers (mostly doctors, nurses, midwives, pharmacist among others) at Children's hospital, Ridge Hospital, Military hospital and Korle-Bu and two maternity homes were interviewed in the country's capital city, Accra from May, 2017 to October, 2017. These hospitals were selected because they are among the biggest and 'well equipped' hospitals in Ghana and serve a lot of the populations in Accra, with Korle- bu been the biggest hospital in the whole of Ghana. Also, some of these hospitals form Ghana's biggest referral hospitals. The children hospital is the biggest and the only children hospital in Ghana, located in Accra – even though most of the hospitals in Ghana have children units (wards). Since most all the maternity hospitals in Ghana are owned by private entities (precisely 379 out of 389 maternity home are private (GHS, 2016)), we selected two most popular among them.

3. Results and discussion

3.1. Financial resource availability

The provision of healthcare services in Ghana is mainly driven by the government, with the private sector providing about 35% of healthcare services (MoH, 2015). The government's responsibility in the delivery of health services has an inextricable link to finance (AFDB, 2017; Bertone and Witter, 2015; Gilson et al., 2011; Knoepfel et al., 2011). The onset of the 21st century saw also a conscious effort by the government to provide financial resources to boost health care delivery to the people of Ghana – mostly mothers and their baby. The New Patriotic Party government, which came into power in 2000, put forward a number of health policies, with finance for maternal and child health as the bedrock (de-Graft and Koram, 2017; World Bank, 2015).

According to MoH, (2015), the action motivated by the need to avoid 'cash and carry' system: that involved individuals having to pay before accessing health care that resulted in high mortality of mother and their children. The National Health Insurance Scheme (NHIS) was formed in 2003, with the government in the position to subsidise the cost of health care (NHIA, 2015). This resulted in maternal (antenatal and postnatal) user fee exemption policy.

An effective maternal and child health care is dependent on finances that have been invested in health infrastructure (Kayode et al., 2016; Koduah et al., 2015). Since 2000, the percentage of gross domestic product (GDP) invested in health, has ranged from 3% (see: de-Graft and Koram, 2017). Of this, 50% comes from the annual budgetary allocation from the government, with the rest coming from donors. The WHO (2016) indicates that Ghana's percentage GDP allocated to health has been insufficient.

The financial architecture of Ghana's health care faces a critical challenge because of the overly dependence on donor funds (MOH, 2015). The report as part of the Health Sector Medium Term Development Plan (HSMTDP II) posits that 71% of expenditure on prevention and public healthcare is sourced from development partners: with 29% coming from government and the National Health Insurance Authority (NHIA).¹ The volatility and

¹The NHIA was established under the National Health Insurance Act 2003, Act 650 (amended under Act 852 in October 2012) to implement, operate and manage the National Health Insurance Scheme (NHIS).

uncertainty of donor funds in the health sector pushes health care service to the brink: reducing its ability to cater for key maternal and child health. Hence there is implementation deficit of the intervention since government are not able to reimbursed service providers on time.

3.2. Healthcare accessibility and service delivery institutions

In the past 20 years, Ghana has seen rapid expansion of the health services: in terms of health infrastructure. But the delivery of effective health care and the general functioning of maternal and child health care service is constrained (see de-Graft and Koram 2017). Kretchy et al. (2014) stress that even though there are modern sciences, a number of pregnant women still resort to traditional way of health care. However, MoH (2015) noted that there is a lack of clear role and coordination among the various health service institutions and workers, which affects maternal and U5 health negatively.

“Currently, I think it is not clear the delineation of job duties. I think the GHS is responsible for the implementation of the health care service while the MoH has the mandate to develop policy, which is clear but the other institutions which are even government institutions are working differently, though they are supposed by the law to be under GHS.... The truth is that the whole institutional roles are confusing..... When my friend’s wife was on labour, I passed by the Coco Clinic to take her to Korle Bu even though Cocoa Clinic is a hospital under government’ – Interview [A former Minister of State]

The account of the former Minister of State supports issues raised by de-Graft and Koram (2017) that currently Traditional Medicine Practitioners (TMP) and Orthodox Medicine Practitioners (OMP) are working separately and there is a mistrust between the OMP and the TMP due to ignorance as they lack information and education on the role of each practice. There is a lack of coordination between national institutions like Teaching hospitals, Food and Drug Authority, Ghana Standards Board and universities that are supposed to train them (MOH, 2015). The heterogeneous way of functioning of health institutions pose a risk to achieving effective maternal and child health care.

Also, the accessibility and delivery of health is linked to the distance of users to health facilities (Rudan et al., 2011). According to Houweling and Kunst (2010), one of the factors that affects under-five and maternal is the inequalities in the quality and accessibility of available health care in urban areas compared to rural areas. This is the case in Ghana. In 2008, under-five mortality (deaths per 1,000 live births) was 90% in rural places and 75% in urban areas of Ghana (MoH 2015: 10). Health care delivery improves in urban but deteriorates in the rural areas. The under-five mortality rate for the poorest quintile of society, who mostly resident in rural areas, was 102 deaths per 1,000 live births compared with just 60 per 1,000 live births for the wealthiest quintile. Rural areas, compared with urban areas, are at extreme disadvantage in accessing health care.

3.3. Human resources

Skilled health professionals are the key drivers of healthcare in every nation. Health professional has been noted to be an agent to measure the healthcare outcomes, as far as maternal and U5 health care is concerned (UNICEF, 2017; WHO, 2016; Bertone and Witter, 2015). By the benchmark set by WHO and UN, doctor population ratio 2.3/1000 for MDGs and 4.5/1000 for SDG’s population. From this benchmark, Ghana since 2006 till

today has not been able to meet this target (MoH, 2015; UNIEF, 2017). In 2012, for instance, the midwife ratio was 0.06/1000 births.

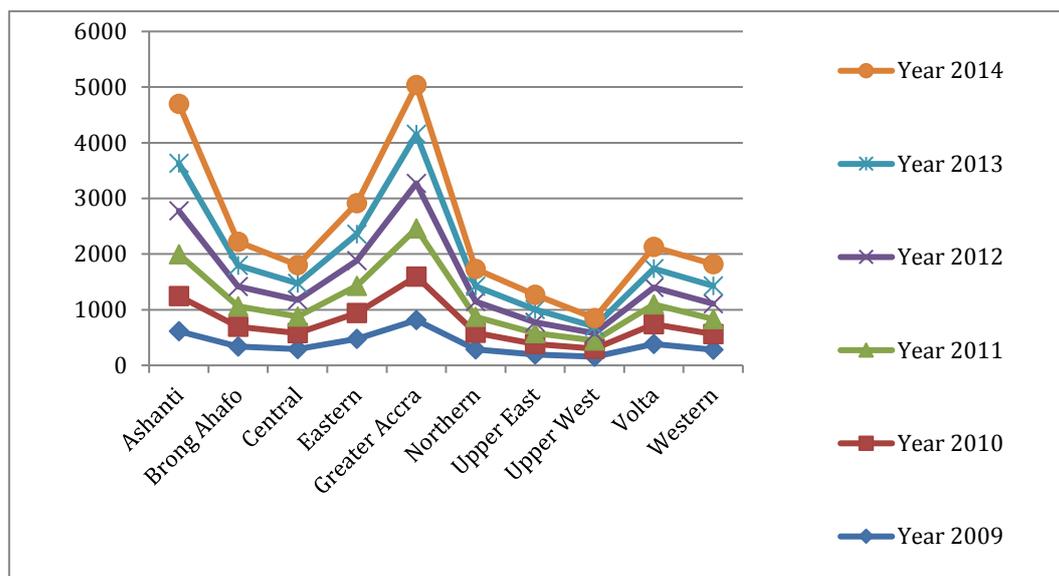


Figure 3: Trend of Midwives Distribution by Region, 2009–2014

Source: Data from GHS, 2015

Ghana has a high fertility rate 4.3%, which means that there is a probability of more women getting pregnant (WHO, 2016). De-Graft and Koram (2017) argue that the human resource component in the Ghana's health care, such as allied health professional, such as medical technicians and community health assistance in the private sector have minimal regulation on their operations. For instance, the traditional and complementary medicine practitioners also cater for prenatal care across the country, but their activation have limited monitoring and supervision by the state institution who are given the mandatory ensure the safety of women and babies. Bad attitude of some health workers also undermine healthcare. One of our interview respondents had this to say;

"Yes, health workers, mostly the nurses, has a bad attitude towards the pregnant women that come to the facilities. You know it's difficult to convince them to come, already they are stressed and when they finally come and we maltreat them, they go and never return. Meanwhile, when they come we are able to detect every form of complication that is associated with the pregnancy. So for me, I think the human resource particular we the nurse are the reason for maternal mortality". – [Midwife/ Registered Anesthetics, current working in Korle-Bu, August 2017]

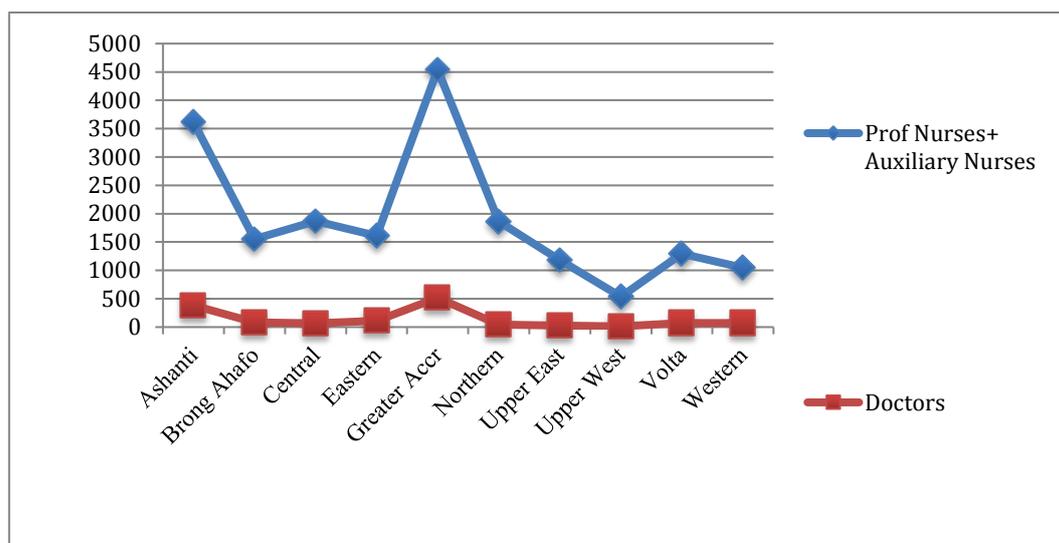


Figure 4: Trend of Doctors & Nurses Distribution by Region, 2016
Source: GDHS, 2016

Also, another problem with the health workforce is the issues of ‘parallel healthcare delivery’. Despite the abolished of the “parallel health care provision” in the 1960s by providing incentives for health workers who work in the public sector, the problem still persists. Osei-Akoto et al. (2017) argue the attitude was born in the colonial era, where public health workers (specialist) could work privately in addition with their formal job. Even though there is a deficiency in human resources for the public health sector, which provides services for more than 70% of the population due to its affordability, yet the health professionals in the public sector run their private health care business (de-Graft and Koram 2017). This affects health care service maternal and child healthcare delivery. A review by the Ghana Health Service reveals that there is a decrease in OPD use in the urban public healthcare where there is a higher density of health workers. While as there is high increase in OPD used in the private sector.

3.4. Discussion

Knoepfel et. al (2011) noted that public policy problem can be solved if there is a functional and effective state institutional system that have clear strategic and coherent policy framework. He argued that institutions ensure policy implementation in two way: (1) institutional rule on the behavior of actor, that impact on public policy as the ‘rule of the game’ and; (2) institutional policy as the facilitator of the realization of a policy (Knoepfel, 1995). In other words, institutions made the rules that govern the administration of the organisations as well as mobiles policy instruments and resources, see figure (2), needed in solving a public problem (Knoepfel et al., 2011; Knoepfel, 1995). Gilson (2012) in their research on health policy system, argued that improving healthcare there ought to be an effective institution that comprise of effective oversight, actors’ coalition building, transparency and accountability, regulations and good managerial practices, incentives and attention to systems design and information distribution.

The political economy of the reforms follows a complication of politics and policy process that shape, sustain reform outcome in a polity (de-Graft and Koram 2017; Gilson et al., 2011). Thus the political administration, interest actors and policy actor in Ghana imposed influence of the implementation of a particular intervention of maternal and

child health. The building blocks of a strong functioning health system, as defined by the WHO (see Figure 2), have not been aligned with best practices in Ghana (see for example: de-Graft and Koram, 2017).

3.4.1. Good governance' of health

“No better diagnosis is done on most of the pregnant women who are brought here on referral bases when they are in labour. Before they bring someone to this hospital then it’s an emergency case yet no better equipment is here to run the examination to see what the exact problem is. In case where the facility is available we work to save life...But again there too few workers or too many patients at a time. They end up dying.” – Interview [Medical Laboratory, Korle-Bu Teaching Hospital, August 2017].

The comments from Dr. Sampson summarises the core problems that are associated with expanding health, access to pregnant women and children under-five.

It is the role of the state (main health decision maker) to ensure that all its population gets equal access to quality and basic health care (WHO, 2016). The result shows the leadership, through the Ghana Health Service, the manifestation of the deficit in good governance, that is a key role for the realisation of a healthy population, particularly pregnant mothers and children under-five who are more prone to risks. Even though institutions are the main engine that drives the health systems, there is some deficiency in the demand and supply of the service provision, as lamented by the respondent. Example, from the result the availability of health facilities are skewed in favour of urban dwellers. It is much easier to get healthcare services such as antenatal care in the urban areas compared to rural. However, the policies and the instruments that work to bring particular health system outcomes are ensured by institutional roles and how they control things in the healthcare system (Gilson et al. 2012).

The lack of good health governance and functioning institutions has resulted not only mistrust of the health care system, but has also in an inequitable distribution of services and skilled health workforce (Bertone and Witter, 2015; Gilson et al., 2012; Koh and Nowinski, 2010). For example, as shown in the results and analyses, there is some disparity in the distribution of highly skilled health workforce between the capital of Ghana Accra and the Northern regions. This has increased the cost of healthcare for people in the rural areas since they have to travel long distances to access health care.

3.4.2. Institutional functioning

The role of the institution has a great consequence to the healthcare system. When there is institutional paralysis like in the case of Ghana, healthcare outcome of the studied group will be undermined. Since U5 is the most vulnerable population and account for 40% (GHS, draft report, 2015) of all the morality cases in Ghana, there is an urgent need for new institutional intervention implementation approach (Koduah et al., 2015).

Institutions are not trusted because of the political involvement. Some of our client instead of going to the health facilities to seek medical attention during pregnancy, stay home because they are not sure if it (maternal and child user fee exemption policy) will work or not. Some healthcare facilities take money from patient, or sometimes refused treatment because they (the providers) are not reimbursed by the state (NHIA) for the services they gave. Many women come here and complain everyday... [Accountant at NHIS, July, 2017].

3.4.3. The politics of healthcare: policy and national framework

It is important to indicate that investments in healthcare and in particular priority for maternal and child health are a political decision (UNIEF, 2017). Ghana has over the past decade investment less than 15% as stipulated in the Abuja Declaration (AFDB, 2017). This has limited the expansion of health facilities in rural areas, where most of the provision of medicines and medical technologies to assist pregnant women and children, who are more prone to diseases (UNIEF, 2017; AFDB, 2017).

The overly dependency on donor funding for health care investments has been a constraint to long term health policy planning: making Ghana's health care reactive than preventive (de-Graft Aikins and Koram, 2017). The influence of political administrative arrangement (PAA) – MOH, GHS, NHIA, MoF and donors support in Ghana has led to the exemption of fees for maternal healthcare for the past 40 years or so at the public healthcare facility, a key positive policy success through a political arrangement of the state. However, its implementation faces challenges (lack of reimbursement of fee and lower health financial allocation) that put mother and their babies in danger.

3.5. Conclusion: what way forward?

The political economy argued the importance of actors, institutions (rule of the game as well as policy implementer) and the resource that interplay to bring policy outcome. Operationally, from the discussion shows the power and influence the administrative structures (MoH, GHS, parliament) have in setting maternal and Under-five healthcare in the national policy agenda and reform changes. However, the implementations of the policy interventions were proven to be a challenge. The health system is a complex one that has other sectors involved (see figure 1). Dealing with maternal and under-five healthcare issues in the case of Ghana needs clear priority settings and common guidelines that place all the necessary institutions and actors in one basket at the conceptual level of the policy (Kretchy et al., 2014). Inappropriate attitude by some healthcare professional (mostly nurses and midwives) in the institutions were seen as a factor for some maternal and U5 death and complications. Using the definition described by Baum et al. (2007) in their study it was observed “public health practitioners may lack the experience, time, resources (including training), or even motivation to deliberately consider ethics in their daily work”. However ensuring the ethical code of any institution means getting to obey ‘what is right and doing it right’.

Institutions activities in Ghana are influenced by much of politics. According to Knoepfel et al. (2011) institutions set the ‘rules of the game’. From the discussion most health institutions are not trusted because of the high political involvement. This is why every sovereign state needs a strong, trusted and independent institutions devoid of political involvement to enhance healthcare development.

4. Conclusions

One area which is important but yet under studied is the role of institutions in Ghana's health care system– in this case the politico-administration system as well as institutional service providers who have the mandate to ensure and deliver effective healthcare for mothers and their babies. For these reasons, it is important to examine the institutional structure and how they influence the maternal and child health outcome. Drawing on

three of the WHO Framework – finance, human resource and leadership – we explore how institutions interplay to influence maternal and child policy implementation in Ghana.

In the case of maternal and under-five healthcare in Ghana, we argue that ineffective institutions lead to poor health outcomes. The roles of institutions in maternal and under-five healthcare were examined using some of the WHO blocks to evaluate the performance of health system and its consequences. Thus, the availability of finance, and healthcare services and leadership or management (Figure 2) explains a well-functioning institution for effective maternal and under-five healthcare delivery.

References

- AFRICA DEVELOPMENT BANK (AFDB). 2017. Speech from Akinwumi Adesina, President of the AFDB. [Online]. Available at: <http://bit.ly/2plThWt>. [Accessed: 20 February 2017].
- BAUM, N., GOLLUST, S.E., GOOLD, S. D., et. al. 2007. Looking ahead: addressing ethical challenges in public health practice. *J. Law Med. Ethics*, 35: 657–667.
- BERTONE, M. P. and WITTER, S. 2015. An exploration of the political economy dynamics shaping health worker incentives in three districts in Sierra Leone. *Social Science & Medicine*, 141: 56–63.
- BLISS, K. E. and STREIFEL, C. 2014. Improving maternal, neonatal, and child health in Ghana. Washington, DC: Center for Strategic and International Studies (CSIS).
- BLOOM, D. and CANNING, D. 2003. The health and poverty of nations: from theory to practice. *Journal of Human Development*, 4 (1): 47–71
- DEPARTMENT FOR INTERNATIONAL DEVELOPMENT (DFID). 2009. Political economy analysis topic guide of the governance and social development. [Online]. Available at: <http://bit.ly/2FB4Mkt>. [Accessed: 26 February 2017].
- DE-GRAFT, A. A and KORAM K. 2017. Health and healthcare in Ghana 1957–2017, In the economy of Ghana: sixty years after independence, (ed. Ernest Aryeetey and Ravi Kanbur). Oxford University Press.
- GILSON, L., 2012. Health policy and systems research: a methodology reader alliance for health policy and systems research. Geneva: World Health Organization Press.
- GILSON, L., HANSON, K., SHEIKH, K., et. al. 2011. Building the field of health policy and systems research: social science matters. *PLoS Med* 8(8): e1001079. doi:10.1371/journal.pmed.1001079
- GHANA HEALTH SERVICE (GHS). 2015. Draft of fact and figure report. Unpublished but in use at the national level. Accra, Ghana health Service
- Ghana Statistical Service (GSS). 2016. Ghana maternal health survey 2016. Accra. Calverton, MA: Ghana Health Service, and Macro International.
- HOUWELING, T. A. and KUNST, A. E. 2009. Socio-economic inequalities in childhood mortality in low-and middle-income countries: a review of the international evidence. *British Medical Bulletin*, 93(1): 7–26.

- KAYODE, G. A., GROBBEE, D. E., KODUAH, A., et.al. 2016. Temporal trends in childhood mortality in Ghana: impacts and challenges of health policies and programs. *Global health action*, 9(1): 31907
- KERBER, K. J., DE GRAFT-JOHNSON, J. E., BHUTTA, Z. A., et al., 2007. Continuum of care for maternal, newborn, and child health: from slogan to service delivery. *Lancet* 2007; 370: (9595), 1358–69
- KNOEPFEL, P., LARRUE, C., VARONE, F. et al., 2011. *Public policy analysis*: Policy Press, University of Bristol, UK Britain Library Publication data
- KNOEPFEL, P. 1995. New institutional arrangements for a new generation of environmental policy instruments: Intra – and interpolicy cooperation’, in B. dENTE ED Environmental policy in search of new instrument, European science Foundation, Dordrecht: Kluwer Academic Publisher, PP 197–233
- KODUAH, A., DIJK, H. and AGYEPONG, I. A. 2015. The role of policy actors and contextual factors in policy agenda setting and formulation: maternal fee exemption policies in Ghana over four and a half decades. *Health Research Policy and Systems*, 13:27.
- KOH, H. K. and NOWINSKI, J. M., 2010. Health equity and public health leadership. *American Journal of Public Health*, 100(Suppl. 1): S9-S11
- KRETCHY, I.A., OWUSU-DAAKU, F. and DANQUAH, F. 2014. Partner and determinants of the use of complementary and alternative medicine: a cross-section study of hypertensive patients in Ghana. *BMC Complementary and Alternative Medicine*, 14:44
- MINISTRY of HEALTH (MoH). 2015. Holistic assessment of the health sector programme of work 2014. Accra: MoH.
- NATIONAL HEALTH INSURANCE AUTHORITY (NHIA). 2015. Strategic Plan, 2015–2018. Accra: NHIA.
- OSEI-AKOTO, I. and ADAMBA, C. 2017. Health and healthcare in Ghana 1957–2017. In *the economy of Ghana: Sixty Years after Independence*, ed. Ernest Aryeetey and Ravi Kanbur. Oxford University Press. 365–384
- POTUCEK, M. and RUDOLFOVA, V. 2016. *Public policy*. Prague: Published in Karolinum Press.
- RUDAN, I., EL ARIFEEN, S., BHUTTA, Z. A., et. al. 2011. Setting research priorities to reduce global mortality from childhood pneumonia by 2015. *PLoS Medicine*, 8(9): e1001099.
- UNIEF. 2017. Monitoring the situation of children and women. [Online]. Available at: <http://bit.ly/2HmRIMz>. [Accessed: 20 February 2017].
- WORLD HEALTH ORGANISATION (WHO). 2016. Ghana health profile. [Online]. Available at: <http://www.who.int/countries/gha/en/>. [Accessed: 20 February 2017].
- WORLD BANK. 2015. *World development report: mind, society and behavior*. Washington, DC.: World Bank.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Factors Shaping the Choice of Purchasing Places on the Food Market. Intergenerational Comparison of Consumers Behaviors

Marek Angowski¹

¹Department of Management and Marketing, Faculty of Agrobioengineering, University of Life Sciences, Akademicka 13, 20-950 Lublin, Poland, e-mail:marek.angowski@up.lublin.pl

Abstract

The principal objective of the article is to present and assess the differences in food purchaser behaviours between two generation groups (X and Y), taking into particular account the factors behind the choice of purchasing location. The age of purchasers appears to strongly determine their behaviours related to purchasing food products. Younger and older purchaser groups differ from each other in terms of priorities, preferences, decision-making processes and communication styles. Purchasers representing various generations make different shopping preparations, review product portfolios and assess commercial facilities in various ways, and display diversified sets of factors shaping their ultimate choices. The analytical part is based on questionnaire surveys conducted in 2016, regarding the purchase behaviours which prevail on the food market. The analyses concern attitudes of the surveyed purchasers, connected with perceiving, assessing and selecting specific food purchasing places.

Keywords: consumer behavior, place of purchase, food product, X and Y generation

JEL Code: D12, M30

1. Introduction

In recent years, changes in consumer purchase behaviours have been observed on the Polish food market. Due to the evolution of consumer needs and preferences, along with the proliferating and more accessible sources of information about producers and sellers, and changes taking place in the trade sector, modern purchasers are exerting a growing impact on food supply chains. It is the consumer, through his or her concrete purchase decisions, that decides about the subject, place and time of the purchase.

Major changes have also concerned trade formats, with the expansion of chain and large-area stores, and the transformation of discount stores' image being the most evident. These processes have led to retail trade transitions, including changes to product portfolios, different modes of rendering trade services, as well as organisational and logistic changes. The retail trade transitions taking place on the food market have created new opportunities for consumers to choose their preferable sales centres, contributing to changes in consumer behaviours regarding the choice of both purchasing places and patterns (Angowski and Lipowski, 2014).

Due to the increasing market competition, coupled with qualitative transitions which have occurred in trade over the last several years, food distribution is now becoming a very significant domain where food producers compete with one another. Decisions regarding the choice of sales channels and distribution intensity levels appear crucial from the point of view of attracting end recipients, thus determining the actual development prospects of enterprises operating on the food market (Angowski and Kijek, 2017). With a view to increasing the efficiency of various distribution-related solutions employed by enterprises, including both current and planned, it is essential to learn about consumer preferences regarding the choice of purchasing places of various types of products. The knowledge of specific factors shaping consumer behaviours is now becoming a major advantage on the competitive food market and can provide a basis for gaining a real competitive edge.

2. The choice of purchasing places – theoretical aspects

Consumer behaviours can be defined as any actions and measures taken by consumers in order to acquire goods and services aimed at satisfying certain needs (in line with a subjective hierarchy of preferences), and various ways of using them. Consumer behaviours are also viewed as including actions connected with searching for, purchasing, using and evaluating goods and services which are likely to satisfy specific needs. The issues related to consumer behaviours include perceiving and attaching values to specific needs, in line with individual preference scales (creating a hierarchy of needs), using various modes of acquiring consumption means, selecting and combining the available sets of goods and services, as well as using or consuming them (Antonides and Fred Van Raai, 1999).

Food products constitute a specific product category, as they satisfy the most basic needs corresponding to the biological needs of our body. Their principal functions are connected with satisfying hunger and with improving the physical and mental well-being of consumers. However, these products are increasingly intended to satisfy psychological and sociocultural needs as well, which makes customer choices of food products more complex than ever before. Shopping for food is classified among routine activities which, along with product and purchaser characteristics, are also environmentally- and culturally-conditioned (Szwacka, 2007). The factors taken into account by consumers in their purchase processes have come to increasingly include the purchasing place.

The choice of the place of purchase-sales transactions forms a purchase process stage. The marketing literature defines the choice of the purchasing place as a process which begins with a store type selection problem, followed by searching for information and assessing alternative solutions (various options), to end with a final decision. This process is often equally important and complex as the choice of specific products or brands (Antonides and Fred Van Raai, 1999).

Due to the transitions which have occurred in recent years in the Polish trade sector, consumers now have more options to choose from as regards the place of food product purchase. These include marketplaces, green groceries, supermarkets, mega stores, discount stores, specialised stores, shopping malls and rapidly-developing online stores (Borusiak, 2016). A large number and variety of commercial facilities available to consumers, resulting from the increasing competition in the trade sector, may pose certain difficulties for purchasers in selecting the purchasing place of fast-moving consumer goods which include food products.

Consumer behaviours on the market result from an array of factors, both economic and non-economic, being connected with external circumstances and internal preferences of individual consumers. According to classic economic theories, major determinants of consumer behaviours comprise factors which enable the maximisation of usefulness based on the resources at hand. In turn, modern concepts of purchaser behaviours, except for the price criterion, point to social, psychological, technological and socio-cultural conditions, as well as marketing activities connected with shaping purchaser attitudes, such as situational impacts, perception processes, learning and memorisation styles, motivations and emotions (Parment, 2013).

Among social factors, elements connected with choosing the purchasing place are emphasised. These issues are also taken into consideration as regards leisure activities of modern consumers, their growing mobility and easy access to information, which can be viewed as technological factors. Among cultural factors, the process of consolidating consumption pattern, the significance of global brands, and similar ways of satisfying specific needs by consumers from various cultural areas are increasingly being emphasised. Finally, among personal factors, the level of income or consumer's age might prove significant in selecting the purchasing place. It is additionally stressed that the types of products selected by purchasers, their quantity and purchasing place depend on purchasers' perceptions, the awareness of their own identity, the socio-cultural background, age, family cycles, attitudes, beliefs, values, motivations, personalities, social classes and many other factors, both internal and external (Shavit, Jiang and Cho, 2016).

Marketing factors correspond to various marketing activities undertaken by trade centres, the principal objective of which is to improve their competitive power with respect to other sellers operating on the market, i.e. to facilitate the purchase process, and increase the quantity and frequency of purchases (e.g. loyalty programmes, price discounts, advertising leaflets, media exposure, etc.) (Domańska and Angowski, 2016). Some authors claim that the choice of a given purchase channel is influenced by supply-related factors, including mainly the spatial and temporal accessibility of various purchasing places and products in certain locations. Literature sources also emphasise that the key factors contributing to the choice between various types of stores comprise the price level, range of products and distance (location) from the sales centre. In terms of the relationship character and control levels, the factors influencing purchasing place choices can be divided as follows: (Bartosik-Purgat, 2014):

- store-specific attributes (products – their prices, quality, variety, etc.; store appearance, internal communication, location, advertising and other sales promotion tools, post-sales services offered by the store, and store reputation);
- customer-specific factors (customers' age, personality, purchase frequency and size, experience, attitudes and income);
- factors related to the ongoing trade sector conditions (retail trade structure).

It appears essential, both for trade and production enterprises, to learn about the process of the transaction place selection by consumers and the contributing factors. In

the case of trade companies, the knowledge of such issues makes it possible to better adjust their commercial portfolios to the preferences and expectations of prospective purchasers, while production enterprises can benefit from a more efficient selection of distribution channels (Domańska and Angowski, 2016).

Demographic factors constitute significant determinants of consumer behaviours, which are most frequently used in segmentation procedures. The most important ones include age which is connected with differing needs of purchasers and the ways to satisfy them. This, in turn, determines consumers' expenditure patterns, consumption styles and the scope of consumer goods that are acquired. The actual consumption structure is also age-dependent (Valkeneers and Vanhoomissen, 2012). Almost all theories regarding purchaser behaviours on the market acknowledge, whether more or less directly, that age, along with age-related experience, life events and circumstances, has influence on consumer awareness which translates itself into specific consumer behaviours (Bakewell and Mitchel, 2003). Given the above, the proper identification of the factors influencing consumer behaviours in various age groups, and the understanding of the typical features of members of various age categories, appear indispensable to developing effective market strategies addressed to specific segments.

The aim of this publication is to identify, analyse and assess behaviours of the surveyed purchasers (by generation group X and Y) with respect to choosing the purchasing place of selected food products (meat and meat products, vegetables and fruit, dairy products, and cereal products).

The generation theory is a commonly recognised theory which describes and analyses differences between "generational attitudes." This is a theory of social history, describing and explaining changes in public attitudes over time. It was first described by Neil Howe and William Strauss in "Generations" (1991), and further developed in "The Fourth Turning" in 1997. The theory assumes that the historic period in which a person is born shapes his or her early life and gives rise to a certain philosophy of life, which then impacts on his or her way of perceiving and interacting with the world. This philosophy of life and the value system are, to a large extent, dependent on the circumstances in which the person develops. This implies that when people grow up in different historic periods, we may expect that their value systems will differ (Dhanapal, Deeparechigi and Subramaniam, 2015; McGarry Wolf, Carpenter and Qenani-Perela, 2005). This theory is also widely applied in behaviour studies regarding various generations of consumers, being practically employed in market analyses, market segmentation and the ability to formulate marketing strategies depending on purchasers' age. In general, the generation theory divides consumers into four generation groups, i.e. BB (Baby Boomers), X, Y and Z. This division is principally meant to classify consumers into groups of people sharing similar life experience, knowledge and motives, and living in similar circumstances. Therefore, the age ranges of individual generations correspond to socio-cultural and economic changes, scientific and technological development, as well as political events occurring throughout the years (Lissitsa and Kol, 2016; Valkeneers and Vanhoomissen, 2012). However, the literature fails to provide any clear-cut criteria determining the age (year of birth) of people belonging to individual generation groups. Moreover, the time frame adopted by researchers depends on the socio-economic conditions in a given country or region (Gołąb-Andrzejczak, 2016). Most authors employ the following generation division: generation BB comprises people born between 1945 and 1964; generation X are people born between 1965 and 1980; generation Y refers to the early 1980s and the beginning of the new century; and the youngest generation Z are people born in the present millennium

Both groups of consumers are very attractive from a cognitive point of view, both for researchers and marketing practitioners. Generation X are relatively well-educated consumers who are already working, have already achieved professional success, have stable incomes, are responsible, have family and children, rather critically perceive the world. It can be said that they are today the main marketing target of enterprises. Generation Y is the future of the market, they are young people who graduate or just finished their studies, are looking for or starting work, sometimes live with their parents and depend on them, they are people who search for their place in the adult world and have very high expectations for it (Gołąb-Andrzejczak, 2016). Both groups know well and are able to use the Internet, but generation Y definitely uses the ICT better. The X as consumers are pragmatic, rather traditionalists, like direct contacts, loyal to favorite products and brands, decisions are taken very carefully on the basis of full knowledge, they are more sceptical and have no confidence in marketing activities. Generation Y means consumers who are more open and courageous, they like to experiment, they are looking for new products, they quickly make decisions and often buy impulsively, they look for lower purchase and service costs (Lissitsa and Kol, 2016).

3. Methodology and Data

This study reflects an attempt at solving the following research queries connected with purchaser behaviours in two generation groups X and Y:

- What criteria are purchasers driven by when choosing a commercial facility?,
- Where do purchasers buy selected food products?,
- What is the frequency of purchasing selected food products by younger purchasers?

Table 1: Sample characteristic by X and Y generation

| Specification | | X (N=238) | Y (N=345) |
|--|---------------|-----------|-----------|
| Total | | 44.24% | 64.13% |
| Gender | women | 67.23% | 70.72% |
| | men | 32.77% | 29.28% |
| Place of residence (the number of residents – in thous.) | to 15 | 36.13% | 57.39% |
| | from 16 to 50 | 44.96% | 20.29% |
| | over 50 | 18.91% | 22.32% |
| | to 180 | 15.13% | 23.77% |
| Net income (per one family member) in EUR | 181 to 240 | 21.01% | 29.57% |
| | 241 to 360 | 39.50% | 32.46% |
| | over 360 | 24.37% | 14.20% |

Source: own calculation

The empirical part was based on the results of questionnaire surveys conducted in 2016 on a group of 739 food purchasers. The surveys comprised two stages. In the first stage interviews were conducted with academic students, while in the second stage the survey sample was supplemented by older respondents. In the sample selection process, the purposive sampling method was used (focusing on food purchasers), whereas CAWI, supported by PAPI, was the principal data collection method. The survey questionnaire was drawn up in electronic format and linked to a SurveyMonkey database. The survey

questionnaire comprised 18 problem questions regarding purchaser behaviours and attitudes on the food market, including the factors shaping the product choice process, purchased quantities, purchasing mode and place, along with respondent characteristics questions. The subject-matter of the survey covered four product groups available on the food market, i.e. meat and meat products, fruit and vegetables, dairy products and cereal products. The analyses included in the publication refer to selected responses provided by the surveyed members of two groups distinguished by age, i.e. generation X and generation Y (N=583). For publication purposes, it was assumed that generation X would comprise people born between 1965 and 1981, and generation Y people born between 1981 and 1999. The characteristics of the surveyed sample are shown in Table 1.

4. Results

The choice of commercial facilities in which food products are purchased depends on numerous factors, which finds confirmation in the questionnaire surveys conducted. Based on these surveys, 19 factors significant for consumers choosing food purchasing places were identified and selected. The relevant factors determining such purchase decisions in the two age groups (generations X and Y) are shown in Figure 1.

In the case of all analysed food groups (irrespective of age), the respondents attached most attention, while choosing their purchasing places, to wide and diversified product ranges, and to the availability of their preferred products. Prices and store location also proved significant. The presence of advertising leaflets in their mailboxes, access to foreign and eco-friendly products, and service quality were considered the least important in selecting the purchasing place. It also appears interesting that a relatively small number of the surveyed purchasers (in each product group) declared that they purchased food products in random places. A conclusion can therefore be drawn that the choice of a food purchasing place is a decision of major importance, from the point of view of individual consumers, irrespective of their generation groups, and the factors taken into account are fairly diversified. The availability of fit and eco-friendly products was considered of little significance to respondents, which seems rather unexpected, given the new eco-consumption trend which has been recently observed in consumer behaviours on the market.

When analysing the significance of individual factors determining the choice of the purchasing place by various generation groups, it can be noted that the most marked differences concern the importance attached to the availability of traditional products (meat, dairy and cereal products), Polish/domestic products (meat, dairy and cereal products), eco-friendly products (meat and cereal products), regional products (dairy and cereal products), foreign products (fruit and vegetable products), as well as service quality (fruit and vegetable products, and cereal products) and store opening hours (fruit and vegetable products). This is confirmed by statistical analyses pointing to statistically significant differences in assessing various criteria by generations X and Y (t-test). For generation Y, as compared to generation X, the following factors prove more important: a wide product range and availability of preferred products (meat products), price (all product groups), store location (meat, fruit and vegetable, and dairy products), opinions expressed by other consumers (meat, fruit and vegetable, and dairy products), availability of foreign products (fruit and vegetable products, and cereal products), service quality (fruit and vegetable products, and dairy products), store opening hours (fruit and vegetable products), and sales promotions (meat products). For the surveyed purchasers representing generation X the following factors were essential: the availability of traditional products

(all product groups), eco-friendly products (meat, fruit and vegetable, and cereal products), regional products (fruit and vegetable, cereal and dairy products), as well as Polish/domestic (cereal and dairy products). In general, purchasers of dairy and cereal products display the largest differences in assessing individual store choice criteria (between generations X and Y), whereas the smallest differences occur in the meat products group. In addition, a statistical analysis was carried out using the U-Mann-Whitney test, which confirmed the statistical significant difference between observed groups (generation X and Y) on the base of the assessment of the significance of factors determining the choice of the store. These were the following criteria: a wide choice of products (meat products), availability of favorite products (meat and cereals products), availability of Polish products (dairy and cereals products), availability of Foreign products (vegetable, fruits and cereals products), availability of traditional products (meat, (vegetable, fruits and cereals products), service quality (vegetable, fruits and dairy products), working hours of store (vegetable and fruits products), opinion of other customers (meat, dairy and cereals products) and buying in the store selected by habit (meat, vegetable, fruits. and cereals products).

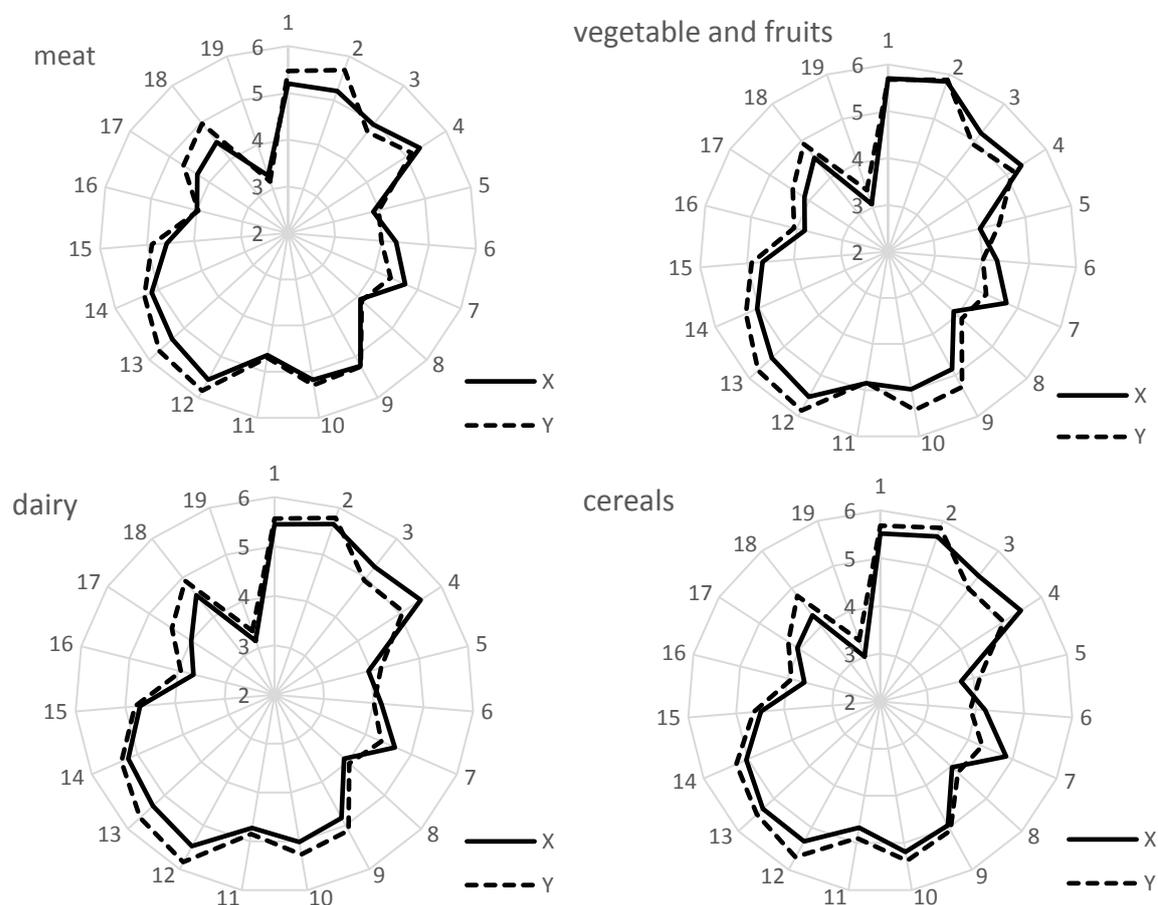


Figure 1: Criteria for the selection of places to buy food in the buyers opinion by X and Y generation
 1 – a wide choice of products, 2 – availability of favorite products, 3 – availability of regional products, 4 – availability of Polish products, 5 – availability of Foreign products, 6 – availability of bio-products, 7 – availability of traditional products, 8 – availability of organic products, 9 – service quality, 10 – working hours of store, 11 – design shop, 12 – product prices, 13 – store location, 14 – credit cards accepted, 15 – promotion activities (special offers, loyalty cards), 16 – promotional newsletters in inbox, 17 – opinion of other customers, 18 -buying in the store selected by habit, 19 – buying in random places
 Source: own calculation

Summing up, it can be inferred that younger purchasers (generation Y), having lower income at their disposal, tend to be savings-oriented, buying less expensive products and seeking to benefit from sales promotions. They also opt for convenient solutions, attaching much attention to store opening hours, location and a wide range of products available in one place. Finally, they are more willing to purchase foreign products. On the other hand, generation Y purchasers are more aware of both product quality and origin. As they opt for stores selling Polish/domestic, regional or traditional products, their behaviour appears consistent with the recent trend of consumer ethnocentrism.

The surveys have revealed that consumers (irrespective of age) perceive discount stores as the most popular places of purchasing all types of food products (Table 2).

Table 2: Frequency of purchase at selected points sale by X and Y generation

| | meat | | vegetables and fruits | | dairy | | cereals | |
|--------------------------------|------------------|------|--------------------------|------|-------|------|---------|------|
| | X | Y | X | Y | X | Y | X | Y |
| | small local shop | 3.47 | 3.05 | 3.72 | 3.46 | 4.04 | 3.40 | 4.32 |
| supermarket | 3.32 | 3.71 | 3.41 | 3.78 | 3.64 | 3.59 | 3.46 | 3.47 |
| discount store | 3.56 | 3.89 | 3.99 | 4.40 | 3.92 | 4.23 | 3.76 | 3.97 |
| hypermarket | 2.80 | 3.11 | 3.15 | 3.45 | 3.08 | 3.35 | 2.89 | 3.12 |
| delicatessen | 2.47 | 2.29 | 2.44 | 2.38 | 2.52 | 2.43 | 2.56 | 2.28 |
| market, bazaar | 2.68 | 2.24 | 3.91 | 3.75 | 2.32 | 1.97 | 2.67 | 2.17 |
| specialized stores | 3.60 | 3.41 | 3.66 | 3.36 | 2.93 | 2.28 | 3.81 | 3.36 |
| shops with organic food | 2.30 | 1.71 | 2.28 | 2.02 | 2.13 | 1.79 | 2.39 | 1.85 |
| health food stores | 2.27 | 1.72 | 2.17 | 1.97 | 2.12 | 1.72 | 2.21 | 1.82 |
| shops with traditional food | 2.28 | 1.87 | 2.21 | 1.97 | 2.30 | 1.74 | 2.13 | 1.85 |
| directly from pro- ducer | 2.18 | 1.91 | 2.40 | 2.20 | 2.38 | 1.85 | 2.14 | 2.01 |

Evaluated in a 7-point scale, where 1 means “do not buy”, and 7 – “I buy very often”

Source: own calculation

This may result from the fact that, in recent years, discount stores have managed to effectively change their image, and are no longer associated merely with low prices, but also with the adequate quality of products. The surveyed purchasers were also relatively eager to shop in supermarkets, small local stores and mega stores. Notably, meat, vegetables and fruit, as well as bread are often purchased in specialised stores, i.e. butcher’s, green groceries or bakeries, whereas in the remaining product groups the interest in these types of stores was definitely lower.

When analysing the frequency of purchases in various commercial facilities, taking into account purchaser behaviours typical of different age groups, a clear relationship with how they assess the importance of individual factors determining the purchasing place choice can be observed. Savings- and comfort-driven purchasers representing generation Y usually shop in discount stores, supermarkets and mega stores, whereas older purchasers from group X, searching for regional, traditional or high-quality products, tend to choose specialised stores, and facilities selling healthy, eco-friendly and traditional food. Interestingly, purchasers X, as compared to purchasers Y, are more likely to buy

meat, dairy and cereal products in small local food stores. This partly confirms the identified tendencies towards ethnocentric behaviours which are reflected, inter alia, in supporting national and regional products, as well as domestic and local entrepreneurs.

5. Discussion and Conclusions

Based on the research and analyzes carried out, it can be seen that consumers from generations X and Y differ in assessment of the validity of the criteria for choosing the place of purchase of food products. However, statistical analyzes show that these differences were not large. Analyzing the respondents' answers, it can be noticed that the purchasers of the X generation considerably more often than Y, in their decisions related to the place of purchase were guided by the quality of products, the presence of bio, national, traditional and regional products. This may indicate greater consumer awareness and ethnocentrism. However, the surveyed buyers of the Y generation paid more attention to the cost and convenience of purchase, i.e. the level of prices, location and working hours, larger assortment as well as the promotion and presence of foreign products. Analyzing the differences in the selection of the place of purchase, generation X, relatively more often than Y, purchases food in small local shops and specialty stores, and the Y generation more often buys in discount stores and hypermarkets. The respondents in the group of purchasers of meat, fruit and vegetable products were the most diverse in the assessment of the selection criteria for the shops due to their age, and the least, the buyer of cereal and dairy products.

The research and analysis results published in the publication may complement existing research on the behavior of buyers on the food market in terms of factors shaping the choice of place of purchase by consumers of different ages, and may also be used as starting material for the development of future, more in-depth studies and analyzes concerning differences in consumer purchasing behavior, taking into account the age criterion.

References

- ANGOWSKI, M. and KIJEK, T. 2017. Segmentacja nabywców na podstawie analizy czynników wpływających na wybór produktów żywnościowych. *Humanities and Social Sciences* 3(22): 9–20.
- ANGOWSKI, M. and LIPOWSKI, M. 2014. Przewagi konkurencyjne sklepów dyskontowych w ocenach nabywców artykułów żywnościowych. *Marketing i Rynek* 8: 797–803.
- ANTONIDES, G. and FRED VAN RAALJ W. 1999. *Consumer Behaviour: A European Perspective*. Chichester: John Wiley & Sons.
- BAKEWELL, C. and MITCHEL, V. 2003. Generation Y female consumer decision making styles. *International Journal of Retail & Distribution Management* 31(3): 95–106.
- BARTOSIK-PURGAT, M. 2014. Zwyczaje zakupowe młodych Europejczyków – wybór sklepu i jego determinanty. *Marketing i Rynek* 4: 22–28.
- BORUSIAK, B. 2016. Ewolucja formatów handle detalicznego. *Problemy Zarządzania*. 14 (1): 71–88.

- DHANAPAL, S., DEEPARECHIGI V. and SUBRAMANIAM. 2015. Perception on the challenges of online purchasing: a study from “baby boomers”, generation “X” and generation “Y” point of views. *Contaduría y Administración* 60 (S1): 107–132
- DOMAŃSKA, K. and ANGOWSKI, M. 2016. Consumer attitudes towards products of regional manufacturers and their impact on the purchasing behavior on the market for dairy products. *Journal of Agribusiness and Rural Development* 4 (46): 739–746.
- GOŁĄB-ANDRZEJCZAK, E. 2016. Konsumenci pokolenia Y – nowe wyzwania dla komunikacji marketingowej. *Handel Wewnętrzny* 2 (361): 140–151.
- HOWE, N. AND STRAUSS, W. 1991. *Generations: The History of America’s Future, 1584 to 2069*. New York: William Morrow & Company.
- HOWE, N. and STRAUSS, W. 1997. *The Fourth Turning: What the Cycles of History Tell Us About America’s Next Rendezvous with Destiny*. New York: Broadway Books.
- LISSITSA, S. and KOL, O. 2016. Generation X vs. Generation Y – A decade of online shopping. *Journal of Retailing and Consumer Services* 31: 314–312.
- MCGARRY WOLF, M., CARPENTER, S. and QENANI-PERELA E. 2005. A comparison of X, Y and Boomer generation wine consumers in California. *Journal of Food Distribution Research* 36(1): 186–191.
- PARMENT, A. 2013. Generation Y vs. Baby Boomers: Shopping behaviour, buyer involvement and implications for retailing. *Journal of Retailing and Consumer Services* 20: 189–199.
- SHAVIT, S., JIANG, D. and CHO, H. 2016. Stratification and segmentation: Social class in consumer behavior. *Journal of Consumer Psychology* 26 (4): 583–593.
- SZWACKA, J. 2007. Kierunki zmian na rynku żywnościowym w Polsce. *Zeszyty Naukowe SGGW. Ekonomika i Organizacja Gospodarki Żywnościowej* 62: 81–95.
- VALKENEERS, G. and VANHOOMISSEN, T. 2012. Generation living their own life: The differences in lifestyle and consumer behavior between busters and baby boomers. *Journal of Customer Behaviour* 11 (1): 53–68.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Knowledge Intensive Business Services and the Entrepreneurial Dynamics. An EU Analysis

Daniel Badulescu¹, Alina Badulescu² and Sebastian Sipos-Gug³

¹*Department of Economics and Business, Faculty of Economics Sciences, University of Oradea, Romania, Universitatii st. 1, 410087, Oradea, Romania, e-mail: dbadulescu@uoradea.ro*

²*Department of Economics and Business, Faculty of Economics Sciences, University of Oradea, Romania, Universitatii st. 1, 410087, Oradea, Romania, e-mail: abadulescu@uoradea.ro*

³*Department of Economics and Business, Faculty of Economics Sciences, University of Oradea, Romania, Universitatii st. 1, 410087, Oradea, Romania, e-mail: ssiposgug@yahoo.com*

Abstract

The decisive role of knowledge-based economy and the importance of the ventures fostering the use of innovation and incorporating knowledge, high technology and creativity are nowadays worldwide recognised, even more considering that EU is in a permanent search of innovation as source of competitiveness. Within this context, in the present paper we aim at investigating the complex relation between the knowledge intensive business services (KIBS) and the imperative of fostering the economic activity, both of the entrepreneurial dynamics and their macroeconomic effects. The analysis performed on EU level leads to interesting results, revealing a complex but contradictory relation between KIBS and economic activity measured by the main indicators of entrepreneurial density and macroeconomic dynamics.

Keywords: knowledge-based services, entrepreneurial activity, macroeconomic indicators, European Union

JEL Code: L84, L86, O33

1. Introduction

The economic transformations of the last decades, both in nature and spatial distribution, are obvious. Fueled by major drivers of change, i.e. globalization and the telecommunications revolution (Audretsch, 1998), the national economies have witnessed a new development paradigm, based on innovation and constant adaptation (Hatos et al., 2015).

The role of innovation and knowledge for the economic growth is not a genuine research theme, but only recently these concepts were associated with the services sector and not only with manufacturing sector, in particular with high-tech industries. The perception on services shifted from considering them as simple adapters of innovation stemming from the manufacturing sector, to acting as important players in the innovation process, not only as individual innovating actors, but also by spurring on the innovativeness of their clients (Muller and Doloreux, 2007; European Commission, 2012).

In this context of innovativeness and development, the research interest focuses on a specific part of the service sector, the so-called knowledge-intensive services (KIS) and specifically on their subfield named knowledge-intensive business services (KIBS), i.e. the sector including companies providing knowledge-intensive (goods and) services for other companies. Defining KIBS as services where ‘knowledge is the main production factor and the good they offer’ (European Commission, 2012, p. 6), the researchers consider that their approach can enrich with different features of KIBS, such as: in-depth interaction between supplier and user (Muller and Zenker, 2001), problem solver, adjusting their capability to customers’ needs, capable to “generate, facilitate or adopt technological, organisational, social or other kinds of innovation” (Merino and Rubalcaba, 2013, p. 218). Finally, other researchers, approaching the role of “business angels” in boosting business, link the KIBS with the presence of so-called “knowledge angels”, i.e. individual persons whose motivations, talents and specific activities play a specific role within the innovation processes of these firms, “a creative knowledge broker responsible for most of KIBS’ efficiency in the global innovation process” (Muller et al., 2015, p. 2), acting as “innovation catalysts” within KIBS (European Commission, 2012, p. 7).

This paper investigates the role of knowledge-based business services (KIBS) in fostering the entrepreneurial activity and macroeconomic results at EU level. It is organised as follows: in the first part we review the relevant literature; in the second part we present the research methodology, including data sources, the indicators used and the research hypotheses; in the third part we present and discuss the relationship between KIBS and the dynamics of the entrepreneurial activity, including the risk of firms discontinuing. The last part presents the findings and conclusions on the complex relationships between these phenomena, as they result from our researches.

2. Literature Review

New venture creation as a process based on a novel business idea, an innovative product or an experiment that allows (following a visionary leader) to overcome the competitors, is a central element of the entrepreneurship theories (Casson, 2005; Shane and Venkataraman, 2000). However, Autio and Acs (2007) or Wennberg (2010, p. 2) avoid to confer to all forms of entrepreneurship (particularly to self-employment and less innovative entrepreneurship) the feature of innovation and knowledge. They focus on “high-potential entrepreneurship” which really matters for economic development. Younger knowledge and innovation-based firms contribute to the economic growth because they are in entrepreneurial alert and oriented (Lumpkin and Dess, 1996), they do not value excessive internal procedures and routines and take quick decisions to adapt to a changing business environment. Moreover, Rosenbusch (2011) consider that the relation between innovativeness and business performance has stronger result in small young firms. Wennberg, citing Agarwal et al (2010), considers that the essential link between entrepreneurship

(as an opportunity for knowledge spillover but also as new venture creation) and intensive knowledge is that “knowledge from technological change can be seen as a non-rival and partially excludable good” (Wennberg, 2010, p. 22). The newly created firms and the established firms that have made the shift from a manufacturing to a service intensive economy were the actors of the explosive growth of knowledge-intensive business services (Wennberg, 2010).

Moreover, Malecki (2007), Varis et al (2014, p. 102) consider that ignoring the contribution of entrepreneurship and new business formation in the new knowledge-based industries will affect the competitiveness of the economies of the world, regardless of their current level of development. EU policies and strategies insist on knowledge-based economy, by fostering entrepreneurship and by the commercialization of new technologies (Varis et al., 2014, p. 102) while Wong et al. (2005) consider that high-potential innovative start-ups contribute positively to economic growth to an extent even greater than the undifferentiated support of the new firms creation. However, recent researches show that it is difficult to endorse a direct relationship between KIBS sector incentives, the creation of new ventures and the economic growth revival in some areas. In their study on the recent development of the knowledge-based industries in a relatively small and remote Finnish region, Varis et al (2014, p. 119) found out that “even if the basic elements for industrial renewal and diversification – firms, basic and applied research, financial institutions, commercialization services etc. – seem to be in place”, the development of knowledge-based industries or the regional economy, as a whole, is not impressive. Researchers hypothesize that in the new era of technology, communications and information, the location of KIBS companies cannot have significant effects on local low tech industries, as long as their functional relationships are not spatial dependent or motivated by them. At the same time, they question the local, national or EU level policies that consume high amounts of funds on impossible targets, counting on a hypothetical multiplier effect of KIBS in the less developed regions.

In another research aiming at finding characteristics of young creative companies that enhance their innovation and the use of knowledge-intensive business services (KIBS), Mas-Tur and Ribeiro Soriano (2014) investigate if the government should consider this type of company as target for their innovation policies (through subsidies, promotion of infrastructure and knowledge transfer etc.). The reason of public support is that KIBS could foster unspecific entrepreneurship, could act as enablers and sources of innovation for companies from different sectors, irrespective of the fact that KIBS enhance innovation mostly in companies that are, by definition, innovative (Audretsch, 2012; Mas-Verdu et al., 2011). Hyytinen et al. (2015) consider that public policies to support innovative start-ups in high-tech field or KIBS should not exaggerate with the argument that innovating ventures are more likely to survive than other start-ups and create stable jobs (Hyytinen et al., 2015, p. 565). The authors consider (without denying other reasons of supporting innovation) that innovativeness should not be seen by entrepreneur, or by advocates of public supportive policies, as a form of insurance against failure in the start-up phase. On the other hand, the access to knowledge can be a chance for ambitious and experienced entrepreneurs from different sectors (not necessarily high knowledge).

The research on the relationship between innovation, intensive knowledge and entrepreneurship does not cease at the stage of creating new companies, but try also to make sense regarding their closure. Thus, discontinuing a business does not necessarily indicate that all fruits of its innovative efforts are wasted (Hyytinen et al., 2015). KIBS firms could generate lasting local knowledge spillovers, regardless of whether these companies have had continued success, or they are still running. The knowledge spillover theory of

entrepreneurship (Acs et al., 2009) asserts that new knowledge stimulate venture creation and new market entry. Moreover, the closure of a company that have promoted and used innovation and knowledge does not automatically mean an empty seat in the local economy and society. It leaves behind resources (e.g. qualified employees, specialized assets, business ideas) that may facilitate (directly or indirectly) new firms launching (Pe'er and Vertinsky, 2008). The essential argument of the link between KIBS and business creation is that they produce positive intertemporal and spatial externalities (Hyytinen et al., 2015, p. 577).

3. Methodology and Data

We used as an indicator of KIBS density the share of companies from the KIBS sector in the total number of active companies, every year, for each country in the study. The data was obtained from EUROSTAT and it covers the EU27 member countries over the 2008–2012 period. Before 2008, the NACE 1.1 system was in use and data regarding the number of active companies is only available according to it. The correspondence between NACE 1.1 and the currently used NACE Rev. 2 classification system does not allow a continuous time series to be build regarding the share of KIBS companies into the total number of active companies in each country, every year. Data after 2012 had not been available, at the time this article is written, for all the investigated countries.

Regarding the definition of the analysed KIBS, we must mention that we have included in the analysis a number of 10 NACE Rev. 2 codes, namely J62, J63, M69–M73, M742, M743, N782. The selection of these codes was based both on theoretical considerations (see Schnabl and Zenker, 2013; European Commission, 2012, p. 12), but also based on the data availability constraints, since data for some codes that we initially planned to consider were only available at the class level.

Taking into consideration the KIBS activities mentioned, a first observation is that the density of KIBS enterprises in the total active companies at the EU level presents major differences between countries, with values starting at 10–11% in countries like Bulgaria and Cyprus, and reaching 25–30% in countries like Sweden and Netherlands (European Commission, 2012).

Regarding the entrepreneurial activity, we also resorted to the data available from EUROSTAT. Therefore, in the case of entrepreneurial activity, we used the EUROSTAT data regarding the number of new/closed companies, yearly, in the EU member states. In respect to the geographical coverage of the study, due to missing data, we have eliminated in the stage a number of three countries, namely Greece, Denmark and Malta, and therefore in the next analysis stage we only have tested our proposed models on a total of 24 countries. Data analysis was performed using R 3.0.3, the “plm” package, developed specifically for panel data linear regression analyses (Croissant and Millo, 2008). We decided to estimate a regression model for panel data because datasets control individual heterogeneity. Also, the panel data models provide a greater amount of information and a lower probability of collinearity between the used variables. There are several types of linear models for panel data. The first step in estimating a panel data is to test whether the series can be estimated through a panel data model or through the OLS model. One of the easiest tests for grouping data has as a null hypothesis the OLS model and as an alternative hypothesis the Fixed Effect Model. In order to decide whether a Fixed Effects model or a Random Effects model is more appropriate, we considered both the information criteria associated with the models and the economic context.

The hypotheses formulated and then tested in this paper, by using the data sources previously mentioned, are as follows:

H1: KIBS act as a stimulating factor for the entrepreneurial activity;

H2: KIBS act as a blocking factor for the number of closed companies and

4. Results

4.1. The relation between KIBS and the entrepreneurial activity

Regarding the share of the companies acting in the KIBS sectors in the total number of active companies, analysed as a stimulating factor for the number of newly registered companies per 1,000 inhabitants of working age, each year, in the investigated countries (EU 27, excluding Greece, Denmark and Malta), the results of the preliminary analysis didn't yield a valid model. The value of the ANOVA test $F(1, 95) = 0.072$, for this model, having an associated p value of 0.79. In this case, we cannot claim that KIBS acts as a factor of the entrepreneurial activity in the EU.

Refining the analysis by investigating the entrepreneurial activity at sectoral level for industry (i.e. total industry and manufacturing industry) and for construction also did not yield valid models. Usually we expect a finer level analysis to reveal some relations that might be missed in a more general analysis; however, in this case, no arguments were found to support any influence of the share of the companies activating in the KIBS sector on the entrepreneurial activity, neither on a general basis or on sectoral level (i.e. industry or construction). Taking into consideration the nature of the industry in general, and of the manufacturing industry in particular, the existence of the KIBS companies could be a motivating factor for starting up new companies (by taking innovation and implementing it into production); however, their impact does not seem to be significant at the level of the investigated countries.

In Figure no. 1 we present a graphical representation of the relationship between the share of the KIBS in total companies and the number of newly registered companies, for the investigated EU countries. The results of the local regression analysis, according to the "loess" method proposed by W. S. Cleveland, E. Grosse and W. M. Shyu (1992) are also presented in Figure no. 1. Due to the limitations of this method in the case of the available data (covering only 5 years), this analysis is shown with the purpose of easing the interpretation of graphical data.

Within the interval 13–17% for the share of KIBS companies in total companies, we notice a higher variability of the entrepreneurial density, as in this case the number of newly registered companies per 1,000 work-age people varies between 1 and 20, while in the case of the rest of the time series the amplitude is lower. This could be an indicator of a certain connection at the level of the said interval. However, it could also be the result of a higher number of countries presenting shares of KIBS companies in total active companies within this 13–17% interval. More studies are required to investigate this aspect, as more data will be available and time series will be long enough to allow more complex analyses.

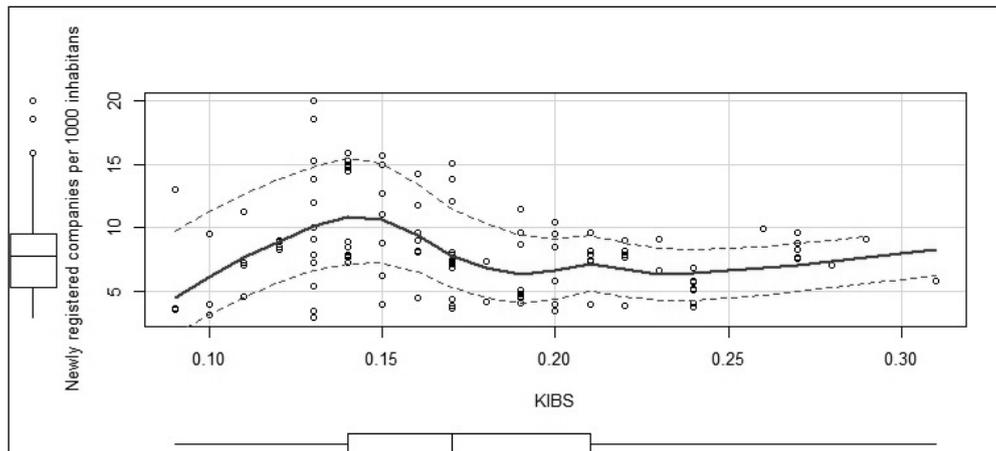


Figure 1: The relation between the share of KIBS in the total number of active companies and the total number of newly registered companies per 1,000 inhabitants
Source: own computations based on EUROSTAT data

Due to the inconclusiveness of the partial results, we decided to go further and detail the relation between the two variables at the EU countries level included in the analysis (for the same period 2008–2012). Due to the relatively short time series (i.e. 5 years), our conclusions are limited. However, we can notice that some countries (e.g. Cyprus, Latvia, Luxembourg and Romania) display relatively strong correlations, in a positive direction, between the share of KIBS companies in total active companies, and the entrepreneurial activity, i.e. a high share of KIBS is related to an increase of the entrepreneurial activity. At the same time, in countries such as Bulgaria, Estonia, Hungary, Poland, Netherlands and Slovenia, the correlation is negative (i.e. a high share of KIBS is related to a decrease of the entrepreneurial activity). Our analysis indicates that the relation displays different magnitudes in the investigated EU countries, even having opposed directions. These results require further investigations to determine the elements that mediate and/or moderate the relations between KIBS and entrepreneurship. Of course, there is a possibility that no relation actually exists at EU level, the two variables being influenced by other factors, which are dependent on each country's economical characteristics.

4.2. The relation between KIBS and the number of closed companies

The analyses performed have indicated that the share of KIBS companies in total active companies exercise a negative influence on the number of closed companies per 1,000 work-age inhabitants, in the selected EU countries, for the five investigated years. The results obtained in R suggests that a panel data estimation is better than a OLS model and according to the Hausman test, the fixed effects model is more appropriate for this data set. The value of ANOVA test for the model is $F(1, 92) = 8.202$ with an associated p value of 0.01. The coefficient of this relation is $b = -36.847$, therefore we can claim that an increase of 1% in the share of KIBS in total companies is associated with a decrease of almost 37 of the number of closed companies per 1,000 inhabitants. In the case of the investigated countries, an increase of 1% of the share of KIBS in the number of total active companies should lead to a number of 118,000 companies continuing their activity, rather than discontinuing it, for each year.

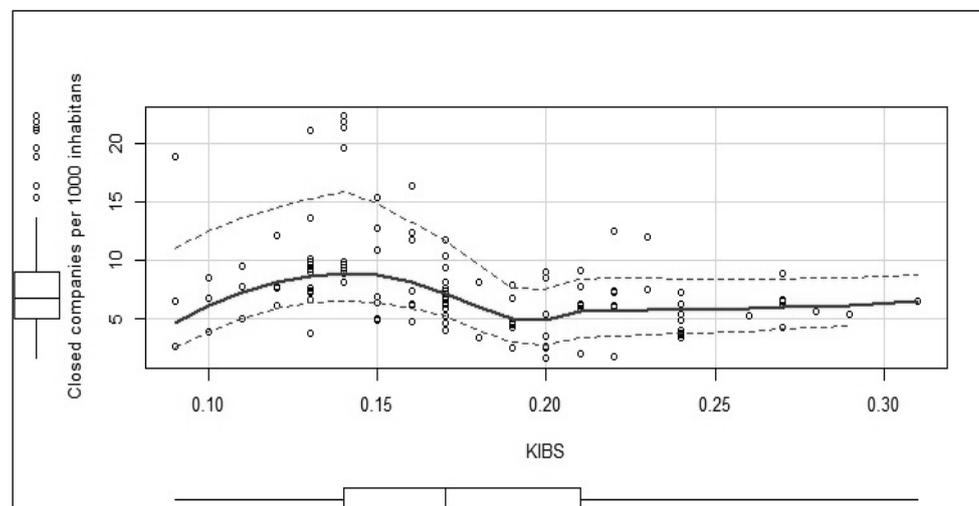


Figure 2: The relations between the share of KIBS companies in the total active companies and the number of companies closed down per 1,000 inhabitants

Source: own computations based on EUROSTAT data

We also looked at a series of other factors that could influence the discontinuing of the companies, including GDP (starting from the premise that a decrease in GDP has a negative impact on the business demography), the entrepreneurial activity of the previous year and the productivity of the companies; however, none of these led to a valid regression model.

The relation holds in the case of sectoral analyses, namely in the case of (total) industry, manufacturing industry, and construction. The model validation analyses are presented in Table no. 1. The three models have similar characteristics from the point of view of the explained variance in the number of closed (discontinued) companies by KIBS density ($\sim 10\%$). The coefficients for industry and manufacturing industry are similar, suggesting that an increase of 1% of the share of KIBS in total companies would lead to a decrease of 4.45 in the number of companies closed per 1,000 inhabitants. In the case of the construction sector, the impact is even stronger, with an increase by 1% of the share of KIBS in total companies leading to 11.64 fewer companies closed per 1,000 inhabitants in the construction sector.

Table 1: The results of panel regressing of the KIBS density on the number of closed companies per 1,000 inhabitants

| Dependent | ANOVA F(1, 91) | P | R2 | Coefficient |
|------------------------|----------------|--------|------|-------------|
| Total companies | 8.202 | 0.01 | 0.08 | -36.847 |
| Industry (total) | 10.312 | 0.002 | 0.10 | -4.45 |
| Manufacturing industry | 11.886 | <0.001 | 0.12 | -4.55 |
| Constructions | 10.6342 | 0.001 | 0.10 | -11.641 |

Source: own computations based on EUROSTAT data

5. Discussion and Conclusions

We started our research with the purpose of addressing a series of questions regarding the relations between KIBS and entrepreneurial activity. Firstly, we have investigated the relation between the share of KIBS companies in total active companies, on one side, and

the number of newly registered business per 1,000 inhabitants, each year, on the other side. The results of our analysis failed to support the hypothesis that KIBS act as a stimulating factor of the entrepreneurial activity, neither on the level of the whole economy, nor on the sectoral level of industry (i.e. total industry and manufacturing industry) and constructions sector. Despite our expectations derived from the theory regarding KIBS companies as a driver of the entrepreneurial activity, but somehow similarly to other studies, our results are far from being optimistic. Apparently, the correlation between KIBS and the entrepreneurship is more complex, as it considerably varies between the investigated EU countries and it registers positive high values only in the case of four countries, i.e. Cyprus, Latvia, Luxembourg and Romania. This suggests that our hypothesis that the innovation taking place at the level of the KIBS companies leads to an increase of the entrepreneurial activity is not supported empirically. Secondly, we have investigated the impact of KIBS on maintaining the companies as active (by extending their “life expectancy”). The panel regression analysis yielded a valid model, supporting our hypothesis that KIBS are a blocking factor for the number of closed (discontinued) companies. This effect can be noticed both at the level of the whole economy, and in the case of the analyses conducted on the sectors of industry, manufacturing industry and constructions.

References

- ACS, Z., BRAUNERHJELM, P., AUDRETSCH, D. and CARLSSON, B. 2009. The knowledge spillover theory of entrepreneurship. *Small Business Economics* 32(1): 15–30.
- AGARWAL, R., AUDRETSCH, D. and SARKAR, M. 2010. Knowledge spillovers and strategic entrepreneurship. *Strategic Entrepreneurship Journal* 4(4): 271–283.
- AUDRETSCH, D. 1998. Agglomeration and the location of innovative activity. *Oxford Review of Economic Policy* 14(1): 18–29.
- AUDRETSCH, D. 2012. Entrepreneurship research. *Management Decision* 50: 755–764.
- AUTIO, E. and ACS, Z. 2007. Individual and Country-Level Determinants of Growth Aspiration in New Ventures. In: A. Zacharakis, ed. 2007. *Frontiers of Entrepreneurship Research*, 27. Babson: Babson College.
- CASSON, M. 2005. Entrepreneurship and the theory of the firm. *Journal of Economic Behavior and Organization* 58: 327–348.
- CLEVELAND, W., GROSSE, E. and SHYU, W. 1992. Local regression models. In: J. Chambers and T. Hastie, eds. *Statistical Models in S*, Chapter 8, Pacific Grove, California: Wadsworth & Brooks/Cole.
- CROISSANT, Y. and MILLO, G. 2008. Panel Data Econometrics in R: The plm Package. *Journal of Statistical Software* 27(2).
- EUROPEAN COMMISSION 2012. Knowledge-intensive (business) services in Europe. Luxembourg: Directorate-General for Research and Innovation Capacities, Publications Office of the European Union.
- EUROSTAT 2008. NACE Rev. 2 Statistical classification of economic activities in the European Community. Luxembourg: Office for Official Publications of the European Communities.

- HATOS, A., HATOS, R., BADULESCU, A., BADULESCU, D. 2015. Are Risk Attitudes and Individualism Predictors of Entrepreneurship in Romania? *Amfiteatru Economic* 17(38): 148–161.
- HYYTINEN, A., PAJARINEN, M. and ROUVINEN, P. 2015. Does innovativeness reduce startup survival rates? *Journal of Business Venturing* 30: 564–581.
- LUMPKIN, G. and DESS, G. 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *The Academy of Management Review* 21(1): 135–172.
- MALECKI, E. J. 2007. Cities and regions competing in the global economy: Knowledge and local development policies. *Environment and Planning C: Government and Policy* 25(5): 638–654.
- MAS-TUR, A. and RIBEIRO SORIANO, D. 2014. The level of innovation among young innovative companies: the impacts of knowledge-intensive services use, firm characteristics and the entrepreneur attributes. *Service Business* 8: 51–63.
- MAS-VERDU, F., WENSLEY, A., ALBA, M. and ÁLVAREZ-COQUE, J.M.G. 2011. How much does KIBS contribute to the generation and diffusion of innovation. *Service Business* 5(3): 195–212.
- MERINO, F. and RUBALCABA, L. 2013. Are Knowledge-Intensive Services Highly Concentrated? Evidence from European Regions. *Tijdschrift voor Economische en Sociale Geografie* 104(2): 215–232.
- MULLER, E. and DOLOREUX, D. 2007. The key dimensions of knowledge intensive business services (KIBS) analysis: a decade of evolution. *Working Papers Firms and Region* 1.
- MULLER, E. and ZENKER, A. 2001. Business services as actors of knowledge transformation: the role of KIBS in regional and national innovation systems. *Research Policy* 30: 1501–1516.
- MULLER, E., ZENKER, A. and HÉRAUD, J.-A. 2015. Knowledge Angels: fostering innovation in knowledge-intensive business services through creative individuals. Observations from Canada, China, France, Germany and Spain, *International Management* 19(1): 201–218.
- PE'ER, A. and VERTINSKY, I. 2008. Firm exits as a determinant of new entry: is there evidence of local creative destruction? *Journal of Business Venturing* 23(3): 280–306.
- ROSENBUSCH, N., BRINCKMANN, J. and BAUSCH, A. 2011. Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing* 26(4): 441–457.
- SCHNABL, E. and ZENKER, A. 2013. *Statistical Classification of Knowledge-Intensive Business Services (KIBS) with NACE Rev. 2*, Karlsruhe: Fraunhofer Institute for Systems and Innovation Research ISI.
- SHANE, S. and VENKATARAMAN, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review* 25(1): 217–226.
- VARIS, M., TOHMO, T. and LITTUNEN, H. 2014. Arriving at the Dawn of the New Economy: Is Knowledge-Based Industrial Renewal Possible in a Peripheral Region? *European Planning Studies* 22(1): 101–125.

- WENNBERG, K. 2010. Entrepreneurship in the knowledge intensive services. In: F. Delmar and K. Wennberg, eds. 2010. *The Birth, Growth, and Demise of Entrepreneurial Firms in the Knowledge Intensive Economy*. Cheltenham: Edward Elgar.
- WONG, P., HO, T. and AUTIO, E. 2005. Entrepreneurship, innovation and economic growth: Evidence from GEM data. *Small Business Economics* 24(3): 335–350.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Selected issues of corporate culture in the enterprise from energy industry

Patrycja Bąk¹, Marta Sukiennik², Barbara Kowal³

¹AGH University of Science and Technology, Department of Economics and Management in Industry, Al. Mickiewicza 30, 30-059 Cracow, e-mail: pbak@agh.edu.pl

²AGH University of Science and Technology, Department of Economics and Management in Industry, Al. Mickiewicza 30, 30-059 Cracow, e-mail: marta.sukiennik@agh.edu.pl

³AGH University of Science and Technology, Department of Economics and Management in Industry, Al. Mickiewicza 30, 30-059 Cracow, e-mail: bkowal@agh.edu.pl

Abstract

The aim of the article is to present the essence and main elements of corporate culture in enterprises from the energy industry. The publication presents the essence and determinants shaping the corporate culture. The problem is presented on the example of enterprises from the energy sector. Only companies that combine innovation with business objectives of the company and design and implement the operational model of innovation will succeed. The main task of energy companies is economic efficiency, developing and ensuring lowest possible costs for generation and supply of energy to the recipients. New business models, directions and modes of investments, enhancing efficiency, use of technological data are only some of the challenges faced by energy companies.

Keywords: business objectives, corporate culture, energy sector, innovations

JEL Code: 031

1. Introduction

The Polish energy sector has been rapidly developing some interesting and advanced projects in the area of sustainable development in the last several years. They take into account the special role of the energy sector in economy, along with the strategic significance of companies operating in this area. A review of activities of companies functioning as part of the “Sustainable Energy” project shows various, strategically interesting approaches. Each of them may be a source of inspiration, not only for the companies from the industry (Report PWC 2015, 2016). The perspective of changes and development challenges that the sector faces encourages one to ask questions on how to adjust the company’s activities to social trends and needs. The milieu of energy companies – on account of global and consumer-related trends – may soon experience various changes. The Corporate Social Responsibility (CSR) strategies should not only follow the situation, but get

ahead of it, identifying such trends (Bluszcz 2015). In this context, dialogue is of key significance (Visser 2008).

The CSR activities of energy companies contribute to creation of the “common value” and to solving significant social problems, e.g. excluded users. Taking into account the strategic significance of the energy sector and convergence of goals and public policies in various ranges (energy saving, pro-environmental behaviour, excluded users), it is worth considering whether some CSR activities should not be implemented jointly, as part of broader agreements and coalitions, including coalitions between companies and the governmental sector. This would allow for maximising the effects at reduced costs (McWilliams, Siegel, Wright 2006; Report PWC 2012, 2013). Building an adequate corporate culture usually begins with determining a company’s vision and mission, which become the determinants of a company’s value and allow for specifying the objective of activities (Report Deloitte 2014). On the other hand, the goal is the guiding post for all decisions that are made (Eccles, Ioannou, Serafeim 2011; Kotter, Heskett 2008; Pohrybieniuk 2014/2015). Corporate culture is the value, attitudes, beliefs and expectations shared by most corporate members (figure 1).



Figure 1: Model of organizational culture in company

Today’s corporate culture is very popular now. Corporate culture is one of the basic management functions. Managers need to change companies so that they have a chance of survival on the market. Managers are becoming increasingly aware that the world has turned its axis, making the necessary fundamental overriding of management orientation, in terms of the goals of operations and its functioning (Bąk, Sukiennik, Kowal 2016; Dyllick, Hockerts 2002).

2. Business model in the aspects of sustainable development on the example of selected companies

Energy industry representatives should meet several challenges (Report 2012). On the one hand, as well as the representatives of other companies fight for financial results, which often involves the financing of operating activities as well as the long-term investment process (Bąk 2007, 2008). Challenges are addressing climate change regulation and the expectations of different stakeholder groups. The energy industry has identified three key success factors or pillars that influence the development of the economy. Education,

innovation and cooperation are discussed. The importance of education is emphasized at every consultation meeting of energy companies. According to business representatives, education responding to the challenges and needs of the market is essential to achieving the goals of sustainable development. The key challenges of education are the way we teach, the subject matter, and, above all, the collaboration between academia and business. These aspects should be addressed both in the perspective of formal education, that is, conducted by schools and universities and informal, organized by enterprises and institutions. The next pillar is innovation, understood as the readiness to transform existing possibilities into new ideas and put them into practical use. Proinnovation attitude should reflect all business decisions. Business representatives emphasize that decision-making must be abandoned solely through prudence of cost-effectiveness for innovation, which is the key to long-term success. Innovative thinking and management allows not only to respond well to changes in the environment, but also to overtake them by looking for new opportunities. Signals for growth in outlays on innovation flow from the entire environment of power companies. They are stimulated by national and EU policies. It is also fueled by the available funds, emerging new business models and the desire to build competitive advantage. It is also important to be involved in investing in start-ups (Report 2016). The third, necessary pillar is cooperation. The goal of sustainable development is the common goal of the business and all other economic actors. Therefore, it is necessary to make joint decisions and actions. There is no way to achieve sustainable development without the synergy and synergies associated with it. Cooperation understood as co-deciding on certain activities and co-responsibility for their implementation (McWilliams, Siegel 2001).

Lubelski Węgiel "Bogdanka" Spółka Akcyjna in Bogdanka (LW Bogdanka SA) is one of the leading Polish hard coal producers. It is also a leader in innovation and efficiency in the Polish mining industry. The mined thermal hard coal is used primarily for the production of electricity, heat and cement. It is still the only hard coal mine in Poland located outside the Upper Silesia area. And – in spite of the interest of foreign companies to invest in the region, declared in the media – the only active coal mine in the Lublin Coal Basin. The customers are mainly industrial companies, primarily entities operating in the power and heat industry, located in eastern and north-eastern Poland. The capital group created by LW Bogdanka SA includes Łęczyńska Energetyka Sp. z o.o. and three subsidiaries established in the years 2013–2014. The latter have taken over certain functions originally performed by the mine and are 100% owned by LW Bogdanka SA. Łęczyńska Energetyka Sp. z o.o. operating within the capital group supplied heat to the mine and is responsible for its water and sewage management (drinking and industrial water supply, treatment of sanitary and rainwater sewage from the mine area). The company also supplies heat to external entities, such as housing estates or other facilities in Łęczna. This business activity, both in terms of turnover and employment, is small compared to the scale of the mine itself. Founded in 2013, EcoTRANS BOGDANKA Sp. z o.o. provides services related to the management of waste generated by washing and cleaning of carbonaceous shale, including its transport and logistics. The scope of activity of RG Bogdanka Sp. z o.o., established also in 2013, is the performance of services, deliveries as well as mining and construction works for the benefit of LW Bogdanka SA. The last subsidiary is MR Bogdanka Sp. z o.o., established in 2014, dealing with surface repairs and overhauls, including the regeneration and production of steel structures. This company also provides services to LW Bogdanka SA. Due to the fact that the scope of tasks performed by the companies described above was previously performed by the mine, these organisational modifications do not

significantly change the nature of LW Bogdanka Capital Group's impact on its surroundings (Report 2016).

A comprehensive approach to responsible management involves a holistic view of the organisation and its performance. One of the model approaches suggested by the Integrated Reporting Framework is to analyse the value creation process by analysing six forms of capital, which shows figure 2.

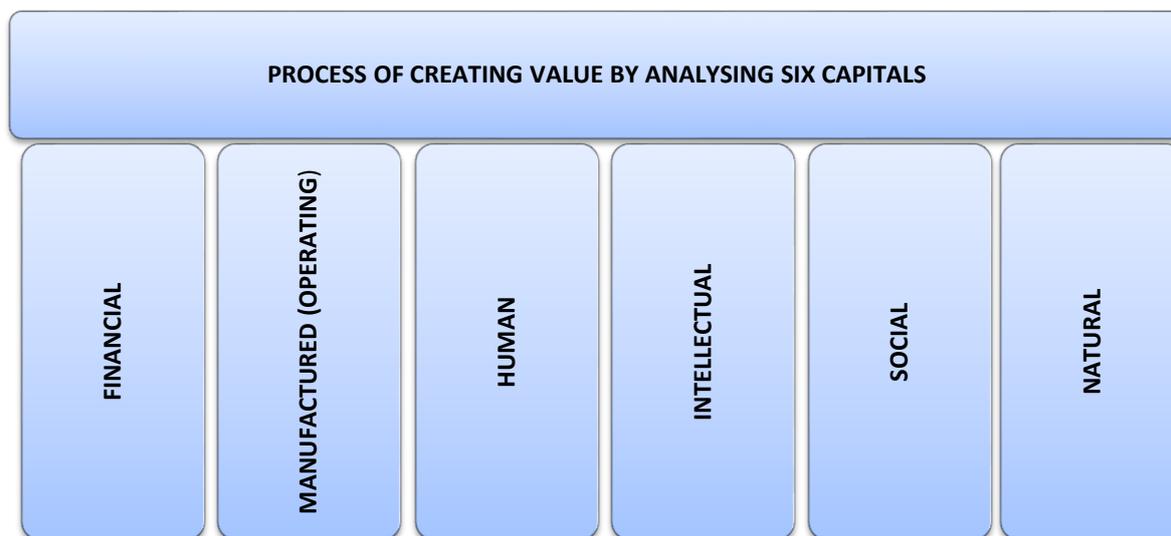


Figure 2: Process of creating value

Source: Own research based on Integrated Report 2016 Capital Groups Lublin Coals "Bogdanka"

This approach became the basis for the integrated report of LW Bogdanka Group for this year.

In addition to the characteristics of the business activity and its results, attention is paid to individual capitals, i.e.:

- accompanying forms of dialogue with the stakeholders,
- the relationship between each capital and the categories of business risk managed and controlled by the Group through a socially responsible management approach.

This approach makes it possible to present in a transparent way the relationship between daily operations and responsible management as well as between the development strategy and the implementation of the concept of sustainable development. In an industry such as mining, social and environmental problems cannot be averted. Neither can one fail to look at the short term, as it is precisely that today's activities and investments will translate into the preparation of deposits for extraction and mining opportunities in the years to come. In turn, the questions whether and which deposits will be extracted determine the time frame in which the mine can operate. Currently, the strategy of LW Bogdanka includes such an approach to the management of licences and production as to allow for conducting mining activities until 2050. This is important inasmuch as it directly affects the functioning of the communities of the Łęczna town and the nearby communes in which mining is carried out. These are thousands of people who have jobs because of the mine. These are also the taxes and parafiscal contributions paid by the mine, thanks to which local governments can carry out their activities. Mine production planning, with the use of unique and very innovative technologies related to, among others, modelling of the deposit and, more broadly, a whole range of solutions collectively referred to as the

Intelligent Solutions Mine, make it possible to predict surface deformation, and thus subsidence processes causing changes in the natural environment. It also means forward-looking thinking about landscape management in relation to the storage of spoil rock as well as looking for solutions for its alternative economic use underground or outside of the mining industry (Report 2016). All actions, all capitals, permeate and become interdependent in the long run. The ability to analyse them comprehensively as well as the process of continuous learning and improvement of overall management is a development strategy that is also a strategy for sustainability.

The JSW Group, as Europe's leading coking coal producer, is also a capital group which is still in a period of major changes, undergoing a particularly difficult and far-reaching restructuring process in the period between 2015 and 2017. The decisions made in the last few months, including a constructive dialogue with the stakeholders of the JSW Group, i.e. the public and banks/bondholders, have translated into a significant improvement of the performance and have opened up new perspectives for the stable development of the JSW Group. It is the ambition of the management to use this progress as a basis for sustainability. Over the last few months, works have been carried out within the organisation on the Sustainable Development Strategy for 2017–2020, which will be consistent with the new business strategy. The work on the strategy completed to date follows the approach presented in the PN-ISO 26000 standard and consists in identifying both key areas of responsibility and key stakeholder groups. Currently, specific measures of goals and their values for the coming years are consulted with managers responsible for particular business areas in the organisation (Report 2017–2012).

Providing JSW Capital Group customer with the highest quality coking coal and coke in a manner ensuring the growth of the value of the JSW Capital Group, taking into account the expectations of its stakeholders, using unique resources, competences and skills. The vision of the company are: strengthening the position of the leading coking coal producer and the leading coke producer on the European market, setting the directions for the entire industry through the highest standards of operation. Overarching strategic objective contain building the value of the JSW Capital Group, taking into account the principles of sustainable development in all business activities aimed at maximising value for the Shareholders. For Strategic key levers belong:

- Maximisation of the production volume for major products.
- Development of the resource base.
- Investments and innovation.
- Increasing stability and competitiveness.
- Organisational improvement.
- Improvement of cost efficiency and an increase of margins.
- Energy security.
- Development and optimal use of human resources.
- Corporate governance, environmental care.
- Acquisitions and alliances

Innovation and development activities can provide an answer to many mining problems, including making the industry more friendly to its natural and social environment.

3. RESPECT Index as a project promoting the highest standards of responsible management.

RESPECT Index is the first responsible company index in Central and Eastern Europe. The project was launched by the Warsaw Stock Exchange in 2009 when the first Index was announced. The RESPECT Index portfolio includes Polish and foreign companies from the GPW (WSE) Main Market. Companies with the highest liquidity, i.e. included in the WIG20, mWIG40 or sWIG80 indices, may aspire to the index. The index only includes companies which undergo a three-stage verification conducted by the WSE and the Polish Association of Listed Companies – the companies must also engage in high-quality communication with the market through current and periodic reports and on their websites. The third condition is socially responsible behaviour towards the environment, communities and employees, which is reviewed on the basis of a survey verified by the project auditor – Deloitte. According to the current formula, the audit of companies and review of the index composition is carried out once a year, in the second half of the calendar year. The shares of companies included in the index are determined according to the same rules as in the case of other stock exchange indices – free float shares are taken into account, with the weighting of the largest companies being limited to 25 percent when the number of participants is less than 20 companies, or to 10 percent in other cases.



Figure 3: Comparison RESPECT Index and WIG
Source: www.gpw.pl

A survey prepared in cooperation with the Forbes magazine, the Warsaw Stock Exchange and Kulczyk Investments presents the composition of the rating of socially responsible companies and the first index of responsible companies by WSE – RESPECT Index. The review auditor – Deloitte – is responsible for the correct evaluation process. The analysis covers companies listed on the Warsaw Stock Exchange, excluding the NewConnect market, foreign companies and dual listing companies. Indices, such as Corporate Social Responsibility (CSR) created for developed markets are becoming a reality. The growing awareness of companies in terms of transparency and honesty of their operations, as well as their long-term impact on the environment, is not only reflected in the improvement of

brand image but also increasingly often entails financial benefits. Today, conducting business activity in a responsible manner is already a standard. Of course, changes in management are also necessitated by legal regulations that make supervisory institutions increasingly accountable.

For seven years now, LW Bogdanka has also made part of the prestigious RESPECT Index, comprising companies listed on the WSE's main floor, which to the highest degree satisfy the requirements regarding the respect for the natural environment, activities supporting the development and safety of employees and local communities, as well as corporate governance, information governance, and investor relations. The RESPECT Index group also enters JSW SA (Report 2017–2020).

4. Discussion and Conclusions

New business models, directions and methods of investment, and efficiency improvement are just some of the challenges faced by energy companies. Energy companies have to remodel their current approach and develop new business goals in line with the principles of sustainable development. The key and dominant role is played by human capital and interpersonal relationships that constitute the pillars of corporate culture. New business models of companies in the energy market require cooperation with new business partners.

Defining the business goal and company strategy, including the elements of innovation is a very important and necessary milestone on the way to success. However, this is not enough. Polish energy companies have already taken the first steps towards increasing innovation by defining business goals, and often also innovation strategies and first directional activities. The key challenges are still to define the assumptions for innovation or to plan budgets using modern financial management tools (Kowal, Kustra 2016).

Acknowledgements

This paper was supported by AGH University of Science and Technology [11.11.100.693].

References

- BAK P. 2008. Financing of the investment activity based on the example of coal mining industry Mineral Resources Management Volume 24 Issue 3.
- BAK P. 2007. Characteristics of the capital gaining sources and financing the activity of coal mine enterprises Part 2 Sources of the foreign capital Mineral Resources Management Volume 23 Issue 2.
- BAK P., SUKIENNIK M., KOWAL B., 2016. Corporate Culture in Terms of Management Processes in the Polish Mining Company Journal of the Polish Mineral Engineering Society R. 17 no. 2.
- BLUSZCZ A. 2015. Classification of the European Union member states according to the relative level of sustainable development: Quality and Quantity vol. 50. Iss. 6. P. 2591–2605.

- CORPORATE DOCUMENTS GPW SA – <https://www.gpw.pl/dokumenty-korporacyjne> [Accessed 20.01.2018].
- DYLLICK T., HOCKERTS K., 2002. Beyond the business case for corporate sustainability *Business Strategy and the Environment* 11(2).
- ECCLES R., IOANNOU I., SERAFEIM G. 2011. The Impact of a Corporate Culture of Sustainability on Corporate Behavior and Performance Working paper Harvard Business School November 25.
- INTEGRATED REPORT 2016 Capital Groups Lublin Coals “Bogdanka”.
- KOTTER J., HESKETT J., 2008 *Corporate Culture and Performance* The Free Press (New York).
- KOWAL B, KUSTRA A. 2016, Sustainability reporting in the energy sector, E3S Web of Conferences 10, 00129.
- MCWILLIAMS A., SIEGEL DS., 2001. Corporate Social Responsibility: A theory of the firm perspective *Academy of Management Review* 26(1).
- MCWILLIAMS A., SIEGEL DS., WRIGHT PM., 2006. Corporate Social Responsibility: Strategic Implications. *Journal of Management Studies*. Volume 43. Issue 1.
- POHRYBIEIUK P. 2014/2015, Wpływ kultury organizacyjnej na cele biznesowe, *Harvard Business Review Polska*, grudzień 2014 – styczeń 2015.
- REPORT PwC 2012, Challenges of sustainable development of the energy sector. *Responsible Energy*.
- REPORT PwC 2013, Vision of Sustainable Development for Polish Business 2050.
- REPORT PwC 2015, Challenges to sustainable development of the energy sector.
- REPORT PwC 2016, 7 temptations of the Polish energy sector.
- REPORT Deloitte 2014, Directions 2014 – the energy sector DNB Bank.
- REPORT of sustainable group development JSW SA. Our obligations For the years 2017–2020.
- VISSER W., 2008. Corporate social responsibility in developing countries. *The Oxford Handbook of Corporate Social Responsibility*. Oxford University Press.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Are the Qualifications and Skills of Consumer Good Product Managers different from those of Mechanical Engineering Product Managers? A Job Advertisement Analysis

Christina Bauer¹

¹*Department of Marketing and Trade, Faculty of Business and Economics, Mendel
University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: xbauer3@node.mendelu.cz*

Abstract

This paper focuses on the skill and qualification requirements for ‘product managers’. It is based on an analysis of job advertisements, published on Stepstone in December 2017. Requirement profiles of mechanical engineering companies (n = 51) were compared with those of consumer good companies (n = 45). Using the Chi-square test, the correlation was evaluated. Results show that the job requirements are different. Mechanical engineering companies are searching for people with a technical degree whereas consumer goods companies are looking for candidates with an economic/business background. But, similarities between the two groups can be found too, both are looking for candidates with experience in Product Management as well as Marketing.

Keywords: Product Manager Requirement Profile, mechanical engineering Product Manager, consumer good Product Manager

JEL codes: M530

1. Introduction

Product Management was conceived by Procter in Gamble in the 1930 (Duffy, 2011). Many companies copied this idea, in the beginning mainly B2C (Business to Consumer) companies and then later also B2B (Business to Business) companies. Some companies still call this position ‘brand manager’ as Procter and Gamble did; others are using ‘product manager’. Irrespective which term is used it always describes a person who takes full responsibility of a product and who is measured by its success (Low, 1994). *“Brand management as a business technique was one of the signal innovations in American marketing*

during the twentieth century” (Daye, 2009). Some authors like Dawes and Patterson have analyzed the importance and performance of the four major PM roles for consumer and industrial ‘product managers’: coordination/Implementation, short-term analysis/forecasting, long-term strategic, product development. Since there was no common practice many companies and branches developed their own job profile, tasks and responsibilities (Chisa, 2014).

Content analysis of job announcements is an established method to analyze which credentials and capabilities are important (White, 1999). Job advertisements expose the areas of job responsibility and current trends in desired qualifications and skills that employers look for in new personnel. There are several studies analyzing job advertisements in different fields like IT, librarian, marketing, general management, finance, human resource management available (Sodhi, 2010, Choi, 2009; Caho, 2005; Avery, 2003; Arcodia, 2003; Bennett, 2002). The studies are often including an analysis of primary work responsibilities, skills and work experience requirements for various jobs.

The purpose of this study is to gain a better understanding of the current demands and to analyze if it is really true that ‘product managers’ in B2C companies mostly require a background in business economics where B2B companies require engineers (Hermes, 2015 and Cummings et. al, 1984). Which skills and qualifications are important for B2B and B2C ‘product managers’? Are different skills needed? Are the companies searching for different candidates with different soft skills?

2. Methodology and Data

The main objective of the analysis was to get better insight if ‘product manager’ jobs differ in B2C and B2B companies. The underlying idea was that consumer good companies (B2C) are searching for different ‘product manager’ candidates, with different skills and qualification requirements than mechanical engineering companies (B2B). Analyzed were all ‘product manager’ job offers posted in December 2017 on the job portal Stepstone (www.stepstone.de) within two sectors „fast moving consumer goods / durables“ and „manufacture of machinery and equipment“.

Stepstone was chosen because its job portal is one of the big players in Germany and allows branch specific searching.

In December 2017 Stepstone offered in total 2450 ‘product manager’ jobs, 45 for the “fast moving consumer goods/durables” and 51 for „manufacture of machinery and equipment“.

The chi-square test was used to compare the job requirements of consumer good ‘product manager’ with those from mechanical engineering. (Manschwetius, 2018 and Schwarz, 2018)

Hypotheses:

- H0: There is no relationship between job requirement and industry type
- H1: There is a relationship between job requirement and industry type

The approach is appropriate because the sampling method was simple random sampling, the variables under study were categorical, and the expected frequency count of the contingency table was at least 5.

3. Results

First of all, differences between the required education levels of 'product manager' for consumer goods and mechanical engineering were analyzed:

Table 1: Contingency Table 1

| | | Included in job advertisement | | Not included in job advertisement | | Chi squared | df | p value |
|--|------------|-------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-------------|----|---------|
| | | Consumer good PM job offer | Mechanical engineering PM job offer | Consumer good PM job offer | Mechanical engineering PM job offer | | | |
| Technical degree (e.g. mechanical engineering, electrical engineering) | quantity | 8 | 24 | 37 | 27 | 9.224 | 1 | 0.002 |
| | % of group | 17.8% | 47.1% | 82.2% | 52.9% | | | |
| Industrial engineer degree (mentioned separate) | quantity | 5 | 23 | 40 | 28 | 13.366 | 1 | 0.000 |
| | % of group | 11.1% | 45.1% | 88.9% | 54.9% | | | |
| Business economics degree | quantity | 17 | 10 | 28 | 41 | 3.904 | 1 | 0.048 |
| | % of group | 37.8% | 19.6% | 62.2% | 80.4% | | | |
| Missing statement about education | quantity | 4 | 1 | 41 | 50 | 2.324 | 1 | 0.127 |
| | % of group | 8.9% | 2.0% | 91.1% | 98.0% | | | |

Results show a significant relationship between the consumer good and mechanical engineering Product Management job offers. A technical degree (e.g. mechanical or electrical engineer), an industrial engineer degree or a business economics degree are not independent from the industry type, the null hypothesis needs to be rejected; there is a relationship between education level of 'product manager' and industry type. The null hypothesis failed to reject for a missing statement about the education level. Thus, missing statement about the education and industry type are independent.

In the next step it was analyzed if 'product managers' for consumer goods and mechanical engineering need a special experience:

Table 2: Contingency Table 2

| | | Included in Job advertisement | | Not included in job advertisement | | Chi squared | df | p value |
|--|------------|-------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-------------|----|---------|
| | | Consumer good PM job offer | Mechanical engineering PM job offer | Consumer good PM job offer | Mechanical engineering PM job offer | | | |
| Long-term experience in product management | quantity | 29 | 35 | 16 | 16 | 0.188 | 1 | 0.664 |
| | % of group | 64.4% | 68.6% | 35.6% | 31.4% | | | |
| Marketing experience | quantity | 8 | 11 | 37 | 40 | 0.216 | 1 | 0.642 |
| | % of group | 17.8% | 21.6% | 82.2% | 78.4% | | | |
| Sales experience for technical products | quantity | 6 | 16 | 39 | 35 | 4.404 | 1 | 0.036 |
| | % of group | 13.3% | 31.4% | 86.7% | 68.6% | | | |
| Project management experience | quantity | 14 | 7 | 31 | 44 | 4.228 | 1 | 0.040 |
| | % of group | 31.1% | 13.7% | 68.9% | 86.3% | | | |

Results show no significant relationship between the consumer good and mechanical engineering Product Management job offers for long-term experience in product management and marketing experience. The null hypotheses failed to reject, they are independent from the industry type.

Results for experience in sales and project management show a significant relationship between the consumer good and mechanical engineering Product Management job offers. The null hypotheses needs to be rejected, they are not independent from the industry type.

The analysis then turns to language. Do 'product manager' require for consumer goods and mechanical engineering to have the same language knowledge?

Table 3: Contingency Table 3

| | | Included in job advertisement | | Not included in job advertisement | | Chi squared | df | p value |
|-----------------------------------|------------|-------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-------------|----|---------|
| | | Consumer good PM job offer | Mechanical engineering PM job offer | Consumer good PM job offer | Mechanical engineering PM job offer | | | |
| Excellent German language skills | quantity | 12 | 19 | 33 | 32 | 1.226 | 1 | 0.268 |
| | % of group | 26.7% | 37.3% | 73.3% | 62.7% | | | |
| Excellent English language skills | quantity | 37 | 50 | 8 | 1 | 7.039 | 1 | 0.008 |
| | % of group | 82.2% | 98.0% | 17.8% | 2.0% | | | |

Mixed results were analyzed. For excellent German language skills there is no significant relationship between the consumer goods and mechanical engineering job offers. For excellent German language skills the null hypothesis failed to reject. Thus, excellent German language skills and industry type are independent; they are required in consumer good product manager job advertisements as well as for mechanical engineering PM jobs. Whereas for excellent English language skills a significant relationship between the consumer goods and mechanical engineering job offers was found. Since the P-value (0.008) is less than the significance level (0.05), the null hypothesis needs to be rejected. Thus, English language skills and industry type are not independent.

Next, are ‘product manager’ for consumer goods and mechanical engineering required to travel?

Table 4: Contingency Table 4

| | | Included in job advertisement | | Not included in job advertisement | | Chi squared | df | p value |
|--------------------------------|------------|-------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-------------|----|---------|
| | | Consumer good PM job offer | Mechanical engineering PM job offer | Consumer good PM job offer | Mechanical engineering PM job offer | | | |
| Willingness to travel | quantity | 2 | 23 | 43 | 28 | 20.514 | 1 | 0.000 |
| | % of group | 4.4% | 45.1% | 95.6% | 54.9% | | | |
| Willingness to travel overseas | quantity | 2 | 11 | 43 | 40 | 5.988 | 1 | 0.014 |
| | % of group | 4.4% | 21.6% | 95.6% | 78.4% | | | |

Results show a significant relationship between the consumer goods and mechanical engineering job offers in the willingness to travel national and overseas. The null hypothesis needs to be rejected; they are not independent from the industry type.

Finally the soft skill requirements of ‘product managers’ were analyzed:

Table 5: Contingency Table 5

| | | Included in job advertisement | | Not included in job advertisement | | Chi squared | df | p value |
|---|------------|-------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-------------|----|---------|
| | | Consumer good PM job offer | Mechanical engineering PM job offer | Consumer good PM job offer | Mechanical engineering PM job offer | | | |
| Communication and networking capabilities | quantity | 22 | 35 | 23 | 16 | 3.861 | 1 | 0.049 |
| | % of group | 48.9% | 68.6% | 51.1% | 31.4% | | | |
| Customer orientation | quantity | 4 | 21 | 41 | 30 | 12.940 | 1 | 0.000 |
| | % of group | 8.9% | 41.2% | 91.1% | 58.8% | | | |
| Decision fortune and assertiveness | quantity | 16 | 14 | 29 | 37 | 0.731 | 1 | 0.393 |
| | % of group | 35.6% | 27.5% | 64.4% | 72.5% | | | |
| Team ability | quantity | 23 | 20 | 22 | 31 | 1.368 | 1 | 0.242 |
| | % of group | 51.1% | 39.2% | 48.9% | 60.8% | | | |
| Analytic, strategic working skill | quantity | 23 | 35 | 22 | 16 | 3.067 | 1 | 0.080 |
| | % of group | 51.1% | 68.6% | 48.9% | 31.4% | | | |
| Entrepreneurship (thinking and behave) | quantity | 17 | 23 | 28 | 28 | 0.527 | 1 | 0.468 |
| | % of group | 37.8% | 45.1% | 62.2% | 54.9% | | | |

Results show a significant relationship between the consumer goods and mechanical engineering job requirements in communication and networking capabilities and customer orientation. For those soft skills the null hypothesis needs to be rejected, they are not independent from the industry type.

Whereas for decision fortune and assertiveness, analytic strategic working skills and entrepreneurship as well as team ability the null hypotheses failed to reject, these soft skills are independent from the industry type.

4. Discussion and Conclusions

This analysis shows that there are both differences as well as similarities between the consumer goods and mechanical engineering Product Management job offers.

Mechanical engineering companies are searching for 'product managers' with a technical or industrial engineer degree, the potential candidates need to have sales experience. Mechanical engineering 'product managers' need to have excellent English language skills and they will also travel overseas. As soft skills are communication, networking capabilities and customer orientation are pre-requisites.

Product Managers in the consumer goods sector need a business economics degree as well as Project Management experience.

But there are also similarities between consumer goods and mechanical engineering 'product managers'. Both groups require potential candidates to have a university degree. Long term experience in Product Management as well as Marketing is important. Entrepreneurship, analytic and strategic working skills, team ability, decision fortune and assertiveness are the main soft skills which are important for both 'product manager' groups.

These results were expected given that Product Management was invented by a B2C company and adapted to the special requirements of this sector. B2B products are compared to B2C often very complex, nonstandard and customized, which requires a different Product Management approach then for B2C products and therefore different skills and qualifications.

The education level is one stand out difference between the two sectors where B2B companies require 'product managers' with a technical background and B2C companies are searching for candidates with economic business background. Both groups place a similar importance on the various same soft skills. The statement that 'product managers' in B2C companies tended to have 'business economics' as their background and B2B companies have 'engineers' is true (Hermes, 2015 and Cummings et. al, 1984). Further analysis into the specific job tasks and responsibilities could be interesting, particularly whether or not there are differences to the qualification and skills level of B2B and B2C 'product managers'.

There are certain limitations to this study that should be recognized and overcome in future research. The results of this analysis are a snapshot and it would be good to verify the results with additional studies in other countries and longer time periods, even over some years. Interesting would be to analyze if shifts in required skills and qualifications can be seen. Maybe the two job profiles of B2B and B2C 'product managers' grow closer in future and the statement of Hermes and Cummings will not be valid anymore. The study of Coviello and Brodie (2001) analyzed if marketing practices of B2C and B2B companies are different and their result was that the overall patterns are similar. Even if

this study had some limitations it could reflect that also the role of 'product managers' will equalize, as they are the central coordinators of all marketing activities (Low, 1994).

References

- AVERY D. R., 2003. Reactions to Diversity in Recruitment Advertising – Are Differences Black and White? *Journal of Applied Psychology*, 2003, Vol. 88, No. 4: 672–679.
- ARCODIA C., BARKER T., 2003. The employability prospects of graduates in event management: Using data from job advertisements [online]. In: Braithwaite, Robyn L (Editor); Braithwaite, Richard W (Editor). *CAUTHE 2003: Riding the Wave of Tourism and Hospitality Research*. Lismore, N.S.W.: Southern Cross University, 2003: 19–34.
- BENNETT R., 2002. Employers' Demands for Personal Transferable Skills in Graduates: a content analysis of 1000 job advertisements and an associated empirical study, *Journal of Vocational Education and Training*, 54:4, 457–476.
- CHAO C., SHIH S. C., 2005. Organizational and End-User Information Systems Job Market: An Analysis of Job Types. *Information Technology, Learning and Performance Journal*, Vol. 23, No. 2: 1–11.
- CHISA E., 2014. Evolution of the Product Managers. *Communications of the ACM*, November 2014: 48–52.
- CHOI Y., RASMUSSEN E., 2009. What Qualifications and Skills are Important for Digital Librarian Positions in Academic Libraries? A Job Advertisement Analysis. *The Journal of Academic Librarianship*, Volume 35, Number 5: 457–467.
- COVIELLO N. E., BRODIE R. J., 2001. Contemporary marketing practices of consumer and business-to-business firms: how different are they?" *Journal of Business & Industrial Marketing*, Vol. 16 Issue: 5: 382–400.
- CUMMINGS W. T., JACKSON D. W., OSTROM L. L., (1984) . Differences between industrial and consumer product managers. *Industrial Marketing Management* 13: 171–180 .
- DAYE D., 2009. Great Moments in Branding: Neil McElroy Memo [Online]. Available at: <https://www.brandingstrategyinsider.com/2009/06/great-moments-in-branding-neil-mcelroy-memo.html#.WgsB0k2WxD8> [Accessed: November 2017].
- DAWES P.L., PATTERSON P. G., 1988. The Performance of Industrial and Consumer Product Managers. *Industrial Marketing Management* 17: 73–84.
- DUFFY S. J., 2011. The McElroy "Brand Man" turns 80 [Online]. Available at: <http://duffy.agency/the-mcelroy-brand-man-memo-turns-80/> [Accessed: October 2017].
- HERMES, V. 2015. Wettbewerbsfähigkeit dank Produktmanagement. *Absatzwirtschaft*, 11/2015: 60–62.
- LOW G. S., FULLERTON R. A., 1994. Brands, Brand Management, and the Brand Manager System: A Critical-Historical Evaluation. *Journal of Marketing Research*, May 1994; 31, 2: 173–190.
- MANSCHWETUS, U., 2018. Grundlagen der Statistik [Online]. Available at: <http://wissenschafts-thurm.de/grundlagen-der-statistik/> [Accessed: 15.02.2018].

- SCHWARZ, J., 2018. Pearson Chi-Quadrat-Test [Online]. Available at: <http://www.methodenberatung.uzh.ch/de/datenanalyse/unterschiede/proportionen/pearsonuntersch.html> [Accessed: 16.02.2018].
- SODHI M., SON B.G., 2010. Content analysis of OR job advertisements to infer required skills. *The Journal of the Operational Research Society*, Vol. 61, No. 9: 1315-1327.
- WHITE G. W., 1999 "Academic subject specialist positions in the United States: a content analysis of announcements from 1990 through 1998," *The Journal of Academic Librarianship* 25 (Sept. 1999): 372–382.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Understanding why Czech late workers envisage retirement. Evidence from the SHARE database.

Monika Bédiová¹, Jakub Šácha², Pavel Žiaran³

¹*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: monika.bediova@mendelu.cz*

²*Department of Statistics and Operation Analysis, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: jakub.sacha@mendelu.cz*

³*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: pavel.ziaran@mendelu.cz*

Abstract

The aim of this study is to analyse and compare the nature of early retirement reported by late workers 50+. The work is based on the sixth wave (2015) of the Survey of Health, Ageing and Retirement in Europe (SHARE) for Czech Republic. The set of statistical tools as logit model were proceeded in IBM SPSS Statistics and Statistica 12 to test for significant between the groups of respondents. Three-dimensional graphs were used to illustrate the most important factors contributing to envisaging early retirement for Czech Republic. The results show that among the most important factors are job satisfaction, opportunity to develop new skills and social support. The factors that serve to moderate the relation between the retirement timing and the consequences are identified and discussed.

Keywords: early retirement, older workers, factors, SHARE, Czech Republic

JEL Code: J0, J1

1. Introduction

During the last decades, many organisations have been implementing early retirement practices as a strategy to cope with the contingencies of the labour market. These practices have stimulated the exit of employees before reaching the established retirement age, and have had a significant impact on European societies at different levels (Von Nord-

heim, 2003). The majority of work has focussed on predicting early retirement behaviours. A research interest in early departures, whilst reflecting the empirical trends over the past two decades, is out of kilter with the prevailing pressures for employees to remain in active work for longer. Pressures for continuing to work later in life arise from financial pressures on pension schemes from an ageing population, labour shortfalls and skills shortages. However, one of the areas that is still unclear is how older workers' views on their jobs impact on their expectations of retirement (Flynn, McNair, 2008).

As ageing workers exit the workforce before official retirement age, with fewer younger replacements, there is substantial pressure on the countries' pension systems (Stattin, 2005). To counteract this economic problem, policies in many countries are changing to encourage ageing workers to remain in the labour force (Bourne, 2007).

Early retirement is an important health policy issue, because its incidence is increasing and the resources of most societies to pay pensions are decreasing at the same time (Gjesdal, Lie and Maeland, 2004). Early retirement depends not only on the individual's health status (*de Wind et al., 2013; Ranzi, Errico and Costa, 2013; Rice et al., 2011; Alavinia, Burdorf, 2008; Schuring et al., 2007; Damkjaer et al., 2011*) but also on nonmedical factors, such as working conditions (*Carlsen, 2008; van den Berg, Elder, Burdorf, 2010; Siegrist, 2007*) socioeconomic status (*Alavinia, Burdorf, 2008; Carlsen, 2008; Hagen, 2010; Mansson et al., 1998; Harkonmaki et al., 2007*) and sex (Rick, 2012). At the macro level, the society's social security system (Rick, 2012; Andersen, Nielsen, Brinkmann, 2012; Hutchens, 1999; Kim, 2009) as well as unemployment rates (Laczko, 1988) influence the likelihood of returning to work.

Multiple factors play a role in the timing of retirement, including micro-level factors (e.g. work characteristics and health) and macro-level factors (e.g. labour market) (*de Preter et al. 2013a, b*). At the individual level, health is frequently cited as a contributing push factor for retirement (*de Preter et al. 2013a; Schuring et al. 2013; van den Berg et al. 2010b*), which can be explained by a link with work capacity. Workers with poor health have a lower work capacity and, thereby, tend to retire earlier (Oksanen, Virtanen 2012). Although poor health is a contributor to early work exit (Schultz, 1998), relatively little attention has been paid to defining the potentially preventable or treatable symptoms of health-related conditions involved in early work exit at the national population level.

2. Methodology and Data

In line with theoretical literature on factors influencing the extension of working life, with an emphasis on the subjective aspects of individuals, the following research question is formulated: "*Which factors influence late workers to leave the labour market early?*"

The research is based on data from the database SHARE (Survey of Health, Ageing and Retirement in Europe). SHARE is a multidisciplinary international database containing microdata about health, socio-economic situation, social and family network of respondents over 50 years old. The research uses data from the most recent wave, number 6 (Börsch-Supan, 2017) for the Czech population, all economically active workers, all sectors combined (private, public and self-employed). The sample consists of 4 858 respondents, including 60% of women. The sample is described in the following table 1.

Table 1: The sample of respondents in total

| | 50–64 years | | 65–75 years | | 75 years and more | | Total | |
|-------|-------------|-----|-------------|-----|-------------------|-----|-------|-----|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Men | 578 | 30% | 829 | 42% | 545 | 28% | 1,952 | 40% |
| Women | 958 | 33% | 1,172 | 40% | 776 | 27% | 2,906 | 60% |
| Total | 1,536 | 32% | 2,001 | 41% | 1,321 | 27% | 4,858 | |

Source: Börsch-Supan (2017)

The set of variables used in the package named “Employment – Pension” includes a sub-group of variables reporting on subjective work-related perception of respondents. Each variable denotes a specific aspect of the perception of the workplace by each individual. The first group of variables includes the following variables: satisfaction at work; salary is adequate; opportunity to develop new skills; receive support in difficult situation; stress due to heavy workload; receive recognition for work; poor prospects for job advancement; poor job stability; little freedom to decide; job physically demanding. The second group of variables includes the following variables: seeking early retirement and fear of health limits before regular retirement. The set of statistical tools as logit model were tested in IBM SPSS Statistics and Statistica 12 for significant differences between the respondent groups. Three-dimensional graphs were used to illustrate the most important factors contributing to envisaging early retirement for Czech Republic (Statistica 12, 2017). Table 2 depicts the selection of economically active respondents (N = 816) used in the research.

Table 2: The sample of economically active respondents

| | Frequency | Percentage |
|-------|-----------|------------|
| Yes | 396 | 49% |
| No | 420 | 51% |
| Total | 816 | 100% |

Source: Börsch-Supan (2017)

3. Results

3.1. Analysis based on the binary regression model (logit)

This section presents results explaining the influence of work-related factors on the tendency of late workers to leave the labour market (seeking early retirement). Table 3 shows the summary of the logit model, explaining the dependent variable “Seeking retirement”. The variables have been sorted by the regression coefficient (B). However, the regression coefficients in the logit model are rather difficult to interpret empirically, as mathematically these are the natural logarithms of odds (ratio of probability that the event occurs to non-occurrence of the event). On the other hand, the polarity of the coefficient and the significance of the variable are in line with empirical interpretation and, to a large extent, also with the value of the binary regression coefficient.

Table 3: Logit model, variable “Seeking early retirement” * $p < 0.05$

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|--|---------------|------------|-------------|----------|-------------|-------------|
| Satisfaction at work | 0.69* | 0.2 | 17.1 | 1 | 0.00 | 0.50 |
| Salary is adequate | 0.39* | 0.1 | 8.5 | 1 | 0.00 | 0.68 |
| Opportunity to develop new skills | 0.29* | 0.1 | 5.2 | 1 | 0.02 | 0.75 |
| Support in difficult situation | 0.24* | 0.1 | 2.7 | 1 | 0.10 | 0.79 |
| Stress due to heavy workload | 0.11 | 0.1 | 0.9 | 1 | 0.35 | 0.90 |
| Recognition for work | 0.05 | 0.2 | 0.1 | 1 | 0.72 | 0.95 |
| Poor prospects for job advancement | -0.07 | 0.1 | 0.4 | 1 | 0.55 | 1.07 |
| Poor job stability | -0.07 | 0.1 | 0.4 | 1 | 0.54 | 1.07 |
| Little freedom to decide | -0.27* | 0.1 | 6.6 | 1 | 0.01 | 1.30 |
| Job physically demanding | -0.33* | 0.1 | 12.2 | 1 | 0.00 | 1.40 |
| Afraid of health limits before regular retirement | -0.72* | 0.2 | 14.4 | 1 | 0.00 | 2.06 |
| Constant | 1.35* | 0.8 | 3.1 | 1 | 0.08 | 3.86 |

Source: authors' calculations, based on Börsch-Supan (2017)

By the polarity and correlation coefficients and the statistical significance three groups can be distinguished of independent variables in terms of their influence on the dependent variable “Seeking early retirement”, as follows:

(1) Variables generating statistically significant relations with the dependent variable, with positive regression coefficients. These variables motivate the late workers not to seek early retirement and thus extend the working life. For the purpose of our research, we denote these variables as ‘motivational’. According to our computations based on the logit model, the motivational factor includes: satisfaction at work; salary is adequate; opportunity to develop new skills; support in difficult situation.

(2) Variables that do not create statistically significant relations with the dependent variable. For the purpose of this research, these variables are called ‘segmentational’; as these create segments of people in relation to their intention to leave the labour market early and do not uniformly influence the whole sample in terms of the working life extension. These variables include: stress due to heavy workload; recognition for work; poor prospects for job advancement; poor job stability.

(3) Variables generating statistically significant relations with the dependent variable, with negative coefficients. These variables increase the probability of seeking early departure from the labour life; in other words, these variables counteract with the work-life extension. These variables include: little freedom to decide; job physically demanding; fear of health limits before regular retirement.

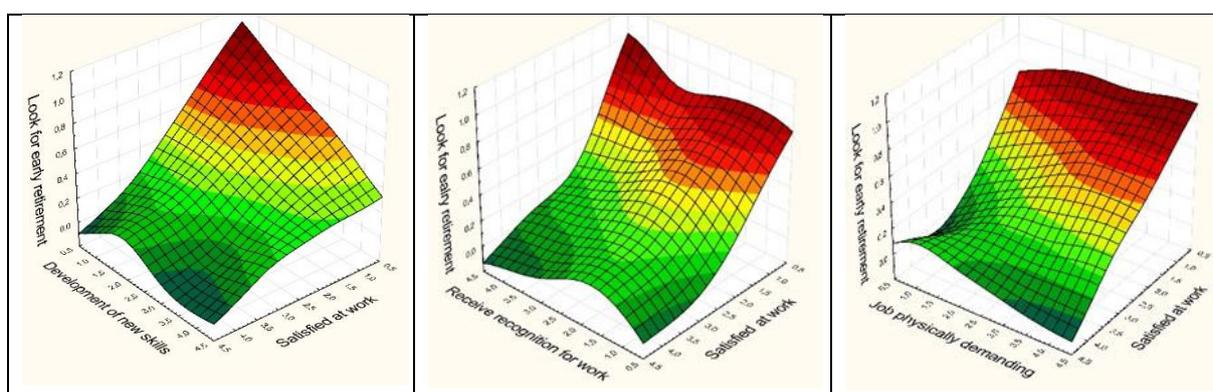
3.2. Three-dimensional graphical analysis

Table 3 suggests that the variable “Satisfaction at work” generates the highest positive regression coefficient. Besides, on the empirical basis, we understand that satisfaction at work represents a universal indicator encompassing a complex continuum of possible influencing factors regarding perception of the work. This brings us to the idea to use the variable “Satisfaction” as a reference to be used in combination with the dependent variable “Seeking early retirement” to analyse the mutual relation of other variables denoting specific aspects of work-place perception.

Thus, we receive a simple trichotomic platform of variables suitable for a three-dimensional graphical analysis which helps reveal complex non-linear relations. In the

three-dimensional graph, we will place the dependent variable “Seeking early retirement” on the z-axis (vertical); independent variable “Satisfied at work” on the x-axis (right – horizontal); the third dependent variable will be on the y-axis (left – horizontal).

Graph 1 shows the selected variables for illustrative reasons, one variable for each group. For the “motivational” variable (Graph 1 – left), we see that the increase in the opportunity to develop new skills is accompanied by an increase of satisfaction at work; and the common occurrence of the high level of the two variables is related to the tendency to stay at the labour market (extension of working life).



Graph 1: Selected factors influencing the tendency to seek early retirement: opportunity to develop new skills (left); receive recognition for work (middle); job physically demanding (right).

Source: authors' calculations, based on Börsch-Supan (2017)

Recognition for the work is not significant in the logit model. In the three-dimensional graph 1, we see that the segment of low recognition for work is accompanied by the high readiness to stay at the labour market. A very similar effect can be observed with the variable “Stress due to heavy work load”. Physically demanding job increases the readiness of the late workers to leave the labour market. However, as we can observe in the graph 1, a high satisfaction with job strongly moderates the tendency to seek early retirement and is accompanied by a high tendency to stay at the labour market, despite the adversity of the work place. The final observation related to all three groups of variables to be made is an important role of the variable Satisfaction at work, which as an encompassing and complex indicator, influences the tendency of late workers to stay at the labour market, thus extending the working life.

4. Discussion and Conclusions

Currently, consumer household spending is increasingly financed by debts. The explanation includes several reasons. First, it is the preference to consume and spend money from the household's available income and from loans. Secondly, households are motivated by the increase in living standards, and by an increase of the real wage. Thirdly, there were other motivations for the increase of indebtedness such as a shift to owner-occupied housing, effective marketing of financial intermediaries and easy availability of money (Pavlíková, Rozboril, 2014). The primary challenge in choosing an early retirement age is making sure you have enough assets to provide an acceptable level of income for your future. Many people do not realize that, even if you choose an early retirement age, you do not have to receive Social Security benefits early. Contrary to what most people believe,

planning in this way can often get you substantially more lifetime income than taking benefits early. Financial difficulties can be avoided by compensating for a reduction in income by taking measures related to your private pension (third-pillar savings) or by making additional contributions to your pension fund. Early retirement planning makes you re-think what brings you happiness and life satisfaction outside of your career and improves your financial footing.

Respondents of the SHARE questionnaire have been asked to refer to several statements relating to their jobs by saying whether they strongly agree, agree, disagree or strongly disagree with them. While these questions have been asked specifically to address the so-called demand-control model and the effort-reward imbalance model (see Siegrist et al., 2005), the individual questions can provide interesting insights into the nature of jobs of individuals aged 50+ and can be helpful in guiding labour market policy to improve labour market conditions for older workers. The decline in the SHARE of the population of working age that will have to finance the health system can be addressed by measures that enable older people to remain in the labour force.

With respect to the labour market status of the 50+ population, the Czech Republic can also be distinguished by the fact that a great majority of both men and women fall into either the working or retired category. Such distribution would suggest that individuals retire relatively early, and that the transition is a direct one, from work to retirement (Bohacek, Myck, 2008). Employment policy might be seen as one of the core elements of the strategy preparing society for an ageing population. In the Czech Republic, employment policy applies two policy types, passive and active, which use different tools to achieve their goals (Mikušová, Rašticová, 2015).

Acknowledgement

This article is based upon work from ISCH COST Action IS1409 *Gender and health impacts of policies extending working life in western countries*, supported by COST (European Cooperation in Science and Technology).

References

- ALAVINIA, S. M. and BURDORF, A. 2008. Unemployment and retirement and ill-health: a cross-sectional analysis across European countries. *Int Arch Occup Environ Health* 82: 39–45.
- ANDERSEN, M. F., NIELSEN, K. M, and BRINKMANN, S. 2012. Meta-synthesis of qualitative research on return to work among employees with common mental disorders. *Scand J Work Environ Health* 38: 93–104.
- BOHACEK, R. and MYCK, M. 2008. *First Results from the Survey of Health, Ageing and Retirement in Europe (2004–2007)*. Mannheim: MEA. ISBN 978-3-00-024969-3.
- BORSCH-SUPAN, A. 2017. *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6*. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w6.600.
- CARLSEN, K., DALTON, S. O., FREDERIKSEN, K., DIDERICHSEN, F. and JOHANSEN, C. 2008. Cancer and the risk for taking early retirement pension: a Danish cohort study. *Scand J Public Health* 36: 117–125.

- DE PRETER, H., VAN LOOY, D. and MORTELMANS, D. 2013a. Individual and institutional push and pull factors as predictors of retirement timing in Europe: a multilevel analysis. *J Aging Stud* 27(4): 299–307.
- DE PRETER, H., VAN LOOY, D., MORTELMANS, D. and DENAEGHEL, K. 2013b. Retirement timing in Europe: the influence of individual work and life factors. *Soc Sci J* 50: 145–151.
- DE WIND, A., GEUSKENS, G. A., REEUWIJK, K. G. et al. 2013. Pathways through which health influences early retirement: a qualitative study. *BMC Public Health* 13: 292.
- FLYNN, M. and MCNAIR, S. 2008. What would persuade older people to stay longer in work? IN CHIVA, A. (Ed.) *Older workers in Europe*. Berkshire, Open University Press.
- GJESDAL, S., LIE, R. T. and MAELAND, J. G. 2004. Variations in the risk of disability pension in Norway 1970–1999 – a gender-specific age-period-cohort analysis. *Scand J Public Health* 32: 340–348.
- HAGEN, K. B., HOLTE, H. H., TAMBS, K. and BJERKEDAL, T. 2000. Socioeconomic factors and disability retirement from back pain: a 1983-1993 population-based prospective study in Norway. *Spine* 25: 2480–2487.
- HARKONMAKI, K., KORKEILA, K., VAHTERA, J. et al. 2007. Childhood adversities as a predictor of disability retirement. *J Epidemiol Commun Health* 61: 479–584.
- HUTCHENS, R. 1999. Social security benefits and employer behavior: evaluating social security early retirement benefits as a form of unemployment insurance. *Int Econ Rev* 40: 659–678.
- KIM, J. Early retirement in the 3 types of welfare states. *Res Aging*. 2009; 31: 520-548.
- LACZKO, F., DALE, A., ARBER, S. S. and GILBERT, G. N. 1988. Early retirement in a period of high unemployment. *J Soc Policy* 17: 313–333.
- LI RANZI, T., D'ERRICO, A. and COSTA, G. 2013. Association between chronic morbidity and early retirement in Italy. *Int Arch Occup Environ Health* 86: 295-303.
- MANSSON, N. O., RASTAM, L., ERIKSSON, K. F. and ISRAELSSON, B. 1998. Socioeconomic inequalities and disability pension in middle-aged men. *Int J Epidemiol* 27: 1019–1025.
- OKSANEN, T. and VIRTANEN, M. 2012. Health and retirement: a complex relationship. *Eur J Ageing* 9(3): 221–225.
- PAVLIKOVA, E. A., ROZBORIL, B. 2014. Consumerism and indebtedness, in Nerudova, D. (ed), 17th International Conference Enterprise and Competitive Environment 2014. *Procedia Economics and Finance*. Amsterdam: Elsevier Science Bv: 516–522.
- MIKUŠOVÁ, J., RAŠTICOVÁ, M. 2015. Employment Policy with Focus on Ageing Population In the Czech Republic as a Service of General Interest. In: *Innovation Management and Sustainable Economic Competitive Advantage: From Regional Development to Global Growth*. International Business Information Management Association (IBIMA), Norristown: 4214-25.
- RICE, N. E., LANG, I. A., HENLEY, W. and MELZER, D. 2011. Common health predictors of early retirement: findings from the English Longitudinal Study of Ageing. *Age Ageing* 40: 54–61.

- RICK, O., KALUSCHE, E. M., DAUELSBERG, T., KONIG, V., KORSUKEWITZ, C. and SEIFART, U. 2012. Reintegrating cancer patients into the workplace. *Dtsch Arztebl Int* 109: 702–708.
- SCHURING, M., BURDORF, L., KUNST, A. and MACKENBACH, J. 2007. The effects of ill health on entering and maintaining paid employment: evidence in European countries. *J Epidemiol Commun Health* 61: 597–604.
- SCHURING, M., ROBROEK, S. J., OTTEN, F. W., ARTS, CH. and BURDORF, A. 2013. The effect of ill health and socioeconomic status on labor force exit and re-employment: a prospective study with ten years followup in the Netherlands. *Scand J Work Environ Health* 39(2): 134–143.
- SHULTZ, K. S., MORTON, K. R., WECKELRE, J. R. 1998. The influence of push and pull factors on voluntary and involuntary early retirees’ retirement decision and adjustment, *J Vocat Behav* 53: 45–57.
- SIEGRIST, J., WAHRENDORF, M., VON DEM KNESEBECK, O., JUERGES, H. and BORSCH-SUPAN, A. 2007. Quality of work, well-being, and intended early retirement of older employees—baseline results from the SHARE Study. *Eur J Public Health* 17: 62–68.
- STATTIN, M. 2005. Retirement on grounds of ill health. *Occup Environ Med* 62(2):135–140.
- STATISTICA 12. 2017. Conceptual Overviews – Surface Plots. [Online]. Available at: <http://documentation.statsoft.com/STATISTICAHelp.aspx?path=Graphs/Graph/UnderstandingGraphs/Concepts/ConceptualOverviewsSurfacePlots>. [Accessed 2017, December 17].
- VAN DEN BERG, T. I., ELDERS, L. A. and BURDORF, A. 2010a. Influence of health and work on early retirement. *J Occup Environ Med* 52: 576–583.
- VAN DEN BERG, T. I., ELDERS, L. A. and BURDORF, A. 2010b. Influence of health and work on early retirement. *J Occup Environ Med* 52(6): 576–583.
- VON NORDHEIM, F. 2003. EU policies in support of member state efforts to retain, reinforce, and re-integrate older workers in employment”, in Buck, H. and Dworschak, B. (Eds), *Ageing and Work in Europe: Strategies at Company Level and Public Policies in Selected European Countries*, Federal Ministry of Education and Research, Stuttgart, 9-26.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Outpatient spending and healthcare system’s efficiency. A key to achieve better outcomes?

Agnieszka Bem¹, Paweł Prędkiewicz², Paulina Ucieklak-Jeż³ and Rafał Siedlecki⁴

¹*Department of Corporate Finance and Public Finance, Faculty of Management, Informatics and Management, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: agnieszka.bem@ue.wroc.pl*

²*Department of Finance, Faculty of Economic Sciences, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: pawel.predkiewicz@ue.wroc.pl*

³*Wydział Filologiczno-Historyczny, Jan Długosz University in Częstochowa, Waszyngtona 4/8, 42-200 Częstochowa, e-mail: p.ucieklak@ajd.czest.pl*

⁴*Department of Corporate Finance and Public Finance, Faculty of Management, Informatics and Management, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: rafal.siedlecki@ue.wroc.pl*

Abstract

It is widely accepted that outpatient treatment is cheaper than hospital one. Assuming the possibility of, at least partial, substitution of hospital treatment by some forms of outpatient treatment, health systems with more emphasis on outpatient treatment should be characterised by better effects at the same cost, or lower costs with the same effects. Using a panel econometric models, we examine, whether, beside an obvious relationship between health expenditure and health status, at a given level of expenditure, we can observe an impact of increased share of outpatient spending. We use data covering the years 2004-2012, on expenditure and effects, coming from Eurostat Database, for selected European countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Spain, Iceland, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia, Sweden, Hungary). Studies confirm, for most variables describing health effects, the existence of a positive relationship between the use of outpatient treatment and health system efficiency.

Keywords: healthcare spending, efficiency, outpatient care

JEL Code: I10, I12, I31

1. Introduction

Developed countries spend an increasing part of its GDP on health benefits. It seems that this increase have certain boundaries and health spending may not grow ad infinitum, despite the ageing population and medical progress (Barešová, Horáková & Urbánek, 2018). Thereby more attention should be given to the efficiency of this limited resources.

One of the basic problems is to determine what proportion of the funds should be directed to the ambulatory health care and how much should be spent on the provision of hospital services. Out-patient treatment are not only low-cost, but also more focused on the health prevention. In the design of the study, we assume, that if in a given health care system the greater part of the funds is spent on the provision of out-patient treatment, the better the results you can achieve.

The aim of this study to analyse the relationship between the structure of health care spending and achieved health care outcomes. We pose several research hypotheses:

(H1) countries which spend more important part of health care expenditures on ambulatory care achieve better health outcomes;

(H2) this effect can be unevenly spread in the population;

(H3) economic transition is a key factor which influence life expectancy.

Unquestionably, countries that spend more on health achieve longer life expectancy, even after taking into account the differences between countries (Jaba, Balan & Robu, 2014), (Gallet & Doucouliagos, 2017), (van den Heuvel & Olaroiu, 2017), (Crémieux, Ouellette & Pilon, 1999). On the other hand, countries characterised by better population's health grow faster economically (Bhargava et al., 2001), (Wang, 2011), (Bloom, Canning & Sevilla, 2004), (Ivanová & Čepel, 2018).

According to the H1 and H2 hypotheses, several studies confirm the negative link between income differences and poor health (Bor, Cohen & Galea, 2017). Low income affect negatively self-rated health, life expectancy or infant mortality. This detrimental impact can be moderated with social transfers – countries where social expenditure is higher show lower health inequalities (Álvarez-Gálvez & Jaime-Castillo, 2018), (Barták & Gavurová, 2015) (Blendinger & Michalski, 2018), (Obrizan & Wehby, 2018). Additionally, it is very important, that the primary care (as a part of ambulatory care) strengthening can reduce this negative impact of income inequality on health (Detollenaere et al., 2018), (Gavurová, Kováč & Šoltés, 2018).

Obrizan and Wehby (2018) also suggest, that increasing health spending should be considered as a major policy objective in countries with low life expectancy in order to improve their population health and longevity. Such action bring positive effect especially in the case of low income quantiles. This suggests that poorer citizens might benefit in another way than richer ones from the different pattern of health care spending distribution, because higher socio-economic status is associated with less emergency room visits and higher affiliation to a family doctor (Ouimet et al., 2015). Additionally, counties characterised by higher inequality have higher potentially preventable admission (López, Loehrer & Chang, 2016), what means, that a sector of ambulatory care is less effective.

Especially, we expect this uneven outcomes distribution between genders. This assumption is based on differences in health care utilization between women and men. First, women have higher rate of health care services utilization, especially in the case of primary care (Manuel, 2017). Women also are more likely than men to use primary care or preventive services (Manuel, 2017), (Pinkhasov i inni, 2010), (Álvarez-Gálvez & Jaime-Castillo, 2018), while men are more likely to use emergency and hospital services

(Manuel, 2017), (Veliu et al., 2018), (Pinkhasov et al., 2010). This higher consumption of health care services do not mean, that women's need are better met. Several studies shows, that women report higher level of unmet medical needs (Manuel, 2017), (Sociás, Koehoorn & Shoveller, 2016), (Pappa et al., 2013) and their perceived health care state is lower (Calzón Fernández et al., 2017).

The hypothesis H3 assumes that countries which went through economic transition are at more unfavourable situation, comparing to West European countries. Jagger (et al., 2008) emphasise an important gap in life expectancy between eastern and western European countries. Carlson (1998) confirms that economic satisfaction is the most powerful predictor of self-assessed health care condition. This is important while the economic transformation, as well as the economic crisis, has a significant effect on the population health status by factors such as reduced health spending, massive privatisation and unemployment, which additionally lowers the status of families (Anastasiou et al., 2016); (Gerry, 2012); (Michalski, 2016), (Stuckler et al., 2011); (Suhrcke & Stuckler, 2012). Another factor may be the reforms, which aim to improve the efficiency of the health sector and which are often not readable for citizens.

2. Methods and Data

In order to verify research hypotheses we estimate the econometric models, by employing OLS method with dummy variables, where health care outcomes are measured using life expectancies (LE, HLY) and are result of inputs, representing health care expenditure. Choosing outcomes' indicator we base on the assessment, that life expectancy is a commonly measure of health system efficiency (Obrizan i Wehby, 2018). We employ two life expectancies – life expectancy (LE) and healthy life years (HLY) which measures the number of remaining years that a person of a certain age is supposed to live without disability² – this indicator is based on a subjective health state's self-assessment. We use expectancies separately for men (LEM, HLYM) and women (LEF, HLYF) at the age of 0.

We expect positive relationship between health outcomes and income and health system financing intensity, however modified by another (dummy) variables. Using OLS method we estimate model's parameters, where health outcomes: life expectancy (LE) or healthy life expectancy (HLE) are result of inputs related to health system current health expenditures, expressed as percentage of gross domestic product (CHE_GDP) and overall income level, measured by GDP per capita (purchasing power standard per inhabitant – GDP_PPP in thousands EUR). We add dummy variables which should represent some other factor influencing health, like country specifics (COUNTRY dummy variables). Based on our previous research we include dummy variable (POST_COMM), having value equal to 1 for ex-communist countries which have undergone economic transformation even after twenty years still have lower health outcomes and health system efficiency, and 0 for another countries.

In table 1 we present descriptive statistic for analysed variables. We can observe, that variables describing the quality of life (healthy life years) have much more diversified values, than the overall life expectancies. Additionally, life expectancies for male's population are more diversified than for female's one. We can also conclude, that analysed countries are quite dissimilar in terms of generated GDP, as well as the level of health care spending or the part of health care expenditure which are consumed by outpatient care.

² The definition employed by Eurostat (https://ec.europa.eu/health/indicators/healthy_life_years/hly_en)

Table 1: Descriptive statistics for research variables

| | LEF0 | LEM0 | HLEF | HLEM | GDP_PPS | CHE_GDP | OUT_CHE |
|----------|-------|-------|-------|-------|---------|---------|---------|
| Max | 85.70 | 81.60 | 73.90 | 72.80 | 34.34 | 11.77 | 42.88 |
| Avg. | 81.26 | 74.58 | 61.25 | 60.16 | 22.16 | 8.29 | 26.98 |
| Min | 75.70 | 64.50 | 52.00 | 48.30 | 7.82 | 4.97 | 8.36 |
| S.dev. | 2.48 | 4.12 | 4.44 | 4.99 | 6.8 | 1.78 | 7.33 |
| No. obs. | 191 | 191 | 183 | 183 | 184 | 176 | 146 |

Source: own elaboration based on Eurostat Database

To test our the H1 hypothesis (H1) we include additional input variable: percentual share of current health expenditures (OUT_CHE) which is a sum of three basic EUROSTAT current health expenditures indicators:

- (1) services of curative home and rehabilitative home care,
- (2) out-patient curative and rehabilitative care,
- (3) day cases of curative and rehabilitative care, measured by percentual share of CHE.

If our research assumption is true, we should observe the positive, and statistically significant, value of coefficient for OUT_CHE variable (α_3):

$$LE = \alpha_0 + \alpha_1 * GDP_{PPS} + \alpha_2 * CHE_{GDP} + \alpha_3 * POST_{COMM} + \alpha_3 * OUT_{CHE} + \sum_{j=1}^{24} \alpha_{4,i} * Country_i + \varepsilon \quad (1)$$

The second hypothesis (H2) is verified by separate models, where the dependent variables are: population's health status, expressed by LE for a newborn, and the health status for, separately, men's and women's subpopulations.

Data are obtained from EUROSTAT database, covering the years 2004–2012. We analyse data for 24 European countries (Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Croatia, Cyprus, Latvia, Lithuania, Hungary, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland).

3. Results

First, we find, that for most health outcomes we can observe, as expected, the positive relationship between gross domestic product (GDP) and the level of health care spending (CHE_GDP) and life expectancies (LEF and LEM). This relationship is highly statistically significant, but it appears only in the case of effects measured LE, which do not include health care's self-assessment (comp.: Tkacova, Gavurova, & Behun, 2017). It is interesting, that there are no statistically significant relationship between the level of spending on health and the healthy life years indicator. It might suggest that the further increase of health care spending, although bring some effects in the form of extending lifespan, but do not improve its quality – do not affect the expected life expectancy in good health (table 2).

However very interesting is the relationship between life expectancy (or life expectancies in good health) and the structure of health care expenditure. We find, that in the case of women's population there is a positive, and statistically significant, relationship between the part of health care spending with is consumed by the out-of-patient (ambulatory) benefits and life expectancies – including the healthy life years. We can conclude that higher percentage of this kind of health care spending stimulate longer, better quality

life. We can see that for men's population this relationship is weaker – expressed by lower values of coefficients and lower values of p-value (table 2). Generally, obtained results are consistent with observations of Obrizan i Wehby (2018), who find that increasing health spending should be considered as a major policy objective in countries with low life expectancy in order to improve their population health and longevity.

This results are consistent which findings presented in the literature review. The differences between the population of men and women may be due to a different pattern of use of health care services (men less intensively benefit primary health care's services, as a result, more frequently use emergency rooms). The state of women's health is increasingly dependent on the availability of outpatient care and this relationship is statistically more significant – women's population, although consume health care services more intensively, is much more at risk of unmet medical needs (Manuel, 2017), (Socías, Koehoorn i Shoveller, 2016), (Michalski, 2016b), (Pappa, Kontodimopoulos, Papadopoulos, Tountas i Niakas, 2013).

Table 2: Models parameters

| Dependent variable | LEF0 | LEM0 | HLYF0 | HLYM0 |
|--------------------|-----------|------------|------------|------------|
| Constant | 76.44*** | 57.85*** | 66.14*** | 44.41*** |
| GDP_PPS | 0.1912*** | 0.2208*** | 0.1089 | -0.1551 |
| CHE_GDP | 0.6608*** | 0.9266*** | -0.6098 | -0.1549 |
| POST_COMM | -0.4786* | -2.1915*** | -5.6078*** | -6.0939*** |
| OUT_CHE | 0.0598* | 0.0584 | 0.3021*** | 0.2740* |

*** p-value<0.1%, ** p-value <1%, * p-value<0.1%

Source: Own study

Country dummies are significant for ca. 80% cases. Our models, although very simple, have generally high prognostic values – R-squared is over 80% for all models. We observe a very strong relationship between economic transition and health outcomes. As we theorise, the efficiency is higher in countries which spend more money on day-cases and ambulatory care. In all cases coefficient for OUT_CHE was greater than 0 and in most models statistically significant.

We find that there is a significant negative difference in life expectancy for post-communist countries compared to Western Europe. This effect is especially high for men and in healthy life expectancy, where post-transition citizens have LE lower by several years. This effect can be measured even after we included income related variables proving our H3 hypothesis. We assume that is effect of lower efficiency of health resources utilisation and high inertia in health system leading i.e. to slow changes in hospital bed structure.

4. Discussion and Conclusions

Our models show, that at a given level of resources spent on health care and the given level of income (GDP) we can observe the positive effect associated with spending a greater part of funds on out-of-patient services. Hence, countries which lead away from a typical model of hospital treatment can achieve better results.

We can even dare to formulate a far-reaching conclusion, that health spending in analysed countries are not fully effective – it is true, that growing spending allows to extend

life expectancies, but do not improve life expectancies in good health (that is, do not improve life's quality). Some change in the pattern of expenditure, without changing their level, can contribute to improving the subjective health status.

We plan to repeat this research, using the long series and examining additional variables – the expected further life expectancy for other age groups (eg. LE60). Another option which can enrich our findings is to include into analysis income groups or other sub-populations with potential poor access to health care benefits.

References

- ÁLVAREZ-GÁLVEZ, J., JAIME-CASTILLO, A. M. 2018. The impact of social expenditure on health inequalities in Europe. *Social Science & Medicine*: 9–18.
- ANASTASIOU, F., ANTONOPOULOU, M., TSILIGIANNI, I., LIONIS, C. 2016. Long term impact of the economic crisis on health care in the Greek setting: The Pandora box? *Health Policy*. <https://doi.org/10.1016/j.healthpol.2016.05.008>
- BAREŠOVÁ, P., HORÁKOVÁ, M., URBÁNEK, T. 2018. An Aging Population: A Competitive Advantage For Companies. *Journal of Competitiveness*, 10 (1): 5–22.
- BARTÁK, M., GAVUROVÁ, B. 2015. Economics and social aspects of long-term care in the context of the Czech republic and the Slovak republic EU membership. In *12th International Scientific Conference Economic Policy in the European Union Member Countries*. Karviná: Silesian University: 35–44.
- BHARGAVA, A., JAMISON, D. T., LAU, L. J., MURRAY, C. J. 2001. Modeling the effects of health on economic growth. *Journal of Health Economics*, 20(3): 423–440. [https://doi.org/10.1016/S0167-6296\(01\)00073-X](https://doi.org/10.1016/S0167-6296(01)00073-X).
- BLENDINGER, G., MICHALSKI, G. 2018. Long term competitiveness based on value add measures as part of highly professionalized corporate governance management of German DAX 30 corporations. *Journal of Competitiveness* 10 (2).
- BLOOM, D. E., CANNING, D., SEVILLA, J. 2004. The Effect of Health on Economic Growth: A Production Function Approach. *World Development*, 32(1): 1–13. <https://doi.org/10.1016/J.WORLDDEV.2003.07.002>
- BOR, J., COHEN, G. H., GALEA, S. 2017. Population health in an era of rising income inequality: USA, 1980–2015. *The Lancet*: 1475–1490.
- CALZÓN FERNÁNDEZ, S., FERNÁNDEZ AJURIA, A., DEL AMO GONZÁLEZ, L., DEL PUERTO, M. I MARTÍN MARTÍN, J. J. 2017. Diferencias por sexo de la salud percibida antes y durante la crisis económica (2007 y 2011). *Revista española de salud pública*: e1-e12.
- CRÉMIEUX, P.-Y., OUELLETTE, P., PILON, C. 1999. Health care spending as determinants of health outcomes. *Health Economics*, 8(7): 627–639. [https://doi.org/10.1002/\(SICI\)1099-1050\(199911\)8:7<627::AID-HEC474>3.0.CO;2-8](https://doi.org/10.1002/(SICI)1099-1050(199911)8:7<627::AID-HEC474>3.0.CO;2-8).
- DETOLLENAERE, J., DESMAREST, A. S., BOECKXSTAENS, P., WILLEMS, S. 2018. The link between income inequality and health in Europe, adding strength dimensions of primary care to the equation. *Social Science & Medicine*: 103–110.

- GAVUROVÁ, B., KOVÁČ, V., ŠOLTÉS, M. 2018. Medical Equipment and Economic Determinants of Its Structure and Regulation in the Slovak Republic. In *Encyclopedia of Information Science and Technology, Fourth Edition*: 5841-5852. IGI Global.
- GALLET, C. A., DOUCOULIAGOS, H. 2017. The impact of healthcare spending on health outcomes: A meta-regression analysis. *Social Science & Medicine*, 179: 9–17. <https://doi.org/10.1016/J.SOCSCIMED.2017.02.024>
- GERRY, C. J. 2012. Re-revisiting the Mass Privatisation – Mortality Debate: A response to Stuckler, King and Mckee. *Social Science & Medicine*. <https://doi.org/10.1016/j.socscimed.2012.02.005>
- IVANOVÁ, E., ČEPEL, M. 2018. THE IMPACT OF INNOVATION PERFORMANCE ON THE COMPETITIVENESS OF THE VISEGRAD 4 COUNTRIES. *Journal of Competitiveness*, 10 (1): 54–72.
- JABA, E., BALAN, C. B., ROBU, I.-B. 2014. ScienceDirect Emerging Markets Queries in Finance and Business The relationship between life expectancy at birth and health expenditures estimated by a cross-country and time-series analysis. *Procedia Economics and Finance*, 15, 108–114. [https://doi.org/10.1016/S2212-5671\(14\)00454-7](https://doi.org/10.1016/S2212-5671(14)00454-7)
- JAGGER, C., GILLIES, C., MOSCONE, F., CAMBOIS, E., OYEN, H. VAN, NUSSELDER, W., ROBINE, J.-M. 2008. Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis. *The Lancet*, 372: 2124–2131. <https://doi.org/10.1016/S0140>
- LÓPEZ, D. B., LOEHRER, A. P., CHANG, D. C. 2016. Impact of income inequality on the nation's health. *Journal of the American College of Surgeons*(4): 587–594.
- MANUEL, J. I. 2017. Racial/Ethnic and Gender Disparities in Health Care Use and Access. *Health services research*: 1-23. doi: 10.1111/1475-6773.12705
- MICHALSKI, G. 2016a. Full operating cycle influence on the food and beverages processing firms characteristics, *Agricultural Economics-Zemledska Ekonomika Volume*: 62(2): 71–77
- MICHALSKI, G. 2016b. Risk Pressure And Inventories Levels. Influence Of Risk Sensitivity On Working Capital Levels, *Economic Computation And Economic Cybernetics Studies And Research* 50 (1): 189–196.
- OBRIZAN, M., WEHBY, G. L. 2018. Health Expenditures and Global Inequalities in Longevity. *World Development*: 28–36.
- OUIMET, M. J., PINEAULT, R., PRUD'HOMME, A., PROVOST, S., FOURNIER, M., LEVESQUE, J. F. 2015. The impact of primary healthcare reform on equity of utilization of services in the province of Quebec: a 2003–2010 follow-up. *International journal for equity in health*(1): 139.
- PAPPA, E., KONTODIMOPOULOS, N., PAPADOPOULOS, A., TOUNTAS, Y., NIAKAS, D. 2013. Investigating unmet health needs in primary health care services in a representative sample of the Greek population. *International journal of environmental research and public health*(5): 2017–2027.
- PINKHASOV, R. M., WONG, J., KASHANIAN, J., LEE, M., SAMADI, D. B., PINKHASOV, M. M., SHABSIGH, R. 2010. Are men shortchanged on health? Perspective on health care utilization and health risk behavior in men and women in the United States. *International journal of clinical practice*(4): 475–487.

- SOCÍAS, M. E., KOEHOORN, M., SHOVELLER, J. 2016. Gender inequalities in access to health care among adults living in British Columbia, Canada. *Women's Health Issues*(1): 74–79.
- STUCKLER, D., BASU, S., SUHRCKE, M., COUTTS, A., MCKEE, M. 2011. Effects of the 2008 recession on health: a first look at European data. *The Lancet*.
[https://doi.org/10.1016/S0140-6736\(11\)61079-9](https://doi.org/10.1016/S0140-6736(11)61079-9)
- SUHRCKE, M., STUCKLER, D. 2012. Will the recession be bad for our health? It depends. *Social Science & Medicine*. <https://doi.org/10.1016/j.socscimed.2011.12.011>
- TKACOVA, A., GAVUROVA, B., BEHUN, M. 2017. The Composite Leading Indicator for German Business Cycle. *Journal of Competitiveness*, Vol. 9, Issue 4, pp. 114–133. DOI: 10.7441/joc.2017.04.08
- VAN DEN HEUVEL, W. J. A., OLAROIU, M. 2017. How Important Are Health Care Expenditures for Life Expectancy? A Comparative, European Analysis. *Journal of the American Medical Directors Association*, 18(3): 276.e9-276.e12.
<https://doi.org/10.1016/J.JAMDA.2016.11.027>
- WANG, K.-M. 2011. Health care expenditure and economic growth: Quantile panel-type analysis. *Economic Modelling*, 28(4): 1536–1549.
<https://doi.org/10.1016/j.econmod.2011.02.008>
- VELIU L., MANXHARI M., PODVORICA N., FEJZA E., HYESNI V. 2018. Managing SMEs In A Turbulent Context: A Case Study From A Kosovan Manufacturing Company. *Journal of Competitiveness*, 10 (1): 155–170.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

What if not Gross Domestic Product per capita?

Anna Bluszcz¹

¹Department of Safety Engineering, Faculty of Mining and Geology, The Silesian University of Technology, Akademicka 2A, 44-100 Gliwice, Poland, e-mail: anna.bluszcz@polsl.pl

Abstract

The article concerns the issue of methods of measuring the level of sustainable development in order to monitor progress of EU member states in this area. The attributes of Gross Domestic Product are presented as a universal and most popular measure of economic development. The aim of this article are presentation of significant faults of GDP per capita index, on the basis of a data analysis for member states which does not include social differences in relation to the achieved income level. As a result of the research the Gini coefficient index are shown as a tool, which points at disparities in incomes of the studied countries. It is proved that EU member states are characterized by one of the lowest levels of disparities in societies incomes in comparison to other countries around the world. As a result of analyses, alternative concepts of indicators are presented too, which could be used to assess progress in realizing the sustainable development strategy as an alternative for GDP, such as: Human Development Index, Ecological Footprint, Happy Planet Index and Environmental Performance Index.

Keywords: sustainable development indicators, synthetic measure of development, GDP
JEL Code: O1, O2, O4

1. Introduction

Sustainable development is a multi-dimensional concept, which requires constructing adequate measuring methods in three perspectives simultaneously: economic, social and environmental ones. These three dimensions are mutually interacting, which often poses a problem in a discussion which dimension is more important and in which direction strategic actions should go.

The European Union defines more than 100 indicators of sustainable development in order to monitor implementing the principles of sustainable development in member states. Growth rate of actual GDP per capita is defined as the main development indicator in the socio-economic development area. The aim of the article is analysing essential arguments in favour of applying the indicator, but at the same time its significant faults are

presented, which results in alternative methods based on synthetic indicators presented in the article.

2. Methodology and Data

The fundamental issue concerning the methodology of measuring the sustainable development level of countries in the economic perspective comes from the following basic definition:

Generally, sustainable development concerns achieving balance in three main dimensions at once, i.e., in the economic dimension signifying the pursuit of sustainable economic development; in the social dimension signifying the protection of public health and social integration; and in the environmental dimension placing a significant emphasis on environmental protection and natural resources in a way as not to endanger the capabilities to meet the needs of future generations (WECD, 1987), (Bluszcz A.2016).

Economic performance of a country is generally being measured through GDP (Gross Domestic Product), a variable that has also become the de facto universal metric for 'standards of living'. However, GDP does not properly account for social and environmental costs and benefits. It is also difficult to achieve sustainable decision-making aiming at sustainable progress and well-being if welfare is being considered from a purely financial point of view (WP, 2010); (Manowska A. et. Al. 2017). As a research method, case studies and literature studies were used.

3. Advantages and limitations of Gross Domestic Product

Despite this fact, GDP (Gross Domestic Product) currently serves as an indicator of economic development in the economic perspective as the most popular and easiest one to use and measure. Data used for calculations are relatively easy to measure as they express the total value of goods produced and services provided in a country during one year and hence its popularity and universalism in use.

Figure 1 shows member states arranged according to the decreasing GDP level in 2014 together with GDP level in 2006.

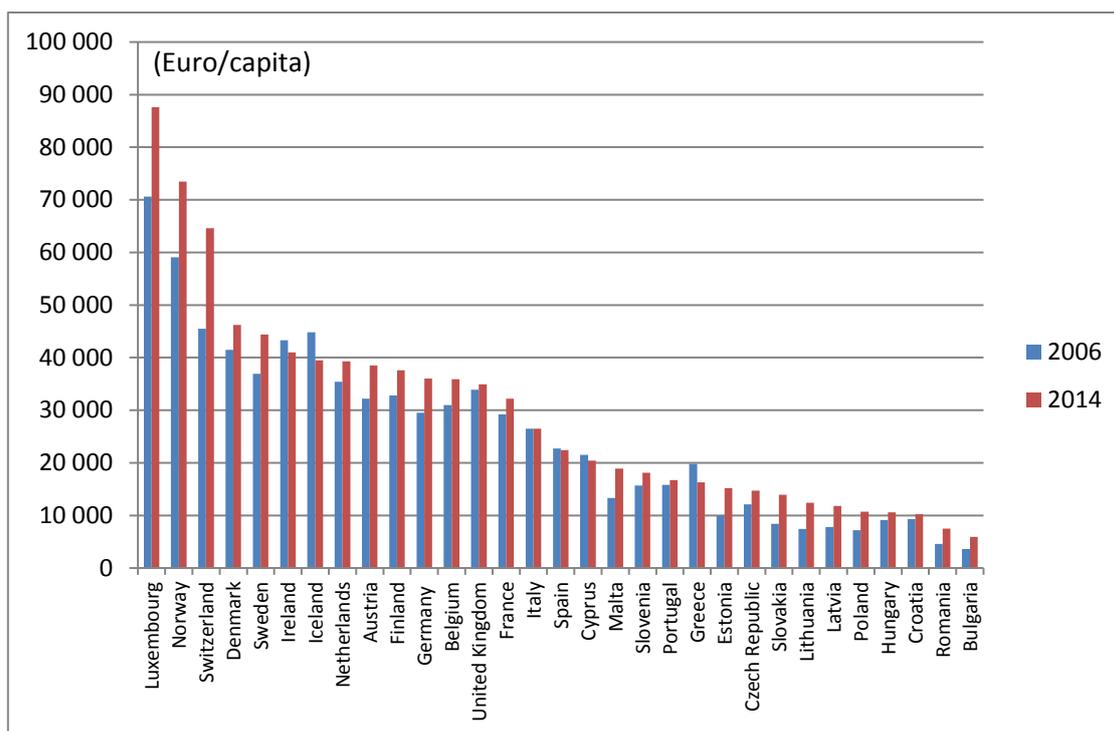


Figure 1: GDP in EU in 2006 and 2014

Source: <http://ec.europa.eu/eurostat> (Accessed: 10 November 2017)

Figure 1 shows GDP index for the EU countries in 2006 and 2014. Countries with the highest GDP per capita include Luxembourg, Norway, Switzerland, Denmark, Sweden, Ireland, Iceland, where GDP reaches the level above 40 000 Euro/capita per year. Countries with the level almost four times lower include Bulgaria, Romania, Croatia, Hungary, Poland, Latvia, Lithuania, Slovakia and so on. Taking into account the trends analysis during the studied 8 years it is worth noticing that the highest increase in the GDP/capita level was in 2014 in relation to 2006 in such countries as: Lithuania (by 68%), Slovakia (by 65%), Bulgaria (by 64%), Romania (by 63%), Estonia (by 52%), Latvia (by 51%), Poland (by 49%) Malta (by 42%). The changes should be regarded as positive ones because undoubtedly the fact that those countries joined the EU enabled their dynamic economic development following the example of highly developed member states. While studying the GDP/capita level we should analyse and publish information on the actual distribution of the income per every inhabitant as the average measure per inhabitant may have a significant level of range, e.g. above 40000 Euro/per capita may mean a substantial proportion of society benefitting from a more than average level and the remaining society proportion benefitting from a significantly lower level. This means that information on statistical dispersion of the level in each country should be published along the level of GDP/capita index, which is done by Gini coefficient. In the general sense of social justice the smaller the social stratification in relation to income, the better. The measure of stratification is Gini coefficient (sometimes expressed as a Gini ratio or a normalized Gini index) which is a measure of statistical dispersion intended to represent the income or wealth distribution of a nation's residents, and is the most commonly used measure of inequality. On the basis of the data presented on the Eurostat website in 2015 the highest level of Gini coefficient index above 35 in the EU was achieved by Lithuania, Romania, Bulgaria, Latvia, which means a significant level of social stratification. A high level between 30 and 35 was recorded for Estonia, Spain, Greece, Portugal, Cyprus Italy, UK, Poland, Croatia,

Germany. The medium level between 25 and 30 was recorded for Ireland, Switzerland, France, Luxembourg, Hungary, Malta, Denmark, Austria, Netherlands, Belgium, Finland, Sweden. The lowest level of income stratification according to Gini coefficient was recorded for Slovenia, Norway, Slovakia, Iceland. In 9 member states the level of the coefficient increased significantly to the level above 5% from the base year 2007 to 2015 in such countries, among others, as: Cyprus increase by 13%, Lithuania 12%, Hungary and France 10%, Denmark 9%, Sweden 8%. Other countries remained at almost the same Gini coefficient level or there was a drop tendency, which should be interpreted as a positive trend, thanks to which the level of social stratification is decreasing. The lowest level of the coefficient was recorded for Iceland 23.6. Gini coefficient calculated as a ratio of the standard deviation to the arithmetic mean for 2015 for the EU countries was 14%, which means a moderate variation level in the income stratification of the EU societies. In the world ranking of the level of social stratification the highest positions are taken by African countries, where the level of Gini coefficient is above 60, whereas twofold lower levels below 30 in the ranking are taken mostly by the EU countries (WF, 2017).

While studying the problem how to describe social wealth increase and how to measure it in the best possible way, many economists underline the fact that in highly developed countries, which include EU states, the constant increase of GDP/capita does not contribute to the increase of life satisfaction among society as much as it could have been a decade or two before (Frajman Ivković, 2016), (Bergheim and Schneider, 2006)

GDP is not a proper measure of economic development because:

- it includes only economic activity, whose increase may reduce human wealth as well as negatively influence the natural environment,
- it does not include all resources (especially household resources),
- it does not include important areas in human life, such as: health, education, work conditions, leisure time use, equality or social relations,
- it ignores essential factors of sustainable development (e.g. environment protection, human and social capital).

Hence, in literature there is an increase in popularity of a change in the attitude towards measuring life satisfaction and assessing social welfare by including into the assessment not only the universal, easy to measure value of GDP/capita, which defines the economic status of an individual, but also aspects concerning health state, healthcare level and the amount of leisure time. (Schepelmann et al., 2010), (Mcneill, 1999)

That is where initiatives of alternative measurement in the European Union come from, such as “The Beyond GDP initiative”, which is about developing indicators that are as clear and appealing as GDP, but more inclusive of environmental and social aspects of progress (European Commission, 2017).

4. Results – Indicators “replacing” GDP

Due to the identified faults of GDP index a search for alternative measures of economic development began, which include among others Human Development Index (HDI), Ecological Footprint (EF), Happy Planet Index (HPI), Environmental Performance Index (EPI).

Human Development Index (HDI) is an indicator created by the United Nations Organisation in order to measure the development of individual countries. The indicator

level is in the range of $\langle 0,1 \rangle$. The calculations started in 1990 and are published annually in the form of country rankings. More in (Bluszcz, 2017), (Bluszcz and Kijewska, 2016, 2017), (Bočková, 2014)

The Human Development Index (HDI) is a composite index measuring average achievements of a country in three basic dimensions of human development (Goossens, 2007):

- a long and healthy life, measured by life expectancy at birth;
- knowledge, measured by the adult literacy rate (with 2/3 weight) and the combined
- primary, secondary and tertiary gross enrolment ratio (with 1/3 weight); and
- living standard, measured by GDP per capita and adjusted for the local cost of living (PPP US\$).

Performance in each dimension is expressed as a value between 0 and 1 by applying the following general formula:

$$\text{Dimension index} = \frac{\text{actual value} - \text{min target value}}{\text{max target value} - \text{min target value}}$$

Theoretically, the maximum of such a measure equals one in a country if three conditions are met simultaneously:

- full school enrolment and complete lack of illiteracy,
- average life expectancy in a given country would reach the record level recorded in the series of studied years between 1980–2016,
- GDP per capita would reach the highest level for the studied years between 1980–2016.

Calculation of HDI index is a resultant of these three indicators as a geometric mean (i.e. as the cube root of their product) and not as their arithmetic mean. In addition, the indicator calculated in such a way is adjusted with regard to the inequality in income distribution, which results in IHDI (Inequality – Adjusted Human Development Index). In the case of the ideal equality both indices, HDI and IHDI, would be equal. In reality the higher the income inequality, the bigger the divergence between both indices. 26 EU member states are classified in HDI ranking in the group of 47 most developed countries – very high human development with HDI index from the highest level for Norway 0.955 to the level of 0.805 for Croatia in 2012 among 186 countries classified in HDI ranking. After taking into account the income inequality according to IHDI index, the level of IHDI index is lower than HDI in all the studied countries, but in general for the group of EU countries the decrease of the IHDI level does not on average exceed 10%. However, in the general world ranking for the 186 studied countries the disparities are significant, with the highest ones occurring in the group of low human development, where in all 40 countries the disparities between the levels of HDI and IHDI range between 27% and 43%. For instance, in this group Congo reaches the highest level of HDI at 0.534, but IHDI is only at 0.368 with 31.1% correction with reference to income inequality. The lowest HDI level occurs in the Central African Republic at 0.352, but after taking into account income inequality it drops by 40.5% to the level of 0.209. As the examples show, HDI and adjusted IHDI indices may become an alternative for so popular GDP index as they take into account income

disproportions in the societies of studied countries as well as health and education aspects, which are priorities in assessing the life quality and development level of a country.

Ecological Footprint (EF) and Happy Planet Index (HPI)

The Ecological Footprint (EF) is a resource accounting tool which measures the extent to which the ecological demand of human economies stays within or exceeds the capacity of the biosphere to supply goods and services. The EF measures how much land area is required to sustain a given population at present levels of consumption, technological development and resource efficiency. The main components of the EF are land used for crops, animal products, fisheries, forest products, built up land and the land needed to absorb and sequester CO₂ emissions from fossil fuels. The EF measures the final consumption attributable to the residents of a country/region, whether or not the impacts of that consumption occur inside or outside the boundaries of that country/area. The Footprint of a country should be understood as a measure of its consumption and its worldwide environmental impact. For this reason, a country's EF can be significantly larger than its actual biocapacity. According to the report from WWF, global EF has more than tripled between 1961 and 2003. The concept of EF is useful for developing and assessing future scenarios related to different policy options. It provides a tool for evaluating success or failure of policies and gearing them into a more sustainable direction (8). Ecological Footprint identifies six categories of areas measured literally with the unit areas (so-called global hectares), i.e.: agricultural and farm use of the land, forests, fishing areas, urban areas and green areas absorbing carbon dioxide. The ecological footprint shows, above all, to what extent the areas with high industrialisation rely on natural resources located in other parts of the world. For each area we calculate the rate, expressed in area units, in global hectares per person (gha/p). On the basis of the data presented on the Global Footprint Network we can see that only four countries from the 26 surveyed member states have got the ecological reserve, that is use less resources than their biological ability. These are: Finland (has got reserve of 6.3 gha/person), Sweden (has got reserve of 3.9 gha/person), Latvia (has got reserve of 1.4 gha/person) and Estonia (has got reserve of 1.1 gha/person). Countries in EU with the highest ecological deficit are: Belgium (6.7 gha/person); Netherlands (5,2 gha/person); Spain, Italy and Greece with the deficit at the same level of 3,8 gha/person, Great Britain (3.6 gha/person), Denmark (3.4 gha/person), Germany and Portugal (3.2 gha/person). More information in (Bluszcz, 2017).

Another indicator of economic development is HPI – Happy Planet Index, introduced in 2006 by New Economics Foundation. The index determines the level of human happiness on our planet irrespectively of people's wealth. HPI includes such components as: life expectancy, life satisfaction and the so-called ecological footprint measured by an extent to which natural resources are consumed and by nature's capacity to regenerate itself. The exact function of HPI comes down to multiplying life satisfaction by life expectancy and dividing by ecological footprint EF. HPI advantages are as follows: it is easy to calculate, it constitutes a combination of soft and hard features – it takes into account life satisfaction and natural resources consumption in individual countries. The disadvantage of the index is the fact that such features as happiness and life satisfaction are subjective and personal. In the HPI level ranking the countries at the highest positions in the world are: Costa Rica, the Dominican Republic, Jamaica and Guatemala. Poland takes the 77th position among 143 studied countries. That means that the happiest countries are those in Latin and South America as well as Southeast Asia, and the least happy are those in Africa, Northern America and countries from the central and eastern Europe – Russia, Ukraine and Belarus.

Environmental Performance Index (EPI)

The Environmental Performance Index measuring the ecological level of countries was devised at the American Universities of Columbia and Yale. The synthetic index was normalized within the scale of (0;100). The first analysis took place in 2006 and comprised 146 countries. The Environmental Performance Index (EPI) is constructed through the calculation and aggregation of 20 indicators reflecting national-level environmental data. These indicators are combined into nine issue categories containing partial indices, such as health impacts (child mortality), air quality (household air quality, air pollution), water and sanitation (access to drinking water and sanitation), water resources (wastewater treatment), agriculture (agricultural subsidies, pesticide regulation), forests (change in forest cover), fisheries (coastal shelf fishing pressure), biodiversity and habitat (natural biome protection, global biome protection, marine protected areas, critical habitat protection), climate and energy (trend in CO₂ emissions, change of trend in carbon intensity, trend in carbon intensity)

Among 174 countries evaluated according to EPI index in the ranking from 2014 the highest positions among EU member states were taken by Luxembourg (83.29), the Czech Republic (81.47) and Germany (80.47). The average increase of the index level by minimum 2% was recorded in all member states, whereas the highest increase by more than 15% was recorded in Slovenia and Estonia to the levels of 76.43 and 74.66 respectively (Bluszcz, 2016).

5. Discussion and Conclusions

The fast pace of changes in the contemporary world causes a situation where traditional methods of measuring global economic development are insufficient.

In addition, it should be noted that the measurement of the level of sustainable development should be adequate at the organizational level, which follows the reporting of social responsibility (Kowal and Kustra, 2016) (Hąbek and Wolniak, 2016), (Hąbek, 2014) (Kustra and Sierpińska, 2008). The macro-environment is the set of conditions resulting from the socio-economic system which influence the operation of the enterprise on the domestic and international market (Sierpińska and Bąk, 2012). The selected methods of measuring sustainable development presented in the article are an alternative to GDP but they do not exhaust the multidimensional problem of adequate and optimum measurement methods. On the whole, we can state that applying the discussed indices to determine economic development provides inconclusive results. The main reason for such a state is that various measurable and subjective characteristics are taken into account while estimating those indices.

In order to raise the level of economic development individual countries should create conditions for their citizens to increase wealth, improve healthcare, improve the range and quality of educational services, look after citizens' safety, improve the state of environment protection, care for preservation of cultural heritage, create active civil attitude in society as well as abide by democratic principles. Economic development includes both quantity and quality changes. That is why there are suggestions that in studies on economic development the analyses scope shall be broadened with demographic processes, ecology, innovations, scientific and technological development as well as social and cultural processes.

Acknowledgements

This paper was supported by Grant (nr. RGJ 06/030/RGJ18/0027-01).

References

- BERGHEIM S. SCHNEIDER S. (2006), Measures of well-being, There is more to it than GDP, Deutsche Bank Research, Frankfurt
- BLUSZCZ A. 2016. A comparative analysis of the selected synthetic indicators of sustainability. *Procedia – Social and Behavioral Sciences* 220. 40–50.
- BLUSZCZ A. 2016. Classification of the European Union member states according to the relative level of sustainable development. *Quality and Quantity*, vol. 50. iss. 6. 2591–2605. DOI 10.1007/s11135-015-0278-x.
- BLUSZCZ A. 2017. Ecological growth boundaries. *Management Systems and Production Engineering*. PANOVA. No 7 iss. 1, 55–59.
- BLUSZCZ A. KIJEWSKA A. 2016. The structure of the social development of the countries on the basis of synthetic indicators. 3th International Multidisciplinary Scientific Conference on Social Sciences and Arts. *SGEM Social Science Sociology and Healthcare* vol. II 1139-1146. doi:10.1016/j.sbspro.2016.05.467.
- BLUSZCZ A. KIJEWSKA A. 2017. Economic growth and the level of emission of the Visegrad Group compared to other EU countries. 20th International Scientific Conference “Enterprise and Competitive Environment”, Conference proceedings. Eds. Svatopluk Kapounek, Veronika Krutilova, Mendel University in Brno, 158–166.
- BOČKOVÁ N. Research and Development Expenditure: Business Enterprises in the Visegrad Four. In *IBIMA 23*. Valencia: International Business Information Management Association, 2014. p. 1363-1371. ISBN: 978-0-9860419-1-4.
- EC – EUROPEAN COMMISSION ENVIRONMENT. 2017 (Online). Available at: http://ec.europa.eu/environment/beyond_gdp/index_en.html (Accessed: 1 November 2017)
- EUROSTAT. 2017 (Online). Available at: <http://ec.europa.eu/eurostat> (Accessed: 10 November 2017)
- FRAJMAN IVKOVIĆ A. 2016. Limitations of the GDP as a measure of progress and well-being. *Econviews* 1, 257–272. UKD:330.55.
- GOOSSENS Y. 2007. Alternative progress indicators to Gross Domestic Product (GDP) as a means towards sustainable development. Policy Department A: Economic and Scientific Policy DG Internal Policies European Parliament.
- HĄBEK P. WOLNIAK R. 2016. Assessing the quality of corporate social responsibility reports; the case of reporting practices in selected European Union member states. *Springer Qual. Quant.* 50(1), 399–420.
- HĄBEK, P. 2014. Evaluation of sustainability reporting practices in Poland. *Springer Qual. Quant.* 48(3), 1739–1752.

- KOWAL B., KUSTRA A. 2016. Sustainability reporting in the energy sector, E3S Web of Conferences 10, 00129.
- KUSTRA A., SIERPIŃSKA M. 2008. Bonus systems in mining industry. Current situation and future developments. *Min. Resour. Manag.* 24(4/2), 223–235.
- MANOWSKA A., TOBÓR-OSADNIK K., WYGANOWSKA M. 2017. Economic and social aspects of restructuring Polish coal mining: Focusing on Poland and the EU; *Resour. Policy* vol. 52. 192–200.
- MCNEILL, J. 1999. GDP growth and human wellbeing: a brief look at why we need a better measure of progress, *New England Perspectives*, No. 3, pp. 135–144.
- SIERPIŃSKA M., BAŁ P. 2012. Financial Structure of Mining Sector Companies During an Economic Slowdown. *Arch. Min. Sci.*, Vol. 57, No 4, 1089–1100.
- SCHEPELMANN P., GOOSSENS Y., MAKIPAA A. 2010, *Towards Sustainable Development, Alternatives to GDP for Measuring Progress*, Wuppertal Institute for Climate, Environment and Energy, Wuppertal special no. 42.
- WCED-WORD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, 1987 *Our Common Future*, Oxford: Oxford University Press. 43
- WF – THE WORLD FACTBOOK. 2017. (Online). Available at: <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html> (Accessed: 1 November 2017)
- WP – WUPPERTAL INSTITUT. 2010. *Towards Sustainable Development. Alternatives to GDP for measuring Progress*. (Online). Available at: <https://wuppertalinst.org/en/a/wi/a/s/ad/1113> (Accessed: 02 February 2018).

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The organizational structure patterns of educational institutions in the Czech Republic

Alexander L. Bobkov¹, Igor V. Denisov², Oksana V. Kuchmaeva³, Emil
Velinov⁴ and Oksana V. Savchina⁵

¹*Department of Industrial Economics, Plekhanov Russian University of Economics, 36
Stremyanny Lane, Moscow, 117997, Russian Federation, e-mail: a.l.bobkov@gmail.com*

²*Department of Management, Plekhanov Russian University of Economics, 36 Stremyanny
Lane, Moscow, 117997, Russian Federation, e-mail: idennis@rambler.ru*

³*Department of Statistics, Plekhanov Russian University of Economics, 36 Stremyanny
Lane, Moscow, 117997, Russian Federation, e-mail: kuchmaeva@yandex.ru*

⁴*Department of Management and Marketing, Skoda Auto University, Mlada Boleslav, Czech
Republic and Department of Enterprise Management, University of Finance and
Administration, Prague, e-mail: emil.velinov@savs.cz*

⁵*Department of Finance and Credit, Faculty of Economics, RUDN University, Moscow,
Russian Federation, e-mail: savchina_ovl@rudn.university*

Abstract

The article analyzes the development patterns of the organizational structure of educational organizations in the Czech Republic. Previous studies on the organizational structure of commercial entities have confirmed the hypothesis of the repeated pattern of such changes and revealed a number of determining factors. The current study examines the development patterns of private educational entities using cluster analysis to generate groups of similar development levels, as well as analyze the impact of various indicators on the structure of private educational organizations using the goal tree. The authors put forward the hypothesis of the two basic types of organizational structures – sequential and parallel, which dialectically replace each other, qualitatively changing in the process of growth, while retaining defining properties at each new level of development. The educational organizations have a relatively stable organizational structure, making them an ideal research object. In this context, educational organizations of similar size (by the number of employees and the volume of income) and form of ownership can form groups with similar (sequential or parallel) organizational structures.

The research methodology includes the statistical methods of cluster analysis and goal tree construction. The calculations are carried out in IBM SPSS Statistics based on the Albertina Gold Edition of Bisnode Česká republika database. The cluster analysis resulted in identification of seven clusters. Addition study on the average values of the variables in the given clusters and the assessment of the goal tree for an independent variable of the

“type of educational services provided” the organizations studied are further grouped into five groups.

In general, the results of the cluster analysis have confirmed the hypothesis on the alternation of sequential and parallel organizational structures in the development process of educational organizations. Assessment of the goal tree generated for an independent variable of the “type of educational services provided” showed its dependence on the size and age of educational organizations and confirmed the attribution of the seven clusters into five groups. At the same time, a more detailed study is required, including an in-depth analysis of the organizational structure of individual organizations. Nevertheless, the obtained results suggest that the general scheme of the evolution of educational institutions can be presented as universal, since the underlying approaches are applicable for analysis of the sector of educational services in any country with a market economy or a particular region, given the consideration of place-specific features.

Keywords: organizational structure, organizational development, statistical research methods, cluster analysis, goal tree

JEL Code: D86, I25, L2

1. Introduction

The results of previously conducted studies on the development patterns of organizational structures were based on the empirics of the educational institutions (Bobkov et al., 2017a) and the retail companies (Bobkov et al., 2017b) of the Czech Republic. The findings suggest that the development of the corporate sector of the economy occurs by moving from sequential organizational structures to parallel and then again to sequential ones. Confirmation of the hypothesis that different types of organizational structures are reduced to two basic types, replacing each other at a new dialectical level of development, and the definition of a set of their quantitative characteristics may enable to achieve optimal managerial decisions, providing a choice of a limited rather than infinite number of development options.

Thompson, Zalds, and Scott (2003) note that the organizational structure is determined by the underlying technology and that there are only three types of structures. The first is ‘unified interdependence’, in which the individual elements of the organization are not related to each other, but each contributes to the whole. Visually, such elements can be represented in the form of a parallel scheme. Another type of structure is ‘sequential interdependence’, where the input of one element is the output of the previous one. The schema in this case will look like a sequence of elements. The third type of structure is the ‘mutual interdependence’ of all elements. According to O’Shaughnessy (2013), organizations with a structure of this type necessarily include the first two.

A critical review of recent studies focusing on the organizational structures of commercial organizations makes it possible to distinguish two main approaches (Bobkov et al., 2017b, p. 32–34). The first approach is to identify changes in the organizational structures that occur in the process of ongoing operations. This approach is considered by Coleman (1990), Daft (2013), Gurkov (2008), Khlebnikov (2002), Mironenko and Terekhanov (2004). The two main types of administrative structures are often distinguished – mechanistic and organic (Daft, 2013), which are based on the concept of vertical and horizontal organizational structures. At the same time, a number of researchers (Gurkov, 2008; Khlebnikov, 2002; Mironenko and Terekhanov, 2004) consider the development of the

organization as a sequential transition from linear and linear-functional structures to divisional, and then to matrix ones.

The second approach involves a statistical analysis of the quantitative parameters of the organizations' activities and the interpretation of the results obtained. This approach is considered by Hanks et al. (1993) and Shirokova (2008). These researchers employ a cluster analysis of organizations on certain quantitative indicators.

Our previous studies retail and education sectors (Bobkov et al., 2017a, 2017b) are carried out using the second approach. In general, the results of the research conducted have confirmed the hypothesis of alternation of two basic types of organizational structures: sequential (vertical) and parallel (horizontal). The studies are carried out on the basis of the Albertina Gold Edition of Bisnode Česká republika a.s.

The results of both studies have confirmed the hypothesis put forward. The results on retail enterprises unequivocally confirm the hypothesis, while the results on educational institutions have posed a number of questions. First of all, it concerned both the sample size of educational organization and the significant impact of the types of educational services provided on the effectiveness of the activities of educational entities and their structure.

2. Multivariate analysis methods for studying organizational structure of educational organizations

In order to confirm the hypothesis on the alternation of the two basic types of organizational structures, sequential (vertical) and parallel (horizontal), the authors propose a theoretical model for the development levels of educational organizations (Table 1). The hypothesis implies that the development of educational entities should occur through a gradual transition to the next level of development. Unfortunately, the features of the Albertina Gold Edition of Bisnode Česká republika a.s. do not allow researching the sample from the whole set of educational institutions, but only private ones. This is due to the lack of financial and economic indicators for state and municipal educational organizations in the database.

Table 1: The development levels of organizational entities

| Development level | Type of organizational entity | Type of organizational structure |
|-------------------|---|----------------------------------|
| 1 | individual rendering of educational services (private tutor) | sequential |
| 2 | educational center in the field of vocational training | parallel |
| 3 | school / educational center that carries out interdisciplinary or multilevel training | sequential |
| 4 | a network of educational centers engaged in interdisciplinary or multilevel education | parallel |
| 5 | higher education institution (institute, university) / large educational center | sequential |
| 6 | organizations of higher education (institutes, universities) with a branch network | parallel |

In addition, it is difficult to ensure accurate allocation of first-level institutions (individual rendering of educational services, private tutor) in the database that is used, which, according to the authors, may be due to the lack of legal status of a significant number of persons providing educational services (i.e., not all individuals, engaged in the provision of educational services, are registered as individual entrepreneurs).

Thus, a total of 588 private educational institutions were initially selected based on their business results for the 2015 calendar year (from 01.01.2015 to 31.12.2015). The choice of the year is conditioned by the completeness of the information available. According to the results of primary processing, 211 educational institutions were excluded due to the lack of indicators necessary for the analysis. Thus, the analysis was conducted for 377 organizations. Financial indicators were calculated in the original currency – Czech korunas (CZK).

Hypothesis confirmation is undertaken in two stages. The first stage implies classification of selected educational organizations by means of cluster analysis. At the second stage, the results of the distribution of educational organizations on clusters are clarified using the goal tree method.

First stage. When conducting a cluster analysis, the following variables were selected, characterizing the activities of a particular organization:

- X1 – the age of an institution (full number of years);
- X2 – the average number of employees (people)
- X3 – the number of places for educational activities;
- X4 – the value of total assets (thousand CZK);
- X5 – the amount of depreciation deductions (thousand CZK);
- X6 – the labor productivity by added value (thousand CZK / person);
- X7 – the average number of employees in one place of educational activity (people);
- X8 – the amount of revenue attributable to one place of educational activity (thousand CZK).

Cluster analysis was carried out by the Word method. Due to different units of measurement, the preliminary data standardization was carried out in the studied indicators. Institutions with missing data were excluded from the analysis, as well as institutions with abnormally high values of added value and total assets against the background of other institutions.

The hypothesis on the equality of dispersions inside and between clusters is rejected for all variables at 6 and 370 degrees of freedom. The value of the probability of error when assuming the hypothesis of dispersion inequality is extremely low, not more than 0.001 (the F-criterion is significant for all variables at a level of not less than 0.001). This suggests that the hypothesis on the inequality of variances is accepted and, accordingly, the clusters are formed correctly.

Stage two. In order to verify the distribution results of private educational organizations on clusters, an assessment is made of the impact of the types of educational services provided on the efficiency of private educational organizations and their structure using the goal tree method (Bell and Brayman, 2012; Zamkov et al., 1999; Mitleton-Kelly et al., 2018).

The target variable used is the “type of educational services provided” (in accordance with the NACE code), the predictors are: “average number of employees (interval scale)” (see Table 2), people; “age of an institution”, years; “number of places for educational activities”; “value of total assets”, thousand CZK; “amount of revenue attributable to one place of educational activity”, thousand CZK. After the analysis made, the CHAID method

is used to choose an appropriate model. Among all possible options for building decision trees the most accurate description option for the available data us used. The “average number of employees” and “age of an institution” are recognized as the best predictor variables for the target variable “type of educational services provided”.

Table 2: Intervals for the distribution of the average number of employees per educational organization, people

| Average number of employee, people | Interval | Number of organizations | |
|------------------------------------|----------|-------------------------|----------|
| | | number | share, % |
| 1-5 | 1 | 234 | 62.1 |
| 6-9 | 2 | 49 | 13.0 |
| 10-19 | 3 | 47 | 12.5 |
| 20-24 | 4 | 8 | 2.1 |
| 25-49 | 5 | 31 | 8.2 |
| 50-99 | 6 | 2 | 0.5 |
| 100-199 | 7 | 5 | 1.3 |
| 200 and above | 8 | 1 | 0.3 |
| Total | | 377 | 100.0 |

3. Research results on the educational organizations of the Czech Republic and their development patterns

The cluster analysis resulted in the breakdown of 377 private educational institutions into 6 clusters. The distribution of the analyzed educational institutions by clusters and the mean values of the variables are presented in Table 3.

Table 3: Average values of variables in clusters, sorted by the indicator value of total assets (X_4)

| Cluster | X_1 | X_2 | X_3 | X_4 | X_5 | X_6 | X_7 | X_8 |
|------------|-------|-------|-------|------------|--------|-------|-------|------------|
| 7 N=75 | 3.4 | 2.1 | 1.2 | 1 188 | 104 | 782 | 1.9 | 2 744 |
| 6 N=37 | 8.7 | 1.0 | 1.9 | 4 067 | 318 | 3 048 | 0.7 | 4 789 |
| 2 N=104 | 8.7 | 6.5 | 1.2 | 7 018 | 295 | 609 | 5.7 | 9 083 |
| 5 N=28 | 16.5 | 1.3 | 1.3 | 7 454 | 254 | 2 662 | 1.2 | 8 077 |
| 4 N=127 | 18.7 | 13.1 | 1.3 | 7 472 | 333 | 382 | 11.7 | 9 015 |
| 3 N=3 | 13.7 | 126.7 | 8.3 | 37 851 | 589 | 281 | 22.0 | 11 435 |
| 1 N=3 | 5.7 | 139.7 | 1.0 | 540 701 | 19 946 | 736 | 139.7 | 216 667 |

Analyzing the obtained results of cluster analysis (Table 3), it becomes evident that the values of the indicator X_3 – the number of places for educational activities, have a sequential pattern. For the entities within cluster 7, the value of this indicator is slightly larger than 1. For entities within cluster 6, the value of X_3 increases almost to 2. Then, for entities belonging to clusters 2, 4 and 5, the indicator value is stabilized within 1.2–1.3. For entities within cluster 3, the value of X_3 sharply increases to 8.3. Finally, for entities within cluster 1, the indicator value decreases again (to 1).

At the same time, the results obtained require further investigation from the standpoint of hypothesis verification. First of all, this concerns educational institutions that are members of clusters 2, 4 and 5. With comparable values of X_3 indicators (the number of places for educational activities) and X_4 (the value of total assets), the educational institutions that make up these clusters differ significantly in the average number of employees (X_2) and the amount of revenue attributable to one place of educational activity (X_8).

Proceeding from this, the authors put forward a hypothesis that significant differences in the effectiveness of the activities of educational organizations of comparable sizes (nearly no difference on the average values of the indicator X_4 – the value of total assets) can be related both to the specifics of personnel records in organizations (in small organizations part of the employees can be recruited on a contract part-time basis without including them in staff records and, accordingly, not considering them when calculating the indicator X_2 – the average number of employees) and the type of educational services provided. Since it is not possible to correctly assess the impact of the specifics of personnel records in private educational organizations using the data available, the authors assessed the impact of the types of educational services provided on the effectiveness of private educational organizations and their structure by constructing a goal tree.

The results of goal tree construction are shown in Fig. 1. The constructed goal tree consists of three levels and contains 4 terminal nodes. The root node includes 377 observations, distributed according to the main type of educational services provided as follows (Table 4).

Table 4: Distribution of the studied educational institutions by type of educational services provided (in accordance with the NACE code)

| № | Type of educational services provided | Number of organizations | |
|----|---|-------------------------|--------------|
| | | number | share, % |
| 1 | other educational services | | |
| 2 | centers of secondary apprenticeship | 161 | 42.7 |
| 3 | secondary vocational schools | 5 | 1.3 |
| 4 | advanced training | 25 | 6.6 |
| 5 | elementary education | 41 | 10.9 |
| 6 | driving schools | 4 | 1.1 |
| 7 | higher education | 55 | 14.6 |
| 8 | general secondary education | 18 | 4.8 |
| 9 | schools of foreign languages | 10 | 2.7 |
| 10 | preschool education | 9 | 2.4 |
| 11 | secondary vocational training | 31 | 8.2 |
| 12 | other service educational services | 4 | 1.1 |
| 13 | consulting on business and management matters | 12 | 3.2 |
| 14 | upbringing | 2 | 0.5 |
| | Total | 377 | 100.0 |

The analysis of the results suggests on the applicability of the model chosen. The cross-check procedure enables the use of classification tree on a larger population, and shows that the models are stable and are quite common for all data sets: the risk values for the model without verification and with verification are similar (no change detected). The prediction matrix containing the percentage of correctly predicted values allows to conclude that the constructed model (classification tree) is stable, with an acceptable accuracy, which allows us to use the constructed classification trees for other data sets.

The risk assessment is 0.216 (standard error 0.026). A fairly high percentage of educational organizations that are classified correctly are indicative of the acceptable quality of the model. Thus, 78.4% of organizations are correctly assigned to one of the allocated groups according to the constructed model.

As can be seen from the results (see Figure 1), the type of educational services provided (in accordance with the NACE code) determines the average number of employees of an organization, as well as the age of an institution.

A detailed analysis of the results shows that the implementation of some types of educational services is more typical for small educational organizations, other types of educational services – for larger educational organizations. The same pattern for certain types of educational services is maintained depending on the age of the organization. The frontier values are average employment of 5 people and the age of 8 and 16 years.

Let us consider in somewhat more detail the characteristics of groups of organizations obtained as a result of analysis (4 nodes). The first group includes 116 educational organizations (30.8% of the total population). These organizations are characterized by a small number of staff (no more than 5 people) and not very long history of work of the organization (no more than 8 years). Typical activities for the organization of this group, in addition to “other types activities” (42.2% of the aggregate), are the services of pre-school education. They also function as driving schools and conduct advanced training.

The second group of educational organizations (118 organizations, 31.3% of the total population) also refers to the small enterprises (up to 5 employees on average). However, these organizations have been operating in the market of educational services for more than 8 years. More than half of them (56.8%) provide “other educational services”, which may indicate a significant diversification of the structure of educational services for small organizations that have been present for a long time in the market: organizations are trying to find their market niche, their consumers.

The third group consists of large educational organizations (71 organizations, 18.8% of total population). The average number of employees is more than 5 people, the age of organizations is less than 16 years. Less number of organizations is involved in “other types of activities” (39.4%), primarily pre-school organizations, driving schools, higher education. Against the backdrop of the small educational organizations of the first two groups, attention is drawn to the increase in the aggregate of institutions of secondary education and secondary vocational and language schools (the study of foreign languages).

The fourth group (72 institutions, 19.1% of organizations) are educational organizations with more than 5 people employed and the age of the organization is more than 16 years. Here, the least number of organizations providing other types of educational services (23.6%). One third of organizations are secondary vocational schools, one in ten organizations operate in the sphere of higher or general secondary education. There are also centers of secondary apprenticeship and preschool institutions.

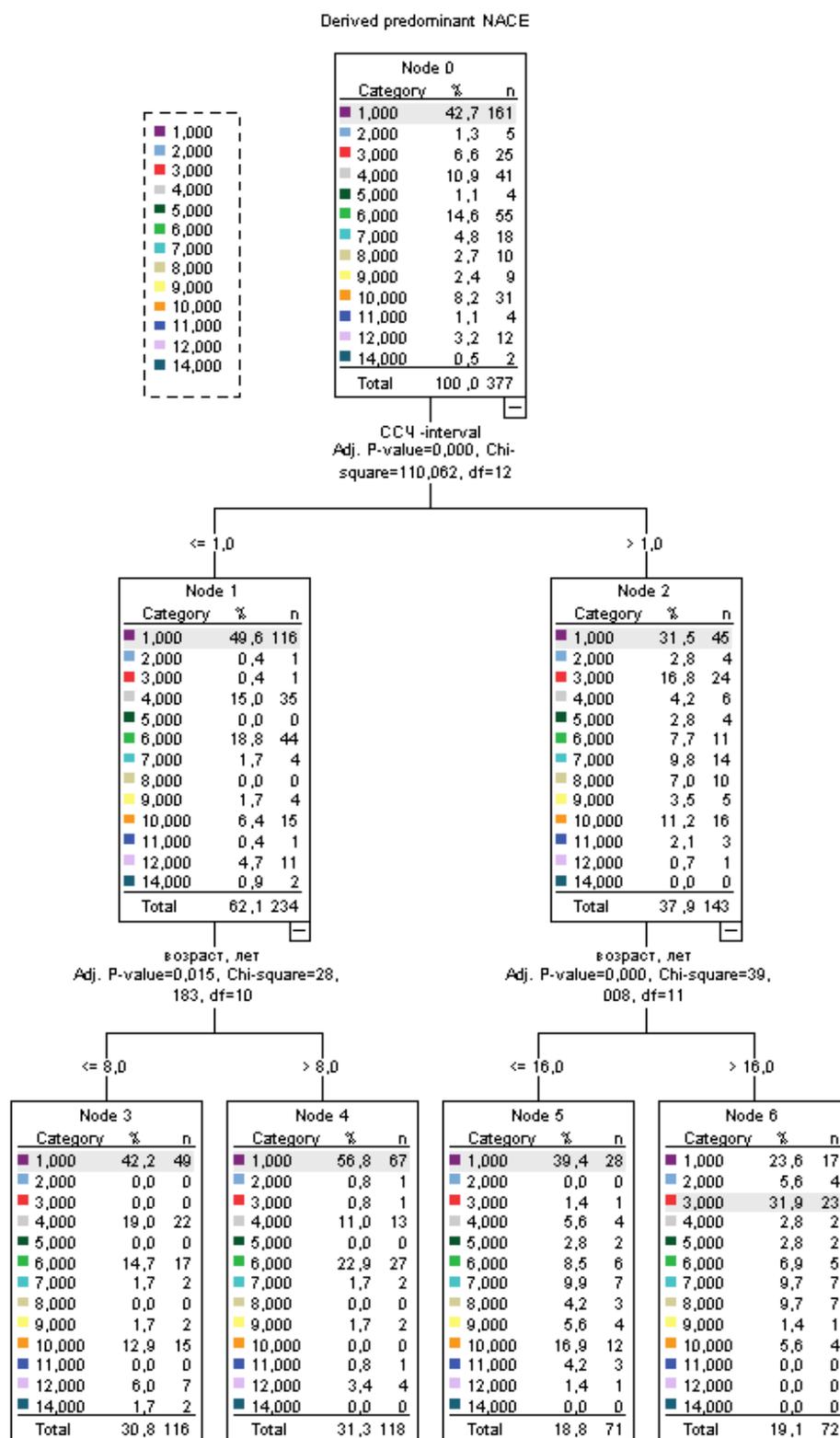


Figure 1: The goal tree results for type of educational services provided independent variable

In general, the results obtained confirmed the hypothesis set, but there are some features of the representation of the initial information in the Albertina Gold Edition of Bisnode Česká republika a.s. database used. Predominantly it concerns the indication of all types of activities specified in the statutory documents by each organization. That is,

each organization has specified several NACE codes. In order to carry out the research described above, the authors always selected the main activity from the database used. The overwhelming number of educational organizations indicated “other types of activities” as their main activity (42.7% of the total number of organizations analyzed). However, according to the authors, these features of the initial information used did not affect the results obtained.

4. Conclusion

The overall results of the cluster analysis confirm the hypothesis set. As can be seen from the average values of variables in clusters, with the growth of the size of organizations (X_4) a consistent change in the number of places for educational activities (X_3) is unambiguously observed.

The hypothesis proposed by the authors about the impact of the type of educational services provided on performance indicators of educational organizations is confirmed by undertaking an additional research stage using the method of constructing a goal tree for an independent variable “type of educational services provided”. The results obtained showed the dependence of the types of educational services provided on the sizes of the analyzed educational organizations and their age.

In general, the results obtained in this study, as well as the results of earlier studies (Bell and Brayman, 2012; Bobkov et al., 2017a) allow us to state that there are regularities in the evolution of the development of organizations that involve the alternation of successive and parallel organizational structures at each subsequent stage of their development.

References

- BELL, E., BRAYMAN, A. 2012. *Methods of social research. Groups, organizations and business.* Moscow: Humanitarian Center.
- BOBKOV, A.L., DENISOV, I.V., KUCHMAEVA, O.V. 2017a. Cluster analysis of financial and economic and organizational and structural indicators of the educational organizations of the Czech Republic. *International trade and trade policy* 4:133–148. (In Russ.).
- BOBKOV, A.L., DENISOV, I.V., KUCHMAEVA, O.V. 2017b. Developing organization structure of retail enterprises (on the example of the Czech Republic). *Statistics and Economics* 3: 31–40. (In Russ.)
- COLEMAN, J.S. 1990. *Foundations of social theory.* Cambridge, MA: Belknap Press of Harvard University Press.
- DAFT, R.L. 2013. *Organization theory and design.* Mason, OH: South-Western Cengage Learning.
- DENISOV, I.V., BOBKOV, A.L. 2014. *Managing the development of the company: the economic and technological approach: a monograph.* Moscow:RGU im. G.V. Plekhanov.
- GURKOV, I. 2008. *Corporate Strategy and Structure.* Moscow: Delo.

- HANKS, S.H., WATSON, C.J., JANSEN, E., CHANDLER, G.N. 1993. Tightening the life-cycle construct: A taxonomic study of growth stage configurations in high-technology organizations. *Entrepreneurship: Theory and Practice* 18 (2): 5-30.
- KHLEBNIKOV, D.V. 2002. Business: Growth Problems. *New Markets* 3. [Online]. Available at: <http://www.newmarkets.ru/nm-ru/issues/nm920027.htm> [Accessed: 28 August 2017].
- MIRONENKO, YU.D., TEREKHANOV, A.K. 2004. The role of strategic management of an enterprise in its organizational development. *Corporate systems* 5. [Online]. Available at: <http://www.management.com.ua/cm/cm047.html> [Accessed: 28 August 2017].
- MITLETON-KELLY, E., PARASKEVAS, A., DAY C. ed. 2018. *Handbook of Research Methods in Complexity Science. Theory and Applications*. Northampton, MA, USA: Edward Elgar Publishing.
- O'SHAUGHNESSY, J. 2013. *Patterns of Business Organization*. London: Routledge.
- SHIROKOVA, G.V. 2008. *Life cycle of organizations: concepts and Russian practice*. 2nd ed. St. Petersburg: Publishing house "Higher School of Management".
- THOMPSON, J., ZALDS, M., SCOTT, W. 2003. *Organizations in action: Social science bases of administrative theory*. New Brunswick: Transaction.
- ZAMKOV, O.O., TOLSTOPYATENKO, A.V., CHEREMNYKH, Yu.N. 1999. *Mathematical Methods in Economics*. Moscow: Business and Service.
- BELL, E., BRAYMAN, A. 2012. *Methods of social research. Groups, organizations and business*. Moscow: Humanitarian Center.
- BOBKOV, A.L., DENISOV, I.V., KUCHMAEVA, O.V. 2017a. Cluster analysis of financial and economic and organizational and structural indicators of the educational organizations of the Czech Republic. *International trade and trade policy* 4:133–148. (In Russ.).
- BOBKOV, A.L., DENISOV, I.V., KUCHMAEVA, O.V. 2017b. Developing organization structure of retail enterprises (on the example of the Czech Republic). *Statistics and Economics* 3: 31–40. (In Russ.)
- COLEMAN, J.S. 1990. *Foundations of social theory*. Cambridge, MA: Belknap Press of Harvard University Press.
- DAFT, R.L. 2013. *Organization theory and design*. Mason, OH: South-Western Cengage Learning.
- DENISOV, I.V., BOBKOV, A.L. 2014. *Managing the development of the company: the economic and technological approach: a monograph*. Moscow:RGU im. G.V. Plekhanov.
- GURKOV, I. 2008. *Corporate Strategy and Structure*. Moscow: Delo.
- HANKS, S.H., WATSON, C.J., JANSEN, E., CHANDLER, G.N. 1993. Tightening the life-cycle construct: A taxonomic study of growth stage configurations in high-technology organizations. *Entrepreneurship: Theory and Practice* 18 (2): 5-30.
- KHLEBNIKOV, D.V. 2002. Business: Growth Problems. *New Markets* 3. [Online]. Available at: <http://www.newmarkets.ru/nm-ru/issues/nm920027.htm> [Accessed: 28 August 2017].

- MIRONENKO, YU.D., TEREKHANOV, A.K. 2004. The role of strategic management of an enterprise in its organizational development. Corporate systems 5. [Online]. Available at: <http://www.management.com.ua/cm/cm047.html> [Accessed: 28 August 2017].
- MITLETON-KELLY, E., PARASKEVAS, A., DAY C. ed. 2018. Handbook of Research Methods in Complexity Science. Theory and Applications. Northampton, MA, USA: Edward Elgar Publishing.
- O'SHAUGHNESSY, J. 2013. Patterns of Business Organization. London: Routledge.
- SHIROKOVA, G.V. 2008. Life cycle of organizations: concepts and Russian practice. 2nd ed. St. Petersburg: Publishing house "Higher School of Management".
- THOMPSON, J., ZALDS, M., SCOTT, W. 2003. Organizations in action: Social science bases of administrative theory. New Brunswick: Transaction.
- ZAMKOV, O.O., TOLSTOPYATENKO, A.V., CHEREMNYKH, Yu.N. 1999. Mathematical Methods in Economics. Moscow: Business and Service.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The role of R&D spending in medium-sized firms

Nina Bockova¹, Tomas Meluzin², Tomas Polacek³

¹*Department of Economics, Faculty of Business and Management, Brno University of Technology, Kolejní 2906/4, 612 00 Brno, Czech Republic, e-mail: bockova@fbm.vutbr.cz*

²*Department of Economics, Faculty of Business and Management, Brno University of Technology, Kolejní 2906/4, 612 00 Brno, Czech Republic, e-mail: meluzint@fbm.vutbr.cz*

³*Department of Economics, Faculty of Business and Management, Brno University of Technology, Kolejní 2906/4, 612 00 Brno, Czech Republic, e-mail: polacek@fbm.vutbr.cz*

Abstract

Studies on the impact of R&D expenditure in small and medium-sized companies have experienced a rapid growth over the last several years. This paper aims to examine the impact of R&D investments on operating revenue growth by medium size Czech companies in the NACE Category 28 – Manufacture of machinery and equipment n.e.c. The paper uses the results of a questionnaire survey as the primary data source and the Amadeus database as a secondary data source. The statistical sample includes panel data of 51 medium businesses with R&D investments. The authors’ finding is that R&D investments generally have a positive effect on operating revenue growth. The authors found a statistically significant difference between turnover in 2014 and 2016 at a level of significance of $\alpha = 0.05$. There is no statistically significant difference between domestic and foreign-owned businesses in changes in turnover in the short term. However, the authors did find a significant difference between the operating revenue per employee of domestic businesses and businesses with foreign equity.

Keywords: Manufacture of machinery and equipment, R&D investments, Operating revenue, t-Test, SMEs

JEL Code: G32, L64, M21, 032

1. Introduction

R&D investments and innovations are difficult to overstate for productivity and long-term economic growth. One of the major public policy instruments that aim to increase R&D investment of private firms is the R&D subsidy. In the modern economy, firms invest in a wide range of intangible assets, including data, software, patents, new organisational processes and enterprise-specific skills. Some studies on innovation process in the context of small and medium-sized enterprises (SMEs) are conducted in the early stage. However,

these studies are mainly based on secondary data, managerial or conceptual. The R&D support programme in Italy was analysed within the research project – the Fondo per le Agevolazioni della Ricerca (FAR), managed by the Italian Ministry of Research (Miur). The time period was 2000–2004. FAR seems to be more suited to large firms, in which it can lead to largely positive results. SMEs need more specific and probably targeted (rather than bottom-up) instruments (Cerulli & Potì 2012).

Garsjö refers to the aspect where the total local R&D expenditure is more efficient for local patent production when allocated via private funding networks rather than via public funding streams. This result may be due to the fact that R&D activity in private firms is monitored more efficiently and knowledge generated is commonly earmarked in terms of patents in order to protect the knowledge discovery for future adaptation (Gråsjö 2012).

The impact of in-house R&D intensity and various knowledge diffusion channels on the productivity of manufacturing firms in Turkey was analysed using a large panel dataset from the Turkish Statistics Office between 2003 and 2007. The findings showed that the impact of in-house R&D intensity on the productivity of Turkish manufacturing firms is conditional on their technological capability: only above a certain threshold of technological capability do the firms reap the productivity benefits from their R&D investment (Ulku & Pamukcu 2015).

A Spanish study using a panel of Spanish manufacturing firms over the period 2001–2008. The researchers estimate a set of dynamic models of program participation. They found the significant true state persistence of participation in R&D subsidy (Busom et al. 2017).

A French study using data from a nationally representative survey of French firms showed the negative effect of R&D investment on the financial performance of the firms surveyed (Laroche & Wechtler 2011).

The impact of the R&D fiscal incentive programme on R&D was examined through Dutch firms. The results suggest that R&D was responsive to enterprise user cost. The authors obtain a statistically significant short-run elasticity of the order of 0.2–0.5 and a significant long-run elasticity of the order of 0.54–0.79 (Lokshin & Mohnen 2012).

Until late 2012, the process of the R & D expenditure structure has changed (the business sector has declined, the government sector and EU funding have grown), but in 2013 market confidence became more positive and the situation stabilized in most Eurozone countries. The crisis has shown that in addition to the clear benefits, financial integration also carries financial stability risks in the absence of a strong institutional framework. (Pietrzak et al., 2017).

Based on the endogenous growth theory and new institutional economics one can point wide range of determinant affecting countries technological potential such as: institutional factors, economic sustainability, quality of human capital, regulations of labour, effectiveness of financial markets influencing allocation of capital, role of economy in the international production chain or finally macroeconomic policy. (Zineker et al, 2016)

In general, medium-sized businesses lack both managerial and technical skills for their effectiveness. A study by the OECD found that only 5–20% of SMEs are actively using an innovative approach. SMEs are less active than large firms in open innovation because of their particular characteristics, such as strategy, culture or organisation. Studies on innovative activities in SMEs are fragmented. Innovative companies of all sizes, regardless of the continuity of the research, have confirmed their ability to use their capital base efficiently (Bockova & Meluzin 2016).

The processing industry in the Czech Republic is an important segment of the economy. It is an important vehicle of job opportunities, of technology development, of

knowledge. It has a long tradition in the Czech Republic. Throughout its evolution, it has proven the ability to sustain itself in a competitive environment, thanks particularly to foreign capital. The involvement of the manufacturing industry is also important to the regional and global value chains. Among the most important sections in terms of sales is NACE 28-manufacture of machinery and equipment. This division includes the manufacture of machinery and equipment that act independently on materials either mechanically or thermally or perform operations on materials (such as handling, spraying, weighing or packing), including their mechanical components which produce and apply force, and any specially manufactured primary parts. In 2015, this section was involved in nearly 8% of revenues for products and services in the processing industry. This section is dominated by large and medium-sized companies. In 2016, medium-sized companies have a share of more than 31% in terms of sales figures and employ more than 36% of the employees. (ČSÚ, 2018)

So far in the scientific literature, there are few scientific articles focusing on Czech companies in the processing industry. In the section Manufacture of machinery and equipment, only large companies were examined from the perspective of change in value added per employee (Bockova & Zizlavsky 2016).

2. Methodology and Data

According to the database Amadeus (which includes 2,706 Czech companies – NACE code 28.1 – with information on operating revenue, employees, sector affiliation) 1,087 companies in NACE section 28 which showed activity in 2016 operate in the Czech Republic. Our research is focused only on medium-sized companies operating throughout the Czech Republic. The number of active companies is 290. Companies were addressed through a questionnaire focusing on investment in research and development. A total of 49 companies responded. These were both companies owned by purely Czech capital and companies controlled by foreign capital. The data would be processed using parametric statistical methods. The software used was STATISTICS 12.

The t-test is any statistical hypothesis test in which the test statistic follows a Student's t-distribution under H_0 . A t-test statistic has the form $t = Z/s$, where Z and s are functions of the data. Typically, Z is designed to be sensitive to the alternative hypothesis (i.e., its magnitude tends to be larger when the alternative hypothesis is true), whereas s is a scaling parameter that allows the distribution of t to be determined.

The tested hypothesis was H_0 : *The innovative medium-sized enterprises in the engineering industry do not show a statistically significant difference between turnover in the years 2014 and 2016.*

An F-test is any statistical test in which the test statistic has an F-distribution under a null hypothesis. Let X_1, \dots, X_n and Y_1, \dots, Y_m be independent and identically distributed samples from two populations which each have a normal distribution. The expected values for the two populations may be different, and the hypothesis to be tested is that the variances are equal. H_0 is rejected if F is either too large or too small (Hindls 2006).

The second tested hypothesis H_1 was: *There isn't a difference in profit per employee among Czech medium-sized enterprises and enterprises owned by foreign capital.*

3. Results

Enterprises with a number of employees between 50 and 249 were included in the statistical set. The second criterion for the size of the enterprise is a balance sheet total ≤ 43 million EUR (EU 2006). More than 67% is composed of domestic companies. Companies with foreign capital include 3 enterprises outside the EU. The parent enterprise has 13 enterprises in the EU. The variables examined in the investigation of the statistical set are listed in Table 1.

Table 1: Variables

| | Model 1 |
|------------------|---|
| OPR14; OPR16 | The total value of the output of an economic activity carried out over a certain period of time, usually measured by total annual sales after deduction of returned goods (thousand CZK). |
| OPEMP14; OPEMP16 | The share of operating revenue in 2014 or 2016 per employee. |
| OPEMP16CZ | The share of operating revenue 2016 per employee in domestic companies or foreign equity ownership companies. |

Enterprises with innovation activities were monitored by means of the territorial range through the NUTS 2 region classification.

A number of enterprises by region and participating interests is shown in Figure 1. Domestic companies make up 67%, foreign equity ownership (FEO) 33%. The descriptive statistics for the individual variables are presented in Table 2.

Table 2: Descriptive Statistics

| | N. valid | Mean | Std. deviation | Kurtosis | Skewness |
|-----------|----------|-----------|----------------|----------|----------|
| OPR14 | 49 | 314810.35 | 283506.97 | 3.2966 | 1.8276 |
| OPR16 | 49 | 355174.69 | 346513.32 | 6.0723 | 2.2533 |
| OPEMP14 | 49 | 2157.48 | 1289.40 | 1.1131 | 6.6467 |
| OPEMP16 | 49 | 2207.06 | 1397.67 | 1.8100 | 4.8749 |
| OPEMP16CZ | 33 | 1777.51 | 823.11 | 1.0704 | 1.6107 |
| OPEMP16AB | 16 | 3093.00 | 1887.49 | 0.9855 | 1.6359 |

Source: Authors calculation, 2017

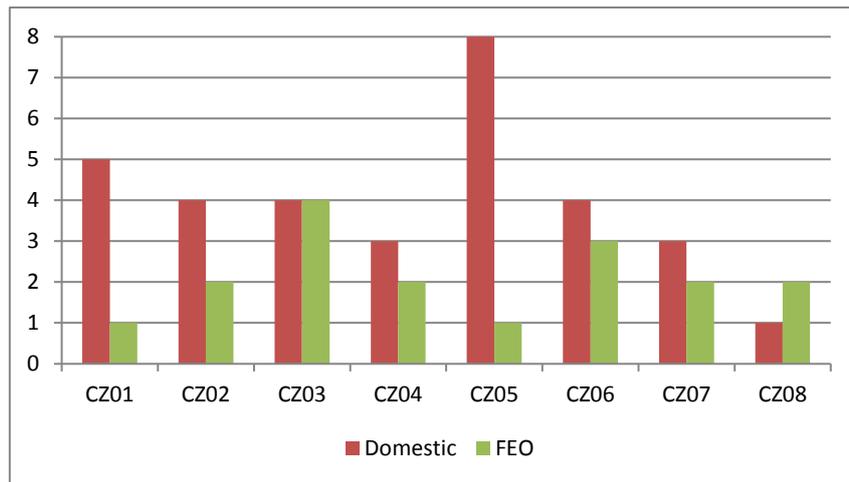


Figure 1: Number of enterprises in region NUTS 2
Source: Authors calculation, 2017

Operating revenue in the years 2014 and 2016 for the reference of a statistical sample was compared by means of the test pair. The test of hypothesis $H_0: \mu = \mu_0$ with unknown σ^2 :

$$T = \frac{\bar{x} - \mu_0}{s} \sqrt{n - 1}$$

For OPR14 and OPR16 we have $T = -2.6831$. $t_{0.95(51)} = 1.676$; thus $W = (-\infty; -1.676) \cup (1.676; \infty)$.

$$T \in W;$$

H_0 we can reject. There is a statistically significant difference between operating revenue in the years 2014 and 2016 for medium-sized enterprises in engineering production. For the observed value $p = 0.0098$, $p < \alpha$; ($0.0098 < 0.05$).

The second tested hypothesis H_1 was: There isn't a difference in profit per employee among Czech medium-sized enterprises and enterprises owned by foreign capital. The descriptive statistic is described in Table 2. To determine the difference between the two groups of enterprises, the double selective F-test was carried out for variances.

The value was $F = 0.19017$ and the critical value $F_{crit} = 0.50201$. We recorded

$$F < F_{crit};$$

where the null hypothesis is true; i.e. variances are the same. For further testing, we used a t-test for equal variances. The result $t = 3.4157$, $p = 0.0013$. For $p < \alpha$; $0.013 < 0.005$, we reject H_1 . We found a statistically significant difference between the operating revenue per employee between domestic enterprises and enterprises with foreign asset participation. For a graphical representation, the box plot was used; see Figure 2. To sum up, H_1 is not confirmed by our assumption: the impact of R&D investment on the operating revenue per employee does not vary according to the type of ownership structure.

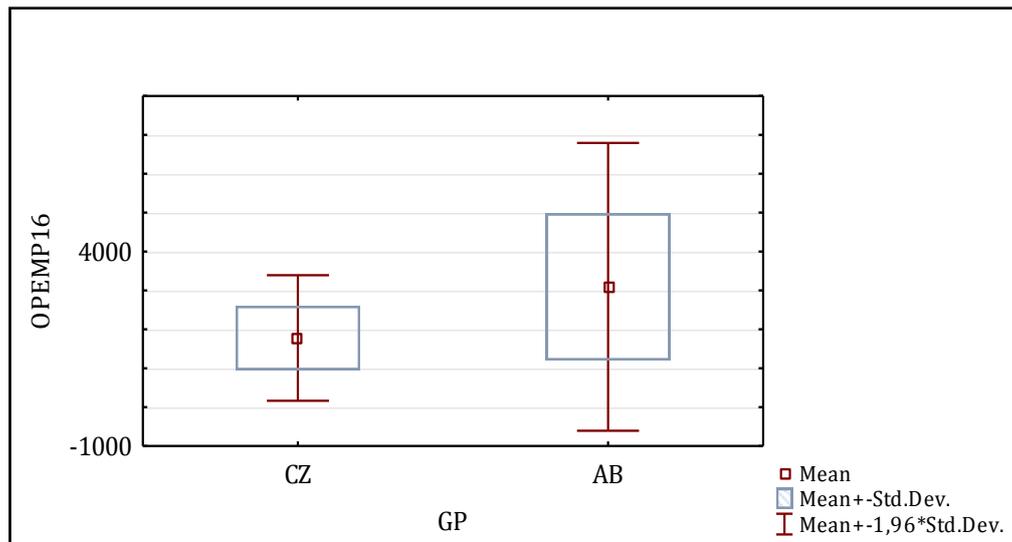


Figure 2: Box graph OPEM16 CZ and OPEM16 AB

Source: Authors own calculations

4. Discussion and Conclusions

A high degree of integration resulting from the enterprise connection at the same time, however, makes the method sensitive to changes in external conditions. An important factor that significantly influenced the growth of operating revenues within the Manufacture of machinery and equipment was the drawing of funds from the financial perspective, in the period 2007–2013. In 2015 and 2016, the NACE section 28 enjoyed high positive economic values and improved economic profitability year on year. The reason for this positive development was the risk of debt of division. Both the European Union and the Czech Republic see the future of their competitiveness in innovation. An innovative corporate environment is one of the key areas for which Europe's 2020 growth strategy is being pursued. Together with the European trend, innovation will play a major role in the next few years, particularly from the point of view of grant funding. The Ministry of Industry and Trade of the Czech Republic is already working with the priorities to be funded from European funds after 2014, in order to support companies in improving their position on the international market through innovation, science and research, as well as to support innovative companies in their potential to commercialise themselves.

In this article, we analysed the relationship between R&D investment and operating revenue in the short-term structure of medium-sized companies in the category of Manufacture of machinery and equipment. The literature usually states that R&D activities are related to corporate growth. Investments are seen as one of the major factors in the competitiveness of enterprises. Schimke & Brenner (2014) show that the autocorrelation of growth rates varies with the size of an enterprise.

Within the section of Manufacture of machinery and equipment, a strong statistical significant difference was detected between operating revenues in 2014 and 2016. As well, we also found a statistically significant difference between the operating revenues per employee for domestic and foreign-owned enterprises. The median OPEM16 AB is 54% higher than the median OPEM16 CZ.

As well, there is a need for more qualitative research in this area. It is important to learn more about public subsidies and companies' own R&D expenditure and how the impact on enterprise growth depends on these R&D investments.

Acknowledgements

This research was supported by the Internal Grant of Faculty of Business and management, BUT Brno No. FP 18 – Microeconomics – Interaction in the market of factors of production – determined by the market of land, labour and capital.

References

- BIANCHI, M., CAMPODALL' ORTO, S., FRATTINI, F. and VERCES, P. 2010. Enabling open innovation in small- and medium-sized enterprises: how to find alternative applications for your technologies. *R&D Management*, 40(4), pp: 414–431. [Online]. Available from: 10.1111/j.1467-9310.2010.00613.x. [Accessed 2017, December 15].
- BOČKOVÁ, N. and MELUZÍN, T., 2016. Electronics Industry: R&D Investments as Possible Factors of Firms Competitiveness. *Procedia – Social and Behavioral Sciences*, 220, pp: 51–61. [Online]. Available from: <https://www.sciencedirect.com.ezproxy.lib.vutbr.cz/science/article/pii/S1877042816305699>. [Accessed 2017, December 13].
- BOCKOVA, N. and ZIZLAVSKY, O., 2016. Innovation and financial performance of a company: A study from Czech manufacturing industry. *Transformations in Business and Economics*, 15(3), pp: 156–175. [Online]. Available from: <http://www.transformations.khf.vu.lt/34>. [Accessed 2018, January 9].
- BUSOM, I., CORCHUELO, B. and MARTÍNEZ-ROS, E., 2017. Participation inertia in R&D tax incentive and subsidy programs. *Small Business Economics*, 48(1), pp: 153–177. [Online]. Available from: <http://dx.doi.org.ezproxy.lib.vutbr.cz/10.1007/s11187-016-9770-5>. [Accessed 2018, January 9].
- CERULLI, G. and POTÌ, B., 2012. The differential impact of privately and publicly funded R&D on R&D investment and innovation: the Italian case. *Prometheus*, 30(1), pp: 113–149. [Online]. Available from: 10.1080/08109028.2012.671288. [Accessed 2018, January 6].
- COLOMBO, M.G., PIVA, E. and ROSSI-LAMASTRA, C., 2014. Open innovation and within-industry diversification in small and medium enterprises: The case of open source software firms. *Research Policy*, 43(5), pp: 891–902. [Online]. Available from: <https://doi.org/10.1016/j.respol.2013.08.015>. [Accessed 2017, December 16].
- EU, E. komise, 2006. *Nová definice malých a středních podniků: Uživatelská příručka a vzor prohlášení*, Lucemburk: EUR-OP.
- HINDLS, R., 2006. *Statistika pro ekonomy 7. vyd.*, Praha: Professional Publishing.
- HOSSAIN, M., 2015. A review of literature on open innovation in small and medium-sized enterprises. *Journal of Global Entrepreneurship Research*, 5(1), p: 1–12. [Online].

- Available from: <https://doi.org/10.1186/s40497-015-0022-y>. [Accessed 2017, December 15].
- GRÅSJÖ, U., 2012. Spatial Knowledge Spillovers in Europe: A Meta-Analysis, Royal Institute of Technology, CESIS – Centre of Excellence for Science and Innovation Studies.
- LAROCHE, P. and WECHTLER, H., 2011. The Effects of Labor Unions on Workplace Performance: New Evidence from France. *Journal of Labor Research*, 32(2), pp: 157–180. [Online]. Available from: <http://dx.doi.org.ezproxy.lib.vutbr.cz/10.1007/s12122-011-9106-9>. [Accessed 2017, December 10].
- LOKSHIN, B. and MOHNEN, P., 2012. How effective are level-based R&D tax credits? Evidence from the Netherlands. *Applied Economics*, 44(12), pp: 1527-1538. [Online]. Available from: 10.1080/00036846.2010.543083. [Accessed 2017, December 11].
- Pietrzak, M.B., Fałdziński, M., Balcerzak, A.P., Meluzín, T. and Zinecker, M. 2017. Short-Term Shocks and Long-Term Relationships of Interdependencies among Central European Capital Markets. *Economics and Sociology*, 10 (1), pp: 61–77.
- RAHMAN, H. and RAMOS, I. 2010. Open Innovation in SMEs: From Closed Boundaries to Networked Paradigm. *Issues in Informing Science and Information Technology*, 7, pp: 471-487. [Online]. Available at: <https://doaj.org/article/94dc58433f3142ef987f1d15a33f4a9b>. [Accessed 2017, December 12].
- SCHIMKE, A. and BRENNER, T., 2014. The role of R&D investments in highly R&D-based firms. *Studies in Economics and Finance*, 31(1), pp: 3–45. [Online]. Available at: <http://www.emeraldinsight.com/doi/10.1108/SEF-02-2012-0017>. [Accessed 2017, December 12].
- ULKU, H. and PAMUKCU, M. 2015. The impact of R&D and knowledge diffusion on the productivity of manufacturing firms in Turkey. *Journal of Productivity Analysis*, 44(1), pp: 79–95. [Online]. Available from: <http://dx.doi.org.ezproxy.lib.vutbr.cz/10.1007/s11123-015-0447-x>. [Accessed 2017, December 9].
- ZINECKER, M., A. BALCERZAK, M. FAŁDZIŃSKI, T. MELUZÍN a M. PIETRZAK. Application of DCC-Garch Model for Analysis of Interrelations Among Capital Markets of Poland, Czech Republic and Germany. In *Quantitative Methods in Economics (Multiple Criteria Decision Making XVIII)*. Letra Interactive. Bratislava: Slovak Society for Operations Research, 2017. p: 416–421.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Deferred Tax Information For External Users – Case Of Czech Agricultural Companies

Hana Bohušová¹, Patrik Svoboda² and Lucie Semerádová³

*^{1,2}Department of Accounting and Taxes, Faculty of Business and Economics, Mendel
University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: uchana@mendelu.cz*

*³Department of Accounting and Taxes, Sting Academy, Stromovka 1, 637 00 Brno Czech
Republic, e-mail: lucie.semeradova@seznam.cz*

Abstract

The reporting of a deferred tax is an instrument for distributable profit or loss regulation in a form of an accrual or a deferral. The current research aimed at a deferred tax reporting within European companies is very limited. The paper is concerned with the materiality of deferred tax category, the impact of a deferred tax reporting on earnings management in the Czech agricultural companies reporting under CAL.

The materiality, structure and the impact on selected financial analysis ratios due to deferred tax reporting in the agricultural companies is a subject of the research. The financial statements of large Czech agricultural companies (two out of following criteria must be fulfilled: turnover over 40 000 000 €, assets over 20 000 000 €, over 250 employees) in the period after the EU accession are analyzed. The comparison with general results concerning the deferred tax reporting over the world was carried out. The results of the analysis revealed the similar impact of the deferred tax category regardless to financial reporting system used.

Keywords: agricultural companies, deferred tax, materiality, profit or loss, tax base.

JEL Code: M41

1. Introduction

Agriculture covers a large scale of activities which join labor, land, animals, plants, solar energy to provide essential food and raw materials. There are some biological characteristics, e.g. the vegetation period, the length of the production cycle, and further characteristics which distinguish the agriculture from other activities running to achieve profit. These are: the fact that some products are further consumed by the agricultural enterprise itself, the connection with farmland which represents a scarce source.

According to IndexMendi (201X), the share of agriculture in the gross domestic product (GDP) in EU is just under 3% (1.6% in 2017), and based on information Statista (2018) 2.46% is recently in the Czech Republic. The agriculture is not only a source of production of raw material and food self-sufficiency but it provides jobs and it significantly influences the formation of landscape, its functionality and aesthetic value. According to the most recent Eurostat data, utilized agricultural area accounted for two fifths (40.0%) of the total land area of the EU-28 in 2013, with a further 9.0% of the land belonging to agricultural holdings, either in the form of forests (7%) or other land not used for agriculture (2.3%).

On the other hand, the sector is the principal source of income for around 20% of its population, which live in predominantly rural regions. According to Eurostat (2015), in 2013, there were 10.8 million agricultural holdings within the EU-28. The utilized agricultural area (UAA) in the EU-28 was almost 175 million hectares (some 40.0% of the total land area). The largest average size of agricultural holdings in any of the EU Member States in 2013 was the 133 hectares recorded for the Czech Republic. According to the Eurostat, the utilized agricultural area (UAA) of the Czech Republic was almost 3.5 million hectares in 2010 – it is corresponding to 44% of the area of the whole country. In the Czech Republic, a relatively small number of farms accounted for a huge majority of the Czech agricultural area, only 19% of the holdings had an UAA of 100 hectares or more, these holdings accounted for 89% of the total Czech UAA. The lowest number of farms was recorded in economy class XI (turnover of at least EUR 3,000,000), which corresponds to large enterprises according to the classification according to Directive 2013/34 / EU. According to the survey carried out in 2013, there were only 269 such entities (1%).

Despite the fact that, the specifics of biological character of transformation should be also reflected by the methodology for reporting the agricultural enterprises' activities, the agricultural companies use the standard methods for reporting their business activities and respect the basic principles for financial reporting in the Czech Republic. These companies prepare their financial statements according to the Accounting Act (563/1991 Col.), Implementing Decree No. 500/2002 Col. and the Czech Accounting Standards.

The above mentioned rules imply an obligation also on the large farms to report the item deferred corporate income tax. Deferred tax is recognized and reported by the entity which is a part of consolidated group and the entity preparing the financial statements in the full form (Section 18 paragraph 3 and 4 of the Act). Other entities report deferred tax voluntary.

In the Czech Republic, there are 269 agricultural enterprises classified as a large firm and obliged to calculate and to report the item of deferred tax since 2016. The deferred tax quantification purposes is associated with spending a considerable amount of time and costs on expert advice. The paper focuses on assessing of the importance of the deferred tax category for internal and external users of the accounting information of these entities.

2. Methodology and Data

The paper focuses on assessing of the materiality of the deferred tax category for internal and external users of the accounting information of the Czech agricultural holdings. The research covers the agricultural holdings in the XIV. class of economic size according to the Commission Regulation (EC) No. 1242/2008 of 8 December 2008 establishing a Community typology for agricultural holdings applied from the accounting year 2010 for the Farm Accountancy Data Network and for the farm structure survey as of the 2010 survey.

The financial statements of agricultural holdings included in the XIV. class published in the publicly available collection of documents data were the subject of the research. Using the application of the Ministry of Finance of the Czech Republic – register of economic subjects ARES. Subjects with code 01 according to the statistical classification of economic activities (NACE) – agriculture. From this database, entities fulfilling the criteria for mandatory reporting of deferred tax were selected. As the number of accounting units that meet the criteria (amendment of the Act on Accounting implementing of the European Directive No. 2013/34 / EU) has been expanded since 2016, the paper is concerned to business entities which are obliged to report the deferred tax category and reported this category during the researched period voluntary. The dataset covers 185 agricultural holdings, and the researched period covers 5 years (2011-2015). Thus, the completed sample is 925 firm-years. However, not all entities presented available deferred tax data over the whole researched period. The missing data was filled in with the value of the deferred tax asset share in the years when the data was not available was added the average share of all companies.

The materiality of deferred tax category evaluation was based on the share of deferred tax expense on the total income and the share of the deferred tax in total assets. The similar methodology is also used in previous studies concerning the materiality of deferred tax in selected industries (Habanec, Bohušová, 2017, Svoboda, Bohušová, 2016, Habanec, 2016). The International standards of audit 320 – Materiality (hereinafter ISA 320) methodology was used for the materiality definition. Due to the fact that neither ISA 320, nor IFRS set any quantitative criteria for materiality calculation, the methods according to the discussion paper6: Audit Risk and Materiality was used for setting quantitative criteria of materiality.

These methods offer a suggested range for the calculation of materiality. Based on the audit risk, the auditor will select a value inside this range

- 0.5% to 1% of gross revenue;
- 1% to 2% of total assets;
- 1% to 2% of gross profit;
- 2% to 5% of shareholders' equity;
- 5% to 10% of net profit.

For income state items materiality level was computed using the method from discussion Paper:

$$IS \text{ Materiality level} = \text{Gross Profit} \times 0.02 \quad (1)$$

For balance sheet items materiality level was computed using the method from discussion Paper:

$$BS \text{ Materiality level} = \text{total assets} \times 0.02 \quad (2)$$

In addition, the structure of the deferred tax was examined. The structure was analyzed only for those entities for which data were available for the entire five-year time series so that the development of the deferred tax structure over time could be recorded. This was about 103 reporting subjects.

3. Theoretical Background

The deferred tax reflects the fact that the tax and rules for financial reporting in most countries differ. While the aim of the financial reporting is concentrated on the fair reporting to users, the aim of taxation is to fill the state budget. From the perspective of business entities, there are efforts to minimize the income tax base. Due to these facts, the reported profit or loss could differ from the income tax base in majority states.

Differences between the tax base amount and the reported profit or loss can be characterized as permanent or temporary. Permanent differences' effect (in the form of reduction or increase of taxable income comparing with reported income) is definitive. Temporary differences give rise to an accounting category called deferred tax.

The reporting of deferred tax represents an instrument for distributable profit or loss regulation in a form of an accrual or a deferral, when in a period of lower payable income tax, the company postpones the part of the reported profit in a form of deferred tax liability. In a period of higher payable income tax, the company increases the reported profit by creation of deferred tax asset or by use of deferred tax liability.

The issue of deferred tax was researched from various aspects. The majority of studies concerning the deferred tax dealt with the relationship of tax and accounting rules for income measurement (Freedman, MacDonald, 2007). Many empirical studies (Desai, 2003, Manzon, Plesko, 2002, Plesko, 2004, Phillips, Pincus, Rego, 2003, Hanlon, Hoopes, Schroff, 2014, Chi, Pincus, Teoh, 2014, Noga, Schnader, 2013, Laux, 2013, Blaylock, Shevlin, Wilson, 2012, Donohoe, McGill, 2011, Haskins, Simko, 2011, Colley et al, 2012, Crabtree, Maher, 2009, Jackson, 2015) were conducted in order to realize the size and sources of differences between profit or loss reported and taxable income.

The extent to which deferred taxes appear in financial statements determines how important they are for evaluation of companies' performances. Poterba, Rao and Seidman (2007) and Poterba et al. (2011) investigated materiality and structure of deferred tax for a sample of large (FORTUNE 50) U.S. corporations.

Besides the studies concentrated on U. S. companies, there is a limited number of studies in Asia or South America. As can be clearly seen from the review of current literature, the research aimed at European companies is very limited. Moreover, the majority of studies cover period beginning in 1994 and concerns firms incorporated in the U. S. A. The year 1994 is the first year when the change of deferred tax can be computed due to effectiveness of SFAS 109 (respectively ASC 740). It means that the conclusions of all over mentioned studies are based on similar dataset.

As was already mentioned above, currently, there exist only a few studies aimed on companies acting on the Internal Market. The first study carried out by Vučkovič-Milutinovič, Lukič (2013), covers the 20 largest non-financial companies and 20 banks in Serbia in the period 2009–2010 the research examines the materiality of DTA and DTL. The research covers only limited sample of companies situated in Serbia, during the limited time span. Due to this fact, the study has very limited scope. Moreover, it deals only with the materiality of this category for Serbian companies. There are several studies concerning the materiality of deferred tax in the Czech business companies (Bohušová, Svoboda, 2005, Habanec, Bohušová, 2017).

The conclusions of the study published by Bohušová, Svoboda (2005) have shown the materiality of the deferred tax category in the Czech Republic – median of deferred tax/total income tax ratio 15.21% resp. 7.4% in the researched samples. The research revealed the impact the deferred tax reporting on return on equity. The study of Habanec,

Bohušová (2017) revealed the lower materiality of deferred tax category in the researched sample of companies operating in chemical industry and reporting according to the Czech accounting legislation (2% in average).

4. Results

As seen from the Table 1, the share of deferred tax in Profit or Loss is in a range between 6.86% and 12.03% in average, the median value is in a range between 3.71% and 6.86%. The analysis of all farms revealed that the deferred tax expense is insignificant (under 2% of Gross Profit) for almost 20% of all farms (37 companies).

Table 1: The share of deferred tax expense in gross profit in%

| Share of DT/GP | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------|------|-------|------|-------|------|
| Average | 9.82 | 12.03 | 6.86 | 11.49 | 9.84 |
| Median | 3.71 | 6.86 | 3.78 | 3.79 | 3.80 |

Source: Own calculation

The analysis of deferred tax asset or liability and its share in balance sheet total revealed that the deferred tax category was insignificant for 62.57% (116 farms) in the researched sample in 2011. As seen from the Table 2 and Figure 1 the situation is very similar in the whole researched period.

Table 2: The share of farms with deferred tax materiality in a given range in%

| Share of DT/Total assets / Year | 2011 | 2012 | 2013 | 2014 | 2015 |
|---------------------------------|-------|-------|-------|-------|-------|
| under 1% | 34.64 | 32.79 | 33.33 | 34.07 | 30.81 |
| 1–1.99% | 27.93 | 29.51 | 27.87 | 27.47 | 26.74 |
| 2–2.99% | 14.53 | 14.75 | 16.94 | 16.48 | 19.19 |
| 3–3.99% | 12.29 | 14.21 | 7.65 | 6.59 | 8.72 |
| 4–4.99% | 6.15 | 6.01 | 8.74 | 8.79 | 7.56 |
| 5% and above | 4.47 | 2.73 | 5.46 | 6.59 | 6.98 |

Source: Own calculation

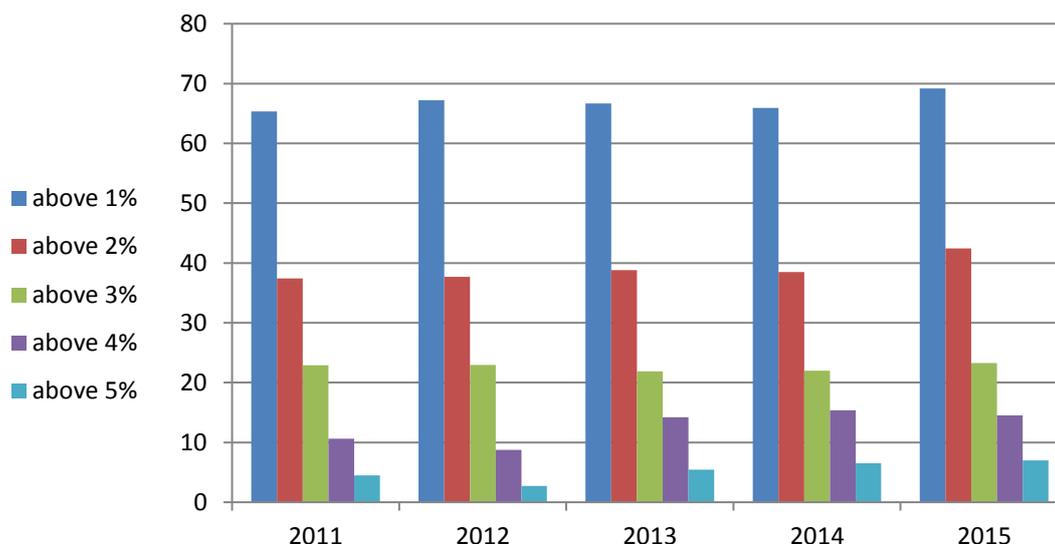


Figure 1: The share of farms with deferred tax materiality higher than given percentage
Source: Own calculation

The amount of deferred tax is significantly influenced by the nature of the economic transactions that result in temporary differences between their tax and accounting point of view. In general, the following items may be considered as the main reasons for the deferred tax recognition:

- Differences between the accounting and tax base of fixed assets
- Recognition of other (non-tax) provisions
- Recognition of impairment
- transferable unused tax losses and deductions
- Revenue from contractual sanctions and default interest
- Unpaid social security and health insurance

In business entities, the individual titles for deferred tax reporting arise in different share in a total deferred tax item, but their identification, analysis and quantification are, irrespective of their subsequent amount, associated with considerable time and costs. For this reason, the structure of the deferred tax item was a subject to an analysis with the intention to determine the significance of individual titles.

Table 3: The structure of deferred tax item in%

| Year | Book value vs Tax base of LTA | Revaluation of asset | Previous years tax loss | Impairment | Tax on Liabilities after term | Accrued items | Provision | Others |
|------|-------------------------------|----------------------|-------------------------|------------|-------------------------------|---------------|-----------|--------|
| 11 | 95.59 | 0.00 | 1.71 | 2.05 | 0.04 | 0.34 | 0.25 | 0.02 |
| 12 | 95.10 | 0.00 | 0.92 | 2.52 | 0.37 | 0.12 | 0.96 | 0.00 |
| 13 | 94.23 | 0.00 | 0.67 | 3.02 | 0.51 | 0.05 | 1.43 | 0.08 |
| 14 | 95.46 | 0.00 | 0.29 | 3.05 | 0.34 | 0.04 | 0.81 | 0.00 |
| 15 | 93.87 | 0.85 | 1.62 | 1.81 | 0.54 | 0.04 | 1.26 | 0.00 |

Source: Own calculation

Within agricultural holdings, as shown in Table 3, the difference between the accounting and tax base of fixed assets is unambiguously the most significant item (approximately 95%). Impairment can be considered as another relatively significant title with value between 2–3%. Other titles can be considered insignificant for most business entities. With regard to the unused tax loss, it is a question if this item should be taken into account in case of farms. Only 3 agricultural holdings in the researched sample have reported this item. There is a higher risk of possibility to use it for decreasing taxable income.

5. Discussion and Conclusions

The results presented in the paper are part of the research concerning the deferred tax reporting within the EU companies. We have investigated the materiality, structure of deferred tax reported according to the Czech Accounting Legislation and the research was concerned at large agricultural holdings obliged to report deferred tax category. The dataset covered the majority of agricultural holdings in the XIV. class of economic size according to the Commission Regulation (EC) No. 1242/2008 of 8 December 2008 establishing a Community typology for agricultural holdings.

The results of the research revealed that the deferred tax category is material for this type of agricultural holdings (37.43% – 42.44% in the researched period). In comparison with conclusions of similar research carried out by Habanec, Bohušová (2017) in chemical and pharmaceutical industry, the materiality of this category is in the similar level.

Regarding the deferred tax structure, there are only two significant titles leading to the deferred tax recognition – difference between book and tax value and impairment. The share of differences between book value and tax base of long term assets is over 90% in each researched period. The share of the second significant title – impairment of long term assets is only under 4%. In comparison to the previous research of the authors there is an increasing significance of the share of differences between book value and tax base of long term assets and a decrease in significance of other titles. This conclusion is motivating authors for the further research with intention to simplification of deferred tax reporting for agricultural holdings.

References

Accounting Act 563/1992 Col.

BLAYLOCK, B., SHEVLIN, T. & WILSON, R., J. 2012. "Tax Avoidance, Large Positive Temporary Book-Tax Differences, and Earnings Persistence", *The Accounting Review*, Vol. 87, No. 1, pp. 91–120.

BOHUŠOVÁ, H., SVOBODA, P. 2005, "Analýza odložené daně z příjmů a její vliv na ukazatele charakterizující ekonomickou výkonnost podniku (An Analysis of the Deferred Income Tax and its Influence on Indicators Describing the Economic Performance of a Company)", *Acta Universitatis Agric. et Silv. Mend. Brun.*, Vol. 53, No. 6, pp. 33–44.

- Czech Statistical Office (2014) Strukturální šetření v zemědělství – analytické vyhodnocení – 2013. [Online]. Available at: <https://www.czso.cz/documents/10180/26566189/27016815k02.pdf/6c68f9a6-aa9b-4aa0-8037-8cdf2fb3660a?version=1.1/>. [Accessed: 15 February 2018].
- COLLEY, R., RUE, J., VALENCIA, A. & VOLKAN, A. 2012, “Accounting for Deferred Taxes: Time for a Change”, *Journal of Business and Economic Research*, Vol.10, No.3, pp. 149–156.
- CRABTREE, A., MAHER, J.J. 2009. “The Influence of Differences in Taxable Income and Book Income on the Bond Credit Market”, *The Journal of the American Taxation Association*, Vol. 31, No. 1, pp. 75–99.
- DESAI, M. (2003), “The Divergence between Book and Tax Income”, *Tax Policy and the Economy*, Vol. 17, pp. 169–206.
- DONOHUE, M.P., MCGILL, G.A. 2011, “The Effects of Increased Book-Tax Difference Tax Return Disclosures on Firm Valuation and Behavior”, *The Journal of the American Taxation Association*, Vol. 33, No. 2, Pp. 35–65.
- EILIFSEN, A., MCKEE, T. E. et al. 2000. Current materiality guidance for auditors. Working paper no. 51/00. Foundation for Research in Economic and Business Administration.
- European Commission 2002, Regulation (EC) No. 1606/2002.
- European Commission 2013 – European Directive No. 2013/34 / EU
- Eurostat 2015 – Farm structure statistics [Online]. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Farm_structure_statistics [Accessed: 17 February 2018].
- Eurostat 2013 Agricultural census in the Czech Republic [Online]. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census_in_the_Czech_Republic . [Accessed: 15 January 2018].
- FREEDMAN, J. 2004 “Aligning Taxable Profits and Accounting Profits: Accounting standards, legislators and judges”, *E Journal of Tax Research*, Vol. 2, No. 1, pp. 71–100.
- FREEDMAN, J., MACDONALD, G. (2007), “The Tax Base for CCCTB: The Role of Principles”, Working paper, Oxford University Centre for Business Taxation.
- HABANEC, P. 2016. The Materiality of the Category of Deferred Income Tax. In: PEFnet 2016 Abstracts. Brno: Mendel University.
- HABANEC, P., BOHUŠOVÁ, H (2017) Comparison of Deferred Tax Materiality Reporting in Accordance with Continental and Anglo-Saxon Reporting System, *Acta Univ. Agric. Silvic. Mendelianae Brun*, 65, 1917–1924.
- HANLON, M., HOOPES, J.L. & SHROFF, N (2014), “The Effect of Tax Authority Monitoring and Enforcement on Financial Reporting Quality”, *The Journal of the American Taxation Association*, Vol. 36, No. 2, Pp. 137–170.
- HASKINS, M., SIMKO, P. (2011), “What a Corporate Tax Cut Might Mean: An Analysis of Deferred Taxes”, Working paper, University of Virginia.

- CHI, S. S., PINCUS, M., TEOH, S.H. (2014), “Mispricing of Book-Tax Differences and the Trading Behavior of Short Sellers and Insiders”, *The Accounting Review*, Vol. 89, No. 2, pp. 511–543.
- Index Mundi (201X) European Union GDP – composition by sector. [Online]. Available at: https://www.indexmundi.com/european_union/gdp_composition_by_sector.html. [Accessed: 11 December 2017].
- JACKSON, M. (2015), “Book-Tax Differences and Future Earnings Changes”, *The Journal of the American Taxation Association*, Vol. 37, No. 2, pp. 49–73.
- LAUX, R.C. (2013) “The Association between Deferred Tax Assets and Liabilities and Future Tax Payments”, *The Accounting Review*, Vol. 88, No. 4, pp. 1357–1383.
- MANZON, G. B., PLESKO, G.A. (2002), “The Relation Between Financial and Tax Reporting Measures of Income”, *Tax Law Review*, Vol. 55, No. 2, pp.175–214.
- NOGA, T.J., SCHNADER, A.L. (2013) “Book-Tax Differences as an Indicator of Financial Distress”, *Accounting Horizons*, Vol. 27, No. 3, pp. 469–489.
- PHILLIPS, J., PINCUS, M. & REGO, S.,O. (2003), “Earnings Management: New Evidence Based on Deferred Tax Expense”, *The Accounting Review*, Vol. 78, No. 2, pp. 491–521.
- PLESKO, G. A. (2004). “Corporate Tax Avoidance and the Properties of Corporate Earnings”, *National Tax Journal*, Vol. 57, No. 3, pp. 729–737.
- POTERBA, J., RAO, N. & SEIDMAN, J. (2007), “The significance and composition of deferred tax assets and liabilities”, Working Paper, Cambridge, MA: National Bureau of Economic Research.
- Statista (2018) Czech Republic: Distribution of gross domestic product (GDP) across economic sectors 2006 to 2016. [Online]. Available at: <https://www.statista.com/statistics/369830/share-of-economic-sectors-in-the-gdp-czech-republic/> [Accessed: 21 January 2018].
- VUČKOVIĆ MILUTINOVIĆ, S., LUKIĆ, R. (2013), “ Analysis of Deferred Taxes in the Business Environment in Serbia”, *Economia. Seria Management*, Vol. 16, No.1, pp. 25–37.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Construction Industry and its Impact on the Financial Position of Enterprises: Case of Latvia

Ivars Brivers¹, Bary Mavlutov² and Inese Mavlutova³

¹*Department of Entrepreneurship and Business Informatics, BA School of Business and Finance, Valdemara str. 161, Riga, Latvia, e-mail: abrivere@td.lv*

²*Department of Finance, Baltic International Academy, Lomonosova str. 4, Riga, Latvia, e-mail: bary@balticom.lv*

³*Department of Finance, BA School of Business and Finance Riga, Valdemara str. 161, Riga, Latvia, e-mail: inese.mavlutova@ba.lv*

Abstract

The relevance of this topic is due to the current economic situation in Latvia, the unstable financial position and distress of many enterprises of the construction industry. Paper deals with the latest issues in the Latvian construction industry and their impact on the financial position of the enterprise. The aim of the research is to develop recommendations how to improve the financial position of the enterprises, taking into account the urgent problems of the construction industry in Latvia. Comparative analysis of economic indicators and construction sector indicators trends in the European Union countries provides the Latvian enterprises with the opportunity to choose the most promising export destinations in order to improve their financial position.

Key words: Financial analysis, construction industry, factors affecting, financial position, enterprises.

JEL codes: D240, M110, O14

1. Introduction

Financial position of an enterprise is the essential part of its economic activity and sustainability. To evaluate the financial position of an enterprise it is important to understand the factors that affect it, as well as the way the said factors affect it, because the stable financial position of an enterprise allows it to be competitive, determines its potential and guarantees efficient activity.

The aim of the study is to develop recommendations for improvement of the financial position of an enterprise while taking into account current problems in the construction industry.

The study was performed by use of such theoretical and practical methods as the method of description and summary, basic methods of financial analysis, data comparison and grouping method according to the performed analysis, graphoanalytical method for comparison of indicators.

2. Problem of Evaluation of External Factor Effect on Financial Situation of an Enterprise

Direct correlation exists between the financial situation of the enterprise and such economic factors as the population wellbeing, gross domestic product, workforce productivity, and employment level. Meanwhile the enterprise development dynamics, financial indicators, and demand for the product create a basis to determine the state and development of the industry, in which the enterprise is participating. Therefore, the industry development factors affect economic factors which in turn shape the state of the whole region or country. Factors are tightly related and intertwined with each other. It is not feasible to evaluate the effects of factors on the financial state of an enterprise separately from each other since it can lead to wrong conclusions (Kazantseva, 2011).

Internal factors reflect the activity of an enterprise. The main internal factors that affect the financial state of an enterprise are factors that reflect financial and economic position of an enterprise, image of an enterprise and level of its openness (Glen, 2013)

Current activity of the enterprise, justification of investment decisions, choice of financing sources and other similar actions do not affect the material and financial situation of the enterprise directly, however these actions must be classified as business operation items and unconditionally taken into account in formation of enterprise value factors. The production potential significantly affects the market value of an enterprise (Van Horne and Vachowicz, 2008). The production potential of an enterprise is created by acquired licences, intangible assets, tangible long term assets, level of stock, technological process and production capacity (Kazantseva, 2011).

Therefore, the evaluation of the internal environment factors of an enterprise allows to detect possible errors made by management related to applied means of business organization, as well as to evaluate the resource potential required to recover from a crisis and to efficiently continue economic activity in the future (Helfert, 1996).

If the internal factors determine the efficiency of an enterprise and are subject to direct action of the management thus making them more flexible, in turn the external factors are intertwined and fickle making the modern enterprises to function in rapidly changing conditions (Bernstein, 1993.) Knowledge of its environment can mostly decide the future development or in some cases even survival of an enterprise.

Among external environment factors the following can be singled out: unstable external-economic situation, unfavourable industry conditions, diminishing market, lack of stimulus and financial support of economic activity (Revsine, 2011).

The external environment of an enterprise is characterized by extremely high levels of difficulty, uncertainty and dynamic.

Many works study external environment factors, for example, Chandler (1994), Andrews (1984), Porter(2004) and others.

The following factors are considered as external environment (micro-environment) factors that indirectly affect the enterprise:

- Suppliers;
- Legislation and state institutions;

- Consumers;
- Competitors.

Factors of external macro-environment, which require study, can be divided in to four main groups: economic, political, technological, sociocultural (Yudanov, 2012).

1) The effect of the economy is determined by the situation of the country's economic conjuncture cycle, meaning that during the growth period the demand increases, free financial resources appear, while during the crisis period the income and demand levels decrease, which leads to rapid restriction of enterprise's abilities (Bragg, 2007).

External economic factors must be evaluated constantly. The inflation rates, international balance of payments, employment levels, business crediting rates and so forth (Azoev, 2013).

2) Political stability affects the economic soundness and stability of enterprises, and determines the attitude of the state towards business activity and property, while also determining means of consumer and entrepreneur protection.

3) Scientific and technological progress is one of the most important structure-forming elements of an enterprise, which mostly determines the development trends and economic soundness of an enterprise by its effect on internal technical and technological variables of an enterprise.

4) Sociocultural trends reflect the cultural environment in which the economic activity of an enterprise takes place. First of all, these are the values and traditions prevailing in the society. This is the foundation for the behaviour standard.

During external environment factor analysis, it is necessary to evaluate the effects of general economic conditions, regional and industry peculiarities of the enterprise activity. To achieve this goal following indexes must be studied:

1) Analysis of the state's money and credit policy allows to evaluate the economic situation of the country as a whole. The tools used for the state policy implementation (changes of interest rates, obligatory reserves of monetary supply) allow to evaluate the effects on the business as a whole and on a particular industry, as well as the activity of the particular enterprise.

2) Country and region development factors are the basic factors that characterize the current situation and development estimates that affect the financial position of the enterprise: gross domestic product, consumer price index, inflation rates, products import/export levels, global price changes, investment level, political stability level, strategic state programmes, currency exchange rate fluctuations, interest rate changes, average salary, unemployment rate (Brigham and Gapenski, 2008).

These factors affect the opinion on the development level and investment attractiveness of the enterprise location area: country, region.

3) The analysis of state regulations of economic activity field in which the enterprise functions, particular industry development dynamics, effects of seasonal factors on the activity, allows to determine key problems which the organisation might face, to evaluate the missed opportunities, and to determine the potential for growth (Mavlutova, 2011).

The factors above reflect the situation and development of the country, region, industry, and these factors must be viewed not only at the particular moment, but also from the point of view of the long-term perspective, while taking into account potential changes in the future. Joint effects of external factors determine the investment attractiveness of the enterprise's country, region, and industry. Low investment attractiveness negatively affects the financial position of the enterprise (Kazantseva, 2011).

Therefore, the retrospective and current evaluation of the effects of external factors allows to determine if the negative effects on the economic activity of the enterprise can cause a real crisis, and if there is a potential for successful development in the future by using all the available opportunities.

A number of methods, which allow to evaluate both external and internal factors affecting the enterprise, is used for the analysis of the macro-environment.

Two of the most universal methods for analysis of the external environment of an enterprise that allow to logically structure perceptions of its effects are the PEST-analysis and SWOT-analysis.

Literature on economics also evaluates such enterprise-affecting factor evaluation methods as:

- Portfolio analysis that allows the management of the enterprise to evaluate the economic activity of the enterprise and to reasonably invest in more profitable and perspective directions, while reducing investments in inefficient projects.
- Scenario analysis is a complex evaluation method that allows to determine the effects of main factors on estimated values of a particular financial index in various conditions (scenarios) of the financial environment, ranging from best to worst.

The performed analysis of theoretical and methodical sources in the field of evaluation of effects of internal and external factors on the financial situation of an enterprise shows that currently there is no single theoretical and methodical approach. A number of methods contemplates division of all factors into internal and external, while other methods single out manufacturing, financial, marketing, innovative, ecological and other types of factors (Barkanov, 2005).

The deficiency of the existing methodology is the fact that these methods mainly propose quality evaluation of stability factors, which are transferred by use of scales into quantitative evaluation. As a result, a problem of subjectivity in creation of scales (indicators evaluation) and use of particular indicators for factor calculation appears in these methods. Besides, the existing methods evaluate the stability of an enterprise only from the point of view of retaining the balanced state.

Matrices for evaluation of external environment factor effects on the financial position of the enterprise developed and described in the literature on economics imply use of integral indicators that further complicate the analysis (Brigham, 1989)

Thus, the problem of external factor effects on the financial situation of the enterprise is caused by:

- Lack of verified models;
- Difficulties in alignment of cause and effect relations;
- Problem of choosing the indexes for factor calculation, etc.

3. Construction Industry Analysis and Current Problems

For the past 10 years there were both upturns and downturns in the construction industry. The construction industry volume indexes increased after Latvia became a member state of the European Union. In 2008 the construction volumes reached the highest point and a rapid decrease of indexes began, which can be explained by the consequences of the economic crisis. Therefore, in 2009 the construction product volumes decreased by

42.38% compared to the previous year. The stabilisation of indexes began only in 2011. (Central Bureau of Statistics, 2017)

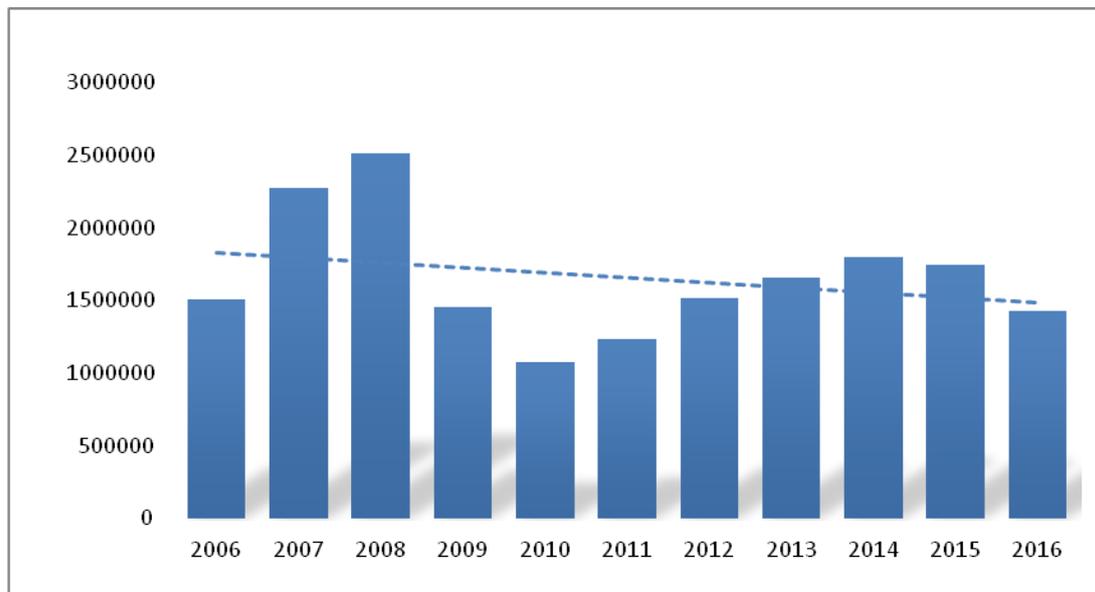


Figure 1: The dynamics of construction products in Latvia from 2006 to 2016 in current prices, thousands of euro.

Source: CSB, 2017

Starting from 2015, the decrease of industry indicators can be seen, which can be explained by difficulties with acquisition of financial support from European funds, decrease in demand for construction services, emigration of workforce abroad, and cancellation of residents permits for citizens of Russia.

The main problems in the construction industry that have the greatest effect on its development:

- Low workforce qualification – the emigration of workforce abroad during post-crisis period has led to lack of employees in the construction industry. This will lead to low quality of construction as the demand for construction services increases.
- Bad payment discipline among the main contractors and low responsibility level can be explained by the long line of subcontractors. Insolvency of one subcontractor causes losses to all subcontractors down the line.
- Existence of grey economy- the main problem that promotes the grey economy is the lowest price principle. To win a contract the enterprises must offer their services at the lowest possible price. To adhere to the proposed cost estimate, the contractors “save” by not paying taxes. Due to this the current volume of the grey economy in the construction industry has reached approximately 40%.
- Corrupt procurement procedures- corruption in construction industry is 2.5 times larger than the general level of corruption in the country.
- Difficulties with EU funding acquisition – the main problem lies in the labour input and bureaucracy of the process, as well as the low quality of project planning, which leads to correcting, revising or freezing the projects. Currently two large-scale projects are planned with EU funding: Rail Baltica and railway electrification project. Studies on the effects of these projects on costs of workforce and materials indicate lack of qualified personnel.

Enterprise SIA “X” was used as an example for analysis of changes in such indicators as construction production volumes in Latvia, net construction industry turnover and net SIA “X” turnover to prove the effects of industry indicators on the financial position of the enterprise SIA “X”.

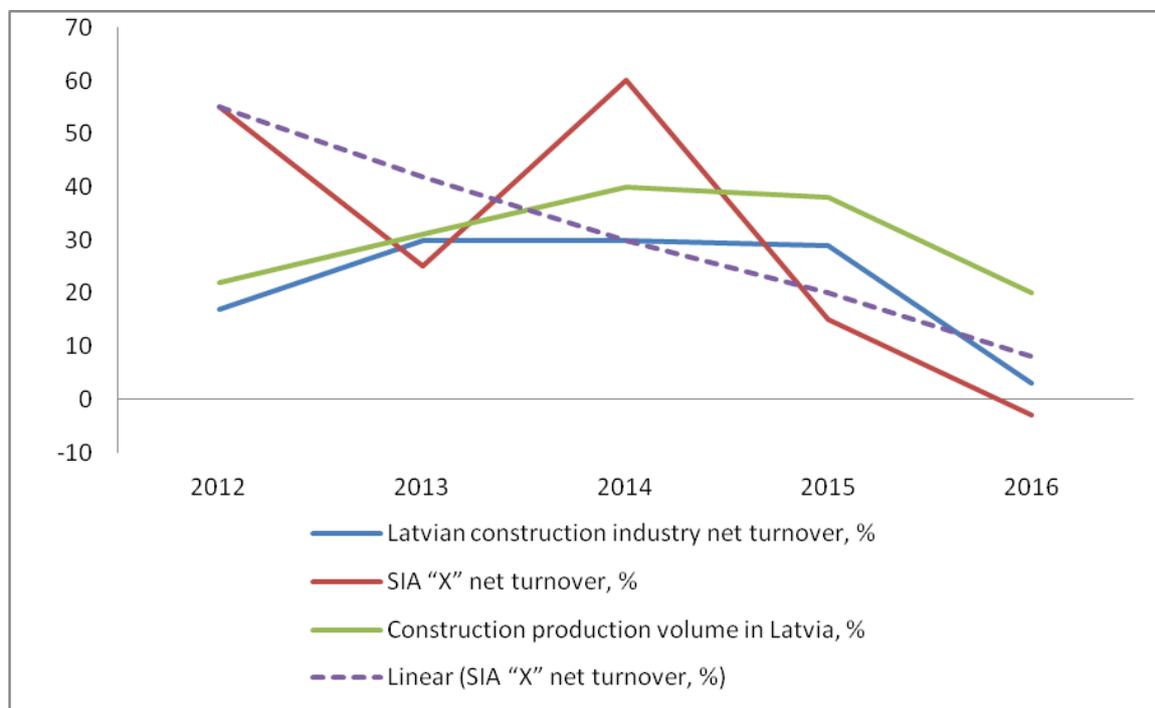


Figure 2: Changes in main indicators of SIA “X” and construction industry compared to the previous year, % Source: compiled by the authors

As figure 2 shows, the general dynamic of enterprise “X” net turnover (trend) corresponds to the changes in the industry net turnover and construction volume in Latvia.

4. Research Results

Lack of economic stability in Latvia, effect of unfavourable dynamics of construction industry indicators on the financial position of the enterprises point to possible ways to increase net turnover of an enterprise. One of the available options is the expansion of the enterprise to markets of neighbouring EU countries. A comparative analysis of main macro-economic indexes, construction industry indexes and future perspectives of following countries was carried out to ensure informed choice of a particular country: Estonia, Poland, Germany.

Table 1: Population gross income from 2006 to 2016, euro in Latvia, Estonia, Poland and Germany

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------|------|------|------|------|------|------|------|------|------|------|------|
| Latvia | 430 | 566 | 682 | 655 | 633 | 660 | 685 | 716 | 765 | 818 | 859 |
| Estonia | 601 | 725 | 825 | 784 | 792 | 839 | 887 | 949 | 1005 | 1065 | 1146 |
| Poland | 619 | 673 | 736 | 776 | 806 | 850 | 880 | 913 | 946 | 975 | 1012 |
| Germany | 2229 | 2261 | 2314 | 2314 | 2372 | 2454 | 2521 | 2574 | 2646 | 2720 | 2787 |

Source: Eurostat, 2017

The analysis of population gross income, which is one of the most significant factors that affects volumes of construction products, has shown that the income levels of the evaluated countries has grown for the past 10 years, however, the highest population income is in Germany (see table 1) (Eurostat, 2017).

The analysis of population size has revealed rapid decline in Latvia and Estonia during the whole period of analysis, which can be explained by demographic situation and emigration to other countries. Population increase in Germany can be explained by attractive economic stability, high work compensation level, social guarantees, as well as influx of migrants in recent years.

Since the economic crisis affected Germany less than other analysed countries, the level of unemployment in the country is gradually decreasing during the period of analysis, while the situation in Latvia and Estonia was different. In turn the analysis of inflation levels shows significant effect of the economic crisis of 2008 on Latvia and Estonia. The growth of population income before 2008 lead to excess demand that caused price growth, which resulted in significant inflation rates: 14% in Latvia and 10% in Estonia. The inflation levels in 2014–2015 decreased in the analyzed countries, which means the cooling of economy. The inflation levels began slow increase only in 2015, which signals the increase of demand, investment volumes, and economy rejuvenation (Eurostat, 2017).

The changes in manufacturing volumes (as shown in figure 3), volumes of sales and added value of construction industry compared to the previous period show the industry development dynamic. The indexes of Latvia and Estonia had significantly decreased during period from 2008 to 2010 due to crisis and returned to their initial values during the period until year 2013 after which another decrease had occurred. However, the indicators of Poland had not endured any significant changes, while indicators of Germany continued growth during the whole analysis period. Similar trend can be observed in analysis of changes in the number of construction enterprise employees (Eurostat, 2017).

To choose a particular country for expansion of the enterprise activity current issues and perspectives of the analysed countries were also taken into account.

The main problem in Estonia is the low number of population fit for work. Direct foreign investments in Estonia remain on the below-average level. EU funds are mainly invested in creation of workplaces and education.

The demand for housing in Poland increased due to attractive pricing, low interest rates and state support programmes. EU funds are mainly invested in infrastructure development.

The housing market in Germany has high demand due to population income growth, low interest rates, and high numbers of migrants (it is estimated that 3.6 million migrants will arrive in Germany until 2020, which will require at least 350 000 new residencies per year). Therefore, the construction industry in Germany faces serious lack of qualified personnel. According to the all of the previously described information, Germany is the most attractive country for market expansion (Germany construction sector report, 2017).

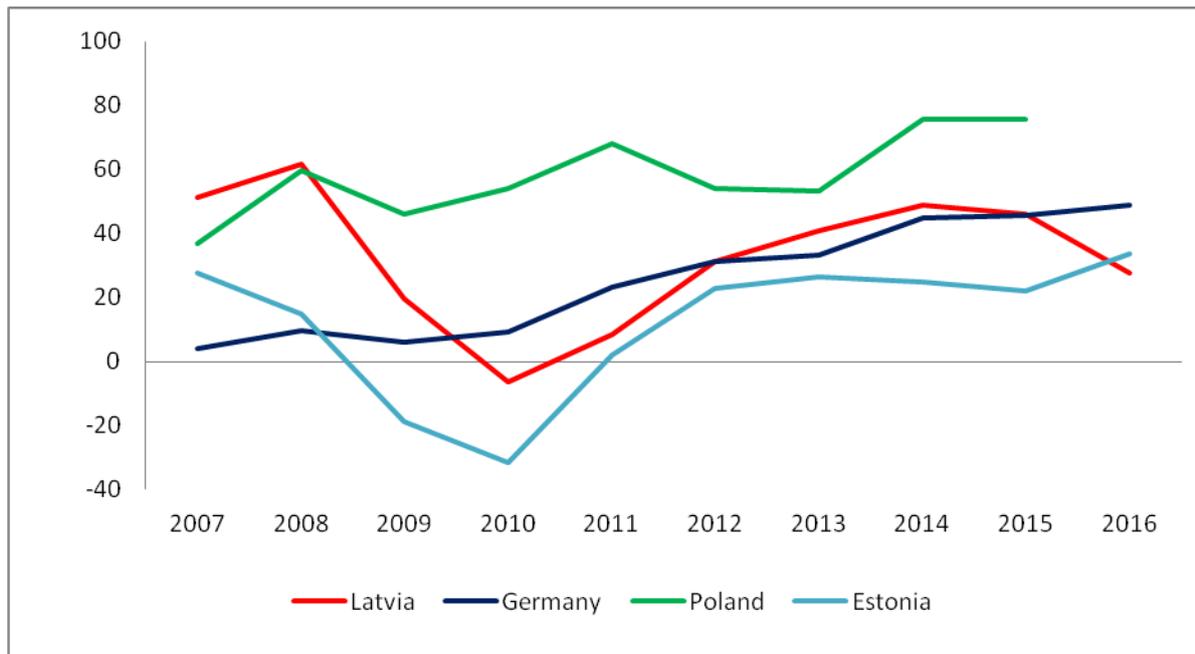


Figure 3: Changes in manufacturing volumes of construction industry compared to the previous year, %
Source: Eurostat, 2017

The construction industry is an indicator of economic situation in the country and sharply reacts to any changes in the economy. Usually, during the economic growth the construction market volumes and structure grow and expand.

The construction industry is one of the most important industries for the economy of Latvia both in turnover and the number of employed, and this industry is considered an indicator of economic situation in the country. Among all economy fields in Latvia, the construction industry ranks fourth by net turnover, 8th by contribution to GDP of Latvia by contributing 6% of the GDP.

5. Conclusions

To enter a market of another country, it is recommended for enterprises to actively participate in international construction industry exhibitions and tenders, to acquire contacts with the largest main subcontractors in the industry.

Timely understanding of construction industry legislation will allow the enterprise management to think through the requirements of implemented provisions, calculate the future demand for services, profitability of the planned type of activity, to train the enterprise personnel thus improving own competitiveness.

By following proposed recommendations, the enterprises will be able to manage financial resources more efficiently, improve the financial situation of the enterprise, which will lead to improvement of the competitiveness, financial stability, and attractiveness of the enterprise for potential investors.

References:

ANDREWS, K., R., 1984. Trade, Plunder and Settlement: Maritime Enterprise and the Genesis of the British Empire, 1480–1630. Cambridge University Press.

- AZOEV, G., L., 2013. Competition: analysis, strategy and practice. – Moskow, Right, 2013
- BARKANOV, A., S. 2005. Estimation of economic stability of a construction enterprise // Economics of construction. Nr. 8.
- BERNSTEIN, L., A., 1993. Financial statement analysis. Theory, Application and Interpretation.- Fifth edition, Irwin.inc., 624 p.
- BRAGG, STEVEN, M., 2007. Financial analysis: a controller's guide. – Second edition, John Wiley& Sons Inc.
- BRIGHAM, E. AND GAPENSKI, L., 2008. Intermediate Financial Management. 4th edition. The Dryden Press.
- BRIGHAM, E., F., 1989. Fundamentals of Financial Management (Fifth Edition). Chicago a.o.: The Dryden Press.
- CENTRAL STATISTICAL BUREAU, 2017, Changes in manufacturing volumes of construction industry [Online]: [Accessed 15.09.2017.]. Available at: <http://www.csb.gov.lv>.
- CHANDLER, A., 1994. Scale and Scope: The Dynamics of Industrial Capitalism. Belknap Press.
- EUROSTAT, 2017. Population gross income [Online]. [Accessed: 12.09.2017.]. Available at: <http://ec.europa.eu/eurostat/data/database>.
- HELPERT, E.,A., 1996. Techniques of financial analysis. Eighth edition, Izwin.inc.
- GERMANY CONSTRUCTION SECTOR REPORT. 2017 [Online]: [Accessed: 18.11.2017.]. Available at: <https://ec.europa.eu/docsroom/documents/23744/attachments/1/translations/en/renditions/pdf>.
- GLEN, A., 2013. Corporate financial management. 5th edition, Pearson Education, 992 p.
- KAZANTSEVA, S., A., 2011. Problems of determining the factors affecting the formation of the value of the enterprise / Actual issues of economics and management: materials of the Interational Scientific Conference, April 2011. – Moscow: RIOR, 183–188.
- MAVLUTOVA, I., 2011. Business restructuring and company's market value. Scenarios for company's development.LAP LAMBERT Academic Publishing GmbH&co. KG, Saarbrucken, Germany.
- PORTER, M., E., 2004. Competitive Strategy. Techniques for Analyzing Industries and Competitors/ New York: Free Press.
- REVSINE, LAWRENCE. 2011. Financial reporting and analysis / Lawrence Revsine, Daniel W. Collins, W. Bruce Johnson. – 5th ed. – Pearson Prentice Hall.
- VAN HORNE, J. AND VACHOWICZ, J., 2008. Fundamentals of Financial Management.- 13th edition, Prentice Hall Inc.
- YUDANOV, A., Y., 2012. Competition: theory and practice: a textbook. – 5th edition. – Moscow: GNOM – PRESS.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Modified method of area division – comparative analysis using Lévy stable motions

Rafał Buła¹

¹*Department of Investment and Real Estate, Faculty of Finance and Insurance, University of Economics in Katowice, 1 Maja 50, 40-287 Katowice, Poland, rafal.bula@ue.katowice.pl*

Abstract

The paper concentrates on the problem of fractal dimension of financial time series calculation. Firstly, the construction of the segment-variation method, method of area division and modified method of area division is described. Secondly, essential fractal features of Lévy stable motions are signalized. The abovementioned methods are used to estimate fractal dimension of sample paths of simulated Lévy stable motions. Finally, the statistical features of estimates received are discussed and the quality of estimates obtained using the modified method is assessed.

Keywords: risk quantification, fractal dimension, segment-variation method, area-division method.

JEL Code: G17

1. Introduction

This paper is devoted to the methodology of estimating the fractal dimension of time series. Due to its character, only data obtained by stochastic simulation was used, making empirical studies subject of separate analyzes (Buła, 2017; Buła and Pera, 2015).

The study follows on the author’s analysis of the use of the fractal dimension in the quantification of financial investment risk. In the previously presented studies (Buła, 2012a; 2012b) the author demonstrated and analyzed the construction of, *inter alia*, segment-variation method and fractal dimension estimation by area-division method. Moreover, the estimation of the fractal dimension of fractional Brownian motion was studied as a result of the adoption of the mentioned methods. As a consequence, interesting conclusions have been received, sometimes contrary to the findings of other researchers.

In the first place, it should be emphasized that the area-division method of the fractal dimension proposed by G. Przekota (Przekota, 2003) yields the biased results (which – as proved – arose from flaws in its construction). Furthermore, as shown by the analysis of

simulated time series of fractional Brownian motion, these estimates are much more volatile than in the case of the segment-variation method used as a *benchmark*. Therefore, the usefulness of this method should be questioned. For this reason, the author proposed a *modified area-division method*, from which construction were eliminated elements that negatively affect the quality of the results obtained. Since only one of the self-similar processes has been analyzed so far, it is advisable to carry out analogous research in the case of α -stable processes, which are also characterized by this property, for both the original method and the modified one.

The main objective of the presented studies was therefore to determine the properties of the fractal dimension estimates obtained by the area-division method for α -stable Lévy motion. Since the previous analyzes point to the undesirable properties of the estimates obtained by this method, it seems probable that an analogous situation may occur with respect to the processes analyzed in this study.

The established research goal corresponds with the formulated research hypotheses. The first hypothesis states that the original area-division method yields less reliable and highly unstable fractal dimension estimates, both in the case of fractional Brownian motion as well as α -stable processes.

The second hypothesis is that if a modified area-division method is used, comparisons can be made in terms of quality with estimates obtained using the segment-variation method.

While conducting research, the author used deductive inference. At the same time, comparative analysis was performed on the fractal dimension estimates obtained by different methods. In calculations, the author used MS Excel and Visual Basic for Applications, as well as Statistica – a statistical software package.

2. Selected methods of estimating fractal dimension of time series

Among methods of estimating the fractal dimension, particular attention should be paid to the methods derived from the variation method (Dubuc, et al., 1989) to which belongs the segment-variation method of M. Zwolankowska (Zwolankowska, 1998; 2000; 2001). This method uses the relationship:

$$\dim_B(X) = 2 - \lim_{\varepsilon \rightarrow 0} \frac{\ln \Gamma_\varepsilon(X)}{\ln \varepsilon} = \lim_{\varepsilon \rightarrow 0} \frac{\ln \Gamma_\varepsilon(X) / \varepsilon^2}{\ln \frac{1}{\varepsilon}},$$

where $\dim_B(X)$ is the box dimension, whereas $\Gamma_\varepsilon(X)$ the volume of hypercubes with a side of ε with at least one common point to the investigated set (time series) X . Having scaled down the plot so that the time takes values from the interval of $\langle 0,1 \rangle$, it is divided into segments with m observations (the last segment may contain less observations). $\Gamma_\varepsilon(X)$ is calculated according to the formula:

$$\Gamma_\varepsilon(X) = \sum_{i=1}^{[(n-1)/(m-1)]} h_i \cdot \varepsilon + h' \cdot (1 - \varepsilon \lfloor \frac{1}{\varepsilon} \rfloor),$$

where n – number of observations, h_i – the range of a given quantity in the i -th segment, ε – the length of the segment, h' – the range of a given quantity in the last segment. This

procedure is repeated for m multiples, however, there cannot be less segments than two. The estimation of the fractal dimension is obtained by using linear regression of $\ln \Gamma_\varepsilon(X)/\varepsilon^2$ in relation to $\ln \frac{1}{\varepsilon}$. Assuming $m = 2, m = 3, m = 5, m = 7$ different fractal dimension estimates are obtained. Finally, when the arithmetic mean is $1\frac{1}{2}$ as the final estimation is considered $1\frac{1}{2}$, when the mean is less than $1\frac{1}{2}$ – the minimum value, and when greater than $1\frac{1}{2}$ – the maximum value.

In the area-division method, the time series plot is covered with a rectangle with sides parallel to the axis of the coordinate system. The height of the rectangle is equal to the range of the analyzed quantity, and the basis to the length of the series. In the next step, the created rectangle is divided into congruent halves and the procedure is repeated with respect to the fragments of the plot contained in each one. To calculate the fractal dimension, the sum of the areas of the rectangles after the division (p) and the area of the original rectangle (P) are calculated. The author of the method postulates the dependence:

$$p = \dim_B(X) \cdot \frac{P}{2}$$

As a result of the conducted procedure, a set of points in the form of $(\frac{P}{2}, p)$ is used to evaluate the fractal dimension by means of linear regression excluding the constant term.

In view of the perceived weaknesses of the area-division method, the author of this paper has proposed several modifications to improve the quality of the estimates obtained. In the first place, the notion of “length of series” was specified more precisely, namely meaning the number of observations reduced by unity to eliminate the errors resulting from the identification of the length of the series and the number of observations available (Przekota, 2003; 2012; 2014; Przekota and Przekota, 2004; Przekota and Szczepańska-Przekota, 2008; Przekota and Waściński, 2012). In order to obtain a better fit of the regression line, it is proposed to use only observations for which the initial number of rectangles being formed is at least 10, thus eliminating observations potentially burdened with the greatest disturbance. In addition, the fact that the area-division method leads to an estimate of the quantity associated with the box dimension exponentially was accounted for (Buła, 2012b), and it was suggested to calculate it as:

$$\dim_B(X) = \log_2 \dim_{MAD}(X) + 1,$$

where $\dim_{MAD}(X)$ is the fractal dimension estimated by the area-division method. This method was called *a modified area-division method*.

The properties of the fractal dimension estimates obtained by the area-division method (original and modified version) and the segment-variation method for other than fractional Brownian motion self-similar processes (with fractal properties) are discussed in the further part of the paper.

3. Data

In the first place it was necessary to resolve the problem which stochastic process should be used when analyzing the properties of the segment-variation method and the area-division method (original and modified). Eventually, α -stable Lévy standard motion was used. This process was chosen for its known fractal properties, as well as relatively non-

complicated method for obtaining pseudo-random variables characterized by the α -stable distribution. In addition, this process is relatively often used to model returns from financial instruments (Papla, 2004).

The random variable is characterized by α -stable distribution if for any $a_1 > 0$, b_1 , $a_2 > 0$, there are such constants $a > 0$, b , that is:

$$F(a_1x + b_1) * F(a_2x + b_2) = F(ax + b),$$

(where $*$ denotes the convolution operator, whereas by $F(x)$ the distribution function). As proved, the above condition leads to the following definition of the characteristic function of the α -stable random variable (Krężołek, 2014):

$$\varphi(u) = \begin{cases} \exp \left\{ i \delta u - \gamma^\alpha |u|^\alpha \left[1 - i \beta \operatorname{sgn}(u) \operatorname{tg} \frac{\pi \alpha}{2} \right] \right\}, & \alpha \neq 1 \\ \exp \left\{ i \delta u - \gamma |u| \left[1 + i \frac{2\beta}{\pi} \operatorname{sgn}(u) \ln |u| \right] \right\}, & \alpha = 1 \end{cases},$$

where $\delta \in \mathbb{P}$, $-1 \leq \beta \leq 1$, $0 < \alpha \leq 2$, $\gamma \geq 0$. The key parameter determining the properties of distribution is the α parameter determining the thickness of the tails. Other parameters refer to the position (δ), scale (γ), or asymmetry of distribution (β) (problems related to parametrization of α -stable distributions are described by H. McCulloch (McCulloch, 1996)).

In an analogous manner to the arithmetic Brownian motion, Lévy standard symmetrical motion is defined:

1. $L(0) = 0$ with probability of 1.
2. For non-overlapping time intervals, process increments are independent random variables.
3. Process increments $L(t) - L(s)$, $0 \leq s < t$ are random variables described by characteristic function $\varphi(u) = \exp \left\{ -(t-s)|u|^\alpha \right\}$ (case $\alpha = 1$ is omitted) (Szczepaniak, 2001).

It is easy to notice that the process defined in the above manner is a self-similar process. The random variable $r^{-H}L(rt)$ is characterized by characteristic function:

$$\varphi(u) = \exp \left\{ -r^{1-\alpha H} t |u|^\alpha \right\},$$

thus for $H = \frac{1}{\alpha}$ it has the same distribution as $L(t)$. This demonstrates the self-similarity of the trajectory of this process with its self-similarity coefficient which equals to $\frac{1}{\alpha}$. Therefore, the fractal (box) dimension of the process is $2 - \frac{1}{\alpha}$.

Chambers, Mallows and Stuck method was used for the simulation (Borak, Härdle and Weron, 2005). Generating a pseudorandom variable with α -stable distribution for $\delta = 0$, $\beta = 0$, $\alpha \neq 1$, $\gamma = 1$ one should:

1. Generate a pseudorandom variable V with a uniform distribution in the interval $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$.
2. Generate a pseudorandom variable W with exponential distribution and mean value of 1 (variables V and W must be independent).

$$3. \text{ Calculate quantity of } X = \frac{\sin \alpha V}{(\cos V)^{\frac{1}{\alpha}}} \cdot \left[\frac{\cos(1-\alpha)V}{W} \right]^{\frac{1-\alpha}{\alpha}}.$$

The pseudorandom variable X will then have the desired distribution. Lévy motion can be simulated by summing up the independent pseudorandom variables obtained in the described manner.

Using the presented method, 100 trajectories of Lévy motion were generated with the lengths of 1008, 2016, 3024, 3960 and 4680 (i.e. numbers close to 1000, 2000, etc. with a potentially highest number of divisors). Each time, parameter α has been selected in such a way that the series has a theoretical fractal dimension of 1.5, 1.4; 1.3; 1.2; 1.1 respectively.

4. Results

The generated series were subjected to fractal analysis using the methods described previously: segment-variation method and area-division method in an original and modified form. As a result, three series of fractal dimension estimates were obtained for each series by different methods. These values were analyzed taking into account the actual level of fractal dimension of the series and their length.

In the first place, it should be noted that the objections made in the literature (Buła, 2012a; 2012b) regarding the area-division method are now also confirmed in case of the trajectories of Lévy motion. This method should not be used in its original form, since the estimates obtained differ significantly from the actual fractal dimension of the analyzed series, while at the same time they are characterized by a considerable dispersion. It is worth noting that increasing the number of available observations (in the analyzed cases nearly five times) does not lead to a significant improvement in the quality of the results obtained.

Referring to the area-division method taking into account the modifications proposed in the study, it should be noted that only in the case of series with a fractal dimension of $1\frac{1}{2}$ the segment-variation method provides, on average, the estimates closer to the real value of the fractal dimension than the modified area-division method. In other cases (especially in the case of having series with a larger number of observations), it seems more appropriate to use a modified area-division method. Although for the values closer unity of the real fractal dimension estimates obtained by both methods can be considered to be burdened, yet the burden is smaller for the modified area-division method. In addition, its estimates are more stable, as evidenced by the standard deviation, their range in the sample and the values of the first and third quartiles.

Statistical tests were also performed to verify the hypothesis of normality (the Jarque-Bera test) and equality of means (test for combined variables) and Morgan's variance test. Additionally, the correlations between estimates were examined. As expected, the distributions of estimates were statistically significantly different (significance level 0.05), but the estimates themselves remain relatively close to the linear relationship (all correlation coefficients are different from zero). The mean values and variances for the estimates obtained by the modified area-division method are significantly lower than for the segment-variation method. The distributions themselves turned out to be mostly normal or close to Gaussian distributions.

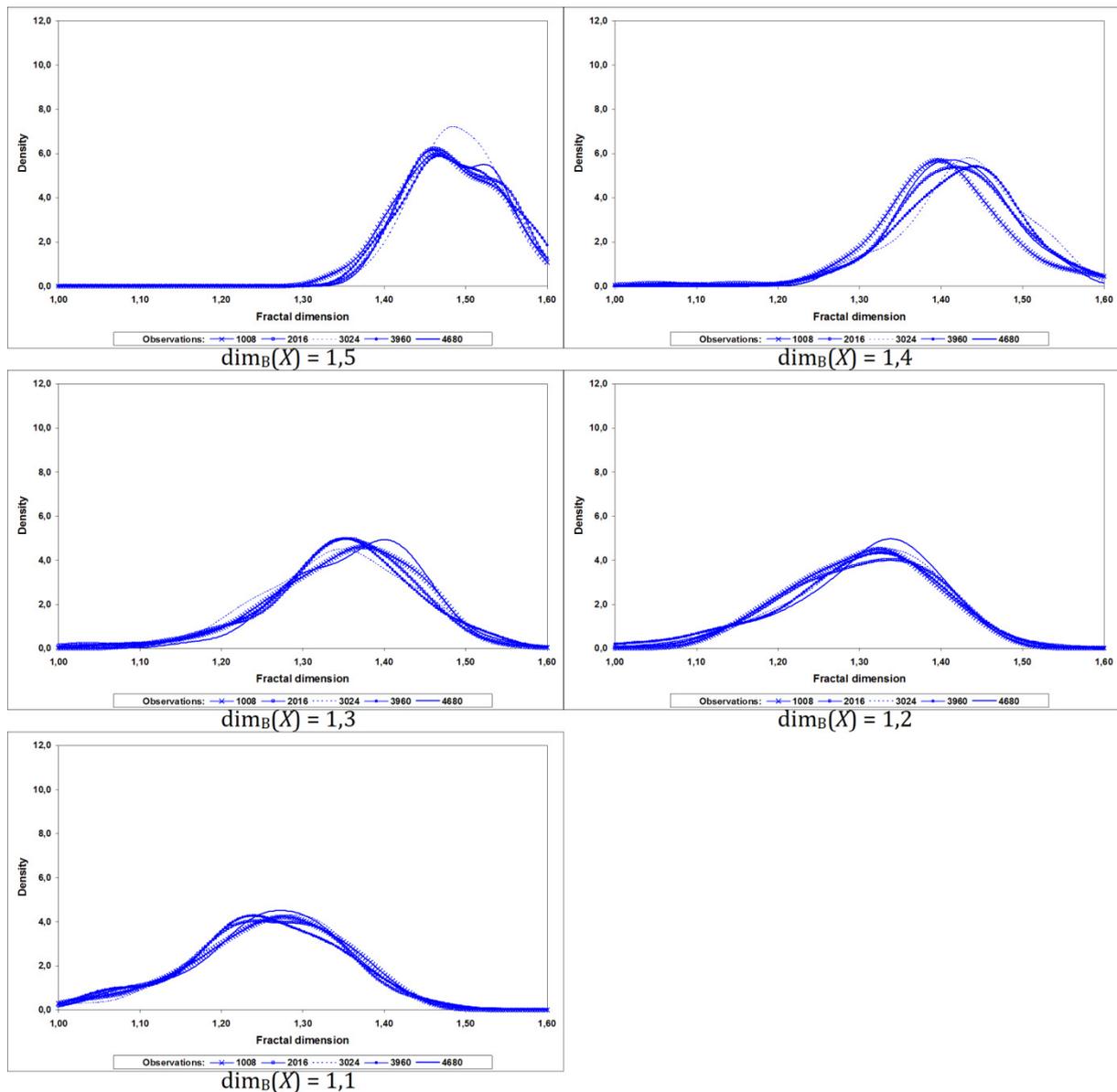


Figure 1: Density function of the fractal dimension of α -stable Lévy motion estimated by the segment-variation method

Source: own elaboration

In addition to the analysis using descriptive characteristics of the obtained results, the estimated density function of fractal dimension was assessed. In order to estimate the density function, a kernel estimator was used. Having N observations, we can estimate the probability density function as (Silverman, 1998):

$$\hat{f}(x) = \frac{1}{Nh} \sum_{i=1}^N K\left(\frac{x-x_i}{h}\right)$$

At the same time it was assumed that $K(x)$ is a density function of the standard Gaussian distribution. Parameter h was estimated according to the literature recommendations as $\left(\frac{4}{3N}\right)^{\frac{1}{5}} \hat{\sigma}$, where $\hat{\sigma}$ is the sample standard deviation. The results for each method are shown in the diagrams presented.

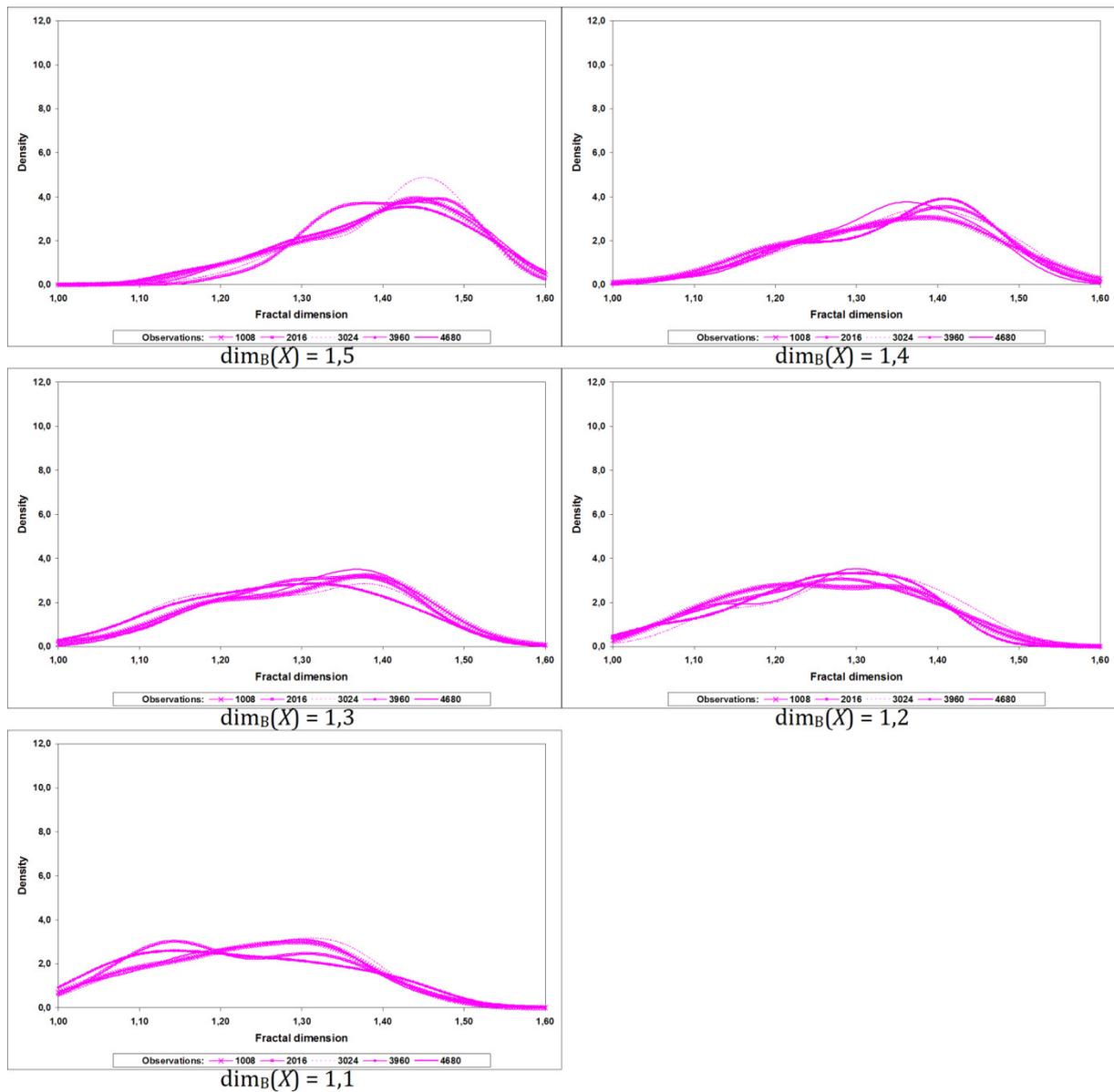


Figure 2: Density function of the fractal dimension of α -stable Lévy motion estimated by the area-division method
 Source: own elaboration

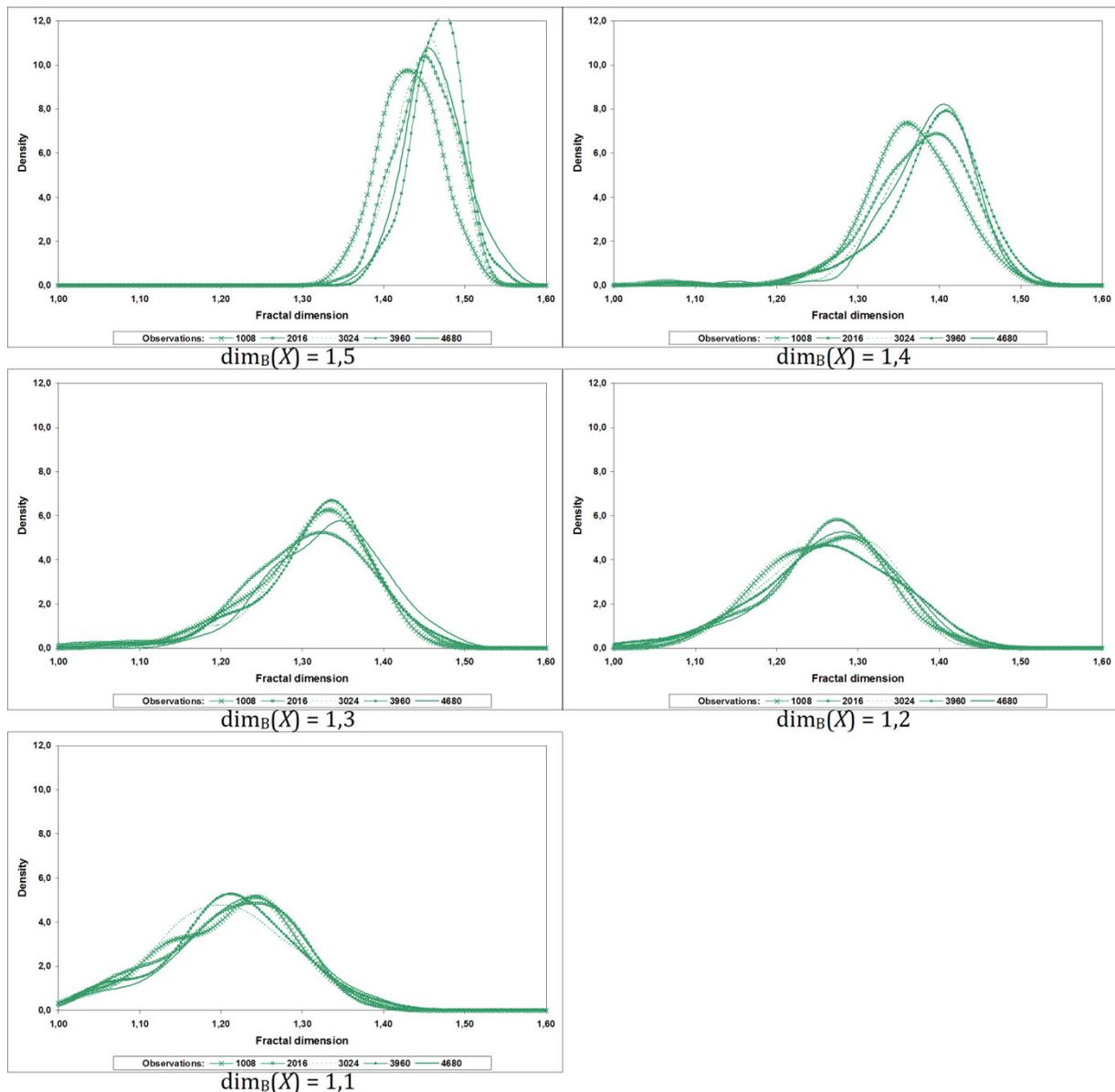


Figure 3: Density function of the fractal dimension of α -stable Lévy motion estimated by the modified area-division method

Source: own elaboration

The estimated density functions are a confirmation of the previously presented conclusions. For the series of fractal dimension of not more than 1.4 it is desirable to use the modified area-division method. The issue of choosing the estimation method in the case when the fractal dimension of the series is greater than 1.4 stays debatable. It is particularly important, as in relation to the empirical time series of prices and cumulative rates of return previously obtained estimates are often relatively close to this value (Buła, 2017). In the light of the results presented, it seems appropriate to use both methods.

5. Conclusions

The results of the presented research lead us to formulate some conclusions concerning the analyzed fractal dimension estimation methods.

In the first place, it should be noted that the fractal dimension estimates obtained by the segment-variation and area-division method for the fractional Brownian motion and Lévy motion have similar properties. In both cases, the Zwolankowska method proves to lead to receiving quantities reflecting the actual fractal dimension in a larger extent and, moreover, characterized by greater stability (thus the Popperian corroboration of the initial research hypothesis was obtained). Therefore, any conclusions drawn so far about these methods remain in force.

The author's suggestion of appropriate corrections and removal of structural flaws made the estimates obtained by the modified area-division method similar in quality to the results obtained in the segment-variation method. Moreover, the modified area-division method proved to be more precise in many cases than the Zwolankowska method. Thus, the second hypothesis was confirmed. At the same time it can be stated that the author's cognitive and practical goals have been fully attained.

References

- BORAK, S., HÄRDLE, W., WERON, R. 2005. Stable distributions. SFB 649 Discussion Papers 8: 1–26.
- BUŁA, R. 2012a. Aspekty metodyczne szacowania wymiaru fraktalnego finansowych szeregów czasowych. In: KUCZERA, M. (ed.). Młodzi naukowcy dla polskiej nauki. Cz. IX. Tom II. Kraków: Creativetime, 192–200.
- BUŁA, R. 2012b. Metoda podziału pola a metoda segmentowo-wariacyjna szacowania wymiaru fraktalnego. In: KUCZERA, M. (ed.). Nowe trendy w naukach humanistycznych i społeczno-ekonomicznych. Cz. 3. Tom III. Kraków: Creativescience, 248–256.
- BUŁA, R. 2017. Analiza wymiaru fraktalnego spółek notowanych na Giełdzie Papierów Wartościowych w Warszawie – aspekty metodyczne. *Nauki o Finansach* 1 (30): 9–27.
- BUŁA, R., PERA, K. 2015. Применение концепции фрактальной размерности для оценки инвестиционного риска на финансовых рынках. In: БЕЛОЗЕРОВ, С. А. (ed.). Международный экономический симпозиум - 2015: материалы Международных научных конференций, посвященных 75-летию экономического факультета Санкт-Петербургского государственного университета 22–25 апреля 2015 г. Сборник статей. Санкт-Петербург: Скифия-принт, 217–235.
- DUBUC, B., QUINIOU, J., ROQUES-CARMES, C., TRICOT, C., ZUCKER, S. 1989. Evaluating the fractal dimension of profiles. *Physical Review A* 39 (3): 1500–1512.
- KRĘŻOŁEK, D. 2014. Rozkłady alfa-stabilne. Zastosowanie w ekonomii i zarządzaniu. Katowice: Wyd. UE.
- MCCULLOCH, H. 1996. On the parametrization of the afocal stable distributions. *Bull. London Math. Soc.* 28: 651–655.
- PAPLA, D. 2004. Przegląd rozkładów teoretycznych używanych do modelowania stóp zwrotu z akcji. *Taksonomia. Prace Naukowe Akademii Ekonomicznej we Wrocławiu* 1022: 144–154.

- PRZEKOTA, G. 2003. Szacowanie wymiaru fraktalnego szeregów czasowych metodą podziału pola. *Zeszyty Studiów Doktoranckich Akademii Ekonomicznej w Poznaniu* 12: 47–68.
- PRZEKOTA, G. 2012. Szacowanie ryzyka zmian cen akcji metodą podziału pola. *Problemy Zarządzania* 4: 178–187.
- PRZEKOTA, G. 2014. *Gospodarcze aspekty ryzyka na rynkach finansowych*. Koszalin: Wyd. Ucz. Politechniki Koszalińskiej.
- PRZEKOTA, G., PRZEKOTA, D. 2004. Szacowanie wymiaru fraktalnego szeregów czasowych kursów walut metodą podziału pola. *Badania operacyjne i decyzje* 3-4: 67-82.
- PRZEKOTA, G., SZCZEPAŃSKA-PRZEKOTA, A. 2008. *Analiza empiryczna efektywności polskiego rynku akcji*. Warszawa: Ośrodek Analiz Statystycznych.
- PRZEKOTA, G., WAŚCIŃSKI, T. 2012. Wybrane problemy oceny ryzyka zmian cen akcji za pomocą miar klasycznych i nieklasycznych. *Zeszyty Naukowe Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach* 95: 71–82.
- SILVERMAN, B. 1998. *Density Estimation for Statistics and Data Analysis*. Boca Raton: CRC.
- SZCZEPANIAK, W. 2001. Modelowanie cen instrumentów finansowych przy użyciu procesów stabilnych i hiperbolicznych. In: *Dynamiczne modele ekonometryczne: materiały na VII Ogólnopolskie Seminarium Naukowe, 4-6 września 2001*. Toruń: Dom Organizatora, 289–298.
- ZWOLANKOWSKA, M. 1998. Szacowanie lokalnego wymiaru fraktalnego szeregów czasowych. *Zeszyty Naukowe Uniwersytetu Szczecińskiego* 233: 157–163.
- ZWOLANKOWSKA, M. 2000. Metoda segmentowo-wariacyjna. Nowa propozycja szacowania wymiaru fraktalnego. *Przegląd Statystyczny* 1-2: 209–224.
- ZWOLANKOWSKA, M. 2001. *Fraktalna geometria polskiego rynku akcji*. Szczecin: Wydawnictwo Naukowe Uniwersytetu Szczecińskiego.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Protection Of Intellectual Property As An Example Of The Ownership Law On The Example Of Computer Games

Radoslaw Bulat¹, Lukasz Poplawski²

¹*Ignatianum University in Kraków, Faculty of Philosophy, Kopernika 26, 31-501 Cracow, Poland, e-mail: radoslaw.bulat@gmail.com*

²*Department of Finance Government, Faculty of Finance and Law, Cracow University of Economics, Rakowicka 27, 31-510 Cracow, Poland, e-mail: poplawsl@uek.krakow.pl*

Abstract

The article presents the role of property rights in economics, and considers manner and scope of protection of those rights in the Polish jurisprudence. In addition, as an example medium, computer games are considered, as their status in the legislation is not clear. This work defines the conditions and the object of legal protection, its exceptions, as well as focuses on the most common cases of its violation. Final conclusions draw attention to the need of making the rights to intellectual property more detailed for new technologies and media that have created for themselves a niche in the new economic model.

Keywords: ownership rights, intellectual property, copyright law, computer games

JEL Code: A12, D02, K20

1. Introduction

The Polish Copyright Protection Act covers many cultural works and techniques created by man, some of them being mentioned there in detail, such as computer programs. Information technologies, however, are a constantly evolving medium, which sometimes gives rise to doubts as to the classification and scope of protection of certain content. The aim of this study is to present a very specific subgenre of computer games, their legal qualification, and the possibility of fair use, both as works of art and sources of their own inspiration in the creation of subsequent quotation works – from the point of view of property rights in institutional economics. The following research methods were used in the work: descriptive, induction, deduction, analogy and literature analysis.

2. Property rights in the case of digital goods

When considering the law and protection of intellectual property in business, it is impossible not to refer to institutions set up by the state in order to implement public tasks in this area, i.e. legal conditions that are located in the legal and economic system of a given country. In the case of this article it will be examined on the basis of Polish jurisprudence. It is assumed that a set of institutions established by the state for the purpose of public tasks being the expression of the state's function based on the public sector (Lubińska, 2010, p. 56). It is an important element of modern economies, a part of them that serves general and full service functions in relation to society (Szewczuk, Zioło, 2008, pp. 18–19, Kleer, 2008, p. 34, and Miłaszewicz, 2015, pp. 127–135), only that this utility should protect the ownership rights of entities. From the right to a given entity, it follows that an unauthorized person can not use it, nor spread as their own work as a whole.

In this context, it is necessary to pay attention to the problem of ownership rights in the theory of property rights. The protection of intellectual property is a special case which can be described by a number of proprietary rights, they are: the right to use property, the right to benefit from ownership or the right to dispose of an item and to sell it. In this case, it should be considered whether the computer game should be subject to the protection of intellectual property from the point of view of ownership, as it can most often not be described as a physical object, but only some amount of structured data. As such, the right to use, can have a waiver clause for some activities that are prohibited (for example reverse engineering, or using it after a set period of time in case of trial software). Similarly, for many contemporary computer programs, which are merely sold as licenses or services, the right to resell might also be waived by end-user license agreement which binds the buyer with a legal contract with the seller, and might contain some other clauses not included in the general ownership law.

Still, those are the conditions set by the seller himself, and as such, license agreements cannot be looked upon as a source of general law, as the Polish jurisprudence system is not based on judicial precedents (like for example an American one) which could be used as a law source. So the exact legal status of digital goods has to be determined on the constitutional basis, with court case proceedings used only as a demonstration of applying it in practice.

3. Legal conditions

It would seem that the classification of a computer game as a computer program (which is mentioned *expressis verbis* in the body of Article 1 paragraph 21 of the Act of 3 February 1994 on copyright and related rights, Journal of Laws of 2016 item 666 (next as the Act)) it should not raise any more doubts, due to the medium used – the game is in fact a processed record of a computer program created by man. It also exhausts the marks specified in article 1 point 1, and these are:

- a manifestation of creative activity (which, apart from some cases, which may be the use of automatic tools that create a computer code – is met)
- of an individual character (which is fulfilled if the software does not bear the signs of plagiarism)
- determined in any form (exists in the form of a program listing or machine code)

However, the very nature of the work and its purpose may raise doubts. Article 1 paragraph 2 point 1 of the Act referring to computer programs as works, gives as a definition of the category to which they belong: “expressed in words, mathematical symbols, graphic signs”. A computer game, as an element of a strictly multimedia category, despite the fact that it was written in a given programming language is more than a listing of commands on the screen (and is not intended to be played in this form – it is not literature that we can read). It can be presumed that the reproduction of the work by the recipient in the form intended by his creator differs from his “expressed in graphic signs” in the same way as the performance of Chopin’s piece from his score – both of them are works, but of a completely different category and function. Thus, a slightly different classification of the work seems to be more appropriate – not according to its actual form of representation (which is inconsistent with Article 1 (1) “Regardless of ... the method of immortalization”), and only according to the reception method as intended by creator of the work, taking the form of a video game based on multimedia (Matusiak, 2014, pp. 200–216),

In addition, in Article 1 paragraph 2 point 2, one can read: “Protection can only cover the way of expression; they are not covered by the protection of discoveries, ideas, procedures, methods and principles of operation and mathematical concepts”, which further strengthens the conviction that the basis for the qualification of the game cannot be its similarity to the graphic record. The components of the binary code that is the basis of the work are “mathematical concepts” and “ideas” that make up the programming language used and the use of programming tools that are not protected as such (and as mentioned before, can be machine generated and what hence, do not fulfill the condition of manifestation of creative activity). The way of expression (which is protected) is a combination of multimedia organized by the creator in a specific order, aimed at causing the recipient to experience certain emotions (emotions resulting from using the game or tracking its plot)

Consequently, it may be tempting to include computer games as products subject to the protection of copyright – on the same principle – as “audiovisual (including film) works” (Article 1 paragraph 2 point 9 of the Act), because it is more like the medium in which the content of the work is available to the recipient, which can then be evaluated, quoted or further inspired. A similar interpretation is also included in the line of judicial decisions, where the definition of an audiovisual work has been interpreted, among others: “an audiovisual work is not only a “classic” feature film, but also “filmed” theater performance, documentary movie or TV commercial. Characteristic for the essence of this concept is the movement factor, fixed with the use of appropriate technical devices, as well as an element of cooperation of numerous entities in the process of creating such a work” (2012.11.20, Court of Appeals in Gdańsk, reference number I ACa 176/10) or “Work audiovisual is a work (and thus a manifestation of creative activity of an individual character) expressed through a series of consecutive images, with or without sound, recorded on any medium that enables multiple playback, evoking the impression of movement” (2006.11.29, District Court for the city of Warsaw in Warsaw, reference number IV K 80/06). According to this concept of an audiovisual work, a computer game fulfills all the above criteria, although it treats it more broadly than a film offering much more freedom in the order of reproduction of the “images” that constitute the whole work.

Therefore, the appropriate, as assumed by the creator, use of his work is not so much browsing its structure (which as a decompilation is usually prohibited by the product license), but playback on adapted electronic equipment (Flisak, 2008, p. 95), the buyer has the right to repeated play of all the elements that make up a computer game as he would prefer to fulfill his enjoyment. He also has the right to use fragments of the game (mostly

visual) by virtue of the quote right, creating his own reviews, parodies or descriptions. However, this law has its limits, which are now quite often violated or considered fluid...

Before discussing specific cases of the use of multimedia that are provided to users by a computer games producer, the general legal interpretation currently in force (Art. 29 of the Act) should be provided: "It is permissible to quote fragments of widespread works in works constituting an independent whole (...), to the extent justified by objectives of quote, such as explanation, polemic, critical or scientific analysis, teaching or the rights of a genre of creativity". An additional requirement is to provide the source and author of the quote. (Article 34 of the Act)

As we can see, not every use of a piece of someone else's work can be justified, mainly due to two restrictions:

- the requirement of independent wholeness – a condition that is quite simple to fulfill – the quotation has to be included in something that is also a work according to the definition of the Act, and therefore being an individual creation. Consequently, it must contain a certain contribution of work and character. The exception (Traple, 2005, p. 346) may be the collection of aphorisms and quotations, which are their only content – in this case the creative contribution is their selection and ordering.
- requirement for legitimate purpose – the Act clearly states that the quote must perform the necessary function in the work – it can be explained, analyzed or polemized with, but only for the purpose required by the work of our authorship. Quoting anything in a form detached from the context or only as decorum, does not meet the conditions of the right to quote.

Coming back to the computer games industry – the most common methods of "quoting" multimedia works are images (screenshots) or film fragments depicting the play-through of quoting person.

Everything indicates that the practice of creating screenshots, while fulfilling the other premises, falls within the scope of the right quote as well as the creation of a physical photograph of a work. The creative participation of the player here is the use of the game so that it allows to get the right shot or frame (sometimes with high aesthetic or compositional value) – which often requires individual skills. However, the other conditions of the quotation must also be met – the source (in this case the name and the author of the original work from which the photograph is taken) and purposefulness – the approach should illustrate or emphasize the part of the creation of the photograph. In this case, it is allowed to create frames illustrating press articles, reviews or any other own creation, provided that they form a common whole with it. A quite controversial case may be internet galleries containing the pictures themselves, but citing the casus (Traple, 2005, p. 346) about the collection of quotations, such use seems also acceptable.

In Polish case law, one can not encounter matters regarding screenshots of computer games. The only known case of such a ruling is the decision of the Court of Appeal in Warsaw of 20.01.2014 (reference number I ACa 1214/13) regarding screenshots of the website. "Using printscreen is a fairly common practice if you want to show off the photo itself (...). Placing this printscreen was meant to show (...) This is confirmed by printouts attached to the lawsuit, which show that the site (...) has a printscreen, or screenshot (...). This picture in a very good way illustrated the text that appeared on the site (...), due to

the content of the photo” The court accepted the position that the use of the right of quote in relation to screenshots is allowed and consistent with the other uses of quotations³.

Another case of the use of images are promotional materials of game developers, which in principle are covered by the same restrictions as any other work, but they often have the opportunity (given to them by their creator) to use them on the basis of press material (in the case of images does not apply Art. 4 Act, excluding “simple press information” from the protection). In this case, as dissemination of the free artwork (trial material) is in the interest of the creator – it is possible to publish them.

4. Audio video recording and the quotation right, in the context of the issue of payment for intellectual value

It would seem that audiovisual recording or streaming do not differ significantly from screenshots in practical terms. However, looking at the issue, it is clearly visible that the recorded or transmitted game is not much different from the form in which it was intended for distribution by its creator, the only additional issue may be the player’s skills or commentary. The decisive factor in this case is the proportion – between the length of the quote (the game being recorded) and the commentary (own contribution, allowing the film to be considered a new work). While the fragment of the game during a long review, embellished with the commentary of the player emphasizing individual production features, falls within the scope of the right to cite in polemic or analysis, the so-called “Let’s Play” movies (frequently recorded live broadcasts of the game from the beginning until the end) one can no longer join with any of the premises for the quote. Such activity, although socially acceptable and frequent, according to the interpretation of Polish law contained in the Act, is not allowed, and taking into account its additional monetization through the income from advertisements displayed during such films, breaks additionally fragments of the Act on profiting from someone else’s work.

An interesting exception in Poland may be the company CD Projekt RED, which in the license agreement (so-called EULA) grants purchasers of its product the rights to, among others, broadcast the game (“We give you permission to create fan work (e.g. machinima, ‘Let’s Play’ or other videos, artwork and fan mods) regarding CD PROJEKT RED games, unless our legal Rules for a game in question say differently.”)

An additional aspect regarding the use of computer game registering is the aforementioned monetization. What is monetization in its most popular approach? This is to benefit from viewership of user-created content by including short advertisements into it. Depending on the popularity of a given game (review or Let’s play) and its audience, the number of ad impressions coming from external entities, which pay the fee to the author of the material, also increases. Practice in Poland indicates that these are rather small amounts (as opposed to similar rates, e.g. in the United States), nevertheless it is a measurable form of payment for the creator for his work – even if he is not rewarded directly by its recipient. At this moment, the video generates revenue for its creator, which is, of course, is allowed under the Act, under Article 17. “The creator has the exclusive right to use the work and dispose of it in all fields of exploitation and to pay for the use of the work” . Monetization of video recordings is therefore one of such forms of remuneration, derived from seemingly free goods in access.

³ However, the defendant lost the case due to his failure to comply with the requirement to provide the source of publication.

As outlined above, within works (user recordings) it is permissible to use the quotation right, which at the same time does not preclude the recognition of the newly created creation as a work separate from the cited (if the statutory conditions were met). In this case, monetization does not apply to cited works – they are used by fair use and their author does not receive any remuneration. Despite this fact, as quoted earlier, there are cases of granting a free license for a wider use of legally protected material – this brings to the authors of the computer game immeasurable profits, consisting of its promotion among gamers.

What about the improper use of legally protected material (violating the intellectual property rights of the creator, exceeding the permitted use and / or not licensed to use it in another work)? In this case, Article 79 of the Act applies: “The rightholder whose copyright property has been violated may demand from the person who violated these rights:

- 1) discontinuation of infringement,
- 2) removing the consequences of the infringement,
- 3) repairing the damage caused (...),
- 4) issuing the benefits obtained. “

As you can see in this case, the creator of the original work may demand payment for its use, as well as the release of benefits obtained by the plagiarist. Moreover, the provision applies irrespective of the fact of any revenue by the infringing party – the use of someone else’s work may (although not necessarily – the case with deliberate licensing) lead to violation of measurable property rights and involve criminal liability.

5. Conclusions

It should be emphasized that not only the right to own a given value is important but also other proprietary rights. When considering property rights issues, they should therefore be associated with applicable standards. It should also be noted that these property rights are a basic factor of economic efficiency or wealth creation. Protection of intellectual property is a special case of ownership rights, which in the case of a computer game was presented in this work.

Copyright law regarding computer games as a medium, in Poland still needs to be more detailed. Continuous development of technology causes the creation of spheres that cannot be fully classified with 100% certainty in accordance with the letter of the law. Judicial jurisprudence seems to be a clue here, but still a large part of this market segment is based on customary practices that are not always “good practices” and often, despite public consent, conflict with the written law.

References

- The Act of February 4, 1994 on copyright and related rights (unified text, Journal of Laws of 2016, item 666)
- FLISAK D., 2008. *Utwor multimedialny w prawie autorskim*, Warszawa: Oficyna Wydawnicza Wolters Kluwer,
- KLEER J. 2008. Sektor publiczny w warunkach współczesnych. *OPTIMUM Studia Ekonomiczne*, 4 (40)

LUBINSKA T. 2010. Budzet a finanse publiczne. Warszawa: Difin.

MATUSIAK I. 2014 Gra komputerowa jako przedmiot prawa autorskiego, Warszawa: Wydawnictwo Wolters Kluwer SA

MILASZEWICZ D. 2015. Propozycja oceny społecznej efektywnosci sektora publicznego na przykladzie UE. Studia Ekonomiczne. Zeszyty Naukowe Wydzialowe Uniwersytetu Ekonomicznego w Katowicach, 209,

SZEWCZUK A. ZIOLO, M. 2008. Zarys ekonomii sektora publicznego, Szczecin: Wyd. Naukowe US

TRAPLE E. 2005. Komentarz do art. 29. W: J. Barta i R. Markiewicz (red.) "Prawo autorskie i prawa pokrewne. Komentarz" Krakow: Zakamycze

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Corporate Social Responsibility and Green Marketing as a Part of Firm’s Philosophy

Jiří Čerkasov¹, Jan Huml¹, Lucie Vokáčová¹ and Klára MargarISOVÁ¹

¹Department of Management, Faculty of Economics and Management, Czech University of Life Sciences, Kamýčká 129, 165 21 Prague, Czech Republic, e-mail: cerkasov@pef.czu.cz, huml@pef.czu.cz, vokacova@pef.czu.cz, margarISOVA@pef.czu.cz

Abstract

The main aim of the article was to determine how the concept of social responsibility is used at Czech companies across selected sectors. Partial aims were to define key stakeholders, identify the stage of use of the social responsibility concept and to identify the specific tools within the economic, social and environmental pillars. Investigations ascertained that key stakeholders are considered employees, consumers, business partners and, last but not least, the general public. Most companies that apply CSR are in the stage of random use of a specific tool for a specific purpose without inclusion in the annual plan. The tools that respondents most often mentioned in the individual pillars in the economic sphere are customer relationships and compliance with labor standards with internal stakeholders and sponsorship of external stakeholders in the social sphere. In the environmental sphere, measures and devices for energy saving, recycling of waste from administrative activities and optimizing the use of vehicles are applied most often. Although most of the respondents labelled CSR, including tools for Green Marketing, as beneficial, the wider application of CSR as a comprehensive tool, i.e. when applying the principle of Triple Bottom Line (TBL), is still limited within Czech companies.

Keywords: Corporate social responsibility (CSR), Triple Bottom Line (TBL), Green Marketing, stakeholders, stage of use of CSR tools, relevance of CSR tools

JEL Code: M14, O13, Q01

1. Introduction

The topic of social responsibility (CSR) penetrates into the considerations of both the general public and companies regardless of their size and focus. The social responsibility is not always seen by the management as a comprehensive tool or concept that must be applied in the long term (Broomhill, 2007). On the one hand many companies see CSR as a strange and expensive element that does not necessarily lead to benefiting the company or stakeholders (Doane, 2005; Jenkins, 2005; Freeman, 2013). On the other hand, CSR is accepted by the management of many companies as an everyday part of their corporate

philosophy that strengthens the position of the company in the following areas: reducing cost and risk; strengthening legitimacy and reputation; building a competitive advantage; and creating win-win situations through synergistic value creation (Kurucz et al. in Carroll, 2010). Among Czech companies CSR represents relatively new qualitative level of internal and external relationships which are also gradually finding their ways into daily firms' activities.

At the end of the 19th century in the United States, companies began to focus their attention on the welfare of their employees, and the first employee social programs began to be implemented in a limited scope (Carroll, 2008). Philanthropic activities aimed at the public also began to develop in the same period (Tarn, 1973). H. Bowen's *Social Responsibilities of the Businessman*, which was first published in 1953, can be considered a significant turning point in the development of CSR (Bowen, 2013). Particularly the social aspect of business was in the spotlight at this time. Later on Carroll (1979) in his publication *A Three-Dimensional Conceptual Model of Corporate Performance*, in addition to economic responsibility, stresses the importance of variables such as compliance with laws, ethics and voluntarism. However, the significance of this study consists of the creation of a three-dimensional model where the axes of the model represent the inclusion of social issues such as consumerism, the environment, discrimination, product safety, and stakeholders. The model represents a concept that can help management in its systematic thinking about key elements of social responsibility and planning. In the 1980s, E. Freeman's (1984) publication *Strategic Management: Stakeholder Approach* had a significant impact on the development of social responsibility. The publication expanded on the traditional understanding of a shareholder, i.e. as someone who is only associated with a company because of economic interest, as well as stakeholders, who were company owners, management, and employees as the representatives of so-called internal stakeholders. Freeman ranks the following as external stakeholders: suppliers, customers, consumers, a closer and more distant community, and government authorities, representatives of the media, political groups, various trade associations and the competition. Another key moment was the increasing interest of the professional and general public in the issue of the environment. In 1987 the United Nations World Commission on Environment and Development published its *Our Common Future* study, also known as the Brundtland Report, which among other things addresses conditions for sustainable development in three key areas: economic, social and environmental (Mitchell, 1991).

Elkington (1994) published *Toward the Sustainable Corporation: Win-Win-Win Business Strategy for Sustainable Development*. Author stresses the need to understand the responsible business as a comprehensive approach in three key areas, namely economic, social and environmental, i.e. the Triple Bottom Line principle (TBL). In conjunction with the stakeholder theory, TBL enables companies to focus defined activities on specific stakeholders. Promoting the idea of social responsibility also appeared in 1999 at the World Economic Forum in Davos, where then Secretary-General Kofi Annan urged the world's leading entrepreneurs to adopt and approve the initiative of shared values and principles in the areas of human rights, labor and environment, called the Global Compact. (Tencati et al., 2004). In the Global Compact document (2013), the United Nations (UN) defines ten principles divided into four areas: human rights, working conditions, the environment and anti-corruption measures. Gradually, countless evaluation mechanisms have been created with aim to help with the objectification of the effects of CSR both as self-evaluation, and evaluation methods by an independent third party. The late 1990s saw the creation of one of the biggest evaluation systems, i.e. the Global Reporting Initiative (GRI), which is constantly being improved and being used ever more often. A standard

according to the International Organization for Standardization – ISO 26000 appeared in 2010. The standard recommends steps for companies that want to manage their business activities according to the principles of social responsibility. Other used standards in the social sector focused on internal stakeholders include Social Accountability – SA 8000, Occupational Health and Safety Standards – OHSAS 18001. Effectiveness of philanthropy can be measured by tool developed by London Benchmarking Group (LBG). An implementation and evaluation system called KORP, which is based on the methods of the Global Reporting Initiative – GRI, was developed in the Czech Republic. For the needs of agricultural practice, worth mentioning is the French method Indicateurs de Durabilité des Exploitations Agricole – IDEA modified for conditions in the Czech Republic (Konečná, 2014).

Green Marketing (GM) appeared later than CSR. Midway through the 1970s, the American Marketing Association (AMA) organized the first ever Ecological Marketing workshop (Polonsky, 1994). A publication called Ecological Marketing was later published by authors Henion and Kinnear (1976), in which Green Marketing was first defined as the “study of the positive and negative impacts of marketing activities in relation to environmental pollution, energy consumption and other sources”. The American Marketing Association currently perceives Green Marketing as a complex of activities assessed from three different angles. The first is: Retail approach – this is the “marketing of products which are deemed environmentally friendly”; in terms of social marketing, the second is: “The development and marketing of products made with regard to minimizing the impact on the environment or its improvement,” and the third environmental view – GM, is described as “the efforts of organizations to develop, produce, promote, package and recycle products in a manner that is responsible and sensitive to the environmental interests of society” (AMA, 2013).

There are several reasons for why companies focus on its use. Green Marketing is seen as an opportunity to achieve their goals, and it is also a conviction of the moral obligation to behave responsibly toward society. An indispensable fact is the increasing pressure by government authorities on the responsible behavior of companies with respect to the environment. The influence of competitive pressure may be another reason for the adoption of Green Marketing. Last but not least, these include increasing costs of raw materials and waste disposal (Polonsky, 1994; Chen, 2011). Along with this, increasing public awareness of environmental issues means that consumers are beginning to gravitate towards green products (Makower, 2009). However, this does not mean that consumers are able to easily get their hands on green products. Companies are not always able to manufacture and sell products so that consumers are aware of their utility value. Many good products entered the market at a time that was not yet ripe for such products. Nor should we forget the generally long time that it takes to introduce a new product, which takes 5.4 to 8.5 years even in high-tech and consumer (economically) advanced countries (Chandrasekaran and Telis, 2008). Companies are also not always able to clearly communicate the usefulness of green products to consumers (Ottman, 2006). There are studies that show that consumers still do not believe claims of companies about the environmental safety of products (European Commission, 2013) or even that the number of unbelieving consumers is increasing (GfK, 2013). This trend may be related to the apparent contradictory business and product thinking as stated by John Grant in his book *The Green Marketing Manifesto* (Grant, 2010). At the moment when business ethics are not based on solid foundations, pragmatic business (sales) thinking can prevail that will result in so-called Greenwashing, i.e. unconfirmed, and in some cases even false claims about the

environmental safety of products. Irresponsible behavior by companies toward the environment and a series of greenwashing scandals are behind the decline in consumer confidence in green products (Leonidou, Skarmas, 2015). For an objective assessment of environmental impacts, systems for the implementation and evaluation of environmental management systems were developed over time into a family of standards ISO 14000. The EMAS, i.e. Eco-Management and Audit Scheme program is a higher degree that can be used to evaluate environmental responsibility.

The article deals with the use of the concept of social responsibility by companies in four sectors (industry, services, transport and agriculture). The aim of the research was to define key stakeholders, to determine whether companies use the social responsibility concept, and what stage of the application of this concept that they are at. The tools used in the different pillars were also identified, and whether or not these tools are evaluated in some way. Finally, the opinion on the benefits of applying social responsibility and marketing products for the company was examined.

2. Methodology and Data

The article has an exploratory research nature. Attention was focused on relationships and development in key areas of social responsibility, i.e. economic, social and environmental sectors. The questionnaire was created using the Lime Survey tool and contained 26 questions. The questions were divided into seven thematic groups: identifying questions, an introduction in which it was examined how the company approaches the application of social responsibility, and what tools it uses in the social and environmental sector in relation to internal and external stakeholders. Another group of questions focused on the economic sector, followed by questions that deal with the evaluation of CSR at the company. Closed questions – a selection of options, the Likert scale and semi-closed questions were used. Respondents were selected from the databases of the Confederation of Industry of the Czech Republic, European Databank (EDB), AgroSeznam s.r.o., and the Complete Database of Czech Companies. The focus of economic activities according to CZ NACE and the number of employees was checked. A total of 600 companies were contacted via deliberate selection according to the following keys: 150 entities were contacted in each sector. The numbers of companies is based on the percentage composition of EU firms according to size (European Communities, 2006). A total of 570 small and medium-sized companies and 30 large companies were contacted. The questionnaire was distributed by e-mail with a cover letter and a hyperlink to the website with the questionnaire. A total of 121 properly filled questionnaires were returned. In terms of sectors, 16.5% of the respondents were from industry, 7.4% from agriculture, 5.1% from transportation and 70% from the service sector. In terms of company size, 73.8% were small companies, 16.7% medium companies and 9.5% large companies.

3. Results

In terms of identifying external key stakeholders (see Figure 1), the results indicate the important position of customers and consumers (74%), followed by suppliers and business partners (45%), and the public (38%). According to the results, less relevant stakeholders can be regarded non-profit organizations, including environmental groups (31%), government institutions and bodies (29%), the media (19%), competitors (17%),

educational institutions (19%) and the local community (14%). Among the most important internal stakeholders were employees (57%), while owners and investors (31%) and unions (12%) were specified less often.

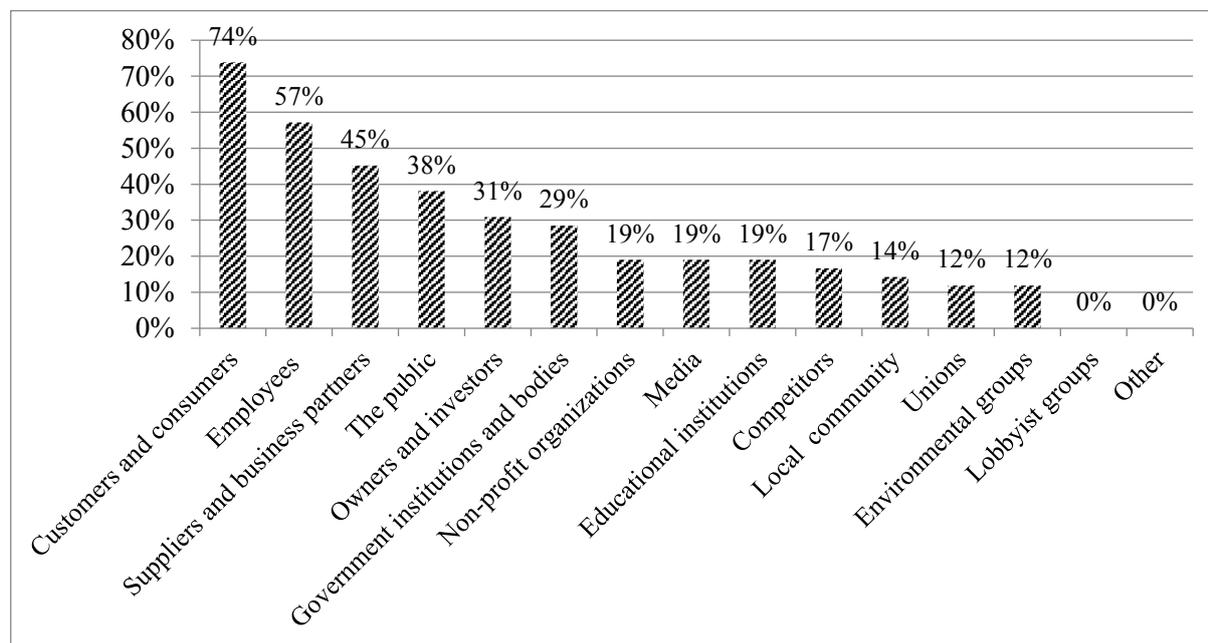


Figure 1: Key stakeholders

Source: Authors, 2017

Social responsibility tools are used by 46% of the companies from the sample, while 54% do not use them, 40% are not considering using CSR tools, and 14% are generally considering using them. Of all of the companies, 17% are in the state of random use of a specific tool for a specific purpose without inclusion in the annual plan. Of all of the companies, 15% use the CSR tools in a planned manner with inclusion in their annual plan, while its impacts are only evaluated by 5%, and the remaining 10% do not evaluate the impact of the tools. Only 14% of companies include the tools in a strategic plan and also evaluate their impact (see Table 1).

Table 1: Stages of preparedness of application of CSR tools

| Use of tools | Stage of use of CSR tools | Relative frequency |
|--------------|---|--------------------|
| No | We are not considering use of social responsibility tools. | 40% |
| No | In the stage of general consideration of use (we are considering the advantages and disadvantages). | 14% |
| Yes | In the stage of random use of a specific tool for a specific purpose without inclusion in the annual plan. | 17% |
| Yes | In the stage of planned use of specific tools included in the annual plan, but without evaluation of the impact. | 10% |
| Yes | In the stage of planned use of specific tools included in the annual plan with evaluation of the impact within the annual plan | 5% |
| Yes | In the stage of including specific tools in a strategic plan and the everyday life of the company with regular evaluation of impact | 14% |

Source: Authors, 2017

In the internal area of the social pillar of the company, in particular adherence to work standards, development of human capital and the safety and health of company employees are applied. They also take into consideration balance of the personal and work life of employees and the creation of equal employment for minority and vulnerable groups of citizens. Communication with the owners and shareholders is used at a lower frequency within the social sector. From external tools, they most often use sponsoring, cooperation with other external stakeholders, volunteering, cooperation with the local community and corporate philanthropy.

In the environmental sector, companies focus most on measures and installation of equipment for energy and water conservation, recycling of waste from administrative activities, optimization of logistics and the use of vehicles. They also purchase raw materials from local sources, minimize the need for packaging materials and they use recycled raw materials during production. Environmental training and cooperation in environmental activities with external stakeholders are also mentioned. Tools that are used less often include the use of standards (ČSN ISO 14001) and an active approach system for monitoring and management, and a gradual reduction of environmental impacts (EMAS). Renewable energy and waste management from main production in terms of recycling are also used less often. At farm enterprises, a number of activities stem from the very nature of agricultural activity, its relation to the environment, and in particular to land. In the environmental sector, businesses are particularly concerned with maintaining soil fertility, utilizing technologies to treat soil that improve carbon absorption and maintaining crop diversity and implementation of welfare in animal breeding.

In the economic pillar, companies primarily focus on maintaining relationships with customers, fair supplier-customer relationships, use of the principles of good management, implementation of the code of business conduct, transparency, quality and safety of products and services. Companies also focus on intellectual property protection, good investor relations and marketing ethics.

Of the companies that apply CSR, 53% do not evaluate it, 31% carry out self-assessment and 16% use external evaluation. The particular methods used for self-assessment and evaluations of external evaluators are measurements based on knowledge gained from questionnaires from stakeholders, OHSAS 18001, measurements on the basis of analyzing the content of annual reports, indexes evaluating corporate reputation, ČSN ISO, EMAS, checking of fulfilment of an own plan in strategic documents and own non-standardized evaluation methods. Respondents cite the use of environmental certificates “Environmentally Friendly Product” and “Green Point”. Mentioning the Green Point as an environmental certificate indicates erroneous understanding of the purpose of the label. Green Point is a trademark, which means that a fee was paid for the labelled container by organization EKO-KOM (EKO-KOM, 2016). Three quarters of companies do not use any environmental labelling certificates.

In terms of evaluation of views on CSR (see Figure 2), 52% of companies deem use of the tools as beneficial, 44% were not able to evaluate it, and 4% rather disagreed with the fact that the use of CSR tools would be beneficial for the company.

Respondents saw a major contribution in the field of building the brand (company) credibility, creation of quality relationships with key stakeholders, responsibility to future generations and the Earth. In terms of Green Marketing (see Fig 2), 56% of respondents see its use a beneficial for the company, 36% were not able to evaluate it, and 8% rather disagreed with the fact that the use of marketing product tools would be beneficial for the company. Respondents saw the main areas of contribution in building the brand image,

responsibility to future generations and the Earth, and for the own conscience of the manager (owner).

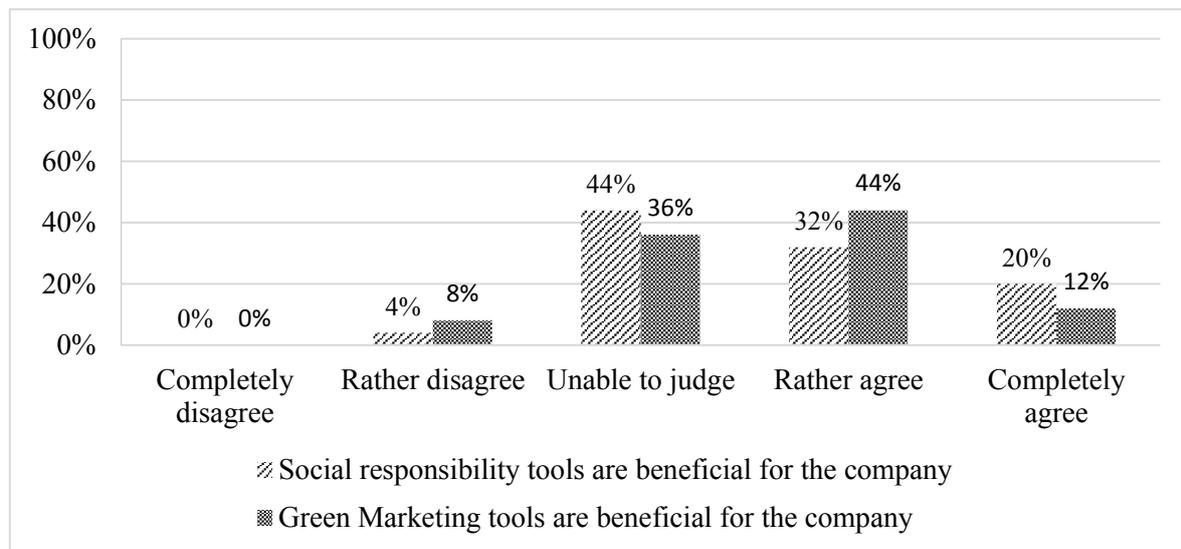


Figure 2: Opinion about social responsibility tools and Green Marketing
Source: Authors, 2017

4. Discussion and Conclusions

When identifying external key stakeholders, the results show the important position of customers, consumers, business partners, the public and suppliers. These results correspond to similar findings published in the work of Zonnenshain (2012), thereby confirming the significant position of so-called stakeholders with a direct link to a company. The most important internal stakeholders are employees. The importance of employees as key stakeholders is mentioned, for example, in the work of Perrini et al. (2007).

Social responsibility tools are used by almost half of the companies in the sample (see Table 1). Of the companies that do not use CSR, only a small part of them are at the stage of general consideration of use. Of the companies, 17% are in the random use stage without including it in the annual plan, which corresponds to claim of Broomhill (2007), which states that CSR is not always understood by management as a complex tool that must be applied over the long term. The CSR concept accepted by the management of companies as a daily part of corporate philosophy as it is understood (Kurucz et al. in Carroll, 2010) is used by only a small part of companies (14%) that include the tools in their strategic plans and also evaluate their impact. A possible reason for the relatively low application of CSR may be the opinion that the application of CSR is financially demanding, and that it simultaneously leads the management of the company away from the main mission of generating profits. Similar views are held by Jenkins (2005) and Doane (2005).

More than half of the companies (Fig. 2) that apply CSR consider its use beneficial, primarily in terms of strengthening the good reputation of the company (brand). Kurucz et al. in Carroll (2010) has a similar opinion. Building quality relationships with key stakeholders is also stated. Many authors, e.g. Freemann (1984), Carrol (1979), point out the significance of good relationships. Other social responsibility benefits include a responsible approach to future generations and the Earth, which may indicate an effort to exercise certain principles of sustainable development. Although 56% of companies see the use of

GM as beneficial, only a small part declares the use of tools for its evaluation (use of environmental audit, labelling of products with ecolabels and bio labels). Ownership of certificates is a prerequisite for successful communication of green products to consumers. It is also necessary to explain to consumers the higher utility value of green products, which is not always successful (Ottman, 2006).

The research found that the concept of social responsibility is used by less than half of the surveyed companies across sectors. Of the companies that apply CSR, most of them are in the stage of random use of a specific tool for a specific purpose without inclusion in the annual plan. The key stakeholders are considered employees, consumers, business partners and, last but not least, the general public. The tools that respondents most often mentioned in individual areas are relationships with customers in the economic sector, and in the social sector, compliance with labor standards for internal stakeholders and sponsoring for external stakeholders. In the environmental sector, companies most often focus on measures and installation of equipment for energy and water conservation, waste recycling from administrative activities, optimization of logistics and the use of vehicles. In terms of evaluation of social responsibility, the majority of companies that use CSR stated that they do not carry out any evaluations.

This result corresponds to the first stage of readiness of a company to use CSR, wherein most companies reported that they tend to use the tools randomly. If an evaluation takes place, then usually it is done through self-assessment. The fact that evaluation by a third party was not used is related to the low incidence of companies awarded with eco-labelling certificates. Although most of the respondents marked CSR (including product marketing tools) as beneficial, the wider application of CSR as comprehensive tools, i.e. when applying the principle of Triple Bottom Line (TBL), is still quite limited within Czech companies. In order to better understand this complex issue, it will be necessary to carry out more detailed research focused not on CSR as a whole, but rather on the individual parts of the TBL.

Acknowledgements

This paper is a follow-up to the project of the Czech University of Life Sciences Prague, University – Internal Grant Agency (IGA), number 20161009 – Significance of social responsibility and green marketing tools and their influence on consumer behavior.

References

- AMERICAN MARKETING ASSOCIATION. 2013. AMA Dictionary. [Online]. Available at: http://www.marketingpower.com/_layouts/Dictionary.aspx?dLetter=G [Accessed: 5 June 2017].
- BOWEN, H. 2013. *Social Responsibilities of the Businessman*. Chicago: University Of Iowa Press.
- BROOMHILL, R. 2007. Corporate social responsibility: Key Issues and Debates. *Dunstan Papers*, 2007 (1), 5–59.
- CARROLL, A. B. 1979. A Three-Dimensional Conceptual Model of Corporate Performance, *Academy of Management Review*, 4(4), 497–505.

- CARROLL, A. B. and BEILER, G. W. 1975. Landmarks in the Evolution of the Social Audit, *Academy of Management Journal*, 18(3), 589–599.
- CARROLL, A. B., ANDREW, C., et. al. 2008. *A history of corporate social responsibility: concepts and practices*. Oxford: Oxford University Press. 19–46.
- DOANE, D. 2005. The Myth of CSR. *Stanford Social Innovation Review*, 3(3), 21–29. [Online]. Available at: https://ssir.org/pdf/2005FA_Feature_Doane.pdf [Accessed: 12 January 2017].
- EKO KOM. 2016. Klienti: Časté dotazy (FAQ). [Online]. Available at: <http://www.ekokom.cz/cz/klienti/uzitecne-informace-pro-klienty/caste-dotazy-faq-klienti> [Accessed: 6 June 2017].
- ELKINGTON, J. 1994. Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development. *California Management Review*, 36(2), 90–100. DOI: <http://dx.doi.org/10.2307/41165746>.
- EUROPEAN COMMISSION. 2013. Flash Eurobarometer 367: Attitudes of Europeans towards building the single market for green products, 7–93. [Online]. Available at: http://ec.europa.eu/public_opinion/flash/fl_367_en.pdf [Accessed: 8 January 2017].
- E EUROPEAN COMMUNITIES. 2006. *European business – Facts and figures*. Luxembourg: Office for Official Publications of the European Communities.
- FREEMAN, R. E. and MOUTCHNIK, A. 2013. Stakeholder management and CSR: question and answers. *Umwelt Wirtschafts Forum*, 21(1), 5–9. DOI: <http://dx.doi.org/10.1007/s00550-013-0266-3>
- FREEMAN, R. E. 1984. *Strategic Management: A stakeholder approach*. Boston: Pitman.
- GFK. 2011. *The Environment: Public Attitudes and Individual Behavior – A Twenty Year Evolution*. [Online]. Available at: http://www.climateaccess.org/sites/default/files/SCJ_GfK_The_Environment_Public_Attitudes_and_Individual_Behavior.pdf [Accessed: 8 June 2017].
- GRANT, J. 2010. *The Green Marketing Manifesto*. 4th ed., Chichester (UK): John Wiley & Sons Ltd.
- HENION, K. E. and KINNEAR, T. C. 1976. *Ecological Marketing*. Chicago: American Marketing Association.
- CHANDRASEKARAN, D. and TELLIS, G. J. 2008. Global Takeoff of new products: Culture Wealth or Vanishing Differences. *Marketing Science*, 27(5), 844–860. DOI: <http://dx.doi.org/10.1287/mksc.1070.0329>.
- CHEN, Y. S. 2011. Green organizational identity: sources and consequence. *Management Decision*, 49(3), 384–404. DOI: <http://dx.doi.org/10.1108/00251741111120761>
- INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT. 1996. *Global green standards: ISO 14000 and sustainable development*. Winnipeg: International Institute for Sustainable Development. [Online]. Available at: <https://www.iisd.org/pdf/globalgrn.pdf> [Accessed: 12 January 2017].
- JENKINS, R. 2005. Globalization, Corporate Social Responsibility and poverty. *International Affairs*, 81(3), 525–540. DOI: <http://dx.doi.org/10.1111/j.1468-2346.2005.00467.x>.

- KONEČNÁ, M. 2014. Udržitelný rozvoj zemědělství – role zemědělce. In AUSPICIA. Recenzovaný vědecký časopis pro oblast společenských a humanitních věd, 2014(1), 114–130.
- KURUCZ, E., COLBERT, B. and WHEELER, D. 2008. The business case for corporate social responsibility. In CARROLL, A. B. and SHABANA, K. M. 2010. The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice. *International Journal of Management Reviews*, 12(1), 85–105. DOI: <http://dx.doi.org/10.1111/j.1468-2370.2009.00275.x>
- LEONIDOU, C. N. and SKARMEAS, D. 2015. Gray Shades of Green: Causes and Consequences of Green Skepticism. *Journal of Business Ethics*, 1–5. DOI: <http://dx.doi.org/10.1007/s10551-015-2829-4>
- MAKOWER, J. 2009. Strategies for the green economy: Opportunities and challenges in the new world of business. In Chen, Y. S. and Chang, Ch. H. 2013. The Determinants of Green Product Development Performance: Green Dynamic Capabilities, Green Transformational Leadership, and Green Creativity. *Journal of Business Ethic*, 116(1), 107–119. DOI: <http://dx.doi.org/10.1007/s10551-012-1452-x>
- MITCHELL, G. J. 1991. *World on Fire: Saving an Endangered Earth*. New York: Charles Scribner's Sons.
- OTTMAN, J., STAFFORD, R. E. and HARTMAN, C. L. 2006. Avoiding Green Marketing Myopia: Ways to Improve Consumer Appeal for Environmentally Preferable Products. *Environment Science and Policy for Sustainable Development*, 48(5), 22–36. DOI: <http://dx.doi.org/10.3200/ENVT.48.5.22-36>
- PERRINI, F. and RUSSO, A. 2007. CSR Strategies of SMEs and Large Firms. Evidence from Italy. *Journal of Business Ethics*, 74(3), 285–300. DOI: <http://dx.doi.org/10.1007/s10551-006-9235-x>
- POLONSKY, M. J. 1994. An Introduction to Green Marketing. *Electronic Green Journal*, 1(2), 1–10.
- TARN, J. N. 1973. *Five Per Cent Philanthropy: An Account of Housing in Urban Areas Between 1840 and 1914*. Cambridge: Cambridge University Press.
- TENCATI, A., PERRINI, F. and POGUTZ, S. 2004. New Tools to Foster Corporate Socially Responsible Behavior. *Journal of Business Ethics*, 53(1–2), 173–190.
- TURNER, G. 2008. *A Comparison of the Limit to Growth with Thirty Years of Reality*. Canberra: CSIRO Sustainable Ecosystem.
- UNITED NATIONS. 2013. *United Nations Global Compact – The Ten Principles*. [Online]. Available at: <https://www.unglobalcompact.org/what-is-gc/mission/principles> [Accessed: 12 January 2017].
- ZONNENSHAIN, A. and SHEPS, I. 2012. Koncept udržitelnosti – výzva pro systémové inženýrství. *Perspektivy kvality*, 2012(1), 8–15.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Adequacy of the financial stability indicators in the European Union countries

Radosław Ciukaj¹ and Krzysztof Kil²

¹Department of Banking, Faculty of Finance and Law, Cracow University of Economics, Rakowicka 27, 31-510 Cracow, Poland, e-mail: ciukajr@uek.krakow.pl

²Department of Banking, Faculty of Finance and Law, Cracow University of Economics, Rakowicka 27, 31-510 Cracow, Poland, e-mail: krzysztof.kil@uek.krakow.pl

Abstract

The financial system is a link that allows purchasing power to flow in the real economy. Furthermore, the banking system and its stability are an important element of the financial system, as well as a factor conditioning the preservation of financial stability. In contrast to price stability, financial stability is not easy to define or measure, taking into account the existing interdependencies between various elements of the financial and banking systems and between elements of the financial system and elements of the real economy. However, over the past two decades, researchers, people from central banks and other supervisory institutions have tried to measure and capture the conditions for financial stability using various measures of financial system stability. This paper sheds light on meaning of selected financial stability indicator, their methodology and information content. Detailed analysis of selected, existing measures and their tendencies tend to seek answers to questions regarding their effectiveness and adequacy in relation to the changing environment conditions and various factors affecting financial stability.

Keywords: financial stability, stability indicators, financial crisis

JEL Code: G01, G17

1. Introduction

In the post-crisis period financial stability became the basic value for the financial system. It is even more important factor of the financial system than the growth potential and innovation, which is commonly exhibited not only in legal regulations (Czerwińska, 2015). The practice of bearing the costs of possible financial institution bankruptcy mainly by taxpayers, and not by its owners, makes the stability of financial system, and in particular stability of banking system, to be considered in terms of the public weal. This highlighted

the need to implement and enforce mechanisms and tools, that will forewarn about deteriorating situation of financial institution, which could lead to bankruptcy. Proper measurement of financial stability enables undertaking preventive actions, which could allow to reduce the consequences both for the government (granting the public aid) and for the economy in the event of bankruptcy of banks (Gradoń, 2014).

The purpose of this article is to assess the prognostic utility of selected financial stability indicators in the pre and post-crisis period. The analysis was carried out on total capital ratio (TCR), Tier 1 ratio, Z-score ratio and Bankometer ratio for banks operating in the European Union between 2005 and 2016. On the basis of statistical analyzes for banks, that were granted public aid in the years 2008–2014, the authors presented recommendations regarding the possibilities of using presented measures as predictors of financial instability.

2. Methodology and Data

In order to analyze the suitability of selected measures for predicting financial instability, the authors collected panel data regarding banks operating in the European Union (EU-28) countries in the years 2004–2016 from the Bankscope / Orbis database. In particular, data on the value of the total capital ratio (TCR), the Tier 1 ratio and the leverage ratio were obtained. The authors also calculated the values of the Z-Score indicator in two versions – with a fixed denominator (for the entire period 2004–2016) and in three-year “window” standard deviation (the beginning of the “window” is in the n-2 period, the end of the window in n period)⁴. The S-Score (Bankometer) was also calculated for the entire period.

A total of 8,322 entities were included in the analysis in relation to which data in the Bankscope/Orbis database were available. Due to gaps in data in certain periods, the final number of analyzed banks was slightly smaller. Based on a publications (Iwanicz Drozdowska, 2016) and (Iwanicz – Drozdowska, 2015), from all banks operating in the EU, the authors chose those banks which benefited from public aid in any period between 2004–2016. Taking into account the availability of data in the Bankscope/ Orbis database, 73 banks with short-term or permanent instability were finally identified during the period considered – (group A). Each bank was assigned a period of using public aid (instability period – NS period) and the period preceding instability (meaning the years NS-1, NS-2 and NS-3 respectively). Other banks, that did not receive public aid and were not liquidated as a result of bankruptcy, were classified as group B.

Additionally, the development of the mentioned above financial stability measures in the N-1 period, in N-2 period and in N-3 period for the banks covered by public aid and by public-private support was analyzed and compared to other banks operating in the European Union in particular years.

3. Problems in defining and measuring financial stability

There is no consensus in the literature on the definition of financial stability. Conceptual differentiation refers primarily to whether the definition describes the financial stability

⁴ Due to such construction of the index, the first calculation concerns 2006 and takes into account the ROA standard deviation for the years 2004–2006.

of a specific financial institution (microeconomic approach), financial market (in particular the banking sector) or the entire financial system (Rogowski, Mesjasz, 2012). The term financial stability appears in the literature generally in the macroeconomic context and in this approach is identified with the stability of the financial system as a whole. W. A. Allen and G. Wood presented six criteria (characteristics) that should be covered by the proper definition of financial stability. It should be measurable, controllable, contain reference to prosperity and be subject to the influence by public authorities. Caring for financial stability should be entrusted to an institution of significant importance with a clear definition of its responsibilities, that will contribute to the achievement of goals. The definition should also take into account the fact that also non-financial enterprises and governments can be a significant threat to financial stability. On the other hand, the definition should not be too restrictive (Allen, Wood, 2006).

Macroeconomic definitions of financial stability include two approaches:

- positive – those definitions indicate conditions that must be met by financial system to be considered stable;
- negative – those definitions describe financial instability and defining financial stability as lack of it (Dobrzańska, 2016).

The first approach is represented by T. Padoa-Schioppa, who defines financial stability as condition when financial system is able to continuously perform its main functions, in particular transformation of savings into investments and ensuring an efficient and safe operation of the payment system (Padoa-Schioppa, 2002). This perspective is also expressed by Father Issing. According to his point of view, financial stability is a state, when financial system is able to provide, in a permanent way and without significant distortions, an effective transformation of savings into investments (Issing, 2003).

In the negative approach, the key issue is defining financial instability as the opposite side of stability. Chant characterizes financial instability as a condition when disturbances in the financial system negatively affect the functioning of the economy (Chant, 2003). According to R.W. Fergusson, the symptom of financial instability could be seen in price deviation of a significant group of financial assets from their fundamentals (Fergusson, 2003).

M. Iwanicz-Drozdowska links the macro- and microeconomic approach to financial stability and indicates, that the stability of the financial sector consists of stability of individual institutions (Iwanicz-Drozdowska, 2002). Stability of individual banks, sectors and financial markets, covered by the new systemic approach, depend on stability of all elements in the set, which are involved in one common mechanism, called financial system stability (Nadolska, 2017).

The concept of financial stability in microeconomic context may refer to the stable financial situation of a single entity (eg a bank). The literature describes stable entity when it is: solvent (transferable assets > transferable liabilities), liquid (liquid assets > current liabilities) and profitable (revenues > costs) (Karaś, 2017).

M. Gorczyńska, emphasizing the fact of the few financial stability definitions in microeconomic context, indicates that, a definition of financial stability of any entity, which conducts business activity, can be created by redefining the macroeconomic aspects of financial stability, and by exposing those institutions' features, that provides proof of stability (Gorczyńska, 2013). This means that an entity with financial stability is characterized by the fact that: it operates in accordance with its purpose despite disruptions, it is able to withstand shocks (by maintaining liquidity, solvency and profitability at an acceptable level) and stays on the path of development. Stability is thus the condition of the entity, which provides it with the possibility to implement actions, that allow it to achieve

its objectives (Gorczyńska, Błach, Wieczorek-Kosmala, Doś, 2016). Thus, financial stability allows the bank to fully implement its economic functions related to raising capital and making its proper allocation.

In relation to particular banks, the lack of microeconomic stability is usually explained as lack of the entity's ability to cover losses and the risk from equity capital (Rogowski, Mesjasz, 2012). **For the purposes of this article, it is assumed that, the financial instability is situation, when a bank is forced to use public aid to maintain its ability to continue operations.**

The banking system is a part of the financial system, which consist of logically related organizational forms, legal acts, financial institutions and other elements, that allow entities to establish financial relationships (Owsiak, 2002). The precondition of maintaining the financial system stability is stability of the banking sector. Banks are the most important entities for the modern financial system. What is more, services provided by them are crucial for the entire financial system and economy (Alińska, 2012). As banks play a key role in financing the economy, particular importance is given to them to ensure the stability of the whole financial system. Also noteworthy is the fact, that in many European countries their size is measured by the quotient of owned assets to GDP and it exceeds 100% (Alińska, 2012).

Financial stability of banks, as an unobservable variable, is difficult to assess unequivocally. The main problem with assessment is the multiplicity of measures and difficulty in selecting the most important one (significance should be understood as the accuracy in predicting the instability in advance) (Smaga, 2014). A crucial difficulty may also be setting threshold values, which determine whether a banking system or a specific bank is unstable.

Despite financial indicators' intrinsic information on the health of a financial system, they have not as yet been extensively analyzed empirically. Recent efforts to improve them have mainly focused on strengthening compilation practices and data quality. A significant part of the literature on aggregated financial stability indicators examining the the endogenous relationship between macroeconomic variables and indicators of financial stability. This study belongs to the later category: Caprio and Klingebiel (1996), Gonzalez-Hermasillo, Pazarbasioglu and Billings (1997), Demirguc-Kunt and Detragiache (1998), Kaminsky (1999) focus on the role of macroeconomic variables in explaining specific episodes of banking crises. More recently, Cihak and Schaek (2005) incorporate Financial Stability Indicators (FSIs) in a early warning model of banking crises to asses what, if any, role FSIs play in predicting banking crises. They conclude that, FSIs have limited use as early warning indicators.

A separate stream of studies derives from the stress testing approach. Stress testing is usually a country – specific and aimed at calibrating potential financial system risks from macroeconomic shocks. Notable studies in this area include studies made by Hoggarth, Logan and Zicchino (2003), Lehmann and Manz (2006) and Arpa, Giulini, Ittner and Pauer (2005).

When we take a look into literature, the capital adequacy and solvency ratios are considered as the most important indicators of the bank's financial stability assessment in microeconomic context (Capiga, 2008). Capital adequacy ratios are perceived by banking supervision, business environment, clients and bank creditors as a synthetic tool for assessing stability of entity (Kopiński, 2008). The basic measures of capital adequacy, in accordance with the CRD IV / CRR package, are core capital ratio, Tier 1 capital ratio and total capital ratio.

The authors of studies on the financial stability of banks use various types of credit risk indicators. For this purpose the NPL indicator is most commonly used one (Haq, Haeney, 2012). An increase in its value means an increasing credit risk of the bank. The second group of credit risk measures are indicators, which evaluate distance from bankruptcy. In this case, the Z-score index is most commonly used one (Roy, 1952). It is an inverted measure of the bank's probability of insolvency and points to the so-called bank's distance from bankruptcy, which may be caused by the lack of profits stability and lack of risk coverage in equity (Barry, Lepetit, Tarazi, 2011).

According to the IMF recommendations in the area of assessing financial stability, multi-index indices can be indicated as a measure of financial stability based on risk analysis. S-score (Bankometer) is a measure which has quality of minimum number of parameters with maximum accurate results. It uses Capital Adequacy Ratio (CAR), Capital to Assets Ratio (CA), Equity to total Assets (EA), NPLs to Loans (NPL), Cost to Income ratio (CI), Loans to Assets ratio (LA) to predict the financial problems of banks. The form of the equation is as follows:

$$S = 1.5 \cdot CA + 1.2 \cdot EA + 3.5 \cdot CAR + 0.6 \cdot NPL + 0.3 \cdot CI + 0.4 \cdot LA$$

All banks having 'S' value greater than 70 are solvent and termed as super sound banks, while those banks having 'S' value below 50 are not solvent. The area between 50 and 70 is defined as gray area because of the susceptibility to error classification (Altman, 1968).

Important tool for assessing the stability of banks at the micro level are also stress tests conducted in recent years. The literature distinguishes two levels of stress test: microeconomic level stress tests are carried on the portfolio of individual institutions and macroeconomic level uses aggregated data at the entire system level (Solarz, 2010).

Real annual growth rate of non-financial sector deposits can be used as an example of indicator to analyze the bank's financial stability from the depositors' perspective. This measure is generally used to assess the depository discipline. What is more, it is an important source of information on the perception of bank stability by the stakeholder groups.

Regardless of the choice of a given measure to assess financial stability, it is necessary to ensure its comparability both geographically and historically. The monitoring of indicators should cover not only the scale of its changes, but also their direction and variance. The literature indicates also the need to conduct qualitative research, in parallel to quantitative analyzes, including impact of regulation on the financial system and financial stability (Dobrzańska, Kosycarz, Pietrzak, 2016).

4. Results

In all cases, the TCR indicator, three years before granting public aid to banks, that benefited from it, exceeded level required by the capital requirements for the banking sector, i.e. 8% (table 1). The TCR value lower than 8% two years before obtaining financial support, was achieved only one bank – Bank of Cyprus Public Company Limited – Bank of Cyprus Group (7.8% in 2011). The situation was the same one year before the public aid was granted – also the Bank of Cyprus Public Company Limited – Bank of Cyprus Group did not meet the capital standards set by Basel II standards (its TCR equaled 0.9% in 2012).

Table 1: Average values of TCR index divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | 12.96 | 12.60 | 11.42 | 11.13 | 13.07 | 13.49 | 14.49 | 13.64 | 13.94 | 17.40 | 17.95 | 19.95 | 20.71 | 14.90 |
| NS-3 | 13.10 | 11.62 | 11.54 | 13.64 | 11.16 | 13.12 | 12.25 | | | | | | | 11.85 |
| NS-2 | | | 11.26 | 11.06 | 12.86 | 11.06 | 11.65 | 11.50 | | | | | | 11.31 |
| NS-1 | | | | 10.79 | 9.66 | 13.85 | 10.22 | 12.47 | 8.28 | | | | | 10.38 |
| B | 22.29 | 18.28 | 18.76 | 17.58 | 16.75 | 17.08 | 18.52 | 18.75 | 18.84 | 20.22 | 21.13 | 22.02 | 21.56 | 19.42 |
| Total A+B | 21.87 | 18.09 | 18.52 | 17.43 | 16.68 | 17.01 | 18.45 | 18.67 | 18.77 | 20.18 | 21.09 | 21.99 | 21.55 | 19.34 |

Source: Own calculations based on Bankscope/Orbis.

In accordance with the current regulations, resulting from the Basel III⁵ guidelines, implemented to European legislation by means of the CRD IV / CRR (Regulation (EU) No 575/2013) package, it should be stated, that only ca. 28% of the analyzed banks in NS-1 and 40% of banks in NS-2 would meet capital requirements, taking into account the maintenance of the capital conservation buffer⁶. This means, that the currently applicable capital requirements would significantly facilitate the anticipation of a negative financial stability assessment in the future. The standards set with Basel II should be considered insufficient.

Also considering Tier 1 in the perspective of regulatory requirements before the implementation of Basel III provisions, it should be clearly stated that it was not an effective tool for forecasting financial instability. The values of the Tier 1 ratio, in the years preceding financial instability, were lower than the average for the B group banks. However, they met the minimum standards in almost all the analyzed banks of the B group (table 2). As in the case of TCR, also for Tier 1 ratio, the reference of the current capital requirements resulting from the CRDIV / CRR package to historical data would limit the number of banks, that meet the standards only to 30% for NS-3 and NS-2 and 23% for NS-1.

Table 2: The average values of the Tier 1 ratio divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | 9.85 | 8.45 | 8.34 | 8.00 | 10.30 | 10.81 | 10.91 | 11.10 | 11.05 | 15.71 | 16.53 | 18.48 | 19.09 | 12.19 |
| NS-3 | 8.00 | 7.81 | 8.95 | 8.46 | 7.56 | 9.15 | 10.35 | | | | | | | 8.61 |
| NS-2 | | | 8.04 | 8.81 | 8.58 | 7.57 | 8.53 | 9.38 | | | | | | 8.46 |
| NS-1 | | | | 7.64 | 7.29 | 9.37 | 6.91 | 9.59 | 5.77 | | | | | 7.54 |
| B | 20.02 | 16.24 | 17.13 | 16.77 | 14.87 | 15.25 | 16.27 | 15.71 | 15.47 | 16.63 | 18.22 | 18.98 | 18.63 | 16.99 |
| Total A+B | 19.40 | 15.97 | 16.82 | 16.46 | 14.72 | 15.11 | 16.13 | 15.60 | 15.40 | 16.61 | 18.20 | 18.97 | 18.64 | 16.89 |

Source: Own calculations based on Bankscope/Orbis.

Significant differences in the value of the leverage ratio in group A and group B are also noticeable. On average, in group A, the value of this indicator was more than 50% lower than in group B (table 3). However, it should be noted that, given the currently implemented regulations (minimum value of the leverage ratio of 3%), only 3 banks would

⁵ The scope of the proposed solutions and the implementation schedule has been posted on the pages of the Basel Committee on Banking Supervision, <http://www.bis.org/publ/bcbs179.pdf>, p.16

⁶ Since 2019 at the level of 2.5%. In addition, a number of countries have introduced a countercyclical buffer, a systemic risk buffer or a buffer of another systemically important institution.

not meet this requirement for a year before receiving public aid and one in the NS-2 period. In the NS-2 period, all banks had a leverage ratio higher than 3%.

Table 3: Average values of the leverage ratio divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | 6.55 | 7.27 | 6.20 | 5.86 | 5.51 | 5.99 | 5.11 | 4.82 | 4.27 | 6.22 | 6.79 | 9.61 | 10.15 | 6.38 |
| NS-3 | 4.60 | 4.93 | 7.56 | 9.03 | 6.87 | 7.60 | 7.85 | | | | | | | 6.36 |
| NS-2 | | | 4.71 | 6.94 | 6.71 | 6.53 | 6.39 | 7.75 | | | | | | 5.86 |
| NS-1 | | | | 4.29 | 5.66 | 4.76 | 5.81 | 6.44 | 4.86 | | | | | 4.87 |
| B | 11.62 | 11.97 | 12.24 | 12.40 | 12.27 | 12.74 | 13.15 | 13.94 | 13.94 | 13.80 | 13.62 | 14.47 | 14.35 | 13.14 |
| Total A+B | 11.56 | 11.92 | 12.18 | 12.33 | 12.19 | 12.66 | 13.06 | 13.83 | 13.83 | 13.71 | 13.54 | 14.42 | 14.30 | 13.06 |

Source: Own calculations based on Bankscope/Orbis.

Interesting results relate to the value of the NPL index in the periods preceding financial instability of the analyzed banks. In the years 2005–2009, there is a situation, when banks from group A in all three periods, i.e. NS-3; NS-2 and NS-1 are characterized by a lower share of impaired loans in the total credit exposure than banks from group B (table 4). This means, that measures based on credit risk approach did not effectively indicate banks threatened with instability in the pre-crisis period and in the first phase of the financial crisis. Different conclusions can be drawn from the second phase of the crisis, i.e. 2010–2012. During this period, the NPL values for the banks from group A were significantly higher than for banks from group B. This difference is undoubtedly due to different reasons for the instability of banks in these two periods – the materialization of market and systemic risk in the first period and the effects of the second round and the transfer of the crisis to the real sphere in the second period. Significant discrepancies in the predictive capabilities of the NPL indicator make it impossible to recognize this measure as an appropriate tool to predict financial instability.

Table 4: Average values of the NPL index divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | 5.43 | 3.45 | 3.10 | 2.67 | 4.13 | 6.36 | 8.59 | 10.93 | 12.79 | 15.36 | 18.07 | 16.77 | 13.99 | 9.86 |
| NS-3 | 8.84 | 1.94 | 4.42 | 1.19 | 3.53 | 5.81 | 12.17 | | | | | | | 4.60 |
| NS-2 | | | 1.95 | 3.45 | 2.72 | 7.09 | 9.98 | 15.43 | | | | | | 4.85 |
| NS-1 | | | | 1.57 | 4.33 | 6.59 | 11.07 | 13.99 | 26.83 | | | | | 6.30 |
| B | 5.17 | 4.13 | 5.26 | 4.95 | 5.58 | 7.26 | 7.83 | 8.42 | 7.77 | 7.87 | 8.07 | 8.08 | 7.14 | 7.35 |
| Total A+B | 5.19 | 4.09 | 5.17 | 4.87 | 5.53 | 7.23 | 7.86 | 8.48 | 7.86 | 7.99 | 8.22 | 8.20 | 7.23 | 7.40 |

Source: Own calculations based on Bankscope/Orbis.

The forecasting of significant financial problems of banks using the Bankometer index should also be considered ineffective. In the analyzed period, all banks should be considered stable (table 5).

Table 5: The average values of the Bankometer index divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | 130.4 | 120.7 | 119.5 | 120.3 | 122.2 | 125.5 | 130.9 | 130.0 | 133.1 | 162.4 | 151.8 | 152.0 | 153.0 | 133.5 |
| NS-3 | 158.6 | 118.9 | 124.8 | 133.6 | 134.3 | 135.3 | 125.5 | | | | | | | 125.0 |
| NS-2 | | | 117.1 | 123.7 | 131.2 | 132.2 | 135.0 | 127.1 | | | | | | 122.9 |
| NS-1 | | | | 114.8 | 114.9 | 134.7 | 130.0 | 141.3 | 109.5 | | | | | 118.0 |
| B | 129.2 | 128.3 | 129.6 | 128.8 | 136.5 | 146.0 | 147.2 | 141.2 | 138.1 | 155.3 | 155.7 | 158.2 | 155.7 | 145.6 |
| Total A+B | 129.4 | 127.5 | 128.5 | 127.9 | 135.2 | 144.4 | 145.8 | 140.7 | 138.0 | 155.6 | 155.6 | 158.0 | 155.6 | 145.0 |

Source: Own calculations based on Bankscope/Orbis.

The Z-score indicator, estimated in accordance with the methodology presented in part two, should be considered as the most reliable predictor of financial instability among the analyzed indicators. Using the index calculated with a fixed denominator (standard deviation for the years 2004–2016), in the NS-3 period, the value of the Z-score for over 70% of banks was classified to the first quartile (25% of the worst assessments), including over 30% to the first decile (10% of the worst results). In the NS-2 period, almost 80% of Z-scores were included in the first quartile, and only one bank had the Z-score in the third decile. A year before the financial instability, all banks from group A had a Z-score with a value much lower than the median of results. What is more, most of the banks had a Z-score assigned to the first decile. In all the analyzed years, the average value of the index for banks from group B was several times higher than for banks from group A (table 6).

Table 6: Average values of the Z-score index (constant denominator) divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | 17.74 | 18.59 | 13.91 | 9.38 | 6.59 | 7.40 | 7.25 | 6.48 | 7.43 | 9.56 | 10.62 | 14.83 | 15.93 | 10.77 |
| NS-3 | 9.71 | 20.64 | 9.69 | 5.04 | 1.83 | 3.75 | 3.52 | | | | | | | 13.15 |
| NS-2 | | | 18.66 | 9.85 | 4.48 | 1.61 | 2.87 | 2.94 | | | | | | 12.41 |
| NS-1 | | | | 9.72 | 7.30 | 2.57 | 1.30 | 2.71 | 1.10 | | | | | 7.29 |
| B | 110.95 | 102.96 | 86.63 | 52.46 | 66.33 | 65.55 | 70.54 | 76.86 | 81.41 | 82.50 | 85.07 | 99.37 | 93.56 | 81.56 |
| Total A+B | 109.98 | 102.04 | 85.84 | 51.98 | 65.63 | 64.86 | 69.77 | 76.03 | 80.56 | 81.64 | 84.23 | 98.45 | 92.69 | 80.76 |

Source: Own calculations based on Bankscope/Orbis.

Due to the partially retrospective nature of the Z-score index, calculated with a fixed denominator, the indicator calculated using three-year standard deviation “window” should be considered more reliable. However, the use of such a calculation methodology gives very similar results to the results presented with the Z-score indicator, based on a constant denominator (table 7).

Table 7: Average values of the Z-score index (standard deviation in three-year windows) divided into the analyzed groups of EU banks in the years 2004–2016

| Group | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total 2004– 2016 |
|--------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| A | X | X | 119.1 | 98.0 | 33.5 | 25.5 | 50.8 | 30.0 | 20.8 | 55.9 | 41.1 | 61.5 | 71.9 | 53.9 |
| NS-3 | X | X | 104.8 | 39.2 | 112.8 | 70.2 | 33.8 | X | X | X | X | X | X | 83.3 |
| NS-2 | X | X | 118.5 | 84.8 | 40.2 | 51.6 | 89.6 | 13.9 | X | X | X | X | X | 88.7 |
| NS-1 | X | X | X | 95.7 | 45.2 | 37.2 | 20.8 | 38.0 | 3.1 | X | X | X | X | 62.5 |
| B | X | X | 373.4 | 179.7 | 226.3 | 203.1 | 246.2 | 326.4 | 367.2 | 385.0 | 424.7 | 464.0 | 434.8 | 328.4 |
| Total A+B | X | X | 370.6 | 178.8 | 224.1 | 200.9 | 243.8 | 322.9 | 363.1 | 381.1 | 420.3 | 459.6 | 430.7 | 325.2 |

Source: Own calculations based on Bankscope/Orbis.

5. Discussion and Conclusions

The conducted research showed, that the most frequently applied financial stability indicators in 2004–2016 were not an effective tool for predicting the financial instability of banks, understood as the need to use public or public-private financial support. In particular, the regulatory norms for capital adequacy in terms of Basel II (solvency ratio, Tier 1 ratio) have been proved ineffective. Due to the small relationship between the financial crisis 2008 and the materialization of credit risk in the European Union countries, the NPL indicator was impractical in predicting financial instability.

The ineffectiveness of the S-Score index (Bankometer) in assessing the future instability of banks was also confirmed. The index values exceeded significantly the minimum level, that proves the stability of banks, even in the NS period, i.e. during direct public aid.

The Z-Score index seems to be the best indicator to differentiate banks, which were threatened by instability and those, that did not have to use external financial support. However, it should be noted that, an index based on a fixed denominator reflects a retrospective approach (includes the standard deviation of the full thirteen-year period).

Low effectiveness of the analyzed indicators and measures in anticipating financial instability raises the need to seek a tool, that will capture the symptoms of instability effectively and prevent them. Considering the results of the research, it is worth considering a relative measure which, aggregates various possible causes of instability and indicate the position of a bank against the peer group.

The results of the conducted research should therefore be an important indication for regulatory institutions in relation to the banking sector, in particular for micro- and macro-prudential supervisors. A negative assessment of the financial instability indicators in the area of capital adequacy indicates, that supervisors should use multi-parameter financial stability indicators, which, in addition to capital adequacy, also include the quality of receivables and operational efficiency.

References

- ALIŃSKA, A. 2012. Sieć bezpieczeństwa finansowego jako element stabilności funkcjonowania sektora bankowego. *Kwartalnik Kolegium Ekonomiczno-Społecznego Studia i Prace* 4(8).

- ALLEN, W.A. and WOOD, G. 2006. Defining and achieving financial stability. *Journal of Financial Stability* 2(2).
- ALTMAN, E.I. 1968. Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *Journal of Finance* 23(4):589–609.
- BARRY, T.A., LEPETIT L. and TARAZI A. 2011. Ownership structure and risk in publicly held and privately owned banks. *Journal of Banking & Finance* 35 (5):1237–1340.
- CAPIGA, M. 2008. Kapitał klienta w systemie zarządzania bankiem a problem bezpieczeństwa. In: *Stabilność i bezpieczeństwo systemu bankowego*. Warszawa: Difin.
- CAPRIO, G. Jr., and KLINGELBIEL, D. 1996. *Bank Insolvencies: Cross-Country Experience*. Policy Research Working Paper 1620. Washington, D.C. World Bank.
- CHANT, J. 2003. Financial stability as a policy goal. In: *Essays on Financial Stability*, Bank of Canada: Technical Report 95. Bank of Canada.
- CRAIG, B. and DINGER, A. 2013. Deposit market competition, wholesale funding, and bank risk. *Journal of Banking and Finance* 37.
- CZERWIŃSKA, T. 2015. Restrukturyzacja i uporządkowana likwidacja – jako nowe instrumenty zarządzania ryzykiem systemowym w sektorze ubezpieczeń. *Problemy Zarządzania* 13(55):220–236.
- DEMIRGUC-KUNT, A., and DETRAGIACHE, E. 1998. *The Determinants of Banking Crises: Evidence from Industrial and Developing Countries*. Policy Research Working Paper 1828. Washington, D.C. World Bank.
- DOBZAŃSKA, A. 2016. *Polityka makroostrożnościowa banku centralnego*. Warszawa: Difin.
- FERGUSSON, J. W. 2003. Should financial stability be an explicit central bank objective. *BIS Working Paper* 18.
- GONZALEZ-HERMOSILLO, B. PAZARBASIOGVLU, C., and BILLINGS, R. 1997. *Determinants of Banking System Fragility: A Case Study of Mexico*. Staff Papers. International Monetary Fund 44: 295–314.
- GORCZYŃSKA, M. 2013. Stabilność finansowa a zrównoważony rozwój przedsiębiorstwa. *Zarządzanie i Finanse* 2.
- GORCZYŃSKA, M., BŁACH, J., WIECZOREK-KOSMAŁA, W., et. al. 2016. Corporate financial stability and change of capital availability as a result of a loss event. *Journal of Economics and Management* 24.
- GRADOŃ, W. 2014. *Metody oceny stabilności systemu bankowego w Polsce*. Studia Ekonomiczne- Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach 186.
- HAQ, M. and HAENEY, R. 2012. Factors determining European bank risk. *Journal of International Financial Markets, Institutions & Money* 22 (4).
- HOGGARTH, G., LOGAN, A. and ZICCHINO, L. 2003. *Macro stress tests of UK banks*. Bank of England. London.
- ISSING, O. 2013. Monetary and financial stability: Is there a trade-off? *BIS Working Paper* 18.

- IWANICZ-DROZDOWSKA, M. 2002. Kryzysy bankowe. Przyczyny i rozwiązania. Warszawa: PWE.
- IWANICZ-DROZDOWSKA, M. 2015. Restrukturyzacja banków w Unii Europejskiej w czasie globalnego kryzysu finansowego. Warszawa: Oficyna Wydawnicza Szkoły Głównej Handlowej.
- IWANICZ-DROZDOWSKA, M. 2016. European bank restructuring during the global financial crisis. New York: Palgrave Macmillan, Houndmills.
- KAMINSKY, G. 1999. The Twin Crises: The Causes of Banking and Balance-of-Payments Problems. *American Economic Review* 89(3): 473–500.
- KARAŚ, P. 2017. Sieć bezpieczeństwa finansowego w krajach UE. In: Europejski rynek usług bankowych. Kraków: Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.
- KOPIŃSKI, A. 2008. Analiza finansowa banku. Warszawa: PWE.
- LEHMANN, H. and MANZ, M. 2006. The Exposure of Swiss Banks to Macroeconomic Shocks—An Empirical Investigation. Swiss National Bank, Working Papers.
- NADOLSKA, A. 2017. Źródła regulacji i nadzoru nad bankami funkcjonującymi na rynku finansowym Unii Europejskiej. *Bezpieczny Bank* 1(66):9–31.
- OWSIAK, S. 2002. Podstawy nauki finansów. Warszawa: PWE.
- PADOA-SCHIOPPA, T. 2002. Central Banks and Financial Stability: Exploring a Land in Between. Second ECB Central Banking Conference on the transformation of the European Financial System. European Central Bank, 24–25 October. Frankfurt a. Main.
- REGULATION (EU) No 575/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.
- ROGOWSKI, W. and MESJASZ, C. 2012. Definicje stabilności finansowej. In: Nadzór korporacyjny a stabilność sektora finansowego. Łódź: Wydawnictwo Uniwersytetu Łódzkiego.
- ROY, A.D. 1952. Safety First and the Holding of Assets. *Econometrica*, Vol. 20(3):431–449.
- SMAGA, P. 2014. Rola Banku Centralnego w zapewnieniu stabilności finansowej. Warszawa: CeDeWu.
- SOLARZ, K. 2010. Istota i sposób pomiaru ryzyka systemu finansowego. In: Ryzyko w finansach i bankowości. Warszawa: Difin.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Academic Integrity and Debt Literacy of Finance Students: A Cross-national Study

Andrzej Cwynar¹, Wiktor Cwynar¹, Przemysław Szuba², Kelvin Leong³, Anna
Yuk Man Sung³, Anna Ostrowska-Dankiewicz⁴, Paulino Manuel Leite da
Silva⁵, Volodymyr Martynyuk⁶

¹*Department of Economics, Faculty of Administration and Social Sciences, University of
Economics and Innovation, Projektowa 4, 20-209 Lublin, Poland,
e-mail: andrzej.cwynar@wsei.lublin.pl*

²*Exacto Sp. z o.o. Rzeszów, Poland*

³*Wrexham Glyndŵr University, Wales*

⁴*Politechnika Rzeszowska, Rzeszów, Poland*

⁵*ISCAP, Porto, Portugal*

⁶*Ternopil National Economic University, Ukraine*

Abstract

The purpose of the paper is to assess – based on a cross-national survey – academic integrity and debt literacy of finance students *vis a vis* their non-finance peers. Financial crises can be driven by both unethical actions of finance professionals and low financial literacy on either side of financial markets, as shown by the recent global crisis. Therefore, we checked whether these two issues are addressed at universities, where finance students are prepared to become future financial professionals. Additional goal is to learn factors related to academic integrity and debt literacy among university students. The study is based on self-reports of 1,022 students from 5 countries on their academic integrity and debt literacy (convenience sample, self-administered survey). We used categorical regression models, along with non-parametric statistical tests, to analyse the survey responses. We did not find support for the hypothesis that finance students were more dishonest than their non-finance peers. Yet, we established that the debt literacy of finance students is alarmingly low, though higher than the debt literacy of other students. This raises many concerns regarding the preparedness of today’s students to make well-informed financial decisions and to perform as finance professionals in the future. The results of this study indicate shortcomings in the education of the finance elite and, therefore, call for a remedy.

Keywords: academic integrity, debt literacy, finance students, financial literacy

JEL Code: A2, D01, D12, D83, D91

1. Introduction

The recent global crisis has undermined public confidence in the finance profession (Owens, 2012; Edelman, 2014). The crisis revealed that moral hazard can be sizable in the financial services market. Moreover, the scale of the crisis suggests that the finance community as a whole had serious difficulty resisting the temptation to behave in an unethical way. Labaton Sucharow's survey (2012) shows that a significant percentage of professionals in the financial services industry, both in the UK and in the US, concede that it is possible that they would behave in an unethical way at work. The same survey shows that such behaviour may be widespread, because 26% of respondents indicated that they had witnessed misconduct in the workplace or had first-hand knowledge of it. On the other hand, empirical findings in the field of academic integrity suggests that business major students cheat more often than others (McCabe, Butterfield, & Treviño, 2006) and that among business majors, students with a concentration in finance are particularly willing to cheat (Brown et al., 2010). Such findings suggest that the financial profession may attract individuals having specific predispositions and personality characteristics, including the inclination to engage in dishonest activities. Hence, in our study we hypothesized that finance students behave dishonestly more often than their non-finance peers (H1).

It can be also supposed that business major students, especially those in finance, are more exposed to formal financial education than other students. Therefore, it seems reasonable to expect that they are more financially literate, too. This issue is important because many of them will professionally guide other people through the world of finance in the future. As experts, they will be responsible for the financial well-being of other individuals, let alone their own. To a degree, they will also be responsible for propagating financial knowledge and skills in society. Because little is known about the link between financial education and financial literacy in universities (particularly outside the US), we were curious whether increased exposure to finance-oriented education translates into higher financial literacy and if it does, then to what degree. The evidence on the effect financial education has on financial literacy in broader populations is mixed (Mandell and Klein 2009; Willis 2008; Fernandes et al. 2014) and this fact reinforced our motivation to investigate this effect among university students. We decided to focus on the little explored field of debt literacy instead of broader financial literacy. The justification for such a choice is twofold. Firstly, many recent shocks in the financial markets were driven by borrowing problems (e.g. the student loan default problem in the US or the Swiss franc loan problem in Poland). Secondly, the majority of recent financial scandals arose around borrowing issues (e.g. subprime mortgages or the LIBOR manipulation). Ultimately, we hypothesised that debt literacy of finance students is higher compared to other students (H2).

We examined both the academic integrity, considered to be a proxy for individuals' disposition to act unethically, and the debt literacy of finance major students in five European countries compared to students with other majors. We started from the premise that the combination of unethical behaviour and of low financial literacy on the part of finance major graduates might be particularly dangerous. The main purpose of the study was to obtain empirical evidence bearing on the presence of these two sources of risk among finance students in a single study. To the best of our knowledge, previous research has not examined these two issues together. The additional purpose of this study was to identify key variables explaining academic integrity and debt literacy of university students.

2. Methodology

2.1. Data

Data were collected at 26 universities in five countries: Bulgaria, Poland, Portugal, Ukraine and Wales, between 11 May 2017 and 18 July 2017 as part of a larger project being conducted at the University of Economics and Innovation (UEI) in Lublin, Poland. Initially, project leaders expertly selected groups of European countries different in terms of characteristics potentially significant in explaining divergences in academic integrity and debt literacy. The characteristics – such as economic development and welfare, social structure and institutions, culture profile, etc. – are closely linked to integration processes in Europe as reflected in the order in which consecutive countries were joining the EU. Then invitation letters were sent to partner universities of UEI in countries representing distinct groups (old EU members, new EU members, and countries applying for EU membership). 26 universities accepted the invitation and research leaders were selected at these universities. Because the leaders were supplied with a questionnaire written in English, translation into national languages (English, Bulgarian, Polish, Portuguese, and Ukrainian) was conducted.

Students were sent an e-mail inviting them to fill in the attached questionnaire. The questionnaire featured a cover letter introducing the survey to students as well as assuring them of the anonymity of their responses. The letter was followed by 56 questions, in total. Overall, we received 1,022 valid responses. Considering the risk of a technical error caused by the application that was saving the survey data, we allowed up to two empty fields in a given respondent's questionnaire and still considered it valid. If a questionnaire had more than two questions left blank, we did not include the data from that questionnaire in the analyses. There were 812 questionnaires without empty fields, 182 with one empty field, and 28 with two empty fields. This procedure resulted in data completeness exceeding 96%.

2.2. Measures

Following McCabe & Treviño (1993) and later researchers who adapted their instrument (McCabe, Butterfield, & Treviño, 2006), we used a composite measure (index) of academic integrity (labelled as AI). The index was calculated on the basis of responses to 13 questions concerning typical forms of dishonest behaviour of students: (i) cheating on exams, (ii) cheating on assignments, and (iii) plagiarism and falsification/fabrication (of data, information, citations) in any formal academic exercises. We allowed respondents to choose among three options converted into numbers: (i) 'Never engaged in this behaviour' (coded as 3), (ii) 'Engaged in the behaviour once' (coded as 2), (iii) 'Engaged in the behaviour more than once' (coded as 1). Therefore, AI values ranged between 13 and 39 with higher values indicating higher honesty levels. The index had a mean of 31.9, a standard deviation of 5.215, and a Cronbach's alpha of 0.809.

To measure debt literacy of respondents we used the only instrument proposed in the literature so far, designed by Lusardi & Tufano (2009). The instrument is a 3-question single choice test resulting from adaptation of a classic financial literacy instrument (for the first time used in 2004 and dubbed the 'Big Three' financial literacy questions – see Mitchell & Lusardi, 2015), adapted to debt specificity. Lusardi & Tufano's (2009) instrument allows measurement of knowledge and skills regarding: (i) interest compounding (first question), (ii) how credit cards work (second question), and (iii) the time value of

money concept (third question). To calculate an index of debt literacy (labelled as DL), we applied the following procedure: correct answers were coded as 1 while all remaining options (incorrect answers, 'Don't know' responses, and 'Prefer not to answer' responses) were coded as 0. Hence, the debt literacy index ranges between 0 and 3 in value. The higher DL, the more debt literate the respondent. The index had a mean of 0.84, and a standard deviation of 0.842.

We used a broad set of independent variables, both suggested by the existing literature on financial literacy and newly introduced by us, in our regression models explaining both – AI and DL. Given the main purpose of this article, major of study was used as key diagnostic variable. This variable was measured by asking the respondents to indicate their major of study out of the following categories: (i) Finance – comprising such majors as Finance / Finance and accounting / Banking or similar, (ii) Other economical – comprising such majors of studies, such as Economics, Management, Business (e.g. International business, Business administration), Entrepreneurship, Marketing, E-commerce or similar, (iii) Other non-economical (respondents were asked to specify them).

Further, to gauge academic orientation as the variable potentially explaining AI, we used the classic instrument introduced by Roedel, Schraw, & Plake (1994) and adapted by later researchers (e.g. Marsden, Carroll, & Neill, 2005). The instrument is a set of statements about attitudes and behaviours that are associated with learning and grade orientation (LO and GO, in brief, henceforth). Academic orientation reflects an individual's motivation to study for its own sake (LO), or to achieve better grades (GO). We do not provide details regarding LO and GO estimation to keep the length of this article within required boundaries (see Roedel, Schraw, & Plake, 1994 for details). To check whether cheating inclination is a pre-existing attitude or has been acquired during college, we asked respondents how they perceived their intention to engage in dishonest academic behaviours at the time when the survey was conducted as compared to the beginning of the study (the variable was labelled as PA – pre-existing attitude). Respondents had three answers available for selection: (i) 'Lower' (coded as 3), (ii) 'The same' (coded as 2), and 'Higher' (coded as 1). Additionally, to get a deeper insight into the drivers of respondents' academic integrity, we asked them how would they describe the attitude of their teachers – on average – towards academic dishonesty (the variable was labelled as TA – teachers' attitude). Again, respondents had three options they could choose among: (i) 'Resistive' (coded as 3), (ii) 'Indifferent or neutral' (coded as 2), and 'Acquiescent or consenting' (coded as 1).

Finally, we used also a broad gamut of standard socioeconomic variables applicable to university students as additional independent variables (the list with adequate summary statistics is available upon request from the authors).

Table 1: Key measures – descriptive statistics

| | AI | DL | LO | GO | PA | TA |
|--------------------|-------|-------|--------|--------|-------|-------|
| Mean | 31.90 | 0.84 | 14.61 | 7.22 | 2.16 | 2.39 |
| Median | 33.00 | 1.00 | 15.04 | 7.35 | 2.00 | 3.00 |
| Standard deviation | 5.215 | 0.842 | 2.670 | 1.830 | 0.666 | 0.716 |
| Minimum | 13 | 0 | 5.135 | 3.411 | 1 | 1 |
| Maximum | 39 | 3 | 18.609 | 10.233 | 3 | 3 |
| Observations | 969 | 999 | 962 | 962 | 1,021 | 1,018 |

Source: Own study

2.3. Tests and models

Our analytical strategy provided for two stages. In the first stage the appropriate non-parametric tests were used to evaluate the statistical significance of mean comparisons for assumed hypotheses. In brief, we used the tests to conduct analysis of the differences in the means of AI and DL obtained for distinguished sub-samples (finance students versus others). Specifically, U Mann-Whitney tests were used to verify both H1, and H2. The selection of the tests were preceded by standard analysis of these tests applicability to the properties of examined data sets (Szwed, 2008).

In the second step, we went beyond the main purpose of our study and we estimated a series of categorical regressions (CATREG, in brief, henceforward) to measure the correlations between AI (and DL as well) and various independent variables indicated in previous section. We decided to do that to get broader view of factors related to AI and DL of our respondents and, thus, to better understand these phenomena. The selection of explanatory variables for DL regression model was preceded by sub-sample mean comparisons for various sociodemographic cohorts'. Ultimately, those respondents' characteristics that differentiated DL scores at statistically significant levels when running the comparisons, were used as independent variables in the regression.

3. Results and discussion

3.1. Academic integrity

Our findings confirm that academic dishonesty of students remains prevalent. A mere 7% of respondents reported that they never engaged in any of 13 dishonest behaviours enumerated in our questionnaire. The most prevalent forms of dishonest behaviours were those related to cheating during a test (using crib notes – 69.5% of respondents did it at least once; copying from other students with their knowledge – 65.3%; and helping other students to cheat on tests – 64.5%).

Major of study turned out to be a statistically significant explanatory variable of AI in our regression model (Table 3; for brevity, in all tables we demonstrate only statistically significant variables). The mean of AI for finance students (31.76) was slightly lower than mean of AI for other students, including other business students (31.89). This indicates that finance students behave honestly slightly less than other students. However, the difference turned out to be statistically insignificant (Table 2). Hence, our findings do not support H1. Such result is in itself positive, however the prevalence of unethical academic behaviours – also among finance students – raises many concerns regarding the education of the business elite and higher education in general.

Presumably our results – inconsistent with the evidence of Brown et al. (2010) who found finance students the most disposed to cheating among all surveyed majors – can be partly explained by differences in study design (Brown et al. distinguished accounting students from finance ones, whereas we considered both as representatives of the 'finance major' cohort). Perhaps the differences can also be attributed to the change of finance curriculum in recent years, following the global financial crisis. Nowadays ethical studies and CSR topics have become increasingly important in finance education.

Table 2: Statistical significance of the difference in AI levels (means) for finance and non-finance students

| | All | Finance | Non-finance | U Mann-Whitney test result |
|--------------|-------|---------|-------------|----------------------------|
| AI (mean) | 31.85 | 31.76 | 31.89 | 87913; p>0.05 |
| Observations | 945 | 271 | 674 | |

Source: Own study

Both GO and LO were significantly linked to AI (the effect of LO on AI was stronger compared to the impact of GO – Table 3). Additionally, the regression revealed that GO and AI were inversely related (more grade oriented students were more likely to be dishonest in formal academic tasks and exercises), while LO and AI were positively related (more learning oriented students were more likely to be honest). Such findings bring support for the literature which posits that academic integrity is driven – among other factors – by academic orientation, i.e. that more goal-oriented students are more likely to behave in an unethical way and more tolerant of such behaviour (Marsden et al., 2005). Common sense suggests that grade orientation can be reinforced by students' predictions that their prospect employers will use GPA to evaluate them, instead of checking comprehensively what they really learned. Hence, grade oriented students' approach to learning may be more instrumental than other students', i.e., they can have an excessively mercenary view of learning in which grades are the strongest 'currency' when entering the labour market. This can adversely affect a student's ethical disposition (Brown et al., 2010).

We found also that higher levels of TA were associated with higher AI values, which is consistent with rational expectations. Interestingly, TA levels did not differ considerably across participating countries, except Ukraine. The value for TA was significantly lower in that country compared to the others, meaning that teachers' assent for unethical behaviour is more frequent in Ukraine than in other (i.e., EU) countries participating in our study. PA turned out to be insignificant in AI model. The results regarding TA and PA, taken together, provide no grounds for the claim that university is the environment entrenching the inclination to behave dishonestly.

Table 3: Results of categorical regression with AI as dependent variable ($R^2=0.203$)

| Variable | β | F |
|------------------------|---------|-----------|
| LO | 0.321 | 97.671*** |
| GO | -0.139 | 20.363*** |
| TA | 0.133 | 15.368*** |
| Gender | 0.059 | 3.865** |
| Country | 0.146 | 21.320*** |
| Major | 0.092 | 9.371*** |
| Level of study | 0.085 | 7.339** |
| Form of study | 0.146 | 14.195*** |
| Working while studying | 0.052 | 2.793* |

* Statistically significant at $p<0.1$

** Statistically significant at $p<0.05$

*** Statistically significant at $p<0.001$

Source: Own study

3.2. Debt literacy

Generally, debt literacy in our sample was low. Only 25 respondents (2.5% of total sample) correctly answered all three DL questions, while almost half of the sample (422 respondents, 42.2% of all) incorrectly answered all of them. As evidenced by prior studies, the question regarding time value of money turned out to be the most difficult in our study, too. Only 89 respondents (8.8% of the total sample) correctly answered this question. In contrast, 46.4% of the sample correctly answered the question on interest compounding.

Finance students fared better than non-finance students on the DL test. The difference between means for DL (0.96 – finance students; 0.81 – all other students) was statistically significant (Table 4). Such result supports H2. On the other hand, despite the higher DL score of finance students, their absolute debt literacy is worrisome. Their DL close to 1 means that finance students, on average, responded correctly to only 1 question out of three that were asked. This raises doubts as to the effectiveness of the educational process with regard to financial literacy. We believe that there are at least three possible explanations of low levels of financial literacy possessed by college students: (i) inappropriate finance curricula, (ii) ineffective teaching ('supply' side factor), (iii) ineffective learning ('demand' side factor). However, examining them is not within the scope of our study.

Table 4: Statistical significance of the difference in DL levels (means) for finance and non-finance students

| | All | Finance | Non-finance | U Mann-Whitney test result |
|--------------|------|---------|-------------|----------------------------|
| DL (mean) | 0.85 | 0.96 | 0.81 | 89318; p<0.05 |
| Observations | 974 | 291 | 683 | |

Source: Own study

Some prior studies found support for the first explanation. For instance, Bianco & Bosco (2011) point to the fact that finance is taught from a business entity perspective, while the consumer (personal finance) perspective is often neglected. This can result from concentration of universities' curricula on sophisticated financial issues and overlooking the need to build deep understanding of everyday choices which people usually encounter. Brau, Holmes, & Israelsen (2015) found experiential learning to be the strongest determinant of financial literacy of undergraduate students in their study. This suggests that more experience-based or simulation-based teaching is needed because the average student is unlikely at their age to have had significant financial market experiences. However, more experience-based teaching requires more experience-oriented teachers who are well-prepared to transfer not only knowledge, but also skills ('supply' side factor). Reconsideration of both – the content and the educational method – is suggested by previous researchers, based on empirical results they collected (e.g. Mandell & Klein, 2009). Finally, perhaps students perceive financial topics as unattractive or even boring ('demand' side factor), do not like learning finance and, consequently, fare poorly on financial literacy tests. Such an explanation gained empirical support in Polish studies (e.g. Kantar TNS, 2016). Likewise, Ford & Kent (2009) showed that the effect of disinterest in finance can explain low financial literacy scores of female students.

Table 5: Results of categorical regression with DL as dependent variable ($R^2=0.161$)

| Variable | β | F |
|-------------|---------|-----------|
| Gender | 0.262 | 69.442*** |
| Country | 0.229 | 48.754*** |
| Scholarship | 0.092 | 7.205*** |
| Major | 0.135 | 11.047*** |

* Statistically significant at $p < 0.1$

** Statistically significant at $p < 0.05$

*** Statistically significant at $p < 0.001$

Source: Own study

Out of the explanatory variables tested in regression models with DL as the dependent variable (Table 5), gender deserves a closer attention. Male respondents fared better than females in the debt literacy test for all measures. The gender difference between DL score – statistically significant in our study – was particularly sizable in terms of the share of respondents who answered none of the questions correctly (male – 26.5%; female – 51.7%). The gender gap was confirmed by numerous studies carried out around the world (see Bucher-Koenen, Lusardi, Alessie, & van Rooij (2017) for a comprehensive review), although there is a lack of consensus regarding factors responsible for the phenomenon. It was also found among students in prior studies (e.g. Chen & Volpe, 2002; Ford & Kent 2010; Butters, Asarta, & McCoy, 2012).

4. Conclusions

This study showed that finance students were not significantly less honest in formal academic tasks than their non-finance peers. Overall, our findings are consistent with the vast body of prior evidence suggesting that dishonest academic behaviour is a widespread phenomenon, also among finance students. The phenomenon can have significant implications not only for the financial services market, but also for the overall economic system because one cannot exclude that students will carry the unethical attitudes to the workplace.

As expected, in terms of debt literacy scores, finance students fared better in relation to their non-finance peers in our study. However, this study showed that literacy – considered in absolute terms – is, in fact, low (even among finance students). The observation seems to be a crucial, because the underlying evidence is very strong: low debt literacy levels were noted for all participating countries, all classes of age, and both male and female respondents. The observation is also crucial as it indicates that finance students are poorly prepared not only to make optimum financial decisions, but also to provide advice on financial issues as future finance professionals. Sooner or later, the shortcomings in financial literacy revealed in our study will eventuate in mistaken economic decisions. The decisions will further entail unnecessary costs, hindering wealth accumulation of our respondents and – in some cases – resulting in financial distress.

Acknowledgements

The study has been financed by Polish Ministry of Science and Higher Education grant [contract no. 0057/DLG/2016/10 under the program 'Dialogue' (within project entitled 'Debt Watch')]. We thank our co-worker Viktoria Stancheva who was responsible for surveys in Bulgaria.

References

- BIANCO, C. A., BOSCO, S. M. 2011. Financial literacy: What are business schools teaching? *Journal of Global Business Management* 7(1): 1–8.
- BRAU, J. C., HOLMES, A. L., ISRAELSEN, C. L. 2015. Financial literacy among college students: An empirical analysis. [Online]. Available at: <http://marriottschool.net/emp/brau/JFED%202015%20Fin%20Lit.pdf> (Accessed 13 July 2017).
- BROWN, T. A., SAUTTER, J. A., LITTVAY, L., et al. 2010. Ethics and personality: Empathy and narcissism as moderators of ethical decision making in business students. *Journal of Education for Business* 85(4): 203–208.
- BUCHER-KOENEN, T., LUSARDI, A., ALESSIE, R., VAN ROOIJ, M. 2017. How financially literate are women? An overview and new insights. *Journal of Consumer Affairs* 51(2): 255–283.
- BUTTERS, R. B., ASARTA, C.J., MCCOY, S. 2012. Financial literacy and gender in U.S. high schools. *Journal of Economics and Finance Education* 11(2): 142–149.
- CHEN, H., VOLPE, R. P. 2002. Gender differences in personal financial literacy among college students. *Financial Services Review* 11(3): 289–307.
- EDELMAN. 2014. Trust in financial services [Online]. Available at: <http://www.edelman.com/insights/intellectual-property/2014-edelman-trust-barometer/trust-in-business/trust-in-financial-services/> (Accessed: 15 February 2016).
- FERNANDES, D., LYNCH Jr., J.G., NETEMEYER, R.G. 2014. Financial literacy, financial education, and downstream financial behaviors. *Management Science* 60(8): 1861–1883.
- FORD, M. W., KENT, D. W. 2010. Gender differences in student financial market attitudes and awareness: An exploratory study. *Journal of Education for Business* 85: 7–12.
- KANTAR TNS. 2016. Financial world of the youth (Finansowy świat młodych). [Online]. Available at: <http://www.tnsglobal.pl/coslychac/2016/05/13/finansowy-swiat-mlodych/> (Accessed: 26 July 2017).
- LABATON SUCHAROW. 2012. Wall Street, Fleet Street, Main Street: Corporate integrity at a crossroad. United States and United Kingdom financial services industry survey. [Online]. Available at: <http://www.labaton.com/en/about/press/upload/US-UK-Financial-Services-Industry-Survey-July-2012-Report.pdf>, (Accessed: 10 June 2017).
- LUSARDI, A., TUFANO, P. 2009. Debt literacy, financial experiences, and overindebtedness. NBER Working Paper No. 14808. Cambridge, Massachusetts: National Bureau of Economic Research.

- MANDELL, L., KLEIN, L. S. 2009. The impact of financial literacy education on subsequent financial behavior. *Journal of Financial Counseling and Planning* 20(1): 15–24.
- MARSDEN, H., CARROLL, M., NEILL, J. T. 2005. Who cheats at the university? A self-report study of dishonest academic behaviours in a sample of Australian university students. *Australian Journal of Psychology* 57(1): 1–10.
- MCCABE, D. L., BUTTERFIELD, K. D., & TREVIÑO, L. K. 2006. Academic dishonesty in graduate business programs: Prevalence, causes, and proposed action. *Academy of Management Learning & Education* 5(3): 294–305.
- MCCABE, D. L., TREVIÑO, L. K. 1993. Academic dishonesty: Honor codes and other contextual influences. *Journal of Higher Education* 64(5): 522–538.
- OWENS, L. A. 2012. Confidence in banks, financial institutions, and Wall Street 1971–2011. *Public Opinion Quarterly* 76(1): 142–162.
- RAKOVSKI, C. C., LEVY, E. S. 2007. Academic dishonesty: Perceptions of business students. *College Student Journal* 41(2): 466–481.
- ROEDEL, T. D., SCHRAW, G., PLAKE, B. S. 1994. Validation of a measure of learning and performance goal orientations. *Educational and Psychological Measurement* 54(4): 1013–1021.
- SZWED, R. 2008. *Statistical methods in social sciences (Metody statystyczne w naukach społecznych)*. 1st Edition. Lublin: Wydawnictwo Katolickiego Uniwersytetu Lubelskiego.
- WILLIS, L.E. 2008. Against financial literacy education. *Iowa Law Review* 94: 197–285.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The behaviors and the attitudes of consumers towards the novelty assortment on fruit market in the aspect of neophobia phenomenon

Eugenia Czernyszewicz¹

¹Department of Management and Marketing, Faculty of Agrobioengineering, University Of Life Sciences in Lublin, Akademicka 13, 20-950 Lublin, Poland, e-mail: eugenia.czernyszewicz@up.lublin.pl

Abstract

Both the behaviours and attitudes of consumers towards novelty assortment on fruit market can influence their feeding behaviours. In paper a questionnaire was used to measure the attitudes towards novelty regarding fruit assortment consisting of 10 statements and specifications. The basis for the questionnaire construction was questionnaire Food Neophobia Scale (NFS). This tool has been adapted to measure the attitudes of fruit consumers. The survey was conducted in a group of 150 persons in 2015. The survey confirmed the usefulness of the tool used to identify the neophobic attitudes of consumers. The survey results show that an important factor influencing decisions regarding the testing of new fruit products is external appearance of fruit.

Keywords: neophobia, attitude, behavior, fruit consumption, novelty assortment

JEL Code: D01, D91, Q13

1. Introduction

The contemporary market of consumer goods, including food goods, is very dynamic. New products are constantly being launched onto this market, and are being improved. Full supply offer increases the possibility to meet consumers needs. Consumers requirements are getting higher as they are aware of the possibilities made by this offer. The attitudes of consumers, defined as a relatively permanent emotional relationship or assessor to the object or decision to such an attitude may be expressed in positive, negative or neutral terms. The knowledge about consumers behaviour and their attitudes towards various products enables the entrepreneurs to elaborate the offer that fully meets consumers needs and requirements. However, some of the consumers avoid or reject new, not known

things or experiences. This can be called as neophobia, and its opposite is neophilia, expressing enthusiastic attitude to all novelties (Babicz Zielińska 2006). Food neophobia is therefore anxiety about new, unknown products and dishes and a kind of reluctance to try them. It is also defined as a very cautious or suspicious attitude to previously unknown dishes and products (Gajewski 1994). In many research on food neophobia authors have tried to identify the factors that consolidate and minimize it (Pliner et al. 1993, Pliner i Pelchat 1991). The literature on the subject indicates that neophobia is connected with prejudices, religious views, the influence of the environment and emotional states of the consumer (client). In the case of food, it is also associated with general aversion to food and eating disorders among children (Kerzner 2009). This kind of behaviour is being associated with not known food and the desire to minimize the likelihood to consume harmful substances that are included in new, not known food (Pliner and Hobden 1992). It is typical among the animals, although it cannot be transferred on the humans on the basis of the analogy. On the food market the unsafe food cannot be launched, and if somehow it is offered to consumers it has to be removed from the market (i.e. beef contaminated with prions). This food also has to be clearly marked as harmful or unsafe (i.e. alcohols, fats) (Babicz-Zielińska 2006). Behaviors, eating habits and preferences are the result of genetic predispositions and environmental factors. The genetic determinants relate to the preference for foods such as sweet flavors and the rejection of foods with a bitter and sour taste, predisposition to reject new foods and acquire preferences for known foods, as well as to acquire preferences by combining food with the context and consequences of its consumption (Brich 1998). It should be said that the term novelty is subjective from consumer point of view as the novelty being launched onto the market not always has to be perceived in the same way by the consumer. New – can be a foreign product culturally imported from other regions of the world – unknown or known to a small extent, mainly as a local cultural element that can be treated as unusual or strange, as well as a product recognized and long-standing in a given culture or family, but not consumed earlier (Dąbrowska et al. 2006). New – can also be a product didn't exist and is launched onto the market on the basis of conducted research, i.e. GMO products, organic food, probiotic food, novel food, convenience food, ethnic food, functional food (Gawęcki 2002). Food neophobia behaviour result in the restrictions in the range of consumed food and exclusion of many ingredients from the diet, including fruits especially the exotic ones leading to the nutritional monotony (Gajewski 1994). According to Jaeger et al. (2017) neophobia is the barrier to diet change and the solution of health problems related to diet.

On the basis of Benton (2004) research it can be said that neophobia may be hereditary – in the study of identical and bilinian twins aged 9-11 years, the heredity of this feature was estimated at 78%. Moreover, Pliner (1994) indicated the high level of mother's neophobia translates into greater neophobicity of children, especially daughters. Nutritional neophobia – despite the indicated biological conditions – can also be a learned attitude. This is indicated by the change in sweet taste preferences under the influence of food-related experiences. Beauchamp i Moran showed that immediately after birth, all tested newborn babies preferred fresh water, after the sixth month of life the child's preferences were conditioned by his previous experiences – children who drank sweetened water during this period showed greater preference for the sweet taste than children who did not drink it (Birch 1998). In the research on neophobia it has been shown that the rejection of certain products changes with age. Benton (2004) pointed out that neophobia does not occur almost in newborns, increases in early childhood, and then decreases to very limited prevalence in adults. This was also confirmed by the studies of Rozin and colleagues – the rejection of food in the youngest children is associated with

sensory characteristics of food – mainly the taste of dishes. The older the child, the more often the reason for rejection becomes a potential threat (younger children accept everything as potential food). With age, the acceptance of food being a threat and causing disgust decreases, with children accepting such combinations of foods that are not accepted by adults (Rozin et al. 1986). Falon i Rozin (1983) indicted three levels underlying the acceptance and rejection of food. They pointed to reactions based on the expected consequences of consumption, sensory-emotional reactions and ideological reactions. They stated that mainly two groups of products are accepted: those whose consumption may be beneficial and those that taste (or will taste) well. For this reason, novel food is accepted – acceptance is based on the expected positive consequences. These applications served to carry out research into the feasibility of a positive attitude towards food by showing consumers the expected benefits. Researchers clarified the expected benefits in the form of terms defining a specific nutrient composition that suggested pro-health activity. Unfortunately, the obtained results were ambiguous in this respect (Eiser et al. 1984). This was also confirmed by research conducted on the so-called novel food. Pelchat and Pliner (1995) proved in their research that positive information about the product did not significantly increase the individual intention of trying a new sauce, chips or fruit. In research on foreign products Pliner et al. (1993) focused on the issue of the taste of products and the conviction of the potential danger associated with their consumption. As a result of the research, it turned out that in the case of known products the individual desire to taste them was conditioned mainly by their liking or expected disliking, in the case of new products, the alleged danger and expectation that the products would be tasteless were of significant importance. This significantly affected the willingness to try unknown food. Pliner and Pelchat (1991), on the basis of the results obtained, stated that an important motive for rejecting foreign products is the feeling of disgust. At the same time, they pointed out that unknown products of animal origin were much more often rejected than of plants origin. Cashdan and Chalcarz came to the same conclusion, in the opinion that disgust may contribute to maintaining existing eating patterns and hamper all actions aimed at changing habits and preferences (Cashdan 1994, Chalcarz et al., 2009). Neophobia research also associated nutritional behaviours with emotional reactions and physiological state, leaving out the meaning of tranquility and relaxation in the translation of these choices. Macht drew attention to this, dealing with the factors determining the daily dietary choices. In his classification, he drew attention to the emotionally controlled choice of food and abstaining from accepting certain products, as well as a conscious selection of some of them with the intention of regulating emotions (pleasuring, mood improvement) (Cooke et al 2006). Research conducted by Pliner et al. (1993) indicated that the lowest level of neophobia was shown by people with lower anxiety and moderately hungry. It turned out that the attitude to the novelty also changes under the influence of inter alia advertising, persuading other people, fashion or positive information about the taste of the product (Cardello and Sawyer 1992). In addition, there are differences in attitudes and willingness to consume unknown products depending on the country and related culture and age (Prescott and Bell 1995, Flight et al. 2003).

The aim of this research was to know and to define the neophobia attitudes by collecting opinions on food novelties on the fruit market.

2. Methodology and Data

Research was conducted in 2015 among the citizens of Lublin. There were 150 respondents at the age of older than 20 years. The questionnaire was the research tool that was built of 10 statements associated with consumption behaviours and opinions on new and unknown varieties and species of fruit with unusual features such as appearance, colour, shape, unknown origin and unknown taste. These statements were modeled on the commonly used Food Neophobia Scale (FNS) (Pliner and Hobden 1992). Hollar et al. (2013) to the study of neophobia for fruit and vegetables among students, also applied and positively verified another specific FVNI instrument (Fruit and Vegetable Neophobia Instrument), also based on the FNS Pliner and Hobden questionnaire (1992).

Respondents were asked to respond to the following statements:

- P1. I constantly try new varieties and/or fruit species
- P2. I do not trust new, unknown varieties and/or fruit species
- P3. If I do not know the variety and/or species of fruit, I do not try it
- P4. I do not try fruit with an unusual color
- P5. I do not try fruit with an unusual shape for the species
- P6. Most new varieties and/or fruit species look too bizarre to eat
- P7. I am afraid to eat varieties and/or fruit species that I have not eaten before
- P8. While eating, I am eager to try cakes or desserts with the addition of new varieties and/or fruit species
- P9. I would not dare (try out) new fruit varieties with specific characteristics, i.e. bananas with a brown skin
- P10. I do not trust fresh fruit of unknown origin

To assess the respondents opinion a 7-point Likert scale was used. The edge opinions were indicated as “I totally disagree” and “I fully agree”, and the middle value as “Nor I agree, neither disagree”. This scale has been used in the research made by inter alia Raudenbush i Frank (1999), Pliner and Hobden (1992) and others. Questions about the characteristics of the respondents concerned gender (woman, male), age (in the ranges of 20–29, 30–39, 40–49, 50–59, 60 and more), education (basic, vocational, secondary, higher) and the level of disposable income per capita in the family (up to PLN 500, PLN 501–1000, PLN 1001–2000, over PLN 2000). These questions formed the basis for segmentation of respondents according to their demographic, social and economic characteristics. The data analysis was carried out using statistical program Statistica, version 10.0. The data obtained was analyzed using correlation analysis and factor analysis. The main components were used as the method for the separation of factors. Factor rotation was applied using the standardized Varimax technique. The analysis includes factor loads greater than 0.7. Thanks to this method, it was possible to reduce the number of variables and detect the structure in relationships between variables.

3. Results

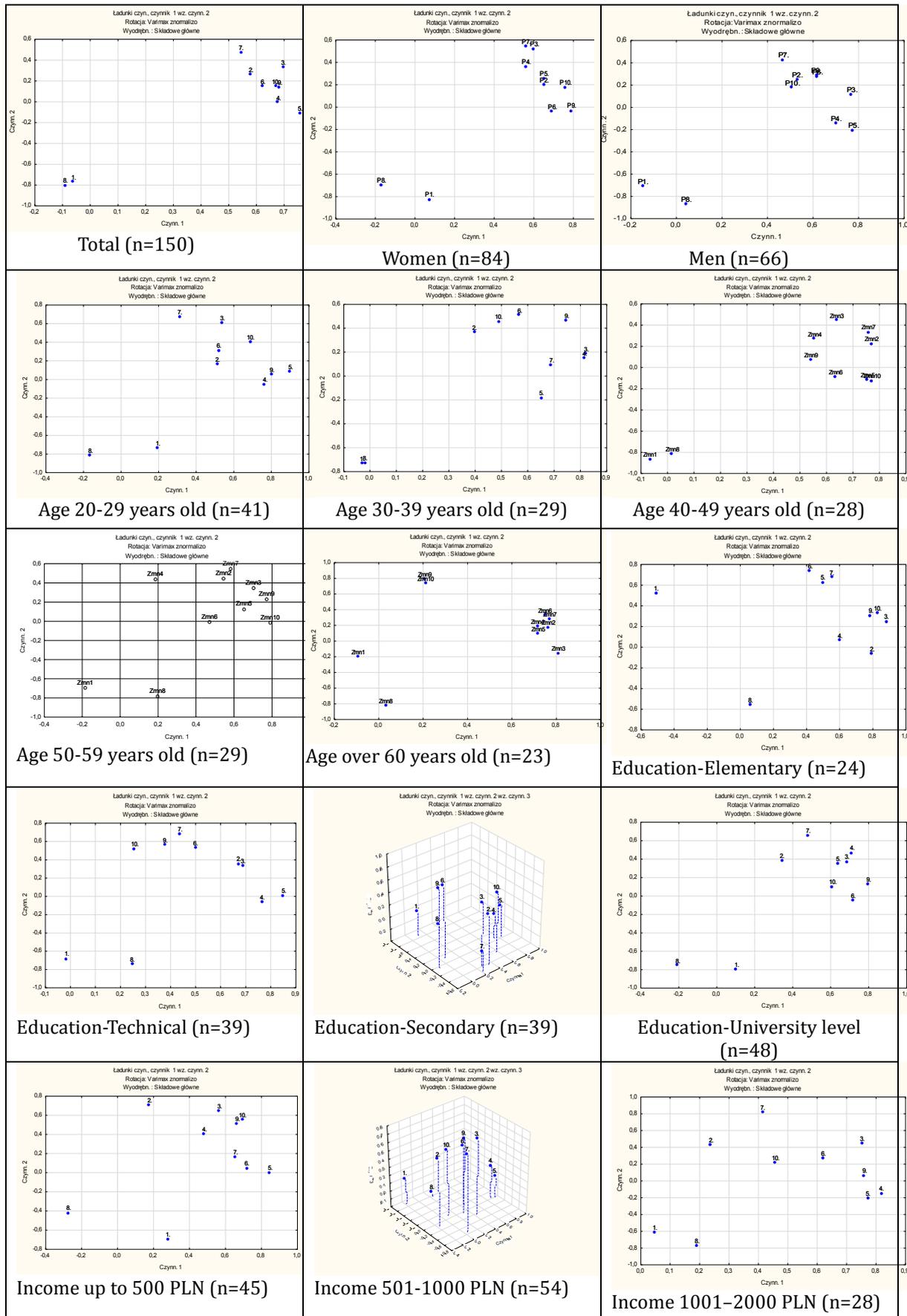
Based on the research results it can be said that there is a significant negative correlation between the age of consumers and fears from eating varieties and/or species of fruit that have not been tried before ($r = -0.194$) and a significant positive correlation between the level of income and the opinion about reluctance to eat new varieties and/or fruit with a bizarre appearance ($r = 0.169$). On the basis of these results two groups of consumers

behaviour were identified. They are consumers who do not try the unknown varieties and/ or fruit or fruit with a bizarre appearance (answers with the highest factors power in the first heads component) and these consumers can be called as neophobic. The second group are the consumers who are not afraid of new food and are ready to try new varieties and/ or fruit or fruit, both fresh fruit and additives to cakes and desserts (Figure 1). These groups of respondents explain the variety of answers in over 52% that is included in both sets of data, with the first heads component explaining the largest part of the variability of respondents' answers (35%).

Among women, a group can be distinguished that constantly tries new varieties and/or species and dishes with the addition of such novelties and a group of neophobes who have a reluctance to try new fruit varieties with specific characteristics and have no confidence in fruits of unknown origin. In the group of men two groups of people can also be distinguished, those who do not try the fruit of unknown varieties and/or species and with an unusual external appearance, i.e. of unusual colour and shape, and a group that constantly tries new varieties and/or species and dishes from addition of such new products (Figure 1). These two groups distinguished among women in more than 56% explain the variability of the answers contained in both sets of variables, and in the group of men in more than 50%.

Age also differentiates consumer attitudes towards novelty, with attitudes associated with lack of trust, fears and reluctance to try new products, depending on the age, different fruit traits (Figure 1). Neophobic attitudes in the age group 20–29 are more often associated with unusual fruit appearance (colour, shape, specific features), in the age group of 30–39 years lack of trust and reluctance to try fruit with specific characteristics and colour, and unknown variety and/or species, in the group of 40–49 years with a lack of trust in unknown varieties and/or species and fruits of unknown origin, reluctance to try fresh fruit of unusual shape, fears by eating varieties and/or species of fruit that have never been eaten before, and in the age group 50–59 years of lack of trust in fresh fruit of unknown origin, unwillingness to try new varieties with specific characteristics. In the oldest group of people aged 60 and over, most people are afraid of new things and it is impossible to clearly identify groups of people who are not afraid of novelty (Figure 1).

Education and income level per person in the family also diversified consumer attitudes towards novelty regarding fruits (Figure 1). In each of the groups diversified due to education, apart from people with basic education, neophobes and people constantly trying new varieties and/or species and dishes with the addition of such novelties can be distinguished. In the group of people with basic education, two groups of neophobes were distinguished: a group that does not eat new varieties and/or fruit species due to their bizarre appearance and group that does not trust new varieties and /or species and fruits of unknown origin and does not try unknown fruits and varieties with specific characteristics. People with higher education with neophobic attitudes do not try new varieties mainly because of their specific external features.



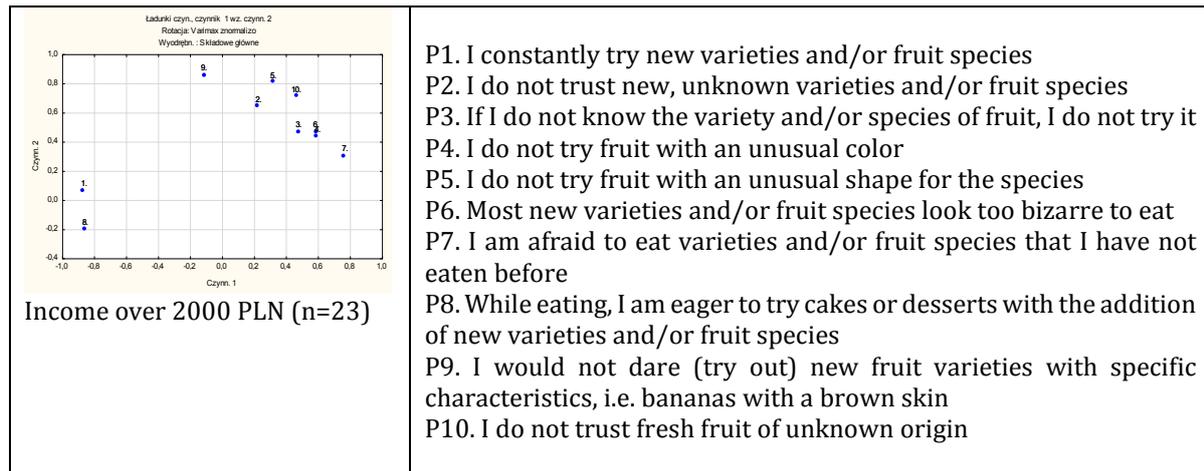


Figure 1: Results of principal components analysis in terms of the behaviors and the attitudes of consumers towards the novelty assortment of fruit
 Source: Own research

Attitudes of respondents towards new products on the fruit market vary depending on the level of income per capita in the family. In each of the surveyed income groups of respondents it is possible to identify people open to new products, constantly trying new varieties and/or fruit species and those fruits in cakes and desserts as well as neophobes. At the same time, the clarity of consumer divisions into neophobes and constantly trying new products decreases with the increase in income above PLN 1001 per capita in the family. There were no clear neophobic attitudes among people with the highest incomes, because in high-key components the high factor loads included a group of people expressing the attitude of trying new things, as well as those who were afraid of eating fruits that had not been eaten before.

4. Discussion and Conclusions

On the basis of own research it can be concluded that neophobia towards new product on the fruit market concerns both men and women, but there are various concerns about lack of trust and failure to try new fruit assortments by women and men. Among men, fears are mainly related to the reluctance to try fruit because of their external appearance, resulting from the specific external features and colour of the fruit and lack of knowledge about the variety and/or species of fruit. However, women's fears are related to the lack of trust in the origin of fresh fruit, as well as the reluctance to try fruit with specific characteristics. In research by Tuoril et al. [2001] it was shown that neophobia concerns men more often than women and decreases with increasing education and degree of urbanization. Own research shows that the increase in education differentiates consumer attitudes towards novelty. In the group of people with primary education, the main component representing a group of people constantly trying new species and/or varieties of fresh fruit or as an addition of such novelties to cakes and desserts was not identified. On the other hand, among the other groups of respondents, such main components have been distinguished. The results obtained cannot be fully confirmed due to the rather small sample of respondents in particular demographic and socio-economic groups.

Research conducted by Dąbrowska et al. [2006] shows that on the Polish market, young people are more open to new products than older ones. Our own research on consumer attitudes towards product novelties on the fruit market confirms this thesis. In the

oldest group of people over the age of 60, most people are afraid of novelty and it was impossible to clearly distinguish groups of people (represented by the main component) who are not afraid of novelty, constantly trying new varieties and/or fruit species. Therefore, they are not in line with the Benton (2004) conclusion, which indicated that neophobia decreases with age, and that its occurrence is very limited in adults. The research confirms the thesis that there are differences in attitudes and willingness to consume unknown products depending on the age, however, a relatively small sample of respondents does not allow to fully confirm this dependence.

Own research also shows that the clarity of consumer divisions into neophobes and constantly attempting novelty decreases with the increase in income above PLN 1001 per capita in the family. There was no clear lack of neophobic attitudes among people with the highest income. However, a small sample of respondents in particular income groups also in this case does not allow to fully confirm this dependence.

In conclusion, the usefulness of the tool modeled on the Food Neophobia Scale (FNS) (Pliner and Hobden 1992) to identify and study neophobic attitudes towards novelty fruit products should be emphasized. A significant impact of features such as gender, age, education and income on consumer attitudes towards fruit assortments was also noted, and some motives of neophobic attitudes of consumers belonging to different socio-demographic groups were pointed out, including the importance of different aspects of the external appearance (like colour, shape, general appearance), the origin of the products, the lack of knowledge of the variety and/or species and experience in the consumption of products. Due to the relatively small sample of respondents in general and in particular demographic and social segments, in order to confirm the obtained results, the research should be repeated and carried out on a much larger sample of respondents.

Further research should focus on providing information on attitudes towards different specific fruit traits of particular species. This information will be very useful when planning strategies and activities related to the introduction of new fruit species and varieties on the market.

References

- BABICZ-ZIELIŃSKA, E. 2006. Jakość żywności w ocenie konsumentekiej. Gdańsk, Gdańskie Towarzystwo Naukowe.
- BENTON, D. 2004. Role of parents in the determination of the food preferences of children and the development of obesity. *Int J Obes Relat Metab Disord* 28(7), 858–869.
- BIRCH, L.L. 1998. Psychological influences on childhood diet. *J. Nutr.* 128(2 Suppl), 407S–410S.
- CARDELLO, A.V., Sawyer F.M. 1992. Effects of disconfirmed consumer expectations on food acceptability. *J Sensory Studies.* 7(4), 253–277.
- CASHDAN, E. 1994. A sensitive period for learning about food. *Hum Nat.* 5(3), 279–291.
- CHALCARZ, W., MERKIEL, S., HODYR Z. 2009. Food behaviour in preschool children from Pabianice. *New Med.* 13(1), 7–12.
- COOKE, L., CARNELL, S., WARDLE, J. 2006. Food neophobia and mealtime food consumption in 4-5 year old children. *Int J Behav Nutr Phys Act.* 6, 3, 14. doi:10.1186/1479-5868-3-14.

- DĄBROWSKA, A., ZABROCKI, R., BABICZ-ZIELIŃSKA, E. 2006. Zastosowanie *Food Neophobia Scale* do oceny postaw konsumentów w stosunku do żywności nieznannej. *Bromat Chem Toksykol – Suppl.*, 227–230.
- EISER, J. R., EISER, C., PATTERSON, D. J., HARDING, C. M. 1984. Effect of information about specific nutrient content on ratings of “goodness” and “pleasantness” of common foods. *Appetite* 5(4), 349–359.
- FALON, A.E, ROZIN, R. 1983. The psychological bases of food rejections on humans. *Ecology of Food and Nutrition* 13, 15–26.
- FLIGHT, I., LEPPARD, P., COX, D.N. 2003. Food neophobia and associations with cultural diversity and socio-economic status amongst rural and urban Australian adolescents. *Appetite* 41(1), 51–59.
- GAJEWSKI, S. 1994. Zachowanie się konsumenta a współczesny marketing. Łódź, Wyd. Uniw. Łódzkiego.
- GAWĘCKI, J. 2002. Żywność nowej generacji a racjonalne żywienie. *Żywność Nauka Technologia Jakość* 4, 5–17.
- HOLLAR, D., PAXTON-AIKEN, A., FLEMING, P. 2013. Exploratory validation of the fruit and vegetables Neophobia Instrument among third – to fifth-grade students. *Appetite* 60, 226–230.
- JAEGER, S.R., RASMUSSEN, M.A., PRESCOTT, J. 2017. Relationships between food neophobia and food intake and preferences: Findings from a sample of New Zealand adults. *Appetite*, 116, 410–422.
- KERZNER, B. 2009. Clinical investigation of feeding difficulties in young children: a practical approach. *Clin. Pediatr (Phila)*. 48(9), 960–965.
- PELCHAT, M.L., PLINER, P. 1995. “Try it. You’ll like it.” Effect of information on willingness to try novel foods. *Appetite* 24, 153–166.
- PLINER, P. 1994. Development of measures of food neophobia in children. *Appetite* 23(2), 147–163.
- PLINER, P., HOBDEN, K. 1992. Development of a scale to measure the trait food neophobia. *Appetite* 19, 105–102.
- PLINER, P., PELCHAT, M. 1991. Neophobia in humans and the special status of foods of animal origin. *Appetite* Jun 16(3), 205–218.
- PLINER, P., PELCHAT, M., GRABSKI, M. 1993. Reduction of food neophobia in humans by exposure to novel foods. *Appetite* 20, 111–123.
- PRESCOTT, J., BELL, G. 1995. Cross-cultural determinants of food acceptability. Recent research on sensory perceptions and preferences. *Trends in Food Science & Technology*, 6, 201–205.
- RAUDENBUSH, B., FRANK, R.A. 1999. Assessing food neophobia: the role of stimulus familiarity. *Appetite* 32(2), 261–271.
- ROZIN, P., HAMMER, L., OSTER, H., HOROWITZ, T. & MARMORA. 1986. The child’s conception of food: Differentiation of categories of rejected substances in the 1.4 to 5-year age range. *Appetite* 7, 141–151.

TOURILA, H., LÄHTEENMÄHI, L., POHJALAINEN, L., LOTTI, L. 2001. Food neophobia among the Finns and related responses to familiar and unfamiliar foods. *Food Qual Prefer.* 12(1), 29–37.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Green Bonds – Sustainable Finance Instruments

Karolina Daszyńska-Żygadło¹, Jakub Marszałek²

¹Institute of Financial Management, Faculty of Management, Computer Science and Finance, Wrocław University of Economics, 118/120 Komandorska Street, 53-345 Wrocław, Poland, e-mail: karolina.zygadlo@ue.wroc.pl

²Department of Finance and Strategic Management, Faculty of Management, University of Lodz, 22/26 Matejki Street, 90-237 Lodz, Poland, e-mail: jakub.marszalek@uni.lodz.pl

Abstract

Financial system has a key role in transition towards a more sustainable economic model. This transition requires large-scale investments in the economy. It also requires dedicated financial instruments. Sustainable finance opportunities for retail investors such as green bonds are the example of those instruments and they are attracting significant public interest. In this paper we analyze characteristics of green bonds, their issuers and purpose of issue. Major purpose of the paper is to provide evidence for differences in pricing and market execution risk with mainstream bonds on the basis of bond indexes performance analysis. Results show that green bond market is getting more sensitive towards changes on the broader market of conventional bonds which proves its growing maturity. Findings of this paper are significant from the perspective of providing informative insights for the investors risk and return characteristics. They also contribute to the development of sustainable finance and risk analysis of sustainable finance instruments.

Keywords: green bonds, sustainable finance, green finance, green bonds indexes

JEL Code: Q56, G15, G32, O16

1. Introduction

Sustainability meaning making economic prosperity long-lasting, more socially inclusive and less dependent on exploitation of finite resources and the natural environment is the theme of current times. The transition towards a more sustainable economic model requires large-scale investments in the economy. Ensuring that the financial system contributes to economic sustainability is particularly important after the shock of financial crisis. Sustainable finance is about improving contribution of finance to sustainable and inclusive growth as well as the mitigation of climate change, in first place. Secondly, it is to strengthen financial stability by incorporating environmental, social and governance (ESG) factors into investment decision-making. In Europe, the driving force is European

Commission and its various bodies. EU High-Level Group on Sustainable Finance (HLEG) had been established by European Commission to help develop an overarching and comprehensive EU roadmap on sustainable finance. Based on a report published at the beginning of 2018 by HLEG the following recommendations of priority actions can be listed: establishing an EU sustainability taxonomy, starting with climate mitigation, to define areas where investments are needed most; clarifying investor duties to extend the time horizons of investment and bring greater focus on environmental, social and governance (ESG) factors into investment decisions; upgrading disclosures to make sustainability opportunities and risks transparent; enabling retail investors to invest in sustainable finance opportunities; developing official European sustainability standards for some financial assets, starting with green bonds; establishing 'Sustainable Infrastructure Europe' to deploy development capacity in EU member states for infrastructure necessary for a more sustainable economy; and integrating sustainability firmly in the governance of financial institutions as well as in financial supervision.

Therefore, one could see that green bonds are focal point of financial instruments supporting sustainability transition. They are deliberately emphasized as financial instruments that should be promoted among retail investors and also instruments that require special attention in the scope of development of official European standards that will differentiate proper green bonds from all other bonds that use the green label without justification. Undoubtedly, green bonds already play an important role as source of financing for climate mitigation projects and the market is constantly growing and becoming more and more significant.

In the paper we analyze current trends and tendencies of the green bonds market, nature of the issuers. We draw attention to the growing recognition of that sector as the major instrument of sustainable finance. We also address characteristics of risk and return in order to provide informative insights for the investors. The main purpose of the paper is to answer the following research questions: what is the volatility of the green bond market in correspondence with the conventional bond market? How did it change in the period of analysis? What is the sensitivity of green bond market for the changes of conventional bond market? Are green bonds prone or immune to those changes? To answer these questions first we provide thorough analysis of characteristics and parameters of green bonds market. Next we provide analysis of volatility in the green bond market and sensitivity analysis based on beta coefficient.

The rest of the paper is organized as follows. Section 2 provides analysis of characteristics of green bond market. Section 3 presents the data, methodology and research results, while section 4 provides summary discussion of results and concludes.

2. Characteristics of green bond market

Common definition of a green bond provided by the World Bank says it is a “debt security that is issued to raise capital specifically to support climate-related environmental projects” (World Bank 2015). Green bonds are integral part and flagship financial instruments for sustainable finance, but also for green finance that aims to “internalize environmental externalities and adjust risk perceptions” while increasing environmentally friendly investments (G20 GFSG 2016). Green finance can support alleviating these externalities using market-based tools. Acting by increasing the flow of funds to environmentally beneficial projects, reducing their costs and in the same time increasing awareness of the financial risks related to climate change (Ehlers&Packer 2017) While one might

consider sustainable and green finance as interchangeable concepts, authors of this study perceive sustainable finance broader than green finance, which also encompass climate mitigation investments and strengthening financial stability by incorporating environmental, social and governance (ESG) factors into investment decision-making.

Recent years have shown an intense increase in green bonds market, but its history is relatively new. The very first bond of that type was issued by European Investment Bank in 2007 as “climate awareness bond”. Introduction of Green Bond Principles by the International Capital Market Association (ICMA) in 2014 is recognized as an accelerator for that market. In the same year first green bonds indices were also established. Various sources, including Thomson Reuters Eikon, Bloomberg and Climate Bonds Initiative, give slightly different values of aggregate issuance, authors that base their studies on Bloomberg report the value of issued labelled green bonds equal to \$216 bn until second quarter of 2017 and Climate Bonds Initiative \$234 bn accordingly (Ehlers&Packer 2017). In case of our sample obtained from Eikon respective value equals to \$220 bn. The discrepancy results from the way of categorizing the bonds.

Verifying the eligibility of green projects for financing by green bonds is not compulsory, it is based on the declaration of the issuer. Although, at the level of European Commission there are attempts to make a European certification body and official green bonds standards as suggested by HLEG (HLEG report 2018).

What is more, the market of unlabeled green bonds exists, i.e. bonds that are used to finance climate-aligned assets but do not carry a green label (where issuer generates over 95% of revenue from climate-aligned assets, thus all of these issuers are solely companies), according to CBI report from 2016, before 31st of May 2016 there were \$576 bn unlabeled climate-aligned bonds in correspondence to \$118 bn labelled green bonds (only 17% of all climate aligned bonds) (CBI State of the Market 2016).

Although the pace of growth of green bonds market is impressive if we put its size in the context of the overall value of the global bond market which is approximately \$90 tn (BIS Statistics 2016) it is rather insignificant. The important provision is that size and density of that market indicates that bonds are essential tool to finance the transition to a low-carbon economy. In that light International Energy Agency (IEA) findings are important – they indicate that cumulative investment of \$53 tn is required by 2035 in the energy sector alone while New Climate Economy estimates that \$93 tn of investment is required across the whole economy by 2030 (Better growth..., 2014) in order to meet obligations from Paris agreement and 2-degree scenario (CBI 2016).

For the purpose of this study data about green bonds were collected from the Thomson Reuters Eikon database, as of 30.01.2018. The sample consisted of 922 issues, of all active bonds, with the amount issued equal to \$284 bn and amount outstanding equal to \$281 bn. Even though all these bonds were labelled as green by their issuers, only in the case of 616 issues (67%) with the value of \$238 bn (84%) the reported use of proceeds could be considered as green according to GBP taxonomy. Solely in 2017 there were 314 new issues, with the amount issued equal to \$115.6 bn and amount outstanding \$115.2 bn. While in 2016 it was only 206 issues with a value of \$82 bn recorded in Thomson database. That confirms a constant rapid growth of that market with a year to year growth rate of approximately 40% based on the value of issued bonds. What is more, if we take into consideration only bonds that declare the use of proceeds related to green projects even higher growth could be observed equal to 50%, from \$64 bn to \$96 bn.

These observations are not identical due to differences in analyzed samples, but stay in line with other studies and findings about green bonds market development (Marszałek&Daszyńska-Żygadło 2016, Kuna-Marszałek&Marszałek 2017, Ehlers&Packer

2017). Additionally, the difference may arise from the fact that the data available in the financial databases refer only to active securities, therefore the bonds that matured or the issues that dropped out are subsequently excluded from the samples of more up-to-date studies.

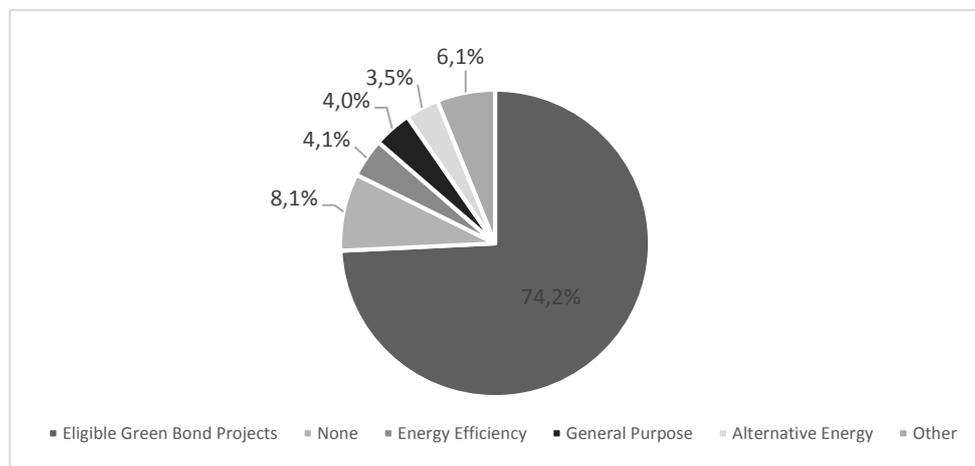


Figure 1: use of proceeds of the sample of green bonds

Source: own elaboration based on data from Thomson Reuters Eikon.

Figure 1 shows the structure of the use of proceeds of issued bonds taking into account amount issued in USD. The highest share belongs to eligible green bonds projects, but right afterwards the biggest group appears to be issued without declared purpose, also general purpose is as equally common as energy efficiency or alternative energy. Among other categories there is the whole variety of purposes connected directly with climate issues, such as land preservation, green construction, clean transport or sustainable water, but there are also acquisitions, refinancing, project finance or working capital.

Bonds with clearly stated purpose connected to green projects were selected (following GBP taxonomy) from the sample in order to indicate the most popular financing goals. Out of 922 green bonds series, 616 were identified, i.e. 67%. Within this subsample also eligible green bonds projects were dominant, having 88.6% of share, followed by energy efficiency (4.9%) and alternative energy (4.2%). Among other green purposes there were environmental protection projects, green construction, sustainable water, clean transport and land preservation. What is interesting, according to CBI market report from 2016, the dominant climate theme was low-carbon transport (67%) and energy (19%), which indicates that those two samples do not coincide and unlabeled bonds that are not included in the sample of this research are being used to finance the transport theme. It could also be the case that under the capacious category of eligible green bonds projects there are those connected with transport.

In the whole sample, 60% of financing was obtained by corporate issuers, i.e. 617 issues, accounting for \$170 bn of amount issued. While government and municipal bonds covered 22%, and agency 18% of the whole amount issued. Solely in 2017 similar structure was maintained, with even slightly higher share of corporate issuers (61%) and smaller share of state issuers (20%).

While one has to remember that the market was pioneered by large development banks in 2014. Increase in corporate issues along with launch of green bonds indices is more likely to attract a broad group of investors such as asset managers, pension funds, companies, foundations and religious organizations This confirms previous studies results of Kochetygova and Jauhari (2014) and Damutz (2016).

In our sample, more than 50% of the issuance holds investment grade (\$149 bn), only 5% is high yield (\$7 bn), and the rest (43%) had no grade (\$129 bn). One could observe that this result might be driven by increased share of investment grade bonds in 2017, equal to 78%, high yield having 7% of the share and remaining 15% without any grade. This shows a good tendency of issuers being more willing to obtain a grade through a rating agency in order to increase credibility of the bond. Only 19% of the amount issued was guaranteed (116 issues) versus 81% not guaranteed (790 issues), while for 1% of the sample there was no information about that parameter.

Within the investment grade bonds, average coupon was 2.34% (median 1.88%), and average yield to maturity was 2.31% (median 2.14%), most common maturity was 5 to 6 years (143 issues) and 9 to 10 years (81 issues). For bonds with high yield grade average coupon was three time higher than for investment grade bonds, equal to 6.08% (median 5.75%), while average yield to maturity was equal to 8.23% (median 7%). Average size of the issue for high yield grade was slightly smaller, \$0.47 bn (median \$0.5 bn) than for investment grade bonds, where the size of the issue was equal to \$0.56 bn (median \$0.5 bn). The subsample of high yield bonds consisted only of 35 issues, among which the most frequent maturity was 3 to 5 years (13 issues), but also 6 to 7 (9 issues). That indicates that high yield grade bonds were issued for shorter period of time than investment grade bonds. No grade subsample was almost the size of investment grade bonds, but the size of a single issue is much smaller, on average it was \$99 mn (median \$19 mn), with the smallest issue of \$10 thousands. Average coupon was relatively similar to investment grade bonds – 3.62% (median 3.63%) and yield to maturity being on average equal to 6.95% (median 5%). All together there were 496 issues without a grade, majority were issued for shorter period of time than other subsamples, it was 3 to 4 years for 130 issues and 5 to 6 years for 176 issues.

Majority of the green bonds were exchange listed. Out of 922 issues 605 issues were placed on stock exchanges amounting to \$268 bn, i.e. 94% of total value of all issues. Only in 2017 there 228 out of 314 issues place on stock exchanges (\$108 bn in comparison to \$115 bn value of all issues from 2017). Bonds were issued at 83 different stock exchanges. Only 25% (\$66 bn) was issued at single market, 15% (\$41 bn) at two or three stock exchanges simultaneously, 60% (\$160 bn) at more than three markets in parallel.

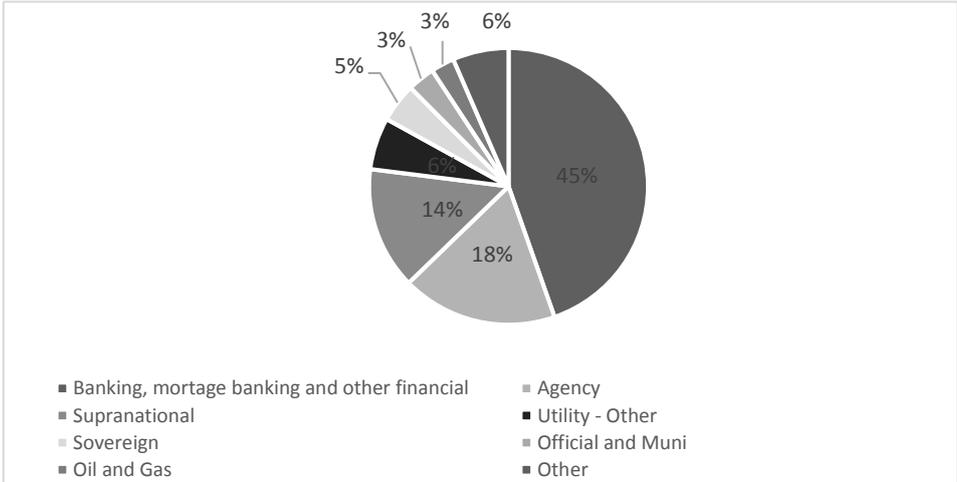


Figure 2: Issuers of green bonds according to sector based on the amount issued in USD
 Source: own elaboration based on data from Thomson Reuters Eikon.

Analyzing the whole sample in respect to sector of issuers (figure 2), we can observe that most common (dominant) issuers are still banks and financial institutions (45%) as well as agencies (18%), but it's interesting to see that after utility sector (6%), most probably running the alternative energy and energy efficiency project, oil and gas industry is entering green bonds market with 3% share in the amount issued.

That structure was mirrored in 2017, where all the financial institutions took a share of 50%, agencies 19%, but utility projects were only 3%, same as oil and gas sector, supranational institutions were clearly more active in previous years, because in 2017 their share was only 7%. Interestingly enough a sector called sovereign appeared to be quite active on the green bonds market in 2017 with a share of 10%. More in-depth analysis shows that the only contributor was the government of France that issued green bonds worth \$12 bn in this year with maturity of 22 years, for the purpose to finance eligible green projects.

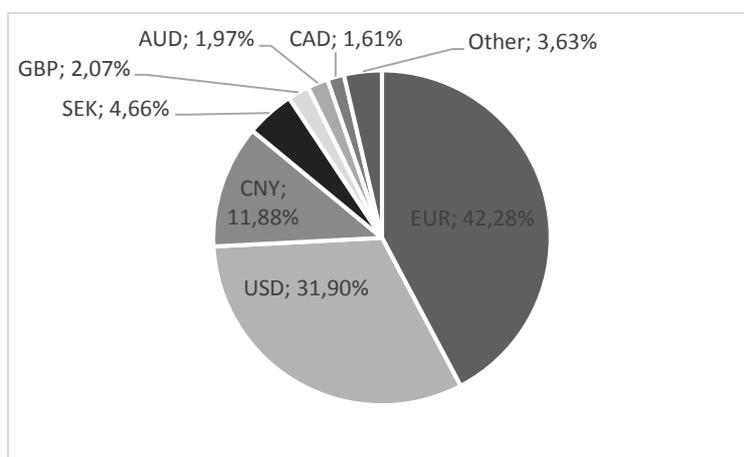


Figure 3: Range of currencies the green bonds sample is denominated in
Source: own elaboration based on data from Thomson Reuters Eikon.

Figure 3 presents the share of issues denominated in major currencies based on the amount issued in USD. In the whole sample bonds denominated in EUR were dominating the sample, mainly due to multinational consortia placing these securities on Eurobond Markets, followed by bonds denominated in USD, issued by banks and other financial institutions.

These two big groups of players are followed by very active, since 2016, Chinese issuers. Chinese yuan holds a share of almost 12% in the whole sample. These observations are confirmed in Marszałek&Daszyńska-Żygadło (2016) study and in Ehlers&Packer (2017) research, that in addition shows especially significant growth of green bonds issuance in emerging market economies (EMEs), particularly Chinese corporate entities. Solely in 2017 the proportions are maintained, including the fourth largest currency in place being Swedish Krona.

CBI report from 2016 also reveals that characteristics of all the bonds issued by companies to invest in green assets, but that weren't labelled as green are slightly different. Taking into account all the labelled and unlabelled green bonds CBI report shows that 35% of bonds are denominated in Chinese RMB, followed by 23% of bonds denominated in USD, only at the third place there were bonds issued in EUR (16%) being common currency for issuers in emerging and developed markets. That mismatch of proportions indicates the differences in perception of labelling bonds issued to finance green projects between markets. While for European and majority of EMEs issuers that place their issues

at Eurobond Markets it is important from the perspective of higher credibility and lowering costs of capital (YTM), it is not that important for Chinese entities that finance green projects.

3. Data, methodology and research results

As the green bond market continues to grow, it is important to understand the volatility dynamics of this market segment in relation with other sectors in the financial market and its sensitivity for the changes of other sectors. Along with this rapid development, indices are playing an important role in tackling the issues of some major barriers that institutional investors were facing in the past, especially a lack of understanding of the types of green bonds and lack of reliable and aggregated data about their risk and performance.

A number of rating agencies and financial institutions in collaborations have created indices to exclusively cover green bonds. The movement has started in 2014. The first green bonds index was launched by Solactive in March 2014. It was followed by S&P in July. Bank of America Merrill Lynch started with their index in October and MSCI in collaboration with Barclays launched their family of green bonds indices in November 2014 (GREEN BOND PRINCIPLES 2017).

These indices play important role in driving demand for green bonds among institutional investors and are a sign of the market's growing maturity.

According to availability of data in databases that authors' universities have access to, namely Thomson Reuters Datastream and Eikon, Solactive Green Bond Index (SOL-GREEN) was chosen for further analysis. It is a rule-based, market value weighted index with the maximum weight capped at 5% per bond, calculated as total return index denominated in USD. Solactive trusts the judgment of Climate Bonds Initiative (CBI) and follows the criteria provided by CBI in order to select bonds for the inclusion in the index. The minimum amount outstanding has to be of at least USD 100 million. Final Maturity must be no later than in 6 months prior inclusion. The index include inflation linked bonds, convertible bonds and municipal bonds. It is being rebalanced on a monthly basis at the end of each month, five working days before month end. As of 3rd of May 2017 the index included 205 bonds, currently on the date of paper preparation (20.02.2018) it included 328 bonds. Among which 40% (132 bonds) were issued by banks, 37% (121 bonds) were issued by corporations, and remaining 23% (75 bonds) were issued by governments and municipalities. That structure reflects the structure of the labelled green bonds market. Increase of the number of bonds included in the index could also be recognized as an argument of growing demand and growing market of green bonds.

Daily logarithm rate of returns of the index are plotted on the chart presented at figure 4.

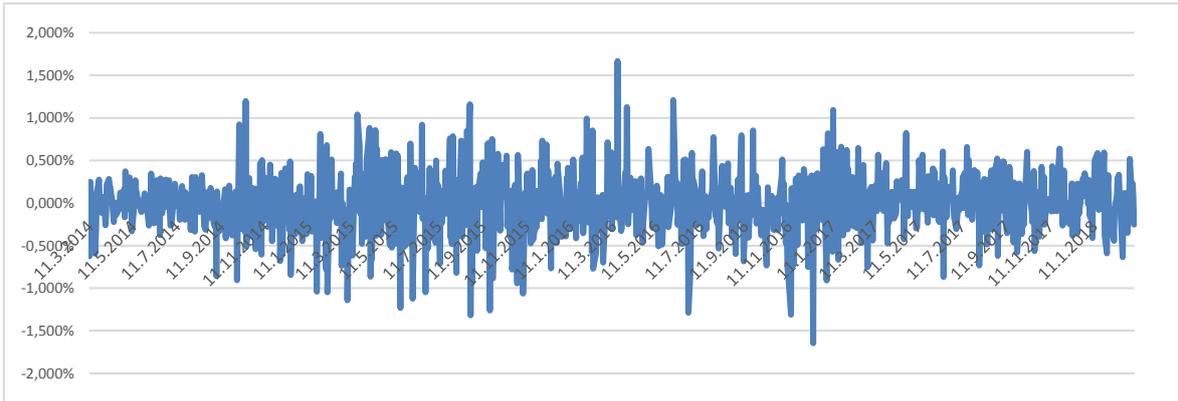


Figure 4: Daily rates of return of Solactive Green Bond Index
Source: own elaboration.

In order to provide evidence supporting increasing recognition of green bonds and rising significance of those instruments as sustainable finance instruments analysis of performance of that index was conducted in correspondence with the broadest and universal bonds index that is provided by Solactive (MVIS EM Aggregate Bond (TR Net)) that is used as a benchmark. Daily logarithm rate of returns of the index are plotted on the chart presented at figure 5.

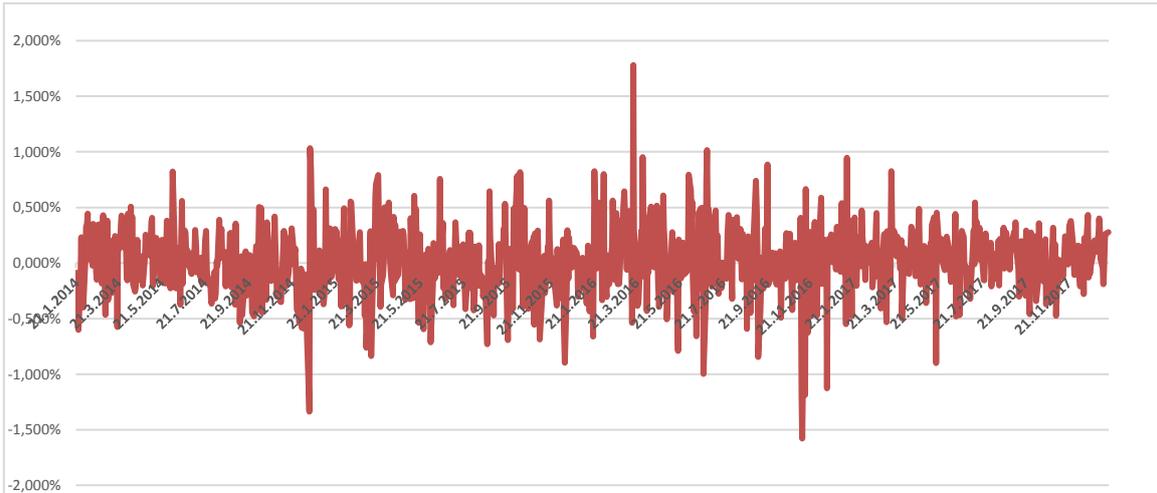


Figure 5: Daily rates of return of MVIS EM Aggregate Bond Index provided by Solactive
Source: own elaboration.

First of all, volatility was measured by standard deviation on the basis of daily logarithmic rates of return calculated for the period between March 2014 and January 2018 of both indices. The yearly results are plotted on figure 6.

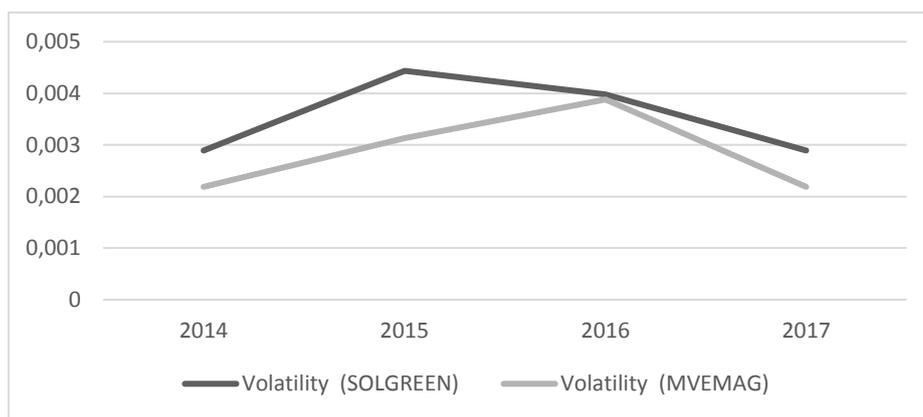


Figure 6: Yearly volatility of Solactive Green Bond Index and MVIS EM Aggregate Bond Index
Source: own elaboration.

One could observe that volatility of green bonds index grows stronger and faster than the aggregated bonds index, it also follows the declining pattern, but still is maintained at a higher level than aggregated bonds index, even though the differences are very minor, it indicates that risk of investing in green bonds index is slightly higher than of the aggregated one.

In order to analyze the sensitivity of green bonds index for the changes of the broader conventional bonds index we estimated beta coefficients, based on the following equation:

$$\beta = \frac{cov_{im}}{V_m}$$

Where: cov_{im} – covariance of the rate of return of green bonds index and the broad conventional bonds index, V_m – variance of broad conventional bond index.

Similarly, as volatility, betas were estimated on the basis of daily logarithmic rates of return calculated for the period between March 2014 and January 2018. In order to reduce, to some extent, the bias of reported daily betas lower than they really should be for illiquid securities, and for liquid securities reporting higher betas than justified, as Damodaran (1999) argues, we decided to use 60-day rolling betas.

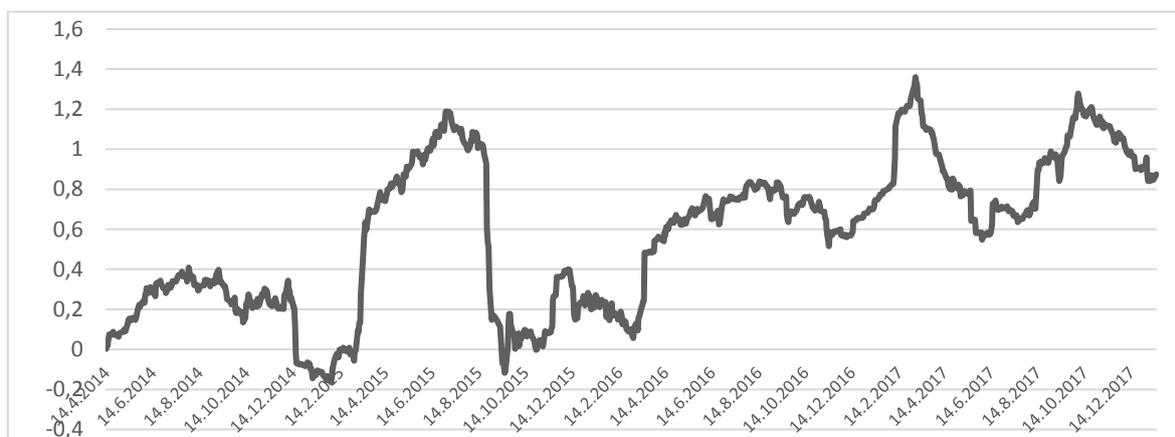


Figure 7: 60-days rolling beta coefficients of Solactive Green Bond Index in reference to MVIS EM Aggregate Bond Index
Source: own elaboration.

One could see that there is continuing trend of increasing sensitivity of Green Bond Index over changes in aggregated index (figure 7), the closer the result was to 0 the more immune the Green Bond Index was to changes of aggregated bond index. After rapid growth in 2015, where 1 indicates exactly the same reaction of green bonds index to changes in aggregated bonds index there was a downturn trend, followed by slow but sustainable increase back to results oscillating around 1. It indicates that along with the development of green bonds market the Solactive Green Bond Index reflects reactions on the changes on overall bonds market. That might also be interpreted as more active trading on the green bonds markets by bigger group of investors. In result that would confirm the thesis about higher recognition of these securities on the market. Growing value of beta and results above 1 also indicates that the risk of investing in the green bond index is increasing and at the end of analyzed period is not immune to changes of the overall bond index, therefore the risk of investing in green bond index is at similar level as the risk of the conventional bond index.

To conduct robustness test we verified our results based on 120-day rolling betas, our findings are plotted on the chart presented at figure 8.

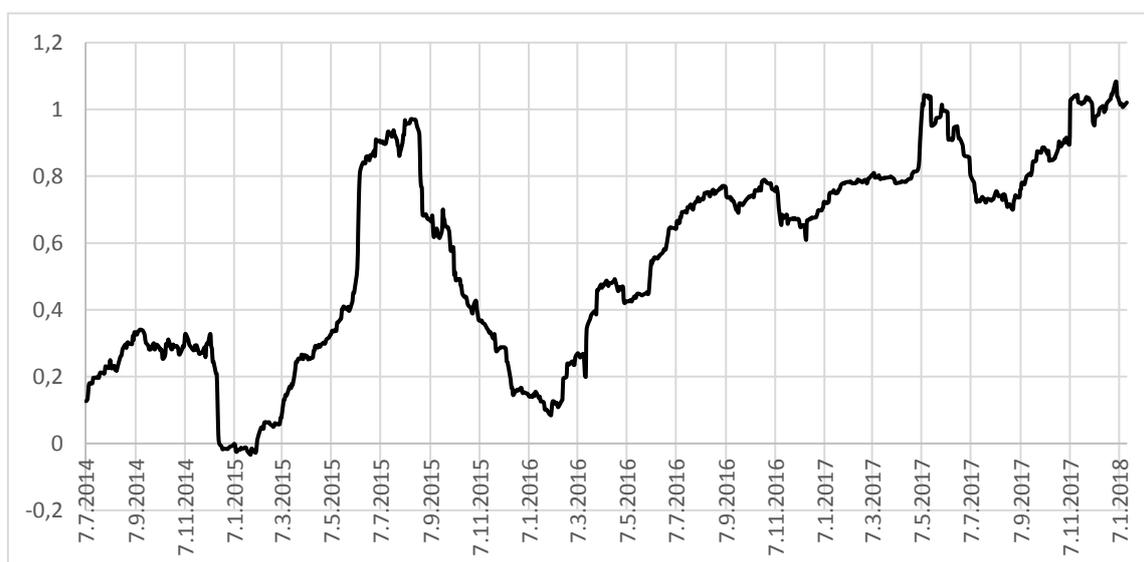


Figure 8: 60-days rolling beta coefficients of Solactive Green Bond Index in reference to MVIS EM Aggregate Bond Index

Source: own elaboration.

Results obtained on the basis of a different time interval reveal exactly the same tendencies in beta behavior, and changes in similar scope. Therefore, they confirm previous findings. One important observation is that using longer time interval leads to results that are more normalized and range of changes is smaller. The highest beta is only slightly higher than 1, while for the 60-day it reaches the result of 1.4.

Both ways of calculations show growing value of beta and results above 1. It indicates increasing risk of investing in the green bond index and at the end of analyzed period no immunity to changes of the overall bond index, therefore the risk of investing in green bond index is connected with the similar level of risk as the conventional bond index.

4. Discussion and Conclusions

Findings of this paper confirm that the market of green bonds is developing in a constant and rapid pace. The dominant sector is still financial institutions, mainly banks. Currency that green bonds are being denominated in is EUR in significant majority of labelled green bonds issues. While looking at the climate aligned bonds without a green label the picture changes a lot. In such a case dominant position is taken over by Chinese investment projects in green assets.

Following Pahn (2017) it could be stated that with the growing awareness of environmental issues among investors and the general public, the determination to mobilize the global debt market as a low-cost and long-term financing instrument for a green economy is very strong and increasing. Green bonds are crucial instruments of sustainable finance, having a lot of attention and support from European Union institutions.

Our findings regarding the volatility of green bonds market in correspondence with a broader market of conventional bonds stay in line with findings of Pahn (2017).

Research results of this paper also show that sensitivity of green bonds market towards changes in conventional bonds market measured by beta coefficient between Solactive Green Bond Index and MVIS EM Aggregate Bond Index is increasing and oscillating around 1 in the recent period of analysis after the time when it was almost independent and not sensitive to changes of the benchmark. It indicates growing maturity of green bonds market as well reaching the risk comparable to conventional bonds market.

Implications for investors and policymakers resulting from this study could be drawn in few categories. First of all, investors could use these results as an indication to construct optimal risk-minimizing portfolio mix between green bonds and conventional bonds. Although changes of sensitivity shown in the studied period indicate that updating of the optimal portfolio mix would be required on a frequent basis. Additionally, due to the fact that risk and returns of both green and conventional bonds are becoming more and more similar, it is important for the issuers to introduce stronger differentiating strategies in order to attract investors. In the light of previous findings about the relatively small size of green bond market (BIS Statistics 2016) and its characteristics as well as huge demand for large scale investment in projects that would support the transition of economy towards more sustainable model (Better growth..., 2014) it is highly recommended to stimulate the investors' awareness in order to allow green bond market to reach wider group of investors. More consistent green bonds standardization across jurisdictions as suggested in HLEG report (2018) could help to further develop the market (Ehlers and Packer, 2017).

Future research could extend the scope of the study by verifying conclusions drawn on the basis of analysis of one green bond index on various green bond indices. Also using different methods of analysis, such as studying conditional volatility and clustering of volatility, could be valuable in order to support findings of this paper. Additionally, it would be worth analyzing not only the attractiveness of green bonds for investors and the risk they carry, but also the climate impact the projects financed by green bonds issuance have.

References

- BETTER GROWTH, BETTER CLIMATE: THE NEW CLIMATE ECONOMY REPORT. 2014. Chapter 6. Finance. Available at: <http://newclimateeconomy.report/2014>. [Accessed: 8 February 2018].

- BIS Quarterly Review. 2016. Annexes, BIS Statistics – Charts, June. Available at: https://www.bis.org/publ/qtrpdf/r_qt1606_charts.pdf. [Accessed: 8 January 2018].
- BONDS AND CLIMATE CHANGE. THE STATE OF THE MARKET IN 2016. Climate Bonds Initiative. Available at: <https://www.climatebonds.net/resources/publications/bonds-climate-change-2016>. [Accessed: 10 January 2018].
- DAMODARAN, A. 1999. Estimating Risk Parameters. S-CDM-99-02, Credit and Debt Markets. Available at: <http://hdl.handle.net/2451/26789>.
- DAMUTZ, T. 2016. Financing Sustainable and Innovative Initiatives. Sparkling Sustainability and Innovation Conference Paper, North Carolina State University.
- EHLERS, T. and PACKER, F. 2017. Green bond finance and certification. *BIS Quarterly Review*: 89–104.
- FINANCING A SUSTAINABLE EUROPEAN ECONOMY. Final Report 2018. High-Level Expert Group on Sustainable Finance.
- G20 GREEN FINANCE STUDY GROUP. 2016. Green finance synthesis report 2016, September.
- GREEN BOND PRINCIPLES. 2017. The GBP Databases and Indices Working Group – Summary of Green Fixed Income Indices Providers, June.
- INTERNATIONAL CAPITAL MARKET ASSOCIATION. 2017. Green Bond Principles, 2 June 2017. Available at: <https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp>. [Accessed: 8 January 2018.]
- KOCHETYGOVA, J. and JAUHARI, A. 2014. Climate Change, Green Bonds and Index Investing: The New Frontier. Technical Report, McGraw-Hill Financial. Available at: <http://us.spindices.com/documents/research/research-climate-change-green-bonds-and-index-investing-the-new-frontier.pdf>. [Accessed 8 January 2018].
- KUNA-MARSZAŁEK, A. and MARSZAŁEK, J. 2017. Some considerations on the green bonds market development. Proceedings of the 14th International Scientific Conference European Financial Systems 2017, Masaryk University, Brno: 458–465.
- MARSZAŁEK, J. and DASZYŃSKA-ŻYGADŁO, K. 2016. Charakterystyka globalnego rynku obligacji klimatycznych. In: *Finanse, Rynki Finansowe, Ubezpieczenia* nr 4/2016 (82), part 1: 945–955.
- PHAM, L. 2016. Is it risky to go green? A volatility analysis of the green bond market. *Journal of Sustainable Finance & Investment*, 6:4: 263–291, DOI: 10.1080/20430795.2016.1237244.
- WORLD BANK. 2015. Innovative Finance for Development Solutions. Technical Report. Washington, DC: World Bank Treasury Department. Available at: <http://sitersources.worldbank.org/CFPEXT/Resources/IF-for-Development-Solutions.pdf>. [Accessed 10 January 2018].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Development of FinTech financial innovation sector – an opportunity or a threat to people employed in banking?

Mateusz Folwarski¹

¹Department of Banking, Faculty of Finance and Law, Cracow University of Economics, Rakowicka 27, 31 510 Cracow, Poland, e-mail: mateusz.folwarski@uek.krakow.pl

Abstract

FinTech financial innovation sector is in the third – the most dynamic development phase. EU directives i.a. PSDII and the activities promoting non-cash trading enable FinTech sector companies to cooperate extensively with banks within financial services distribution. The development of the FinTech sector will substantially reduce the costs of banking operations. The largest financial institutions in the Czech Republic and Poland face numerous challenges that, if properly used, may affect the achievement of lasting competitive advantages in the financial market. The cooperation of banks with FinTech companies will lead to a redefinition of banks strategies. For this purpose, banks will most likely limit the level of employment in their branches and even further promote online and mobile banking. In 2011-2016, in the largest banks in the Czech Republic and Poland the increase in the number of people employed in these institutions depended on i.a. the increase in the size of the bank and financial result. In 2018-2020, despite the increase in the total assets of banks and the improvement of the financial result, employment in the banking sector may be limited.

Keywords: FinTech, Banks, CE countries,

JEL Code: G21

1. Introduction

FinTech (Financial Technology) is a sector of companies that use modern IT technologies in the financial market. They offer their services to the financial sector, consisting of the subsectors: banking, insurance, Asset management and capital markets, capital raising and personal finance, payments, data and analytics, cybersecurity and other software. Financial services through the development of this market can reach consumers using modern distribution channels. Financial institutions, which initially did not support the development of this market, currently note more and more positive aspects that can significantly affect the efficiency of their operations. The dynamic development of this market is

a challenge for market supervisors and institutions creating the financial security network. The FinTech market creates opportunities for dynamic development of the entire financial market, but also has numerous barriers that can significantly affect its development.

The aim of the study is to present the level of FinTech market development in the Czech Republic and Poland and to identify variables affecting employment level in the largest banks operating in these markets. Numerous literature and panel studies were used to fulfil this aim.

2. FinTech market in the Czech Republic and Poland – directions of development

The financial market in the countries of Central and Eastern Europe is especially open to modern solutions within financial services development. The dynamic development of online and mobile banking, as well as the functionality of payment cards (including online payments using cards, proximity and contactless payments, cashback), lead to the interest of financial institutions in CEE countries with innovative IT solutions. The FinTech sector has been developing since 1866 (Table 1).

Table 1: Classification of FinTech eras

| Range | 1886–1967 | 1968–2008 | 2009–Present | |
|--------------|-----------------|-------------|-----------------|----------------------------|
| Era | FinTech 1.0 | Fintech 2.0 | Fintech 3.0 | Fintech 3.5 |
| Geography | Developed world | Global | Developed world | Developing world |
| Key players | Infrastructure | Banks | Startups | |
| Shift origin | Globalization | Technology | 2008 crisis | Financial Market reform |

Source: Douglas W. Arner, Janos Barberis, Ross P. Buckley, Fintech and regtech in a nutshell and the future in a sandbox, CFA Institute Research Foundation, s.4.

In a generous sense of term, FinTech encompasses companies that simply provide the technology (such as software solutions) to financial service providers (Dorfleitner, Hornuf, Schmitt, Weber, 2017). The development of financial system infrastructure in these countries and relatively low hourly gross labour costs (in Poland EUR 8.4, the Czech Republic EUR 9 – the EU average EUR 24.6), provides the opportunity to create significant competitive advantages in these markets. Banks in Poland and the Czech Republic are characterized by modern solutions compared to other European banking sectors. In these markets technology is very well developed in the field of offering card and mobile payments, which thanks to their advancement can be an example of the development of this market segment for western European countries. That is why we talk more and more often about “FinTech banks” or “FinTech at banks” in Poland, and the most innovative banks treat themselves as part of the FinTech sector (FinTech w Polsce, 2016). Nevertheless, the management also sees a number of threats related to the development of this market. According to surveys, 43% of the management say that FinTech companies pose a serious threat to banks activity (World FinTech report, 2017). It is worth mentioning that the development of technology can significantly affect the employment level in the banking sector. The reorganization of traditional bank branches and the creation of modern, automated banking outlets can significantly reduce the number of people employed in the banking sector.

The FinTech market development will certainly in a significant way:

- reduce the level of costs in financial institutions,
- create the opportunity to stand out in the market,
- enable clients to be maintained in financial institutions,
- create additional revenues for the financial sector.

According to the PWC (Banki i Fintechy, 2016) report, with regard to the development of the FinTech market, by 2020, the biggest change will affect individual (personal) banking sector and the form of money orders and payments (including through the development of payment systems – enabled by the PSDII directive) (Figure 1).

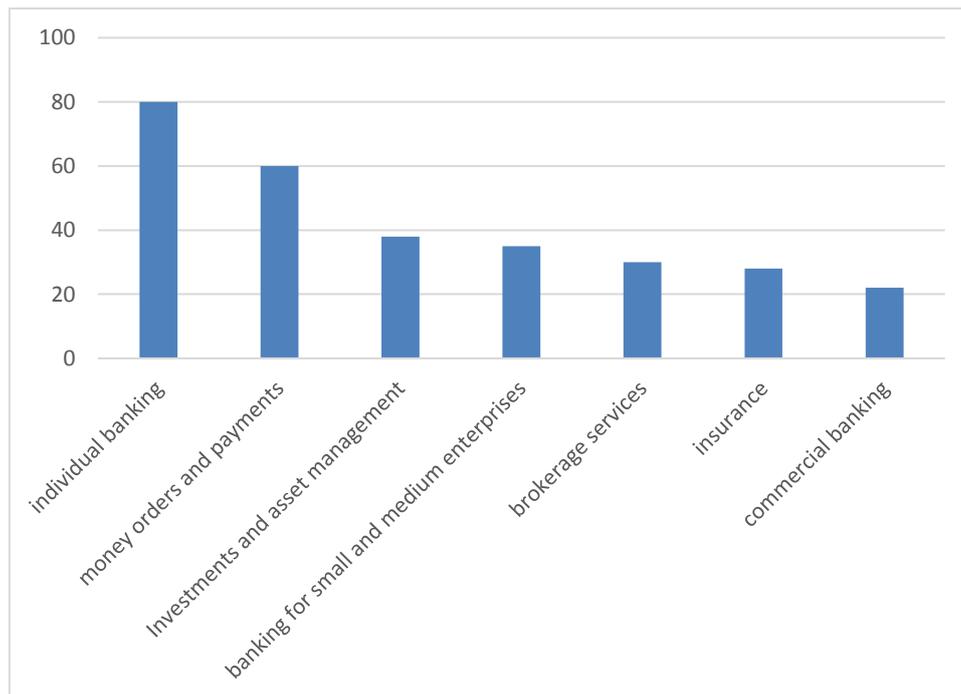


Figure 1: Figure caption

Source: own study based on PWC, Banki i Fintechy, s.18.

According to the Deloitte report (FinTech in CEE, 2016), the FinTech market in all CEE countries is valued at over EUR 2.2 billion. The largest markets in the analysed area of Europe are:

- FinTech market in Poland – EUR 856 million,
- FinTech market in Austria – EUR 588 million,
- FinTech market in the Czech Republic – EUR 190 million.

The FinTech market in Poland and the Czech Republic will grow dynamically in the coming years. Financial institutions in these countries will be interested in maintaining the clients they own and attracting innovative clients, including the so-called. Millenians who are interested in modern solutions within technology used in finance. In recent years, the symbol of innovation in the financial services market in Poland and the Czech Republic was the dynamic development of the payment card market and their functionality. According to Visa Europe data, in the Czech Republic there are 3.3 proximity transactions carried out monthly per capita, whereas in Poland 2.4 transactions.

Nevertheless, according to the Recent trends report in banking (Recent trends report, 2017), Western European countries are definitely more developed (in terms of digital transformation and the use of modern technologies) (Table 2)

Table 2: % of TOP 5 Banks in given country offering digital sales*

| | Internet channel | | | Mobile channel | | |
|----------------|------------------|-----------|-------------|----------------|-----------|-------------|
| | Overdraft | Cash loan | Credit card | Overdraft | Cash loan | Credit card |
| Poland | 40 | 100 | 100 | 40 | 20 | 20 |
| Czech Republic | 40 | 60 | 40 | 40 | 40 | – |

Notes: *Including sales through digital channels which require signature on documents delivered by courier.

Source: Recent trends in banking, Deloitte, p. 26.

Innovations in the instant payments market can have a significant influence on the development of this type of payment market. The Bank of England decided on a revolutionary step in terms of the functioning of payment systems in July 2017 (Bank of England, 2017). Its decisions led to the fact that non-bank payment institutions have the option of setting up settlement accounts. This may result in making external transfers in the near future with the use of non-bank payment institutions without the intermediation of banks. It is worth noting that in Poland, the ordinance of the Finance and Development Minister of July 2017 (Rozporządzenie MFiR, 2017) allows national payment organizations that are not banks to apply to the NBP for a bank account number – the clients they serve. Such actions of market regulators and dynamic development of innovations – especially FinTech market may lead to significant changes in the functioning of systems and payment schemes, and the PSDII directive implemented in EU countries can only develop this market.

Among the barriers to the development of financial innovations in the FinTech market it can be mentioned:

- unclear legal regulations,
- general lack of knowledge among potentially interested entities in this sector,
- lack of policy to stimulate the financial innovation development in Poland,
- lack of supervisory cooperation with market participants,
- lack of incentives of a fiscal nature.

The work of the team for the development of financial innovation (FinTech), operating at the Polish Financial Supervision Authority, led to the identification of as many as 85 barriers – a significant discouragement to the development of this market in Poland. The largest number of barriers has been identified in the area of implementation of the PSD II Directive and the MIFID II Directive (Raport z prac zespołu, 2017). All opportunities and threats posed to financial institutions can significantly improve their financial results and numerous indicators, e.g. cost to income relation. However, this will happen at the expense of limiting employment in traditional bank branches – which will be less and less often used to sell banking services.

3. The situation of the largest banks in the Czech Republic and Poland in the domestic banking market

The banking sector in the Czech Republic and Poland is one of the best developed banking markets in the countries of Central and Eastern Europe. The analysis of the situation of banks in domestic sectors included four largest institutions operating in the banking market. In the Czech Republic, the largest banks in terms of total assets belong to foreign capital (CEE Banking sector report, 2017):

- CSOB – (Belgian KBC group) – 17.7% – market share,
- CS – (Austrian ERSTE group) – 16.8% market share,
- KB – (French SG Group) – 14.6% market share,
- UniCredit (Italian group) – 10.3% market share.

The four largest banking groups in the Czech Republic have nearly 60% of the entire sector assets.

In Poland, the largest banks in terms of total assets in 2016 were:

- PKO BP SA – (State Treasury) – 16.7%,
- Bank PEKAO SA (in 2016, the Italian Unicredit group – currently the State Treasury) – 10.2%,
- Bank Zachodni WBK SA (Spanish group Santander) – 7.7%,
- mBank SA (the German Commerzbank group) – 7.5%.

The four largest institutions in Poland in 2016 had over 42% share in the entire banking market. The State Treasury was a strategic investor only in PKO BP SA bank among the analysed institutions. It is worth emphasizing, however, that as a result of numerous changes in the banking market in Poland – bank repolonization, a large part of the sector has been nationalized and the State Treasury has an increasingly larger share in the Polish banking sector (including the purchase of PEKAO SA bank from the Italian UniCredit group).

The largest banking groups in the Czech Republic and Poland are presented in Figure 2. All analysed banks in 2016 had larger assets than in 2011. Among the analysed banks, PKO BP SA bank stands out definitely in terms of its size, which in 2016 had total assets exceeding EUR 64 billion. The largest banks in the Czech Republic (CS and CSOB) have assets of around EUR 40 billion.

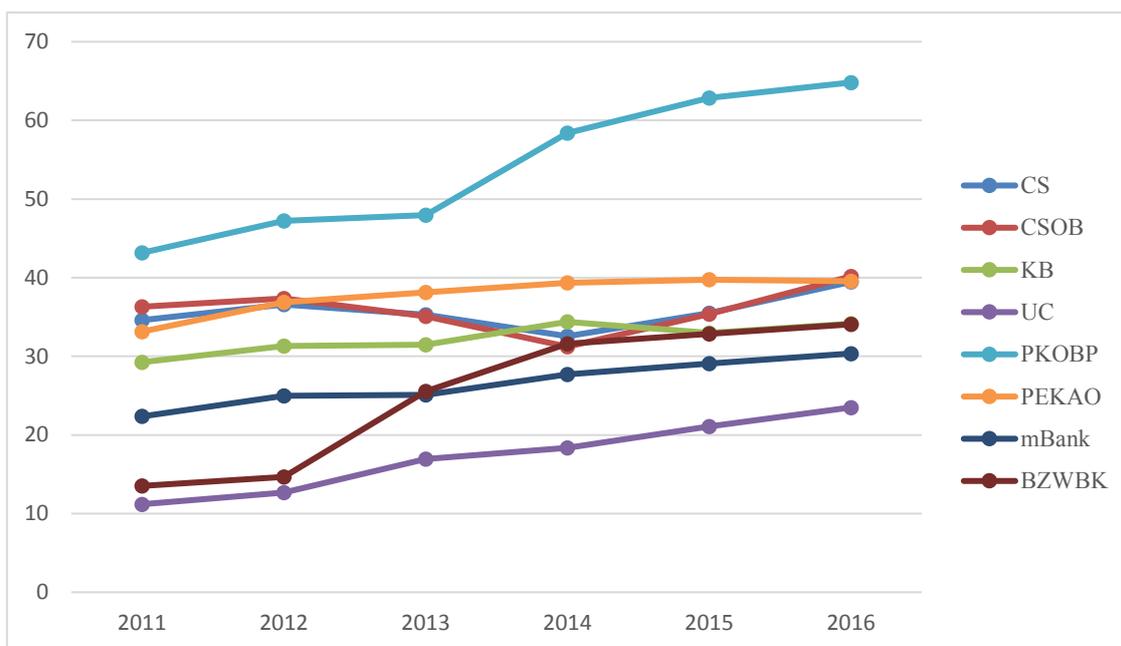


Figure 2: total assets (mld euro)
Source: own study.

The development of the FinTech market can significantly affect the level of costs related to running banking operations – significantly limiting them. The cooperation of banks with companies from this sector may affect the modernization of financial services distribution channels. This should result in a decrease of the cost to income indicator, the level of which in the analysed banks was presented in Figure 3. The two largest banks in the Czech Republic have a relatively low C/I level (about 48%). In turn, the two largest banks in Poland have a high level of this indicator (about 56%) – which may suggest that Czech banks better manage the relation of the income earned to the costs incurred in banking operations. It is worth emphasizing that in the largest banks in Poland in 2015–2016 the level of this indicator has increased significantly, which may be caused by:

- problems of the parent company of PEKAO SA bank (Unicredit group),
- numerous takeovers by PKO BP SA bank,
- introduction of a bank tax in Poland (0.44% of total assets),
- increasing the capital requirements for banks.

Introducing financial innovations in the FinTech market should significantly reduce the costs of banking operations – and thus increase bank profits. However, a decline in employment in the banking sector can be a very significant social cost of this market development. Financial innovations may encourage banks to distribute banking services through modern distribution channels (e.g. internet banking, mobile banking), and closing traditional bank branches. Therefore, a significant number of people who are employed in the so-called branch banking may be dismissed. It is also worth emphasizing that the decrease in employment in the banking sector may be affected by numerous mergers and acquisitions in the banking market. Analysing the employment level in the largest banks in the Czech Republic and Poland (Figure 4), there is no downward trend in the number of people employed in the largest banks. However, these are data until 2016. In 2017, the implementation of numerous EU regulations (including the PSDII directive) started, while companies from the FinTech sector began a dynamic development in the

banking market. In addition, noting significant consolidation of the banking sector in Poland (at the end of 2017, 35 commercial banks carried out activities, in 2011 – 49 commercial banks), a significant drop in the number of people employed in the banking sector can be expected. It is also worth emphasizing that the promotion of non-cash transactions in both countries will have a significant impact on this situation.

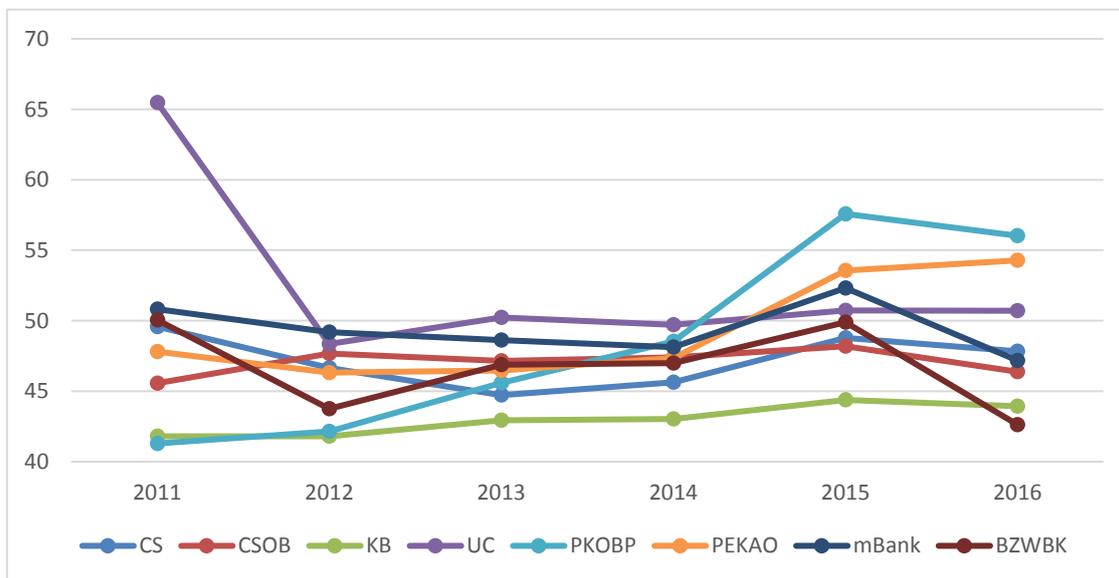


Figure 3: cost to income %
Source: own study.

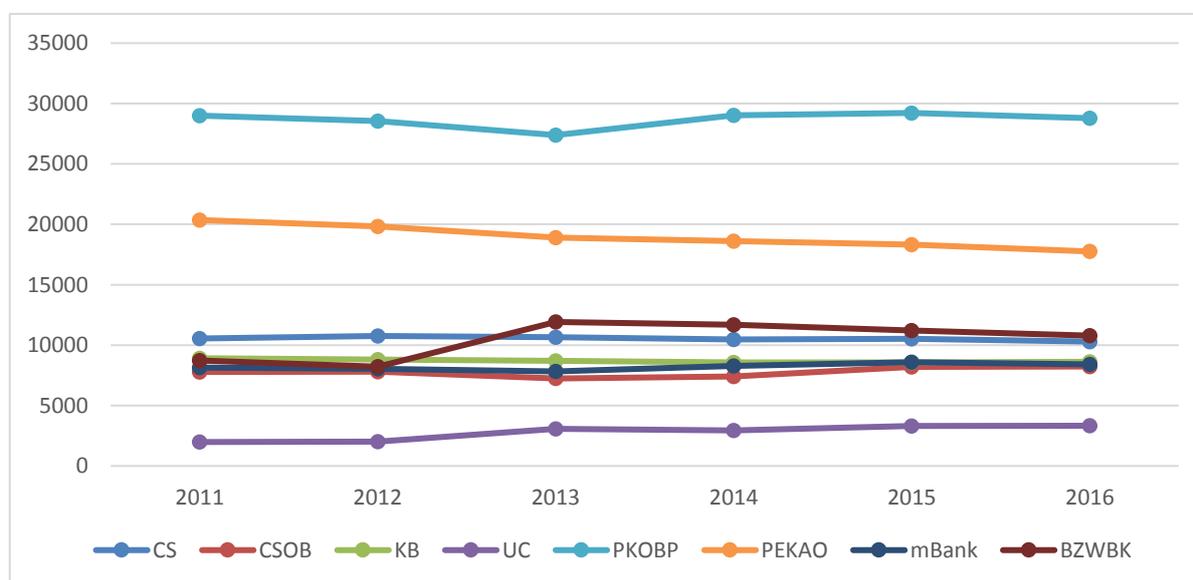


Figure 4: number of employees.
Source: own study.

4. Methodology and Data

The level of people employed in the banking sector is a particularly important element on which the development of banking will have a clear impact. Therefore, in the panel study an attempt was made to answer the question what factors affect the number of people employed in the largest banks in the Czech Republic and Poland. The number of people employed in banks was established as an explanatory variable. Multiple regression was used to verify determinants affecting the number of employed persons in banks. Statistical data describing multiple regression are panel data. The weighted least squares method formulated by Gauss and developed by Markov was used showing the results of regression. The estimation was made using the “gretl” program. Multiple regression makes it possible to present some quantities in the form of a logarithm – to avoid excessive variation. Such an option was used at the response variable – the number of people employed **lnLZ**, and explanatory variables – total assets **lnSA** and the net financial result **lnWF**. The response variable in the model was the number of people employed in banks **lnLZ**. Various explanatory variables were chosen to determine the impact of selected variables:

- macroeconomic variable: **GDP** – the rate of economic growth measured by the change in the value of GDP at constant prices in the country
- microeconomic variables: the bank size, measured by the value of **lnSA** assets, the efficiency of action measured by average return on equity **ROE**, the share of costs in income **C/I**, gross profit margin **PM** and net interest margin **NIM**, net financial result, as profitability of the business – **lnWF**, and the capital adequacy ratio as the level of bank security – **SR**.

The significance of all variables is presented with the assumption of *ceteris paribus*.

Table 3: The research results

| Variable | Factor | Value p | Significance |
|-------------------------------|---------------|----------|--------------|
| ree term | -20.4572 | <0.00001 | *** |
| PM | -0.0399 | <0.00001 | *** |
| NIM | -0.0596 | 0.48168 | |
| CI | -0.0033 | 0.66236 | |
| ROE | 0.0292 | 0.11659 | |
| SR | 0.0946 | 0.00036 | *** |
| lnSA | 0.5188 | 0.07854 | * |
| lnWF | 0.8843 | 0.00125 | *** |
| GDP | 0.0435 | 0.00040 | *** |
| R² | 0.9717 | | |
| Adjusted R² | 0.9659 | | |

Source: own research.

5. Results

As a result of the conducted research (table 2), it was concluded that the employment in the largest banks in the Czech Republic and Poland in 2011–2016 depended on several variables. The macroeconomic variable of GDP growth characterizing the country economic development positively influenced the increase in the number of people employed. Similarly, microeconomic variables such as – an increase in the total assets of the bank and the bank financial result caused an increase in the number of people employed in

these banks. In addition, the increase in the solvency ratio also promoted employment growth. In the case of a decline in the gross margin, the number of people employed in banks also decreased.

The above trends characterized the impact of variables on the number of people employed in the largest banks in the Czech Republic and Poland in 2011–2016. The development of the FinTech financial innovation sector and other activities promoted by market regulators will certainly have a positive impact on the growth of banks total assets and their financial results. However, the development of this market may be connected with a significant reduction in the number of people employed in banking – especially in 2017–2020.

6. Discussion and Conclusions

The development of the FinTech market is inevitable. Changing the preferences of financial institution clients – towards more complex, innovative banking services, favours the development of companies from the financial innovation sector. As a result of regulatory changes (including the PSDII directive), banks must adapt to the new law and start deeper cooperation with companies offering financial innovations. In the absence of cooperation between the bank and these companies – banks may in the future be only a place to store cash. All other operations will be carried out by companies from the FinTech sector. In the face of these changes and forecasts determining a significant increase in the FinTech sector, banks will limit employment in their institutions. Modern distribution channels of banking services will force banks to redefine their strategies. Therefore, many traditional banking branches (employing over a dozen people) will be replaced by the so-called bank kiosks – located in large groups of people – e.g. shopping centres. Modern channels of banking services distribution – e.g. mobile banking, will lead to the fact that the sale of banking services in traditional branches will be marginalized. As a result of shifting the distribution channel to electronic banking, banks will significantly reduce the costs associated with the sale of banking services, i.a. by limiting the employment. In addition, it is promoted by e.g. the governments of countries, non-cash transactions, which already leads to the resignation of cash transactions at a bank branch by banks operating in the Czech Republic and Poland.

References

BANKI I FINTECHY – MAŁŻEŃSTWO Z ROZSĄDKU. 2017. PWC.

BANK OF ENGLAND EXTENDS DIRECT ACCESS TO RTGS ACCOUNTS TO NON – BANK PAYMENT SERVICE PROVIDES. 2017. [http://www.bankofengland.co.uk/publications/Pages/news/2017/048.aspx?utm_source=Bank+of+England+update%20es&utm_campaign=ae79ae4f87EMAIL_CAMPAIGN_2017_07_19&utm_medium=email&utm_term=0_556dbefcdc-ae79ae4f87-111037245].

CEE BANKING SECTOR REPORT. 2017. Raiffeisen Bank International, Vienna.

DIRECTIVE 2014/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.

DIRECTIVE (EU) 2015/2366 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

DORFLEITNER G., HORNUF L., SCHMITT M., WEBER M. 2017. *Fintech in Germany*. Springer.

ARNER, D. W., BARBERIES, J., BUCKLEY, R. P. 2017. *Fintech and regtech in a nutshell and the future in a sandbox*, CFA Institute Research Foundation.

FINTECH W POLSCE, BARIERY I SZASNE ROZWOJU. 2017.
[http://fintechpoland.com/wp-content/uploads/2016/12/FinTech_w_Polsce_bariery_i_szanse_rozwoju.pdf].

FINTECH IN CEE, CHARTING THE COURSE FOR INNOVATION IN FINANCIAL SERVICES TECHNOLOGY. 2016. Deloitte.

RECENT TRENDS IN BANKING. 2017. Deloitte.

ROZPORZĄDZENIE MINISTRA FINANSÓW I ROZWOJU, z dnia 10 lipca 2017 roku, w sprawie identyfikatorów i numerów rozliczeniowych nadawanych niektórym dostawcom usług płatniczych oraz unikatowych identyfikatorów nadawanych rachunkom płatniczym prowadzonym przez tych dostawców, Poz. 1360.

SEKTOR FINANSOWY CORAZ BARDZIEJ FINTECH. 2016. PWC.

WORLD FINTECH REPORT. 2017. Capgemini.

WORLD PAYMENTS REPORT. 2017. Capgemini.

WORLD RETAIL BANKING REPORT. 2017. Capgemini.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Factors influencing decision making in sustainable, responsible and impact investing

Sylvie Formánková¹, Oldřich Trenz², Oldřich Faldík³ and Jan Kolomazník⁴

¹*Department of Management, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: sylvie.formankova@mendelu.cz*

²*Department of Informatics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: oldrich.trenz@mendelu.cz*

³*Department of Informatics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: oldrich.faldik@mendelu.cz*

⁴*Department of Informatics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: jan.kolomaznik@mendelu.cz*

Abstract

This paper deals with the sustainable investing issue. Special attention will be paid to sustainable, responsible, and impact investing (SRI) and so called ESG investing. This type of investing incorporates measurable criteria to compare investments across the three broad categories of Environment, Social and Governance (ESG). The results will be based on the Mutual Fund and Exchange-Traded Fund (ETF) Performance Chart which displays all sustainable, responsible and impact mutual funds and ETFs offered by member firms of the Foundation's Center for Sustainable Investment Education. 178 SRI funds will be evaluated and compared. The correlation between the assets under management (AUM) and the 5 year return will be observed as well as the relation between the 5 year return and the management fee. From these outcomes, negligible dependence of the management fee (Mgmt) on the volume of managed funds can be deduced, but a certain dependence of the average five-year (stable) return on the invested funds can be drawn. In case of the relationship between the 5-year average return (5yr) and the management fee, we can only confirm mutual independence of the assessed quantities. The results will be used for the recommendations in the investment decision making process.

Keywords: sustainable investing, SRI, ESG, sustainability, corporate social responsibility, decision making, impact investing

JEL Code: G11, D81

1. Introduction

1.1. Sustainable and Responsible Investing

In the aftermath of the 2008/2009 World Financial Crisis, SRI is an idea whose time has come. (Puaschunder, 2017) Sustainable and responsible investing (SRI) is an investment policy that adds a third dimension to the risk to investment return ratio, namely the social responsibility. It is a unique approach to melding mission and investing. (Matloff, Chaillou, 2013) Sustainability and responsibility of individual companies are the main topics. Voorhes and Humphreys (2011) define SRI as an investment strategy that includes environmental, social and (corporate) governance criteria to generate long-term competitive financial profits and positive social impact. Criteria of social responsibility usually guarantee a certain security level and long-term sustainability of the company for the investors, and hence investing in it. Trnková (2014) points out that ability of the company to respond to environmental and social issues is the explicit indicator of its maturity and quality of its management. It is therefore clear that SRI has a close link with corporate social responsibility (CSR), which addresses the issue of sustainability from the point of view of the company, not the investor.

SRI emphasizes the areas important for the investors, namely to find interesting financial returns with a positive impact on the environment. With respect to growing concerns about climate change and global warming, geopolitical instability and uncertainty in financial markets, such a search has become more urgent. Rising awareness and promotion of responsible investing has caused that such approach becomes a common integral part of the investment processes of many investors. These responsible investors hope to improve sustainability by cooperating with corporate managers and capital allocating to socially responsible companies (Desclée, et al., 2016).

The socially responsible investing is one of the ways how to support the entities contributing to life improvement on Earth (Bublová, 2016). The reasons, why the investors prefer SRI, are mostly either personal values or values and hence requirements of the clients. Awareness that the funds are invested to support their values is so important for some investors that they are willing to accept a lower return on their investment. (Desclée, et al., 2016) This statement is also supported by Hong and Kacperczyk (2019), who claim that investors are willing to pay financial costs by excluding the so called Sin stocks, such as alcohol, tobacco, weapons beyond social norms, even though they would have a higher expected return than other comparable stocks. A much larger group of investors would like to support these values, provided that negative impact on the return is minimized. The investors within SRI pinpoint a strong financial performance and confidence that the invested funds will contribute to social, environmental and governance progress (SRI basics, 2017). Though it has not been demonstrated yet that SRI investing would reach a lower or higher return than investing in “unsustainable and irresponsible” funds, a certain non-financial benefit has been proved. This non-financial benefit is referred to as the ‘psychic dividend’ of socially responsible investing (SRI). Using constant relative risk aversion and loss aversion utility functions, we estimate that investors only need to earn a non-financial benefit of two to six basis points per month for them to be indifferent between investing in SRI and non-SRI portfolios. (Ainsworth et al., 2018) Therefore, focusing on long-term responsible investing should be important for all fund managers to fulfill their trust responsibilities towards the investors (Friede et al., 2015).

Financial data such as financial statements are no longer sufficient for a complete report on the nature and business prospects of corporate investing in this changing environment. There is an urgent need for additional information to describe the risks caused by negative factors. The companies affecting their surroundings negatively may face undesirable changes in their operating environment resulting, for example, from regulations (Desclée et al., 2016).

The term SRI seems to be preferred and accepted thanks to its wider range. There is not only one term for describing the socially responsible investing (Voorhes & Humphreys, 2011). We can meet different terms such as ethical investment, green investment, impact investing, responsible investing, ESG investing, and many others. Bublová (2016) points out that all such types of investing involve the factor of social responsibility and their definitions often intersect; differences arise in the type of the used financial instruments or in a more detailed addressing. The SRI abbreviation can thus be used as an umbrella incorporating socially responsible investing as a complex whole.

In 2012, \$1 out of every \$9 US assets under professional management was invested in some form of sustainable investment. Global sustainable investment assets have expanded dramatically, rising from \$13.3 trillion at the outset of 2012 to reach a total of \$21.4 trillion at the start of 2014. Most of the SRI assets are in Europe (63.7 percent), but the relative contribution of the United States has increased from 28.2 percent in 2012 to 30.8 percent in 2014, and over this two-year period, the fastest growing region has been the United States, followed by Canada and Europe. These three regions are also the largest regions in terms of assets, accounting for 99 percent of global SRI. (Mikolajek-Gocejna, 2016)

In Europe, according to the SRI Study 2016, Impact Investing is confirmed as the fastest growing strategy with a growth of 385%. Although the growth remains small in terms of assets, it has made Impact Investing, once more, the most dynamic and definitely the most promising approach for investors. Impact Investing is followed by Sustainability Themed investments in 2015, with a remarkable growth of 146%. Norms-based screening is the second biggest SRI approach with over €5 trillion in assets under management (AuM) and a steady growth rate of 40%, demonstrating a sustained growth per annum of 31% since 2009. (SRI Study 2016)

1.2. ESG pillars

Areas of the Socially Responsible Investing (SRI) are defined differently. Bublová (2016) mentions the 3P concept: profit, planets, people, other sources show 3 pillars: financial, social and environmental (Socially Responsible Investing Gains Popularity, 2017); in practice, the ESG abbreviation, incorporating environmental, social and governance aspects, is used as well.

Desclée et al. (2016) claim that the ESG indicators play different roles depending on the type of company and its geography. For example, the risk of pollution and environmental damage is important in the sectors such as chemical industry, on the contrary, it is almost unimportant in the financial sector, where social and governance factors are more relevant. Various factors highlight attitudes of the companies towards the risks that could threaten or even disrupt the trading company in the long run. ESG indicates whether or not the company is managed well and whether or not priority of the shareholder interests is ensured. It can therefore be understood a certain quality standard of corporate management. However, reliance on ESG can be considered a method of confidence that

the desired corporate behaviour will be beneficial to the investors for a long time period (Desclée, et al., 2016).

The Environmental criterion incorporates the overall environmental policy, utilization of local resources, waste management and disposal, and much more (Bublová, 2016). The Environmental part contains threats and opportunities that are specific to a particular sector and activities of the company (Desclée, et al., 2016), and therefore they differ from one sector to another. Negative impact of the company on its surroundings then poses a greater risk to the company resulting from the legal actions or regulatory penalties.

The Social part incorporates health and safety of employees, consumer's rights, working conditions, relations with the local community (Bublová, 2016), further on, human rights, customers and employee's rights and, of course, disagrees with the child labour. The Social part takes into account work management, diversity and discrimination, working conditions, employee's safety, product safety, fair trade products, advertising ethics, human rights policy. Poor conditions under this part may lead to high employee turnover, low productivity and quality of labour.

Governance is focused on ethical behaviour, equal opportunities and good business relationships (Bublová, 2016), but also on sound financial indicators and development potential. It also monitors business governance, business ethics, anti-competitive practices, corruption and instability, anti-corruption policy, anti-money laundering policy, disclosure of compensation, gender diversity of the council. Desclée et al. (2016) points out that bad corporate governance may result in bad incentives from the management or in a higher risk of accounting irregularities.

The Barclays research (Desclée, et al., 2016), addressing large asset managers, showed in 2016 that their view of ESG importance differs from the view of the asset owners. The owners consider the environmental (E) component as the most important one, whilst the managers consider governance (G) a more relevant component.

2. Methodology and Data

2.1. Method of selecting investment opportunities

For assessment of sustainable investing, data from the selected funds have been used, namely from the American premier financial Barron's magazine and from the Bloomberg Environmental, Social and Governance (ESG) Data Service. Volume of the managed funds (AUM), average returns for five years (5 yrs) and the management fee (Mgmt) as a supplement, have been selected as the basis for further expertise. 178 descriptive data from investment funds have been applied in total.

Table 1: Input data, abridged view

| ID | Ticker | AUM [US\$ millions] | 5 yr Avg [%] | Mgmt Fee [%] |
|-----|--------|------------------------|-----------------|-----------------|
| 1 | BLX | 16 115.20 | 14.42 | 0.60 |
| 2 | PARWX | 5 217.38 | 18.49 | 0.69 |
| 3 | TISCX | 2 978.66 | 14.90 | 0.15 |
| 4 | TRPSX | 2 978.66 | 14.72 | 0.15 |
| 5 | TICRX | 2 978.66 | 14.58 | 0.15 |
| 6 | TRSCX | 2 978.66 | 14.60 | 0.15 |
| 7 | PARMX | 2 801.65 | 13.70 | 0.74 |
| 8 | NBSRX | 2 357.06 | 14.71 | 0.73 |
| 9 | NRARX | 2 357.06 | 14.21 | 0.73 |
| 10 | NBSTX | 2 357.06 | 14.51 | 0.87 |
| ... | ... | ... | ... | ... |
| 173 | PAFSX | 16.39 | 0.00 | 1.10 |
| 174 | TSMDX | 14.52 | 0.00 | 0.75 |
| 175 | LCILX | 8.35 | 0.00 | 0.65 |
| 176 | SEEFX | 5.25 | 0.00 | 0.65 |
| 177 | VGSRX | 4.18 | 0.00 | 0.40 |
| 178 | ICAN | 4.06 | 0.00 | 0.50 |

Source: The Forum for Sustainable and Responsible Investment; Morningstar (2017), Sustainability in The Top Sustainable Mutual Funds (2017)

2.2. Assessed data testing

To assess dependence of the input data, it is advisable to apply the correlation analysis (Pearson's correlation coefficient) and a selected test of independence of the measured quantities, namely the Pearson's chi square test. Calculation of the Cramer's coefficient seems to be a suitable supplement.

Correlation analysis

The correlation analysis assesses dependence of the quantities, i.e. how strong their mutual relationship is. In statistics, correlation is understood as the mutual linear relationship between the measured quantities (quotation). Covariance and/or a better interpretable Pearson's correlation coefficient is the basic approach for testing intensity of the linear dependence of two random variables (X_1 , X_2) (Pecáková, 2011). Calculation of the Pearson's correlation coefficient is demonstrated by (1).

$$r_{x_1x_2} = \frac{Q_{x_1x_2}}{\sqrt{Q_{x_1x_1} Q_{x_2x_2}}},$$

$$Q_{x_1} = \sum_i^n (x_{1i} - \bar{x}_1)^2, \quad Q_{x_2} = \sum_i^n (x_{2i} - \bar{x}_2)^2 \quad (1)$$

where $Q_{x_1x_2}$ is the so-called covariance of the variables X_1 and X_2 . The correlation coefficient takes values from the interval $(-1; 1)$, and its zero value is understood as the absence of linear dependence of the monitored pair of variables. On the other hand, in case of func-

tional dependence, where value of one variable, based on the straight line equation, indicates clearly value of the second variable, the correlation coefficient is ± 1 . The sign in this case reflects direct and/or indirect linear dependence, and magnitude of the coefficient reflects intensity of this dependence (Meloun, Militký, 2012). Specifically, in the case of a positive correlation, the variable values are rising; when the correlation is negative, the value of one variable is rising and the other is decreasing. We use the zero-value to mark the non-existence of a linear relation.

Pearson's chi square test

Pearson's chi square test is the basic and most frequently used paired independence test in the contingency table. In this approach, under the zero hypothesis we shall understand the claim that the random variables X_1 and X_2 are independent, interdependence of random variables being the alternative hypothesis. This is the probability rate that the random variable X_1 will not affect the random variable X_2 in case of the zero hypothesis (Řezanková, 2011).

$$\chi_P^2 = \sum_{i=1}^R \sum_{j=1}^S \frac{(n_{ij} - m_{ij})^2}{m_{ij}}, \quad (2)$$

where the chi square statistics takes values from the interval $\langle 0; n(q-1) \rangle$, where $q = \min\{R, S\}$. The test is based on comparison of the observed frequencies (experiment) and the so called expected frequencies (based on H_0 hypothesis validity) of individual combinations of the random variables X_1 and X_2 (Meloun, Militký, 2012).

However, the chi square independence test does not indicate anything about the relationship strength, it merely fails to reject or rejects the zero hypothesis about dependence of the random variables X_1 and X_2 . To identify strength of the relationship, it is advisable to use an adequately chosen descriptive coefficient.

Cramer's coefficient

This is a chosen coefficient, on the basis of which strength of the mutual state (dependence) of two random variables can be determined.

$$K = \sqrt{\frac{\chi^2}{n \cdot \min(r-1, s-1)}}, \quad (3)$$

For random variables X_1 with r values (1, 2, ..., r) and X_2 with s values (1, 2, ..., s). In the formula, the n marking pertains to the range of the file set of the observed variable. The closer the coefficient to 1, the higher the dependence of the variables X_1 and X_2 , for $K=0$, there is a maximum independence, and for $K=1$, a maximum dependence of variables. (Řezanková, 2011).

3. Results

3.1. Calculated dependences – correlation coefficients

In the first stage, the test of the interdependence of the assessed quantities was performed, see Table 2, by applying (1). From these outputs, negligible dependence of Mgmt on the volume of managed funds can be deduced, but a certain dependence of the average five-year (stable) return on the invested funds can be deduced as well.

Table 2: The result of the correlation analysis – correlation coefficients

| Variable | AUM | 5 yr | Mgmt |
|----------|---------------|---------------|---------|
| AUM | 1.000 | 0.2880 | -0.0547 |
| 5 yr | 0.2880 | 1.000 | 0.0744 |
| Mgmt | -0.0547 | 0.0744 | 1.000 |

Result of the linear dependence in the graphic form is presented by the point graph – Figure 1. The graph shows not only the mutual correlation value ($r = 0.2880$), but also the p value ($p = 0.00010$), i.e. the lowest level of significance of the test, at which the zero hypothesis is rejected with the given data. The lower the p-value of the test, the lesser the probability that the zero hypothesis is valid. In the case under consideration, the zero hypothesis can be rejected, based on the p-value level.

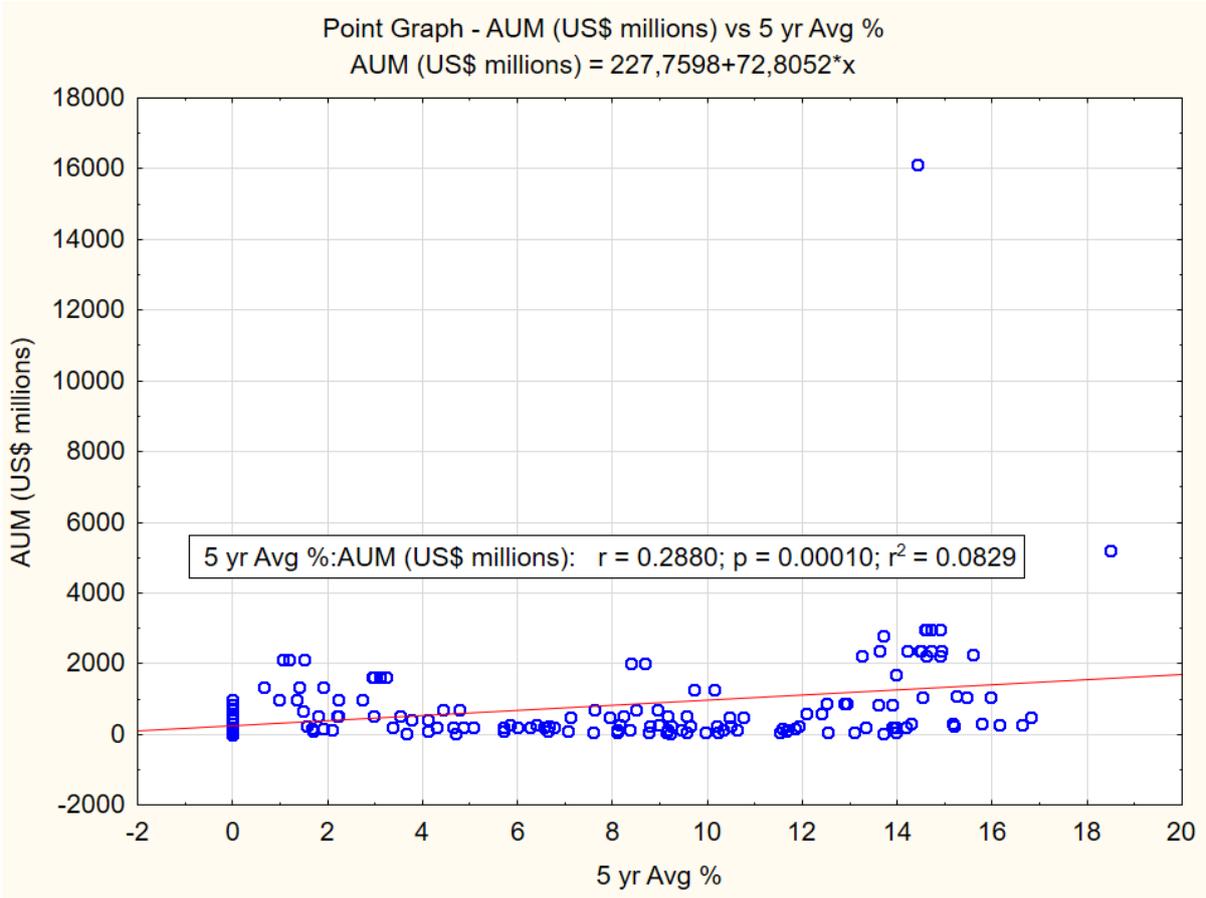


Figure 1: Point Graph of AUM vs 5 yr dependence
Source: Own calculations

3.2. Independence test of variables – Pearson’s chi square test

In the first stage, the 5-year average return on investment (5 yr) was assessed, taking in view the amount of the funds managed by the relevant fund (AUM). The results are available in Table 3, calculated in accordance with (2) and (3).

Table 3: Pearson’s chi square test, 5 yr vs AUM

| | chi square test | p |
|-----------------------------|------------------------|------------|
| Pearson’s chi square | 2064.2654 | p = 0.0000 |
| M-V chi square | 782.9289 | p = 1.0000 |
| Cramer. V | 0.8026 | |

As a result, the test statistics value is equal to 2064.2654 and the p-value is 0.0000. The latter figure means that the zero hypothesis of mutual independence is rejected. Because this considered dependence is important for further assessment, value of the Cramer’s coefficient was also calculated; in this case the value close to one confirms interdependence. To complete the picture, for the given division, the number of degrees of the scope is equal to n–1. If one of the division parameters should be unknown, the number of degrees of scope decreases for each unknown parameter. This applies for the data here processed.

Further on, the management fee (Mgmt) dependence on the amount of the managed funds (AUM) was assessed. Mutual independence of the monitored quantities can be seen and confirmed here.

Table 4: Pearson’s chi square test, Mgmt vs AUM

| | chi square test | p |
|-----------------------------|------------------------|------------|
| Pearson’s chi square | 337.7028 | p = 0.0000 |
| M-V chi square | 220.2557 | p = 0.0011 |

Identification of the relationship between the average five-year return (5 ye) and the management fee (Mgmt) seems to be a suitable assessment of dependence. It is possible to confirm mutual independence of the measured quantities, the previous case alike.

Table 5: Pearson’s chi square test, 5 yr vs Mgmt

| | chi square test | p |
|-----------------------------|------------------------|------------|
| Pearson’s chi square | 48.0733 | p = 0.0860 |
| M-V chi square | 54.4229 | p = 0.0250 |

Confirmation of dependence of the amount of investments funds (AUM) and the average five-year return (5 yr) follows from the facts above.

4. Discussion and Conclusions

Socially responsible investing (SRI) integrates environmental, social, and governance (ESG) criteria into investment decisions, enables investors to reflect personal values in their portfolio choices, and encourages ethical corporate behavior. (Dawkins, 2016) This paper was focused on assessment of investment criteria of the SRI funds, in particular on the volume of the managed funds, the average five-year return and the management fee. Interdependences of the management fee and volume of the managed funds, the average five-year return and the managed funds, and the average five-year return and management fee were analysed. From the shown outcomes, negligible dependence of Mgmt on the volume of the managed funds can be deduced, but a certain dependence of the average five-year (stable) return on the investment funds can be deduced. In case of the relationship between the 5-year average return (5 yr) and the management fee (Mgmt), mutual independence of the assessed quantities can be confirmed. It follows clearly that the companies requiring a higher management fee from their investors cannot use the argument that the investors achieve a higher average return. Therefore, if the investor believes that the higher the management fee, the higher the return on his funds, he would be wrong. Despite a certain dependence of the average five-year (stable) return on the invested funds, it is impossible to claim explicitly that larger amounts of the managed funds would also guarantee a higher return. Nevertheless, these results do not diminish the importance of sustainable and responsible investing. The neoclassical approach suggests that the attractiveness of investment should result from the risk-return relationship that is satisfying for the investor. However, the performance analysis of SRI vs. conventional investment, conducted in numerous research papers, often delivers contradictory conclusions. If financial factors could not explain the phenomenon of SRI, nonfinancial factors may have played a decisive role in the formation of modern SRI market. (Sliwinski, Lobza, 2017) This opinion is shared by the authors of the SRI Survey 2016, which state that the fiduciary duty considerations have been recognised as a main driver for SRI. (SRI Survey 2016)

The SRI screening has certain limits. In our case, only the SRI funds were tested in this paper, and therefore these results cannot be generalized for common types of investments. Secondly, SRI screening can give firm incentives to voluntarily remove an externality, but these incentives can be substantially reduced or even reversed if SRI investors also trade on private information on the cash flow effects of externality removal and disagreement exists among investors on their existence. (Vanwalleghem, 2017) There are other approaches occurring in the society. As some high-profile foundations and socially conscious university students are calling for divestment and exclusionary SRI, best-of-class engagement has gained currency among academics and practitioners who shun exclusion or divestment on the basis of unacceptable activities, and support engagement even with troubled firms and industries. (Dawkins, 2016)

This topic could be very controversial and has many issues for discussion. This paper was working with one database. Different results could be obtained in case of using other sources. The problem is that sustainability ratings are produced by a worldwide growing, but still limited number of private rating agencies that offer a dazzling variety of in some cases even contradictory ratings, rankings, indices and awards that have an enormous potential to influence investment decisions of all kind of investors. (Ilgaz, S. et al, 2015)

Acknowledgements

The authors are thankful to the Grant Agency of Czech Republic (GAČR), project: “Modeling and simulation of sustainable investment decision-making”, CEP ID GA17-23448S.

References

- AINSWORTH, A., CORBETT, A., SATCHELL, S. (2018) Psychic dividends of socially responsible investment portfolios, *Journal of Asset Management*, p. 1–12, DOI: doi.org/10.1057/s41260-017-0073-4.
- BUBLOVÁ, A. (2016) Společensky odpovědné investování [online]. Brno, Diplomová práce. Masarykova univerzita, Ekonomicko-správní fakulta, Katedra financí, [cit. 08/02/2018]. Available at: <http://narodniportal.cz/wp-content/uploads/2016/08/Spolecenskyodpovedneinvestovani.pdf>.
- DAWKINS, C.E. (2016) Elevating the Role of Divestment in Socially Responsible Investing. *Journal of Business Ethics*, p. 1–14, DOI 10.1007/s10551-016-3356-7.
- DESCLÉE, A., HYMAN, J., DYNKIN, L., POLBENNIKOV, S. (2016) Sustainable investing and bond returns, 2016 [online]. *Barclays Bank PLC*, [cit. 07/02/2018]. Available at: <https://www.investmentbank.barclays.com/content/dam/barclaysmicrosites/ibpublic/documents/our-insights/esg/barclays-sustainable-investing-and-bond-returns-3.6mb.pdf>.
- FRIEDE, G.; BUSCH, T.; BASSEN, A. (2015) ESG and financial performance: aggregated evidence from more than 2000 empirical studies, *Journal of Sustainable Finance & Investment*, p. 210–233, DOI: 10.1080/20430795.2015.1118917.
- HONG, H., KACPERCZYK, M. (2009) The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, Vol. 93, Issue 1, p. 15–36. DOI: doi.org/10.1016/j.jfineco.2008.09.001.
- ILGAZ, S., ZADEMACH, HM. (2012) Performative capital market practices. The case of socially responsible investments in Germany. *Zeitschrift für Wirtschaftsgeographie*, Vol. 59, Issue: 4, p. 243–258, ISSN: 0044-3751.
- MATLOFF, R., CHAILLOU, J., H. (2013) Socially Responsible Investing. In *Nonprofit Investment and Development Solutions: A Guide to Strategies and Solutions for Thriving in Today's Economy*, DOI: 10.1002/9781118650837.ch11.
- MELOUN, M., MILITKÝ, J. (2012) Kompendium statistického zpracování dat. Praha: Karolinum, 2012. ISBN 978-80-246-2196-8.
- MIKOLAJEK-GOCEJNA, M. (2016). The Relationship Between Corporate Social Responsibility and Corporate Financial Performance – Evidence from Empirical Studies. *Comparative economic research-Central and Eastern Europe*, Vol. 19, Issue 4, p. 67–84, DOI: 10.1515/cer-2016-0030.
- Morningstar (2018) Sustainability in The Top Sustainable Mutual Funds. [online] 30/9/2017. [cit. 07/02/2018], Available at: <http://online.wsj.com/public/resources/documents/TopSustainableMutualFunds.pdf>.

- PECÁKOVÁ, I. (2011) Statistika v terénních průzkumech. 2., dopl. vyd. Praha: Professional Publishing, 2011. ISBN 978-80-7431-039-3.
- PUASCHUNDER, JM. (2017) Socio-psychological motives of socially responsible investors. *Socio-psychological motives of socially responsible investors. Advances in Financial Economics*. Vol. 19, p. 1–255, DOI: 10.1108/S1569-3732201719.
- ŘEZANKOVÁ, H. (2011) Analýza dat z dotazníkových šetření. 3., aktualiz. vyd. Praha: Professional Publishing, 2011. ISBN 978-80-7431-062-1.
- SLIWINSKI, P., LOBZA, M. (2017) The impact of global risk on the performance of socially responsible and conventional stock indices. *Equilibrium-Quarterly Journal of Economics and Economic Policy*. Vol. 12, p. 657-674, DOI: 10.24136/eq.v12i4.34.
- Společensky odpovědné investování získává na popularitě (2017), [online]. *Investiční web s.r.o.*, 09/08/2017 [cit. 07/02/2018]. Available at: <http://www.investicni-web.cz/spolecensky-odpovedne-investovani-ziskava-na-popularite/>.
- SRI basics (2017), [online]. *US SIF*, [cit. 07/02/2018]. Available at: <https://www.us-sif.org/sribasics>.
- SRI Study 2016 (2016), [online]. *Eurosif*, [cit. 07/02/2018]. Available at: <http://www.eurosif.org/wp-content/uploads/2016/11/SRI-study-2016-HR.pdf>
- The Forum for Sustainable and Responsible Investment (2018), [online] 31/1/2018. [cit. 07/02/2018], Available at: <https://charts.ussif.org/mfpc/>.
- TRNKOVÁ, J. (2004) Společenská odpovědnost firem: kompletní průvodce tématem & závěry z průzkumu v ČR, *Business Leaders Forum* [online], [cit. 04/02/2018]. Available at: http://www.neziskovky.cz/data/vyzkum_CSR_BLF_2004txt8529.pdf.
- VANWALLEGHEM, D. (2017) The real effects of sustainable & responsible investing? *Economic Letters*, Vol. 156, p. 10–14, DOI: 10.1016/j.econlet.2017.04.008.
- VOORHES, M., HUMPHREYS, J. (2011) Recent Trends in Sustainable and Responsible Investing in the United States, *Journal Of Investing*, [online], p. 90–94, Business Source Ultimate [cit. 15/02/2018], DOI: doi.org/10.2469/dig.v42.n1.43.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Application of DuPont model in a rentability assessment of manufacturing companies located in Poland

Barbara Fura¹, Alina Szewc-Rogalska²

*¹Department of Quantitative Methods and Economic Informatics, Faculty of Economics,
University of Rzeszów, Źwiklińskiej 2, 35-601 Rzeszów, Poland, e-mail: bfura@ur.edu.pl*

*²Department of Quantitative Methods and Economic Informatics, Faculty of Economics,
University of Rzeszów, Źwiklińskiej 2, 35-601 Rzeszów, Poland, e-mail: aszewc@ur.edu.pl*

Abstract

The paper presents the results of studies on an application of the DuPont model to assess rentability of joint-stock companies in the production sector (31 according to NAICS classification) based in Poland. The purpose of the study was to identify the orientation and power of factors determining the return on equity (ROE). The method used a multiple regression model, with ROE as a variable, while the following three steps from the DuPont model: profit margin (PM), total assets turnover (TAT) and equity multiplier (EM) were explanatory variables. The study revealed validity of the three-step DuPont model in the evaluation of ROE development, but it is suggested to use an extended model to complete the analysis.

Keywords: DuPont model, performance, companies

JEL Code: G30, D22, D24

1. Introduction

A traditional approach to a company performance measurement is based on financial indicators (Horta and Camanho, 2014). They provide information on a selected area of a company operation in a fairly simple manner, becoming a component of a general economic and financial situation.

So far no set of indicators has been identified which would enable objective identification of general results of market competitors. Moreover, using only the values of individual indicators can lead to contradictory conclusions - favourable from one point of view and unfavourable from another point of view. Models or algorithms used in a diagnosis of a company's situation and presenting cause-and-effect relationships between a greater number of indicators can be a good alternative to individual indicators (Bieniasz et al. 2008a).

The DuPont model can be quoted as an example. It considers the impact of the following three factors on the return on equity: operating effectiveness (expressed by return on sales), effectiveness of using the company assets (expressed by return on assets) and financial leverage reflecting the impact of involving third-party equity on higher profitability per unit of equity (equity multiplier) (Rosińska-Bukowska, 2015). Such a ROE indicator covers production and sales, and finance (Stępień, 2008). Combining ROE with important areas of operation (Kharatyan, 2016) helps to make the indicator an aggregated measure of an entity's development potential. Many authors regard an increase in the indicator value as a measure of competitiveness improvement (Rosińska-Bukowska, 2015; Dehning and Stratopoulos, 2002) or company efficiency (Mioduchowska-Jaroszewicz et al., 2016; Hak-Seon, 2016). Hence, the ROE is very useful as a measure which can be applied to compare a company with its competitors (Zelgalve et al., 2014).

The purpose of the study was to perform an assessment of a rentability of companies with the application of the DuPont's model as a tool which supports measurements of company competitiveness. An analysis was carried out on an example of 106 companies listed on the Warsaw Stock Exchange, and classified in a production sector (31 according to NAICS). To ensure relative comparability of the entities, the study covered companies with a workforce of over 250 people. A multiple regression method was selected as a study method since it helps to identify the orientation and impact of factors determining return on equity (acquired according to the three-step DuPont model).

2. Literature review

Polish and foreign researchers have been dealing with the issue of using the DuPont model to identify the impact of selected indicators on the financial condition, effectiveness or competitiveness of companies (measured by means of the ROE indicator). Consequently, their studies identified companies with the best and worst results within the analysed sector.

Mioduchowska-Jaroszewicz et al. (2016) carried out studies in the area and used the three-step DuPont model to evaluate management effectiveness in four largest mining companies in Poland. Comparing the values of ROE for the studied companies with the mean ROE indicator value for the sector they confirmed a gradual deterioration of effectiveness of mining companies. Szczecińska (2008) followed a similar approach and evaluated the effectiveness of three food companies. According to the author, ROS had the greatest impact on the return on equity. Her results correspond to the results obtained by Sajnóg (2016) who employed Spearman's rank correlation to show that return on sales was the main factor determining the return on equity of companies from the WIG30 list.

Despite the simple (three-step) model, one can also use an extended DuPont model (e.g. five-, six- or even ten-step model) to evaluate profitability (Sibilski, 2013). Bieniasz et al. (2008a) used both models (the simple and extended one) to identify the factors determining the ROE for selected processing companies, based on a regression analysis. For the simple model, the return on sales had the greatest impact on the ROE, followed by the total asset turnover (TAT). The equity multiplier had the relatively lowest impact on the ROE level (Bieniasz et al. 2008a; Bieniasz et al., 2008b). For the extended model, the ROE was mainly determined by the operating profit margin (OPM) and financial structure ratio (FSR). Sajnóg (2016) obtained similar results using the Spearman correlation rank analysis. He revealed that return on sales was the main factor determining the ROE of companies in the WIG30 list in the simple model. The OPM and financial cost ratio (FCR) were

the two factors with the greatest impact on ROE among the ones in the five-step model. In their studies, Burja and Mărginean (2014) continued evaluation of ROE in entities operating within the selected sector. The authors applied Pearson correlation and observed (on an example of five large furniture-making companies) the relationships between financial indicator/effect measures and profitability (return).

The results for industrial companies concerning the effects of the DuPont model factors corresponded to the results of similar analyses carried out for services. According to Chang et al. (2014) analysts and investors dealing with investment in the health care sector, should pay more attention to changes in the return on net sales than on asset turnover to improve accuracy of the return forecasts.

Despite the fact that the presented results of studies deal with the impact of factors occurring in the DuPont model on profitability, with regard to a limited number of entities covered by the studies, they should be treated like case studies. The drawback of the obtained results is that they do not allow for any generalisations or formulation of general conclusions. The limitation does not apply to this study which fills the observed research gap and provides representative results of studies (for listed companies) on the ROE level modelling based on the DuPont model.

3. Data and Method

3.1. DuPont model

The DuPont model in its original version was developed in 1918 by F. Donaldson Brown, an engineer working for DuPont Corporation (Doorasamy, 2016). Brown observed a mathematical relationship between two commonly used indicators, i.e. net profit margin (a profitability measure) and return on assets (ROA). In the 1970s, the commonly accepted objective in the finance management was shifted from ROA to ROE, which marked the first significant modification of the original DuPont model (Liesz and Maranville, 2008). The model evolved with time, becoming a classic diagnostic tool identifying the strengths and weaknesses and potential improvement of an entity's equity structure to maximise the shareholders' wealth (Mitchel et al. 2013).

In the DuPont model, ROE is disaggregated into three profitability factors: (1) operational effectiveness measured with the profit margin (PM); (2) effectiveness of asset use measured with the total asset turnover (TAT); and (3) financial leverage measured with the equity multiplier (EM) (Chang et al. 2014). PM and TAT are the components of ROA and they measure the effectiveness and efficiency of using the company assets to generate profits. The disaggregation of ROA into the components helps the users (i.e. managers, market participants) understand the sources of the highest/lowest return in the sector/sectors. The equity multiplier (EM) is the last component of the DuPont model. A higher EM indicates a higher financial leverage (FL), which means a firm relying more on a loan taken to finance its asset (Ramesh, 2015). The DuPont model used for ROE calculation is given below (Chang et al. 2014):

$$ROE = \frac{\text{Net profit}}{\text{Sales}} (PM) \times \frac{\text{Sales}}{\text{Total assets}} (TAT) \times \frac{\text{Total assets}}{\text{Shareholder's equity}} (EM) \quad (1)$$

3.2. Data

The study used secondary statistical data from financial reports of companies, available in the Emerging Markets Information Service (EMIS) database for the financial year 2016. Out of the entities in the database (243) 111 large companies were selected (i.e. having a workforce of over 250 people). The collection of entities obtained this way was more uniform for its potential. Then 5 companies were removed from the list (KGHM Polska Miedź SA, Żywiec S.A., Kopex S.A., PZ Cormay S.A. and Zastal S.A.); they were considered outliers. This way a study sample of 106 entities was obtained.

3.3. Regression model

In identifying rentability factors both a deterministic or a stochastic approach can be applied (Skoczyła, 2007). In the deterministic approach, it is assumed that both the number of factors as well as the type of a relationship between the dependent variable and individual factors are established. Additionally, this approach does not include random factors. In this paper we use a stochastic approach which takes into account not only main factors affecting rentability but also random factors.

The DuPont model provided a theoretical base for developing a multiple regression model. The regression analysis allowed to analyse the joint impact of selected indicators on ROE (Sur et al., 2014). It was applied to find out which variables had the most explanatory power or variations occurring in return on equity quantifying that explanatory power (Kharatyan, 2016). The model regression model assumed the following variables: Y – return on equity (ROE),

X₁ – profit margin (PM) (net profit/sales),

X₂ – total assets turnover (TAT) (sales/total assets),

X₃ – equity multiplier (EM) (total assets/shareholder's equity).

The model parameters were estimated using the Method of Least Squares (MLS). The relevance of the model parameters was checked using a t test. A coefficient of multiple correlation R and determination R² were used for evaluation of the model quality. Additionally, the evaluation of the model correctness evaluation was completed with an analysis of residuals. STATISTICA (licensed software) was used for the calculations.

4. Results

4.1. Descriptive statistics

Basic measures of descriptive statistics such as the mean, median, quartiles, standard deviation and coefficient of variation were used to characterise the variables. The values of the statistics are presented in Table 1.

Table 1: Descriptive statistics

| DS | Mean | Median | Min | Max | Lower quartile | Upper quartile | SD | CV [%] |
|----------------|-------|--------|--------|-------|----------------|----------------|-------|---------|
| Y | 0.088 | 0.083 | -0.726 | 0.638 | 0.040 | 0.138 | 0.151 | 171.576 |
| X ₁ | 0.043 | 0.039 | -0.307 | 0.210 | 0.008 | 0.078 | 0.069 | 159.561 |
| X ₂ | 1.200 | 1.047 | 0.269 | 4.422 | 0.795 | 1.465 | 0.649 | 54.087 |

| | | | | | | | | |
|-------|-------|-------|--------|-------|-------|-------|-------|--------|
| X_3 | 2.239 | 1.947 | -1.074 | 9.582 | 1.591 | 2.533 | 1.123 | 50.155 |
|-------|-------|-------|--------|-------|-------|-------|-------|--------|

Legend: DS – descriptive statistics, Min – minimum, Max – maximum, SD – standard deviation, CV – coefficient of variation.

Source: Own elaboration

The return on equity (Y) in the studied large production companies amounted to 8.8% on average. The higher the return on equity, the more favourable the financial situation of a company and its shareholders. A high return on equity opens opportunities for the shareholders to get higher dividends. Companies with high ROE tend to be favourably valued by the capital market, which is reflected in higher market prices of their shares. The return on equity in the studied companies was highly diversified and ranged from -72.6% to 63.8%. A half of the studied entities reach the ROE over 8.3%. The value of the upper quartile indicates that in 25% of large production companies, the ROE exceeded 13.8%. The return on equity was highly volatile, which is confirmed by the value of the coefficient of variation of 171.6%.

The average return on sales (X_1) was 0.043, which means that the share of net profit in the sales value was 4.3%. The higher the return on sales, the more favourable the financial situation of the companies. The return on sales among the studied companies was highly diversified, and ranged from -30.7% to 21.0%. A half of the studied companies reached the return on sales over 3.9%. The value of the upper quartile indicated that in 25% of the companies, the return on sales was greater than 7.8%. The return on sales demonstrated the greatest volatility as compared to other factors in the DuPont model, because the coefficient of variation was nearly 160%.

The total asset turnover (X_2) is another variable which identifies how many times the sales exceeds the company's assets. The higher the indicator is, the greater the asset management effectiveness. The mean asset turnover was 1.2. It means that the sales was on average 1.2 times higher than the value of assets owned by the studied companies. It simply means that 1 PLN in assets brings 1.2 PLN revenue from sales. The asset turnover in the studied companies ranged from 0.3 to 4.4. In a half of the entities the asset turnover exceeded 1.0, which means their sales was greater than the value of the assets owned. 25% of the studied companies had a relatively high asset turnover, exceeding ca. 1.5.

The equity multiplier (X_3) is the last variable which represents the relationship between assets and equity. It informs to what extent the company's assets were financed with equity. According to the golden rule of financing, the share of equity in financing the company assets should amount to 50%. It means that the equity multiplier should be 2. However, many companies fail to observe the rule and use third-party equity to a greater extent to ensure long-term development. As Sierpińska and Jachna (2004) quote according to standards assumed in financial literature, the share of third-party equity in the company's assets may vary between 57% and 67%. It means that the share of equity in financing the assets should range from 33% to 43%. In such a case – as own calculations suggest – the equity multiplier (X_3) should be between 2.3 and 3.0. It means that the value of assets should be from 2.3 to 3 times higher than the equity. The higher the value of the equity multiplier, the lower the share of equity in financing the company assets, and hence – a greater share of third-party equity.

The average value of the equity multiplier (X_3) in the studied companies was 2.24, which means it was close to the lower limit of the range regarded as optimum. The median identified for the equity multiplier amounted to 1.95, i.e. it was close to the value of the multiplier which results from the golden rule of financing. The range of the indicator level observed for the studied companies was quite wide, i.e. from 1.07 to 9.58.

4.2. Regression analysis results

The impact of individual factors (X_1 , X_2 and X_3) on changes in the return on assets (Y) was studied with a multiple regression analysis. The results are presented in Table 2.

Table 2: The results of analysis of equity factors by means of multiple regression

| Regression summary for dependent variable Y: R = 0.891, R ² = 0.793, Adj. R ² = 0.787, F (3, 102) = 130.531, p < 0.000, Std. Err. of the Estimate (SEE) = 0.070 | | | | | | |
|---|---------|-------------------------|--------|-------------------|---------|---------|
| N=106 | β | Std. Err. of β | b | Std. Err. of b | t (102) | p-value |
| Intercept | | | -0.128 | 0.020 | -6.563 | 0.000 |
| X ₁ | 0.907 | 0.047 | 1.982 | 0.102 | 19.503 | 0.000 |
| X ₂ | 0.141 | 0.047 | 0.033 | 0.011 | 3.006 | 0.003 |
| X ₃ | 0.302 | 0.048 | 0.042 | 0.006 | 6.259 | 0.000 |

Legend: R – coefficient of multiple correlation, R² – coefficient of determination, Adj. R² – adjusted coefficient of determination, F(3,102) – F-statistic value, SEE – standard error of the estimate, β – beta coefficient, Std. Err. of β – standard error of β , b – regression coefficient, Std. Err. of b – standard error of b, t(102) – t-values.

Source: Own elaboration

The coefficients of partial regression presented in Table 2 facilitate a synthetic evaluation of the orientation and impact of return on sales, total assets turnover and financing structure (measured with an equity multiplier) on the ROE. Independent variables assumed in the regression model explained to a great extent (about 79%) the variability of the ROE in the studied companies. Each variable considered in the model turned out to be statistically significant. To verify the hypothesis concerning relevance of the whole model, an analysis of variance in regression (using F statistics) was used. The obtained results confirm statistical relevance of the whole model describing ROE development.

The coefficient of partial regression at the variable X_1 informs that an increase in the return on sales by a unit causes a growth of the ROE by 1.982 units on average, assuming that the other variables remain constant. For the same assumptions, the increase in the total asset turnover by a unit causes a rise in ROE by 0.033 unit on average. An increase in the equity multiplier by a unit – assuming that the other variables remain constant – translates into an increase in ROE by 0.042 unit on average.

The coefficient of regression can be expressed in different units of measure, depending on the type of variables taken into account. One must not use them directly to identify the relative impact of each variable on the ROE. To that end, standardised beta (β) coefficients are used (Table 2). The return on sales (X_1) had the greatest impact on ROE fluctuations in the studied population of companies. The equity multiplier (X_3) was ranked as the second for importance. The total asset turnover (X_2) exerted a relatively weakest impact.

4.3. Residual analysis

A correctly constructed model is characterised by the desired values of the residuals (normality, constancy of variance and a lack of autocorrelation). The first assumption was verified based on a graph that enables evaluation of compliance of the distribution of residuals with a normal distribution (Fig. 1). A graph of residuals dispersion versus the predicted values calculated from the model was used to check if the second condition is met

(Fig. 2). The graphs are treated as standard tools to verify a regression model (Law and Jackson, 2017).

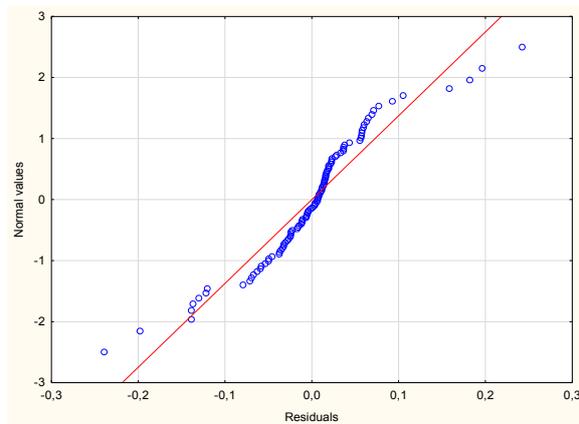


Figure 1: Normal probability plot of residuals
Source: Own study

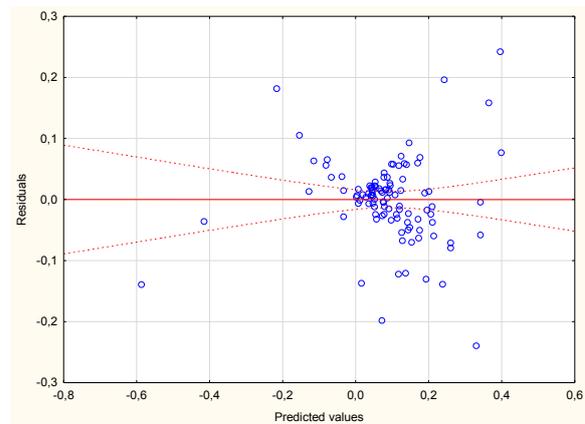


Figure 2: Plot of residuals versus predicted values
Source: Own study

The model shows that the points are arranged along the plotted straight line (Fig. 1), which confirms normality of the residuals distribution. The first two and last four observations may raise certain doubts because they are at a certain distance from the straight line but the distance does not significantly affect normality of the value of the residuals. Moreover, for relatively large trials, some deviations from normality are acceptable. An increase in the predicted values of the residuals caused neither an increase nor a decrease in the variance of the residuals (Fig. 2). Therefore it was decided that the assumption concerning a constancy of a random factor variance was met. Another LSM requirement related to a lack of autocorrelation of residuals was verified with the Durbin-Watson test. The results of the test are presented in Table 3.

Table 3: Durbin-Watson test results

| N=106 | Durbin-Watson | Serial correlation |
|------------|---------------|--------------------|
| Estimation | 1.9610 | -0.0433 |

Source: Own elaboration

The critical values read from the Durbin-Watson tables (DW) for $\alpha=0.05$, $k=2$ and $n=106$ amount to $d_L=1.6258$ and $d_U=1.7420$. Since $DW=1.9610 < 2$, the occurrence of positive autocorrelation was tested. Finally, based on inequality $DW > d_U$ ($1.9610 > 1.7420$) a lack of autocorrelation of the residuals was stated.

5. Discussion and Conclusions

The study included an empirical verification of the DuPont model on an example of large production companies listed on the stock exchange. An analysis by means of multiple regression helped to identify the key factors determining the return on shareholders' equity invested in the companies listed on the Warsaw Stock Exchange. The use of a stochastic approach (based on multiple regression) enabled more in-depth analysis than in the case

of the deterministic approach (based on accounting methods). The study confirmed a statistical relevance of the model describing the ROE variability in listed companies. It is of great importance for the explanation of mechanisms of return on equity in large production companies.

It was demonstrated that all factors taken into consideration in the study, i.e. return on sales, total asset turnover and financial structure (expressed by an equity multiplier) had a statistically significant, positive impact on the ROE level. The results of our study correlate with the results obtained by other authors in relation to a positive impact of the return on sales and total asset turnover on the ROE indicator level. As for the relationship between the level of the equity multiplier and ROE, the results of studies presented in the literature are ambiguous. The authors of the studies demonstrated both a positive and negative relationship (Bieniasz et al., 2008a; Bieniasz et al., 2008b; Szczecińska, 2008; Mioduchowska-Jaroszewicz et al., 2016). When discussing the issue, one should remember that the ambiguity of the results is mainly related to the nature of the equity multiplier. Previous studies suggested that the equity multiplier can be approached as a neutral variable. It means that the most favourable situation for a company occurs when the indicator value is in the optimum range. Too high a level of the equity multiplier means that the company uses a third-party equity too much to finance its assets. It may generate a risk of a financial hazard for the company. When the level of the equity multiplier is too low, it means the company does not use a third-party equity enough. The FL effect is not used in such a case. Our study revealed that an increase in the equity multiplier translates into an increase in the ROE. It means that for the studied companies it is justified to use more of the third-party equity especially if the credit interest rate is lower than the return on equity.

It shall also be added that large entities such as the studied companies have more possibilities to take loans than smaller ones. With regard to their potential, the loan givers are more prone to concessions as they are more afraid to lose a large contractor than a small one (Sierpińska, Jachna, 2004). The level of the equity multiplier greatly depends on the company size. Large companies with a high potential can have a higher level of the equity multiplier and – as our study suggests – a rise in the indicator has a positive impact on the ROE level.

Moreover, our study showed a highly diversified impact of different factors on the ROE level. It was discovered that the return on equity depended first and foremost on the return on sales. It correlated with the studies carried out by other authors (Szczecińska, 2008; Sajnog, 2016; Bieniasz et al., 2008a, Chang et al., 2014). The second important factor – as for the impact – was the financing structure expressed by the equity multiplier. That is why it is necessary to continue studies that will explain the impact of the key factors on the ROE level in detail. The study conducted revealed validity of a three-step DuPont model but to complete the analysis it is recommended to use an extended model. In large production companies an extended model should take into account a wider analysis of factors that affect the return on sales and equity multiplier, and consequently determine the ROE level.

Acknowledgements

This paper was supported by the National Science Centre, Poland [grant No. 2016/23/D/HS4/03007] and by the Ministry of Science and Higher Education, Poland [grant No. DS-PB/WE/KMIIG/4].

References

- BIENIASZ, A., CZERWIŃSKA-KAYZER, D., and GOŁAŚ, Z. 2008a. Applying Du Pont model to determinate factors influencing the rentability of processing companies. *Zeszyty Naukowe SGGW. Ekonomia i Organizacja Gospodarki Żywnościowej* 64: 53–64.
- BIENIASZ, A., CZERWIŃSKA-KAYZER, D., and GOŁAŚ, Z. 2008b. Analysis on enterprise profitability with application of method of diversifying. *Journal of Agribusiness and Rural Development* 3(9): 23–32.
- BURJA, V., and MĂRGINEAN, R. 2014. The study of factors that may influence the performance by the DuPont analysis in the furniture industry. *Procedia Economics and Finance* 16: 213–223
- CHANG, K.J., CHICHERNEA, D.C., and HASSABELNABY, H.R. 2014. On the DuPont analysis in the health care industry. *Journal of Accounting and Public Policy* 33: 83–103.
- DEHNING, B., and STRATOPOULOS, T. 2002. DuPont analysis of an IT-enabled competitive advantage. *International Journal of Accounting Information Systems* 3:165–176.
- DOORASAMY, M. 2016. Using DuPont analysis to assess the financial performance of the top 3 JSE listed companies in the food industry. *Investment Management and Financial Innovations* 13(2): 29–44.
- HAK-SEON, K. 2016. A Study of Financial Performance using DuPont Analysis in Food Distribution Market. *Culinary Science & Hospitality Research* 22(6): 52–60.
- HORTA, I.M. and CAMANHO, A.S. 2014. Competitive positioning and performance assessment in the construction industry. *Expert Systems with Applications* 41: 974–983.
- KASILINGAM, R., and JAYABAL, G. 2012. Profitability and Solvency Analysis of A Manufacturing Company using DuPont and Altman model. *Management Edge* 5(2): 53–64.
- KHARATYAN, D. 2016. Ratios and indicators that determine return on equity. [Online]. Available at: <http://www.aeca1.org/xviiencuentroaeca/comunicaciones/104a.pdf>. [Accessed: 29 December 2017].
- LIESZ, T.J., and MARANVILLE, S.J. 2008. Ratio analysis featuring the DuPont method: an overlooked topic in the finance module of small business management and entrepreneurship performance courses. *Small Institute Journal* 1: 34–38.
- LOW, M., and JACKSON, D. 2017. Residual plots for linear regression models with censored outcome data: A refined method for visualizing residual uncertainty. *Communications in Statistics – Simulation and Computation* 46(4): 3159–3171.
- MIOUCHOWSKA-JAROSZEWICZ, E., HAWRAN, K., and KOWALIK, J. 2016. Use of DuPont model to evaluate the effective management of selected companies with mining sector. *Studia i Prace* 431(1): 183–195.
- MITCHEL, T., MITCHEL, S., and CAI, C. 2013. Using The DuPont Decomposing Process To Create A Marketing Model. *Journal of Business & Economics Research* 11(11): 485–496.
- RAMESH, M.P. 2005. DuPont Analysis of Axis Bank. *Asian Journal of Management* 4(5): 566–569.

- ROSIŃSKA-BUKOWSKA, M. 2015. The Concept of Competitiveness Assessment of Network Enterprises. In: J. Toruński, M. Chrzęścik (Eds.), *Wiedza i doświadczenie a współczesne koncepcje i narzędzia zarządzania organizacją* (pp. 38–49). Siedlce: University of Natural Sciences and Humanities in Kielce.
- SAJNÓG, A. 2016. The comprehensive income versus return on equity of enterprise. *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach* 263: 166–178.
- SIBILSKI, W. 2013. Modified Du Pont Models for Profitability Analysis of Polish Corporation. *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse, Rynki Finansowe, Ubezpieczenia* 64(1): 257–268.
- SIERPIŃSKA, M., and JACHNA, T. 2004. *Ocena przedsiębiorstwa według standardów światowych*, Warszawa: PWN.
- SKOCZYŁAS, W. (Eds.) 2007. *Determinanty i modele wartości przedsiębiorstw*, Warszawa: Polskie Wydawnictwo Ekonomiczne.
- STĘPIEŃ, K. 2008. *Rentowność a wypłacalność przedsiębiorstw*, Warszawa: Difin.
- SUR, D., MITRA, S., MAJI, S. 2014. Disintegrating Return on Equity Using the DuPont Model: A Case Study of Tata Steel Ltd. *Journal of Management Research in Emerging Economies* 2(2).
- ZEGALVE, E., SPROGE, I., and BERZKALNE, I. 2014. Profitability assessment of Latvian companies: emphasis on ROE. *Journal of Applied Economics and Business* 4(2): 45–58.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

How the pharmaceutical industry can generate new sales fields by using complementary medicine. Shown by means of homeopathy

Alexandra Gschwendtner¹

¹Doctoral study in Department of Economics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic

Abstract

The main goal of this paper work is to give an overview of complementary medicine's status quo on the German market, using the example of homeopathy.

The main focus is on the potential capacity of homeopathy as a part of the German economy.

After a short description of the German health care sector, the concept of the Bundesberichterstattung Deutschland (Federal Bureau of Reporting) will be recorded, by using the principle of *ceteris paribus*.

This Council of the German Health Care Sector is recommending to increase the use of naturopathic treatments. Especially with chronically ill people. This order gives the essential consideration of an industry analysis by Michael E. Porter.

So, academic and complementary medicine (e.g. homeopathy) will be defined as participants on the German Market and Healthcare Sector.

The results of the SWOT-Analysis are showing that complementary medicine (homeopathy is still used as an example for complementary medicine) has a various number of qualities which can also lead to a new business field for the pharmaceutical industry.

The result that modalities of the German Healthcare Sector could be achieved, can also be significant.

Keywords: healthcare – growth – complementary medicine – economic

1. Introduction

The main goal of this paper work is to give an overview of complementary medicine's status quo on the German market, using the example of homeopathy.

The main focus is on the potential capacity of homeopathy as a part of the German economy.

Point of origin of this study is the German Health Care Sector. On this basis by means of the principle of *ceteris paribus* a comparison between academic and complementary medicine, using the example of homeopathy, within the framework of a 5 forces (Porter, 2004; 2013; 2014) and SWOT-analysis is targeted (Kotler et al., 2010, pp. 30).

In the course of this, excerpts from the sector capabilities/competences of the internal analysis and excerpts from the sector customers' requirements of the external SWOT-analysis are examined from the viewpoint of different market participants.

Academic medicine and complementary medicine (using the example of homeopathy) have significant characteristics, from which further fields of sales could arise for the pharmaceutical industry.

Besides the well-known and successful synergies between both disciplines on the basis of treatment methods, it is the aim of this examination to point up an initiation for further synergy effects on the level of economic viability. The focus is on the invitation of the "Sachverständigenrat für die Konzentrierte Aktion im Gesundheitswesen" (Fischer et al., 2003) and potential new business fields for the pharmaceutical industry.

2. Methodology and Data

Medical background

In principle, comparability of conventional medicine with holistic medicine (homeopathy) is only possible to a very limited extent.

The respective disciplines are a certain approach to the patient's symptoms; it cannot be excluded that both disciplines work together or side by side.

SWOT analysis

Despite this imbalance, a SWOT analysis is used to stimulate how the attractiveness of the production of homeopathic medicines can be demonstrated for a newcomer to the market.

The SWOT analysis takes on the task of addressing the "abilities" of the two medical disciplines and those of the customer's wishes. Among other things, it is intended to briefly explain the growth of the market in recent years from a medical perspective.

The market participants of the SWOT are as follows:

The center of the circle is formed by the German Health Care Sector with its structure:

1. The Association of Statutory Health Insurance Physicians
2. The Health Insurances
3. The German Bundestag: Commission for Health and
4. The German Hospital Federation

It interacts with its so called rivals. The parties thereto are the same as in the classical academic medicine; doctors, chemists, health insurances, politics, experts and professionals.

Porter model

The subsequent Porter model is modelled with the results of the SWOT analysis in a supportive manner, so that the interested party gets a picture of why homeopathy is interesting from a medical perspective and from an economic perspective, where the interests of future customers lie and where the interest (from which parties) in homeopathic medicines comes from.

The execution and evaluation of the Porter model takes place resolutely with graphic number 2 on page 5.

Methodical Implementation

SWOT-Analysis for complementary medicine/ homeopathy:

The following aspects form the framework of the SWOT-Analysis in this paper:

The internal analysis mirrors “capabilities & competences” based on three aspects.

The external analysis focuses on “customers’ requirements” also based on three aspects.

The internal analysis has the following benefits:

- a) without side effects
- b) exceptional differential diagnostics, because of a broad field of view – generating loyal patients
- c) always multiply and supportingly applicable – cross-departmental in the medicine

The internal weaknesses are:

- a) insufficient long-term studies in research situation and quantitatively at a disadvantage in medical branches
- b) long-term training necessary to diagnose especially chronic illnesses in a good and efficient way (Deutscher Zentralverein homöopathischer Ärzte, Landesverband Bayern, 2018).
- c) the applicability in emergency medicine/acute care is negligible

The external analysis offers the following opportunities:

- a) the German Health Care Sector (Fischer et al., 2003) and the expert reports (Fischer et al., 2003; Gerlach et al., 2015) call for new complementary therapy methods especially for the treatment of chronically ill people
- b) the demographic change (Deutsches Bundesamt für Statistik, 2008; Robert Koch Institut, 2011) and the trend towards organic products indicates changing customer demands (Altmann, 2009, pp. 110–112).
- c) Homeopathy provided – especially in the last few years – many evidence-based studies attesting immaculate results regarding the applicability of homeopathy according to the guidelines and the gold standard (Ammon & Kösters, 2016) – as an alternative or substitute method of treatment.

The internal analysis shows the following risks:

- a) homeopathic societies are inactive, although there is demand
- b) the buyers/customers are only small groups so far
- c) self-medication and online-sale make potential customers back out (Fischer & Breitenbach, 2013, p. 271; BPI, 2016)

SWOT-Analysis for academic medicine:

The internal analysis mirrors “capabilities & competences” based on three aspects.

The external analysis focuses on “customers’ requirements” also based on three aspects.

The internal analysis has the following benefits:

- a) very efficient pain therapy
- b) unbeatable in acute care/emergency medicine

- c) high qualification due to diverse research situation

The internal weaknesses are:

- a) hardly any bonding to patient/customer
- b) insufficient differential diagnostics
- c) chronic treatment difficult; insufficient instrumentarium (Gerlach et al., 2015, p. 247)

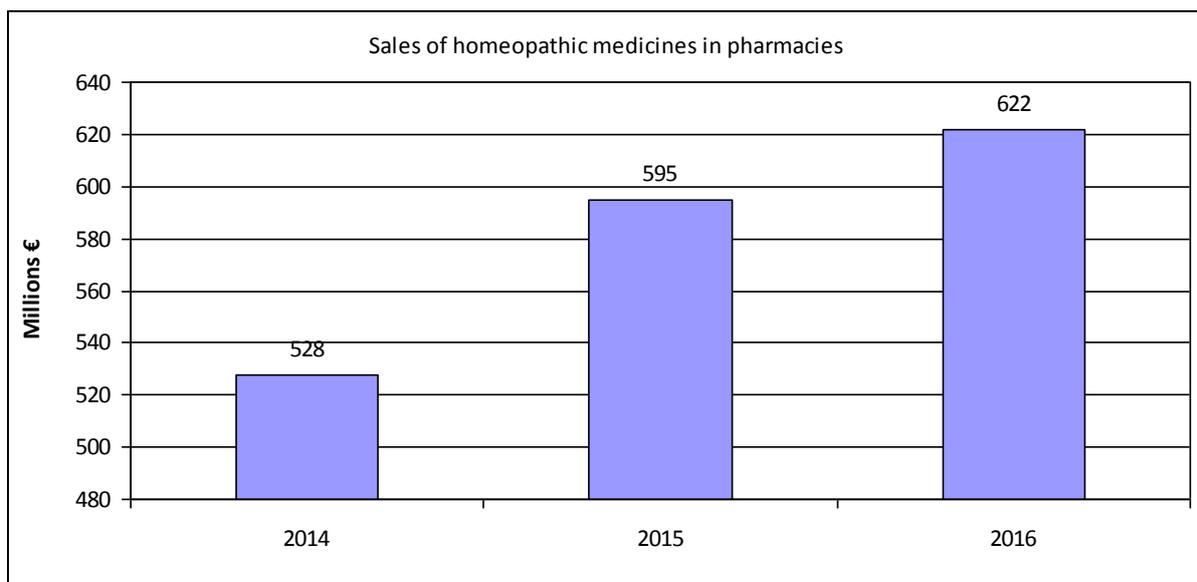
The external analysis offers the following opportunities:

- a) unbeatable in acute care/emergency medicine
- b) the demographic change outlines an increasing number of patients and thus an increasing demand of treatments and medication (Altmann, 2009, pp. 110–112)
- c) great trust of people in academic medicine (Altmann, 2009)

The internal analysis shows the following risks:

- a) people want organic products and “nature” (Altmann, 2009, pp. 222–224)
- b) not free from side effects
- c) health care sector wants alternative therapy methods (Gerlach et al., 2015, p. 247)

2.1. Graphics



Graphic 1: Sales of homeopathic medicines in pharmacies in the years 2014, 2015, 2016.

Source: Boden et al; Verband deutscher Arzneimittelhersteller

| | 2014 | 2015 | 2016 |
|--|------|------|------|
| Sales of homeopathic medicines in pharmacies | 528 | 595 | 622 |

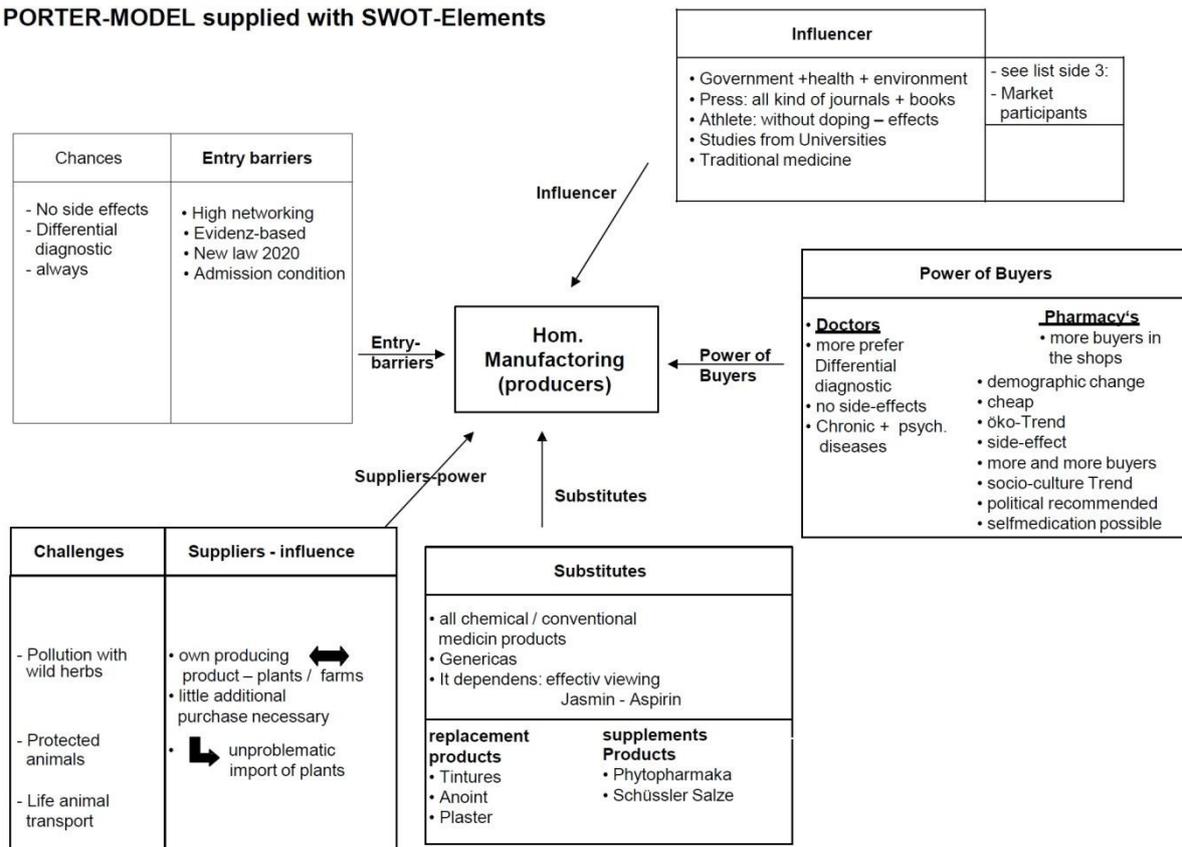
The changes in% values from year to year

| | 2014 | 2015 | 2016 |
|--|------|---------|--------|
| Sales of homeopathic medicines in pharmacies | - | 11,261% | 4,341% |

In 2016, approximately 100 manufacturers of homeopathic remedies (Bpi, 2016) all over Germany generated a sales volume of 622 million Euros (Boden et al., 2017, p. 34). That is an increase of 4.3% compared to the previous year (Boden et al., 2017, p. 34).

According to the BAH, the sales volume of homeopathic remedies sold in pharmacies was 595 million Euros in 2015, which is an increase of 12.8% compared to the previous year (Boden et al, 2016, pp. 24–26).

PORTER-MODEL supplied with SWOT-Elements



Graphic 2: Porter Model self-representation (2018)

Entry Barriers

The entry barriers are high, as the existing market is divided between a few well-networked manufacturers (Walz, 2012). There are gaps in the evidence of homeopathy in some places, so that the manufacturers have to meet difficult approval requirements. The new EU legislation from 2020 represents a hurdle for all pharmaceutical manufacturers (Bundesverband der Arzneimittel-Hersteller e. V., 2016b, p. 21). It then requires a preliminary clinical examination for all products before an application for approval can be submitted (ibid.).

Nevertheless, interested newcomers have a good chance of entering the market, as the effects of demographic change and the increase in demand are predictable. Ultimately, there are business fields in the homeopathy sector that are still virtually unconsidered.

Power of Buyers

The negotiating power of buyers has been increasing for years (Walz, 2012); the reasons are manifold. The focus is on demographic change and the associated effect of "wanting to live healthier" as well as the increase in chronic diseases, which increases with the age curve. Altmann (2009) explained these reasons in detail in her dissertation. The political desirability of naturopathic medical therapies and also self-medication are allowing more and more people to buy homeopathic medicines that can be purchased over the counter in Germany, especially in pharmacies (Fischer et al., 2003).

Added to this is the rising OTC market (over-the-counter-market).

More and more doctors are also interested in homeopathic products for the treatment of their patients and the extremely detailed diagnostics of homeopathy (Deutscher Zentralverein homöopathischer Ärzte, Landesverband Bayern, 2018).

Suppliers Power

The suppliers have very little influence on homeopathic manufacturers in Germany, as almost all companies have their own plantations and laboratories for their production. Imports of protected plants or animals are so small that they are negligible. One major challenge is that more and more wild plants worldwide are being poisoned by environmental influences and can no longer be used for the production of medicines (Bundesverband der Arzneimittel-Hersteller e. V., 2016).

Substitutes

Threat of substitute products: all kind of school-medicine-pills are potential threats for the homeopathic companies. So, for example all generic pharmaceutical medicine too. And, companies with other natural products too: Phytopharmaca, Schüssler Salze.

Basically, it depends a personal view: school medicine products or homeopathic products.

Influencer

The influence of numerous parties on complementary medical procedures is high. For years a heated discourse has been taking place about the evidence of homeopathic medicines, which is also expected to degrade only slowly, as the often missing long-term studies are in current work. The chairs at German universities are generally shaped by orthodox medical research and homeopathic research is only carried out in the faculties for a few years.

In Germany, homeopathy is a folk medicine that has been used for over 200 years from Samuel Hahnemann. Surveys clearly show an increasing popularity. Professional athletes from many sports also promote homeopathy because it is considered free of side effects and thus doping. Finally, the entire German health care system is also influencing the production of homeopathy, since there has been a political desire since 2003 (Fischer, et al, 2003) to integrate alternative methods of treatment into the health care system.

3. Results

The results of the combination of SWOT and Porter with regard to the possible generation of new business fields in the homeopathy producing division show the following: A direct comparison, or a direct equality of orthodox and complementary medicine (homeopathy)

is not possible due to different world views and approaches. Creating a synergy effect is already common practice.

One of homeopathy's benefits is that it is free from side effects.

This is a unique ability which cannot be confirmed by treatments with conventional medication evidence: see patient information leaflets coming with every medication. As homeopathic medication is free from side effects, it can be combined with orthodox medication without reservations.

The homeopathic individual diagnosis is independent of age, gender and condition (Deutscher Zentralverein homöopathischer Ärzte, Landesverband Bayern, 2018). Its approach is different from the orthodox symptom diagnosis of conventional medicine. Thus it offers the possibility to be used in all medical fields.

However, the applicability of homeopathy in emergency medicine is only very limited. In case of acute care the approach of conventional medicine is unbeatable and enormously important. Homeopathy – by contrast – is stronger in the field of soft alleviation and relief (Altmann, 2009).

Demographic change

The increasing age of the German population generates a rising number of treatments and the need for corresponding medication. Statistically, chronic illnesses increase with age. These chronic illnesses are a major burden for the German Health Care Sector (Deutsches Bundesamt für Statistik, 2008).

With a demand of 90% the trend towards homeopathy within the German population is rather self-explaining (Wolf & Windeler, n.d.). The trend towards organic products and lifestyles (Altmann, 2009) and the fact that homeopathy is free from side effects could even increase this demand. Thus, academic medicine could be supported by homeopathy, as the findings show that academic medicine is stretched to its limits when it comes to the treatment of chronic illnesses (Fischer et al., 2003; Gerlach et al., 2015). Notwithstanding the above, people's trust in academic medicine is unshaken.

Both the high quality and the quantity of the state of research in all disciplines of academic medicine is well-known and undoubted within the German society (BPI, 2016).

Homeopathy, which has mainly been based on experience so far, has only caught up on evidence-based medicine in the last few years. Though there are qualitatively excellent studies, which comply with the gold standard (Ammon & Kösters, 2016) of medical research, the quantity is not yet there (long-term-studies). The studies that explicitly deal with the treatment of chronic illnesses by means of homeopathy are efficient and successful on the one hand, but cannot score economically due to a lack of long-term studies (Baumgartner, 2016; Becker, 2008).

This paper work is dealing with raw data (Porter, 2004; 2013; 2014) and the excerpt from a study.

The comparison between academic medicine and homeopathy based on three perspectives does not allow a statistical assessment of significant results.

The collection of data with Porter and the associated results of the SWOT analysis show that the homeopathic product market is attractive. A detailed examination of all influencing forces is recommended.

Statistical data

Health care costs

The increasing health care costs (356.5 billion Euros, an increase of 3.8% compared to the previous year) (Destatis Statistisches Bundesamt, 2018b) the demographic change

and the mandate of the Council of Experts for the concerted action (Fischer et al., 2003), call for new perspectives within the German Health Care Sector. The Council of Experts encouraged the search for new complementary treatment methods and thus also the search for new medication – which means that the pharmaceutical industry in Germany will have to meet new challenges (ibid.). Within the last few years there was an increase in the field of self medication and in the purchase of over the counter pharmaceuticals (all in all 6.582 million Euros, plus an increase of 2.6% in 2016) (Boden et al., 2017, p. 31); this growth serves as a basis for the analysis of the profitability of companies producing homeopathic pharmaceuticals in Germany.

In Germany, there is a clear trend towards the combination of healthy nutrition and medicine (Altmann, 2009). As a result, the market for dietary supplements (1.175 billion Euros in 4/2015 to 3/2016) (Bächle, 2017) and homeopathic products (622 million Euros in 2016) (Boden et al. 2017, p. 34).

All over Europe, the homeopathic remedy sector has a turnover of 1 billion Euros (Stieber, 2009). The manufacturing of Homeopathics in Germany can be regarded as a niche market.

Statement from the Pharmaceutical industry 2013

Reasons for the increasing demand according to the “Pharmaceutical industry 2013” (Fischer & Breitenbach, 2013, p. 23 et seqq.) are among others:

- growing global population
- increasing demand of the Emerging Market (EC 2009)
 - new markets for “old products” in advanced developing countries
- countries with lower laboratories costs produce pharmaceuticals
- the rate of chronic diseases – even among young people
- pandemic emerge and there is an urgent need for new medication
- EU-members extend the market
- the demand to reduce costs by the concerned European health care systems;

4. Discussions and Conclusions

This paper work is a short analyzed collection of raw data, used as a basis for further investigations.

The previous state of research shows that the Health Care Sector is stamped by the topics of evidence-based medicine and by several aspects of economic viability of various fields of interests of the participants (1. The Association of Statutory Health Insurance Physicians, 2. The Health Insurances, 3. The German Bundestag: Commission for Health and 4. The German Hospital Federation).

So far no common examinations or studies, dealing with the possibility to create a synergy between academic medicine and complementary medicine (especially homeopathy) are known (Altmann, 2009).

The results of the short SWOT-analysis done in the fields of capabilities and customers needs can lead to the assumption that synergy-effects can be shown with further investigations.

Normally the view towards medicine is heavily influenced by the pharmaceutical industry, mainly caused by working and researching hand in hand with academic medicine.

However, the capability (refer to SWOT analysis) of homeopathy is so significant that its potential shall be reviewed with regard to the strategic management and marketing sector.

For example, the medicine Traumeel from Heel shows a successful synergy between modern school medicine and an alternative medication. It combines the experience and the knowledge regarding active agents of both disciplines.

It is possible that in the future R&D of medication and its combination remedies will be of importance to include homeopathic experience and knowledge.

Demographic change and thus the increasing number of chronically ill people (Gerlach et al., 2015) is – besides conventional medication – an unexploited market for combination remedies dietary and food supplements (BPI, 2016; Altmann, 2009).

The capabilities of homeopathy with its differential diagnostics could point up new approaches for innovative medicament combinations.

Also the increasing health consciousness (organic lifestyle trend, New age – wave), (Altmann, 2009, pp. 110–112) of the German population constitutes a rising interest in above mentioned remedies (Altmann, 2009, pp. 110–112).

The aim of the study was on the one hand to give an overview of the complementary medical field using the example of homeopathy, and on the other hand to provide an insight into possible new business fields for interested newcomers to the industry or to expand existing business fields.

All available data indicates a potential business area. Even if the entry barriers identified by Porter correspond to a high level, the actual increase in sales of homeopathic products is self-explanatory both nationally and Europe-wide.

References

- ALTMANN, S. (2009). *Alternativmedizin und ihre Akzeptanz in der Gesellschaft*. Wien: Universität Wien.
- AMMON, K. v., & KÖSTERS, C. (2016). *Methodische Probleme von randomisierten Doppelblindstudien in der Homöopathie-Forschung*. In: *Der aktuelle Stand der Forschung zur Homöopathie. Versorgungsforschung. Randomisierte kontrollierte klinische Studien. Meta-Analysen. Grundlagenforschung*. Köthen (Anhalt): Wissenschaftliche Gesellschaft für Homöopathie e. V. (WissHom).
- BÄCHLE, C. (20. 01 2017). *DEBInet Deutsches Ernährungs- & -informationsnetz*. Available at: <https://www.ernaehrung.de/blog/nahrungsergaenzungsmittel-weiter-auf-erfolgskurs/abgerufen>
- BAUMGARTNER, S. (2016). *Stand der Grundlagenforschung in der Homöopathie*. In: *Der aktuelle Stand der Forschung zur Homöopathie. Versorgungsforschung. Randomisierte kontrollierte klinische Studien. Meta-Analysen. Grundlagenforschung*. Köthen (Anhalt): Wissenschaftliche Gesellschaft für Homöopathie e.V. (WissHom).
- BECKER, C. (2008). *Lage zur Evidenz der Wirksamkeit homöopathischer Medikamente bei Kindern. – Systemische Übersichtsarbeit -*. Homburg/Saar: Universitätsklinikum des Saarlandes.
- BIOLOGISCHE HEILMITTEL HEEL GMBH. (2018). *-Heel Healthcare designed by nature*. Accessed : 26. 02 2018 Available at <http://www.heel.de/de/traumeel-s-tabl-creme.html>

- BODEN, L., GROMES, A., KÖNIG, J., REINERT, W., & VERHEESEN, M. (2017). Der Arzneimittelmarkt in Deutschland, Zahlen und Fakten, 2016. 2017: Bundesverband der Arzneimittel-Hersteller e. V.
- BODEN, L., GROMES, A., MICHELS, C., & REINERT, W. &. (2016). Der Arzneimittelmarkt in Deutschland. Zahlen und Fakten. Bonn, Berlin: Bundesverband der Arzneimittel-Hersteller e. V. .
- BPI. (2016). Pharma-Daten 2016. 46th. Ed. Berlin: Bundesverband der Pharmazeutischen Industrie e.V.
- BUNDESVERBAND DER ARZNEIMITTEL-HERSTELLER E. V. (2016b). Geschäftsbericht 2015/2016. Bonn: Bundesverband der Arzneimittel-Hersteller e. V.
- DESTATIS Statistisches Bundesamt . (17. 04 2018 a). DESTATIS Statistisches Bundesamt. Von <https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Gesundheit/Gesundheitsausgaben/Gesundheitsausgaben.html> abgerufen.
- DESTATIS Statistisches Bundesamt . (2018. 02 2018 b). DESTATIS Statistisches Bundesamt. Von https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2018/02/PD18_050_23611.html abgerufen.
- DEUTSCHER ZENTRALVEREIN HOMÖOPATHISCHER ÄRZTE, Landesverband Bayern. (2018). Deutscher Zentralverein homöopathischer Ärzte, Landesverband Bayern. Accessed: 26. 02 2018 Available at <http://www.lv-by.dzvhae.de/lvbayern-weiterbildung/struktur-der-weiterbildung.html>.
- DEUTSCHES BUNDESAMT FÜR STATISTIK. (2008). Ausgaben für Gesundheit: Informationssystem der Gesundheitsberichterstattung des Bundes. Berlin: Statistisches Bundesamt.
- FISCHER, D., & BREITENBACH, J. (. (2013). Die Pharmindustrie. Einblick – Durchblick – Perspektiven. 4th ed. Berlin Heidelberg: Springer-Verlag.
- FISCHER, G., KUHLMEY, A., LAUTERBACH, K. W., ROSENBROCK, R., SCHWARTZ, F. W., SCRIBA, P. C., & WILLE, E. (2003). Finanzierung, Nutzerorientierung und Qualität. Band I Finanzierung und Nutzerorientierung. Band II Qualität und Versorgung. Bonn: SACHVERSTÄNDIGENRAT für die Konzertierte Aktion im Gesundheitswesen.
- GERLACH, F., GREINER, W., HAUBITZ, M., MEYER, G., SCHREYÖGG, J., THÜRMAN, P., & WILLE, E. (2015). Krankengeld – Entwicklung, Ursachen und Steuerungsmöglichkeiten. Sondergutachten 2015. Berlin/Bonn: SACHVERSTÄNDIGENRAT zur Begutachtung der Entwicklung im Gesundheitswesen.
- INSTITUT DER DEUTSCHEN WIRTSCHAFT KÖLN, F. P. (2015). Die pharmazeutische Industrie in Deutschland. Ein Branchenporträt. Berlin, Köln: Verband Forschender Arzneimittelhersteller e. V., Institut der deutschen Wirtschaft Köln e. V.
- INSTITUT ROBERT KOCH. (2011). Auswirkungen des demographischen Wandels. Notebook 2. Berlin: Deutsches Bundesamt für Statistik.
- KOTLER, P., BERGER, R., & RICKHOFF, N. (2010). The Quintessence of Strategic Management. Berlin: Springer-Verlag.

- MERZ, F. (2008). *Wachstumsmotor Gesundheit. Die Zukunft unseres Gesundheitswesens*. München: Carl Hanser Verlag.
- PORTER, M. E. (2004). *Competitive Strategy. Techniques for Analyzing Industries and Competitors*.
- PORTER, M. E. (2013). *Wettbewerbsstrategie. Methode zur Analyse von Branchen und Konkurrenten*. 12th. Ed. Frankfurt am Main: Campus Verlag GmbH.
- PORTER, M. E. (2014). *Wettbewerbsvorteile. Spitzenleistungen erreichen und behaupten*. 8th. ed. Frankfurt am Main: Campus Verlag GmbH.
- STIEBER, B. (25. 01 2009). WELT. Abgerufen am 28. 03 2018 von https://www.welt.de/wams_print/article3086108/Kuegelchen-auf-Rezept.html
- WALZ, P. (2012). *Erwerb von Kernkompetenzen am Beispiel von Novartis*. Mittweida: Hochschule Mittweida.
- WITTCHEN, H.-U., JACOBI, F., KLOSE, M., & RYL, L. (2010). *Gesundheitsberichterstattung des Bundes. notebook/Heft 51. Depressive Erkrankungen*. Berlin: Robert Koch-Institut.
- WOLF, R., & WINDELER, J. (kein Datum). *GWUP Gesellschaft zur wissenschaftlichen Untersuchung von Parawissenschaften e. V.* Abgerufen am 26. 02 2018 von <http://www.gwup.org/infos/themen-nach-gebiet/77-cam/333-homeopathie-erfolge-nur-placeboeffekt>.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Does reporting obligation affect credibility of information disclosed in corporate social responsibility reports?

Patrycja Hąbek¹

¹Institute of Production Engineering, Faculty of Organization and Management, Silesian University of Technology, Roosevelta street 26-28, 41-800 Zabrze, Poland, e-mail: patrycja.habek@polsl.pl

Abstract

This paper analyses whether mandatory corporate social responsibility (CSR) reporting regulation leads to improved credibility of information disclosed in the CSR reports. For the study the author have chosen six European Union Member States which have developed additional mandatory requirements (to certain groups of companies) for CSR data disclosure. It was admitted for the study 482 CSR reports from the international online database. To assess the credibility of information disclosed in the CSR reports it was used six criteria. The study finds that the level of credibility of the analysed reports is generally low for both groups of the reports, prepared as mandatory as well as on voluntary basis. The analyzes in the sample showed that there are statistically significant differences in the level of credibility of information disclosed in voluntary and mandatory CSR reports, and the value of the credibility index is higher for the mandatory reports. However, analyses of individual countries do not confirm those differences.

Keywords: CSR reports, credibility, mandatory reporting, EU Member States, regulations

JEL Code: M14, M41

1. Introduction

When considering the last financial crisis, which resulted in decrease of public trust, it seems justified to tackle the topic of credibility of corporate social responsibility (CSR) reports (Kołodziej, Maruszewska, 2015). The growing expectations of stakeholders in regard to the transparency and responsibility of enterprises imply measuring and disclosing the impact of business decisions on society and the natural environment (Jonek-Kowalska, Zieliński, 2017; Cierna, Sujova, 2015). The number of published CSR reports increases year-on-year, however, such reports do not always provide complete data, which might intensify issues with their assessment and the comparison of the results achieved

in this area, both in regards to historical data and between individual enterprises. Literature on CSR reporting points to increasing lack of relevance, completeness and credibility of the information reported (Michelon, Pilonato, Ricceri, 2015; Husillos, Larrinaga, Álvarez, 2011; Adams, 2004; Dando, Swift, 2003; Gray, 2010). There are justified fears that companies can use CSR reports only to improve their reputations and social image without relating the information disclosed in these reports to their operational reality (Håbek, Brodny, 2017; Ryszko, 2017). According to the Federation of European Accountants (Accountancy Europe), “CSR reporting without the authentication of the veracity of the disclosed data is rightly deemed as worth little more than advertising activities”. This phenomenon is known as “greenwashing” (Bowen, 2014). It seems that until the methods of reporting and authentication of credibility of non-financial data carry on evolving, the readers and users of these reports will continue to question the intentions behind them and the legitimacy of the information disclosed in these reports.

Governments activity can influence shaping of appropriate behaviour amongst companies, including reporting relating to social responsibility. It is possible to distinguish numerous initiatives which can be undertaken by governmental agencies in order to support and promote CSR reporting. One of them is drawing up of regulations which legally mandate reporting for companies. Nowadays it is possible to observe a growing tendency in the activity level of governments from across the world as well as in European Union (EU) relating to the introduction of legal regulations (KPMG International et al., 2016). Some Member States have developed national legislation that goes beyond the requirements of the EU Accounting Directives. For example, in the Netherlands reporting on CSR has become mandatory, based on the “comply or explain” approach for all listed companies since 2008, and in Sweden there is a duty to report CSR since 2007 to state-owned enterprises, the reports must comply with the international guidelines of the Global Reporting Initiative. However, legal regulations of reporting practices do not always improve the process of communication and the quality of disclosed information. In some cases companies may concentrate on reducing reporting costs by complying with only minimal requirements resulting in low quality of reported data (Schaltegger, 1997). The research question stated in the paper is if there are differences in credibility of information disclosed in CSR reports developed on mandatory and voluntary basis? Thus, the aim of this paper is to examine the level of credibility of information disclosed in mandatory as well as voluntary CSR reports and to assess for which group of the reports the level is higher.

The rest of the paper is structured as follows. The next section provides an overview of CSR reporting literature, with a particular emphasis on studies focusing on obligatory and mandatory models of reporting. This is followed by a section dedicated to methodology used in the research process. Then the research findings are presented. The paper ends with discussion and conclusions including limitation as well as recommendations for further research.

2. Literature Review

Within the last decade, a lively discussion has been taking place between the supporters of voluntary (Francis, Nanda, Olsson, 2008; Rodríguez, LeMaster, 2007; Dhaliwal, Li, Tsang, Yang, 2009) and obligatory (Maguire, 2011; Ioannou, Serafeim, 2011) CSR reporting. Initially, corporations were decisive in their support of voluntary standards, while non-governmental organisations, pressure groups and trade unions were rigid that CSR

reporting should be voluntary, as they did not believe that corporations would objectively disclose any crucial information. Within the last couple of years, this debate has become more mature. It could be said that at present, companies, investors and analysts promote legal regulations in CSR reporting (KPMG et al., 2010). However, as it often happens, there are still arguments for and against, both for obligatory and voluntary CSR reporting.

Voluntary sustainability reporting, while increasingly recognised for its valuable contributions, also put many challenges. For example, companies reporting on a voluntary basis may (Lydenberg, Rogers, Wood, 2010):

- choose different time periods in which to report – some may report annually, some biannually, some at irregular intervals,
- report different indicators – companies in the same industry may choose to report on a variety of different key indicators,
- report in different formats and using different metrics – even when reporting on the same indicators, companies may report data covering different time periods, using different units of measurements, or choosing different benchmarks against which to measure performance.

When CSR reporting is a voluntary practice, it is often perceived as non-vital or incomplete (CGA, 2011). Obligatory CSR reporting promotes socially-responsible management practices (Ioannou, Serafeim, 2011). Nonetheless, it also has some flaws, for instance, the necessity to disclose information on a level which is compliant with the requirements of the legislator. Without guaranteeing suitable monitoring and enforcement of the obligatory model, this type of reporting may result in a waste of time and resources for all interested parties (CGA, 2011). Legal regulations of reporting practices do not always improve the process of communication and the quality of disclosed information. In some cases companies may concentrate on reducing reporting costs by complying with only minimal requirements resulting in the neglect of the processes of collecting, aggregating and analysing of CSR data. This can lead to an adverse situation, where information of low quality displaces information of high quality (Schaltegger, 1997), which provides data and reports with limited or absent informative value for the interested parties (Herzig, Schaltegger, 2006). The most often used arguments against obligatory CSR reporting are those linked to the usability of these types of reports and costs. It is difficult to define what data should be required, in what way it should be monitored, and whether the disclosure is appropriate (Lydenberg, Rogers, Wood, 2010). In addition, developing a CSR report generates costs. The cost of non-financial reporting for large companies is an expense which oscillates between EUR 155,000 and EUR 604,000 and for smaller companies, between EUR 8,000 and EUR 25,000 (Centre for Strategy and Evaluation Services, 2011).

In recent years, various combinations of the models discussed have been implemented in different countries. It could be said that a global trend to regulate CSR reporting is currently noticeable. Among 140 national standards of voluntary and obligatory approaches to CSR reporting, identified in 30 countries, more or less two-thirds are obligatory (KPMG et al., 2010). When regulation is introduced, companies tend to respond and CSR reporting rates are seen to increase rapidly (KPMG, 2015). In China and South Africa non-financial disclosure increased when laws were passed (Ioannou, Serafeim, 2014). Ioannou and Serafeim (2014) find that corporations increased disclosure following mandatory reporting requirements in their respective jurisdictions, which suggests greater transparency and conforming with globally-accepted norms in CSR. What is interested to be seen is whether increased disclosure is actually accompanied with improved credibility of those reports. The assurance statement, the output of the assurance process, adds

to the credibility of the CSR report (Jones, Solomon, 2010) but do the same reporting obligation? The study which results are presented in this paper, tries to answer the question put forward.

3. Methodology

The study refers to corporate social responsibility reporting practices in the selected EU member states. Since 2005, based on the European Modernization Directive companies are required to analyze and disclose non-financial key performance indicators relevant for the particular business, including information relating to environmental and employee matters. All member states have implemented the requirements of the Directive (Knopf et al., 2011). For the study the author have chosen those countries which have developed additional mandatory requirements (to certain groups of companies) for CSR data disclosure. The selected for analysis member states are: Denmark, Sweden, France, the United Kingdom and the Netherlands. The study included all reports published in 2012, developed by companies which disclose CSR information on voluntary as well as mandatory basis. In the study a mixed method research was applied (Alavi, Hąbek, 2016). The information about CSR reports published in 2012 was obtained from the online directory of sustainability reports – corporateregister.com. The study included separate CSR reports, annual reports with CSR section and integrated reports. The assumption of the research was evaluation of CSR reports therefore the author excluded from the study: environment reports, UN GC Communication on Progress which contained only general statements, citizenship plans, collective industry reports, occupational safety and health (OHS) reports and several pages brochures. Only reports that were published in English language were selected for this study. The reports published in English together with those that were available, having regard to the above, finally gave the number of 482 CSR reports admitted to the study.

To assess the credibility of information disclosed in the CSR reports the author used six criteria. The structure and explanation of these criteria is shown in Table 1. During the assessment process a five-point scale (from 0 to 4) was applied (see Table 2).

In order to determine the level of credibility of the CSR reports and check whether the reports prepared as mandatory obligation have higher level of credibility then those prepared on voluntary basis the author aggregated the credibility indicator (CI) related to the CSR reporting practices (Bluszcz, 2016; Orszaghova, 2015). The CI indicator was specified using the arithmetic mean of sub-indices constituting it. The indicator of credibility consists of six sub-indices (CI1, CI2, CI3, CI4, CI5, CI6). In the first step, individual CI indicators were calculated for each of the analysed CSR report. Then, on this basis, values of the CI indicators were calculated for each of the analysed country.

Table 1: Structure of the assessment tool

| CREDIBILITY OF INFORMATION (CI) | |
|--|---|
| CI1 | Readability <i>The report has a logical structure, uses a graphical presentation of the data, drawings, and explanations where required or uses other tools to help navigate through the document</i> |
| CI2 | Basic reporting principles |

| | |
|------------|--|
| | <i>The reporting period, scope and entity are defined in the report as well as limitations and target audience</i> |
| CI3 | Quality of data <i>The report describes the processes, procedures of collection, aggregation and transformation of data and determines the source of the data</i> |
| CI4 | Stakeholder dialogue outcomes <i>The report contains a description of the stakeholders' dialogue and the results of this dialogue in relation to aspects of CSR (surveys, consultations, focus groups, round tables, programs, engagement, etc.)</i> |
| CI5 | Feedback <i>The report contains a mechanism that allows a feedback process (contact point for suggestions or questions, hotline, email, reply card, questionnaire, etc.)</i> |
| CI6 | Independent verification <i>The report contains a statement of independent body attesting the authenticity of data presented in the report as well as proposals for future improvements</i> |

Source: Based on Hąbek, Wolniak, 2014, p.406

Table 2: Scoring system

| Scores | Assessment requirements |
|---------------|---|
| 0 | No mention or insufficient information on individual criteria |
| 1 | Some/little/partial mention or coverage |
| 2 | Most important aspects covered, average |
| 3 | Better than average, the report presents detailed information |
| 4 | Best practices and creative approach, innovative disclosure and explanation |

Due to the lack of conformity of distributions of dependent variables with the normal distribution, the non-parametric Mann-Whitney U test was used in the statistical analysis. The analyses were conducted at the level of statistical significance $\alpha = 0.05$. For all calculations, SPSS 21.0 software was used.

4. Results

Enterprises disclose CSR data in many different ways. Due to the regulations in force concerning this type of reporting in some countries, we can distinguish generally two reporting models: voluntary and obligatory. In the European Union, in addition to the Modernization Directive, whose requirements have been adopted by all Member States, in some countries there are additional solutions relating to various groups of enterprises and defining different scope of data which should be disclosed. In order to check whether the reporting model affects the credibility of information disclosed in CSR reports, the analyzed reports (N = 482) were grouped due to the reporting obligation into voluntary and mandatory reports. More than a half of the reports in the sample were mandatory (63%) while 37% were prepared on voluntary basis (see Table 3).

Table 3: Characteristic of reports in the sample

| CSR report | Separate report | Annual report with CSR section | Integrated report | Report according to GRI | Independent verification |
|-----------------|-----------------|--------------------------------|-------------------|-------------------------|--------------------------|
| Voluntary N=178 | 85% | 14% | 1% | 46% | 17% |
| Mandatory N=304 | 76% | 23% | 1% | 48% | 26% |
| Total N=482 | 79% | 20% | 1% | 47% | 23% |

Source: own study

Most of the reports in the sample were prepared as separate CSR reports both in the group of voluntary and mandatory reports (see Table 3). Nearly a half of assessed reports were prepared according to GRI guidelines. Only 23% of the reports in the sample were independently verified, more from mandatory reports subsample than from voluntary one.

The Table 4 presents descriptive statistics as well as results of the normality test for the distribution of the level of credibility of information disclosed in the reports under examination.

Table 4: Characteristics of the level of credibility of information (CI) in the sample (N = 482)

| Variable | <i>M</i> | <i>SD</i> | <i>Mdn</i> | <i>Min</i> | <i>Max</i> | <i>K-S</i> | <i>p</i> |
|---|----------------------|-----------|------------|---------------------------------|------------|------------|----------|
| Index of credibility of information – CI | 1.26 | 0.78 | 1.17 | 0.17 | 3.50 | 0.12 | <0.001 |
| Note | | | <i>Mdn</i> | – median | | | |
| <i>M</i> | – mean | | <i>K-S</i> | – Kolmogorov-Smirnov test value | | | |
| <i>SD</i> | – standard deviation | | <i>p</i> | – probability value | | | |

Source: own study

The minimum level of the credibility of information indicator (CI) of the examined reports was 0.17 points, while the maximum level was 3.5 points, the average level of credibility of information (CI) revealed in the reports was $M = 1.26$ points (with standard deviation $SD = 0.78$ points).

In order to check whether the reports prepared on voluntary basis differed from the mandatory reports in terms of the level of the credibility of information (CI), the Mann-Whitney U test was carried out. Table 5 shows the results. Analysis with the Mann-Whitney U test showed statistically significant differences between the groups, the test value $Z = 3.97$ with probability value $p < 0.001$. This means that mandatory reports were characterized by a higher level of the credibility of information indicator (CI) than voluntary reports.

Table 5: The credibility of information (CI) for voluntary (n = 178) and mandatory (n = 304) reports

| Variable | Reporting | <i>n</i> | <i>M</i> | <i>SD</i> | <i>Min</i> | <i>Max</i> | <i>Z</i> | <i>p</i> |
|---|-----------------------|----------|-----------|-----------------------------|------------|------------|-------------|------------------|
| Index of credibility of information – CI | Voluntary | 178 | 1.06 | 0.65 | 0.17 | 3.33 | 3.97 | <0.001 |
| | Mandatory | 304 | 1.38 | 0.83 | 0.17 | 3.50 | | |
| Note | | | <i>SD</i> | – standard deviation | | | | |
| <i>n</i> | – number in subsample | | <i>Z</i> | – U Mann-Whitney test value | | | | |
| <i>M</i> | – mean | | <i>p</i> | – probability value | | | | |

Source: own study

In order to check whether in individual countries the mandatory reports also differ from those prepared on voluntary basis, in terms of the level of the credibility of information (CI), the Mann-Whitney U test was carried out. Table 6 shows the results.

Table 6: The Level of credibility of information (CI) of voluntary and mandatory reports in individual countries

| Index of credibility of information – CI | Reporting | n | M | SD | Min | Max | Z | p |
|---|-----------------------|----------|-----------|-----------------------------|------------|------------|-------------|--------------|
| The Netherlands | Voluntary | 16 | 1.31 | 0.46 | 0.50 | 2.33 | 2.34 | 0.019 |
| | Mandatory | 44 | 1.68 | 0.61 | 0.50 | 3.17 | | |
| Sweden | Voluntary | 57 | 1.28 | 0.75 | 0.33 | 3.33 | 3.08 | 0.002 |
| | Mandatory | 10 | 2.07 | 0.52 | 1.00 | 2.83 | | |
| UK | Voluntary | 98 | 0.89 | 0.58 | 0.17 | 2.50 | 1.95 | 0.051 |
| | Mandatory | 156 | 1.16 | 0.84 | 0.17 | 3.50 | | |
| France | Voluntary | 7 | 1.17 | 0.48 | 0.67 | 1.83 | 1.95 | 0.052 |
| | Mandatory | 55 | 1.67 | 0.70 | 0.33 | 3.33 | | |
| Note | | | <i>SD</i> | – standard deviation | | | | |
| <i>n</i> | – number in subsample | | <i>Z</i> | – U Mann-Whitney test value | | | | |
| <i>M</i> | – mean | | <i>p</i> | – probability value | | | | |

Source: own study

The Mann-Whitney U test analysis showed statistically significant differences between groups of voluntary and mandatory reports only for reports from Sweden and the Netherlands. Therefore, the analyzes carried out showed that not in all countries mandatory reports are characterized by a higher level of credibility. There is no statistically significant difference between obligatory and voluntary reports in France and the UK. Due to the lack of differentiation of the “reporting obligation” variable among reports published in Denmark (100% of the Danish reports were subject to reporting obligation), no test was made to differentiate the credibility of information indicator in this group (N = 39).

5. Conclusions

The assessment of the level of credibility of the CSR reports led to the conclusion that there is still a lot to be done in this regard. The level of credibility of the examined reports is generally low both among the group of reports prepared as obligatory and those prepared voluntarily. In all the analyzed countries, indicator of credibility of information (CI), calculated in a five-point scale, only approached to the level of 2 points. The exceptions were mandatory reports from Sweden, where the CI indicator slightly exceeded this level and amounted to 2.07. The analyzes in the sample (N = 482) showed that there are statistically significant differences in the level of credibility of information for voluntary and mandatory reports, and the value of credibility indicator is higher for reports from mandatory subsample. However, analyzes for individual countries do not confirm those differences for CSR reports from France and United Kingdom. The CSR reporting is a multi-dimensional topic and legal obligation can be one of many factors that can affect the level

of credibility of disclosed information. The organizational culture of the reporting organization, the awareness of its managers as well as whether the report is treated as a tool for improving the process of social responsibility management. Stakeholder involvement in the process of CSR report preparation may also influence the credibility of information disclosed in these reports. The example of France and the UK is specific because these countries are characterized by a long tradition of social reporting and high awareness in the society of the need for the business sector to disclose how responsibly they conduct their activities. On this basis, it can be concluded that the introduction of legal regulations in the area of corporate social responsibility reporting is justified because it may contribute to improving the credibility level of these reports, however, it is worth considering the appropriate approaches and legal solutions in the discussed area as well as voluntary initiatives of national governments to create a favorable climate for the development of this type of reporting.

The research methodology used in the study is limited by various factors. The restrictions relate particularly to two issues. First limitation is related to sample selection. The selection of CSR reports was based on language criteria and thus raises the question of the representativeness of the sample. The second limitation of the study is the subjective way of the assessment of the CSR reports based on the substantive knowledge of the examiner. It seems, that in this case it would be more appropriate to carry out the assessment of quality of the reports by more people to balance the subjective views. Possible future directions for research in the field of CSR reporting concern several issues. First of all, future research can focus on the scope of the legal regulations in the analyzed countries and ask the reporting companies how much their reports are the result of the reporting obligation or their willingness to distinguishing themselves on the market or a way to communicate with their stakeholders. Finally, it will be also interesting to examine how voluntary government initiatives in individual countries influence creating favorable climate for disclosing credible information in the CSR reports.

References

- ADAMS, C. A. 2004. The ethical, social and environmental reporting – Performance portrayal gap. *Accounting, Auditing and Accountability Journal*, 17(5): 731–757.
- ALAVI, H. and HÄBEK, P. 2016. Addressing Research Design Problem in Mixed Methods Research. *Management Systems in Production Engineering*, 21: 62–66.
- BLUSZCZ, A. 2016. A comparative analysis of selected synthetic indicators of sustainability. *Procedia – Social and Behavioral Sciences*, 220: 40–50.
- BOWEN, F. 2014. *After greenwashing. Symbolic Corporate Environmentalism and Society*. Cambridge: Cambridge University Press.
- Centre for Strategy and Evaluation Services, 2011. Framework Contract for projects relating to Evaluation and Impact Assessment activities of Directorate General for Internal Market and Services. Disclosure of non-financial information by Companies. Final report. [Online]. Available at: http://ec.europa.eu/internal_market/accounting/docs/non-financial-reporting/com_2013_207-study_en.pdf. [Accessed 2015, May 28].

- CGA, 2011. Regulating Sustainability Reporting – Is a Mandatory Approach Better than a Voluntary One? [Online]. Available at: http://www.cga-canada.org/en-ca/ResearchReports/ca_rep_2011-12_informed-view.pdf. [Accessed 2015, May 25].
- CIERNA, H. and SUJOVA, E. 2015. Parallels Between Corporate Social Responsibility and the EFQM Excellence Model. *MM Science Journal*, 10: 670–676.
- DANDO, N. and SWIFT, T. 2003. Transparency and assurance: Minding the credibility gap. *Journal of Business Ethics*, 44(2/3): 195–200.
- DHALIWAL, D., LI, O. Z., TSANG, A. H. and YANG Y. G. 2009. Voluntary non-financial disclosure and the cost of equity capital: The case of corporate social responsibility reporting. Working Paper. Tucson, AZ: University of Arizona. [Online]. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1343453. [Accessed 2015, May 27].
- FRANCIS, J., NANDA, D. and OLSSON, P. 2008. Voluntary Disclosure, Earnings Quality, and Cost of Capital. *Journal of Accounting Research*, 46(1): 53–99.
- GRAY, R. 2010. Is accounting for sustainability actually accounting for sustainability and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society*, 35: 47–62.
- HĄBEK, P. and BRODNY, J. 2017. Corporate Social Responsibility Report – An Important Tool to Communicate with Stakeholders. In: *Business and Management: proceedings of the 4th International Multidisciplinary Scientific Conference on Social Sciences & Arts*. 22-31 August. Albena, Bulgaria, 241–248.
- HĄBEK, P. and WOLNIAK, R. 2016. Assessing the quality of corporate social responsibility reports: the case of reporting practices in selected European Union member states. *Quality & Quantity*, (2016) 50: 399.
- HERZIG, C. and SCHALTEGGER, S. 2006. Corporate Sustainability Reporting. An overview. In: SCHALTEGGER, S., BENNETT, M. and BURRITT, R. (Eds.) *Sustainability Accounting and Reporting*. Dordrecht: Springer.
- HUSILLOS, J., LARRINAGA, C. and ÁLVAREZ, M. J. 2011. The emergence of triple bottom line reporting in Spain. *Revista Española de Financiación y Contabilidad*, 60(150): 195–219.
- IOANNOU, I. and SERAFEIM, G. 2011. The Consequences of Mandatory Corporate Sustainability Reporting. Working paper. Boston, MA: Harvard Business School. [Online]. Available at: <http://hbswk.hbs.edu/item/6691.html>. [Accessed 2017, July 11].
- IOANNOU, I. and SERAFEIM, G. 2014. The Consequences of Mandatory Corporate Sustainability Reporting: Evidence from Four Countries. Boston, MA: Harvard Business School Research Working Paper, 11–100.
- JONEK-KOWALSKA, I. and ZIELIŃSKI, M. 2017. CSR Activities in the Banking Sector in Poland. In: *Proceedings of the 29th International-Business-Information-Management-Association Conference*. 03–04 May. Vienna, Austria, 1294–1304.
- JONES, M. J. and SOLOMON J. F. 2010. Social and environmental report assurance: Some interview evidence. *Accounting Forum*, 34(1): 20–31.

- KNOPF J., KAHLENBORN W., HAJDUK T., WEISS D., FEIL M., FIEDLER R., KLEIN J. 2011. Corporate Social Responsibility. National Public Policies in the European Union. European Commission, Directorate-General for Employment, Social Affairs and Inclusion. Unit C2, Publications Office of the European Union, <http://ec.europa.eu/social/BlobServlet?docId=6716&langId=en>. [Accessed 2017, June 12].
- KOŁODZIEJ, S. and MARUSZEWSKA, E. W. 2015. Economical Effectiveness and Social Objectives in Corporate Social Reports – A Survey Among Polish Publicly Traded Companies. In: Political Sciences, Law, Finance, Economics And Tourism, vol. II: Finance, Economics & Tourism, proceedings of the 2nd International Multidisciplinary Scientific Conferences on Social Sciences and Arts. 26 August – 01 September. Albena, Bulgaria, 161–167.
- KPMG International, GRI, UNEP and the Centre for Corporate Governance in Africa, 2016. Carrots & Sticks. Global trends in sustainability reporting regulation and policy. KPMG International, GRI, UNEP and the Centre for Corporate Governance in Africa [Online]. Available at: <https://www.carrotsandsticks.net/wp-content/uploads/2016/05/Carrots-Sticks-2016.pdf>. [Accessed 2017, March 23].
- KPMG, 2015. KPMG Survey of Corporate Responsibility Reporting 2015. [Online]. Available at: <https://home.kpmg.com/content/dam/kpmg/pdf/2015/12/KPMG-survey-of-CR-reporting-2015.pdf>. [Accessed 2017, January 17].
- KPMG, UNEP, The Global Reporting Initiative and The Unit for Corporate Governance in Africa, 2010. Carrots & Sticks. Promoting transparency and sustainability. An update on trends in Voluntary and Mandatory Approaches to Sustainability Reporting. KPMG Advisory N.V., United Nations Environment Programme, Global Reporting Initiative, Unit for Corporate Governance in Africa [Online]. Available at: <https://www.globalreporting.org/resourcelibrary/Carrots-And-Sticks-Promoting-Transparency-And-Sustainability.pdf>. [Accessed 2012, May 25].
- LYDENBERG, S., ROGERS, J. and WOOD, D. 2010. From Transparency to Performance. Industry – Based Sustainability Reporting on Key Issues. The Hauser Center for Non-profit Organizations at Harvard University and Initiative for Responsible Investment. [Online]. Available at: http://hausercenter.org/iri/wp-content/uploads/2010/05/IRI_Transparency-to-Performance.pdf. [Accessed 2015, May 26].
- MAGUIRE, M. 2011. The future of Corporate Social Responsibility Reporting. The Frederick S. Pardee Center for the Study of the Longer-Range Future. Boston, MA: Boston University. [Online]. Available at: <http://www.bu.edu/pardee/files/2011/01/PardeeIIB-019-Jan-2011.pdf>. [Accessed 2015, July 11].
- MICHELON, G., PILONATO, S. and RICCERI F. 2015. CSR reporting practices and the quality of disclosure: An empirical analysis. *Critical Perspectives on Accounting*, 33: 59–78.
- ORSZAGHOVA, D. 2015. The function of two variables – useful tool for maximizing of the profit and utility. In: proceedings of the X International Conference On Applied Business Research – ICABR 2015, 690–697.
- RODRÍGUEZ, L. C. and LEMASTER, J. 2007. Voluntary Corporate Social Responsibility Disclosure: SEC “CSR Seal of Approval”. *Business & Society*, 46: 370–384.

- RYSZKO, A. 2016. Corporate social responsibility reporting and green supply chain management – case of Poland. In: proceedings of the Carpathian Logistics Congress CLC'2016, 28–30 November. Ostrava: Tanger Ltd., 450–455.
- SCHALTEGGER, S. 1997. Information Costs. Quality of Information and Stakeholder Involvement. *Eco-Management and Auditing*, 87–97.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

A goal programming approach to measuring efficiency in two-stage DEA models

Josef Jablonský¹, Petra Zýková¹

*¹Department of Econometrics, Faculty of Informatics and Statistics, University of
Economics, Prague, W. Churhill Sq. 4, 13067 Praha 3, Czech Republic,
e-mail: jablon@vse.cz, petra,zykova@vse.cz*

Abstract

Data envelopment analysis (DEA) is a non-parametric approach designed for evaluation of efficiency and performance of the set of homogenous decision making units (DMUs). Conventional DEA models evaluate efficiency of transformation of multiple inputs into multiple outputs in one stage. In two-stage serial models the outputs leaving the first stage serve (all or their part) as the inputs for the second stage and this stage produces final outputs of the production process. The paper deals with analysis of efficiency and ranking of DMUs in two-stage processes. The proposed original goal programming approach is based on minimization of the weighted sum of efficiency scores of the DMU under evaluation in both stages from their ideal values under the assumption that the efficiency scores of all other units in the set do not exceed 1. The results of the proposed model are compared with traditional two-stage models using a real data set with 24 DMUs and two inputs, two final outputs and two intermediate variables.

Keywords: data envelopment analysis, goal programming, efficiency, two-stage model

JEL Code: C61

1. Introduction

Data envelopment analysis (DEA) is a well-known method for evaluation of relative efficiency and performance of decision making units (DMUs) described by multiple inputs and outputs. In general, DEA models measure efficiency of transformation of multiple inputs into multiple outputs relatively with respect to other members of the set of DMUs under evaluation. Let us suppose that the set of DMUs contains n elements. The DMUs are evaluated by m inputs and r outputs with input and output values x_{ij} , $i = 1, \dots, n$; $j = 1, \dots, m$, and y_{ik} , $i = 1, \dots, n$; $k = 1, \dots, r$, respectively. The efficiency of the q -th DMU can be expressed as the weighted sum of outputs divided by the weighted sum of inputs with weights expressing the importance of single inputs/outputs v_i , $i = 1, \dots, m$ and u_k , $k = 1, \dots, r$:

$$\theta_q = \frac{\sum_{k=1}^r u_k y_{qk}}{\sum_{j=1}^m v_j x_{qj}} \quad (1)$$

where θ_q is the efficiency score of the unit DMU $_q$.

Conventional DEA models, firstly introduced by Charnes et al. (1978) and further extended by Banker et al. (1984) deal with efficiency analysis of single-stage processes. However, reality is usually more complex and production process under consideration can be defined as a multi-stage process. They can be analyzed using so called network DEA models that have been introduced by Fare and Grosskopf (2000) at first. A simplest case of multi-stage processes is the one that consist of two serial sub-processes. These two sub-processes can be evaluated independently using conventional DEA models but several attempts have been published how to analyze efficiency and performance of the whole two-stage system. (Kao and Hwang, 2008) and (Chen et al., 2009a) are two first DEA models of this nature. They have been further studied and extended by (Chen et al., 2009b). They are based on traditional definition of efficiency as the weighted sum of outputs divided by the weighted sum of inputs. A slack-based model (SBM) for two-stage processes is proposed in (Jablonsky, 2017). Two-stage systems and their evaluation of efficiency using DEA models is still subject of research among many researchers. (Kao, 2014) is an interested review of two-stage DEA models. A similar study about two-stage DEA models is the main topic of the paper (Halkos et al., 2014). An importance and attractiveness of the research in this field is illustrated by the latest studies (Despotis et al., 2016), (Koronakos et al., 2018) or (Li et al., 2018). They discuss the latest developments in this field and propose original models extending the traditional ones.

The aim of this paper is to propose alternative approaches to evaluation of efficiency in two-stage serial systems based on the methodology of goal programming or, in more general, on multiple criteria decision making methodology. The paper is organized as follows. Section 2 contains formulation of (Kao and Hwang, 2008) model and its extensions. Section 3 introduces an original two-stage DEA model and illustrates its use on a numerical example taken from (Kao and Hwang, 2008). Final section discusses given results and possibilities of a future research in this field.

2. Two-stage DEA models

Two-stage production process is graphically illustrated on Figure 1. The first stage of this process spends m inputs and produces p outputs. For simplicity, we suppose that all outputs of the first stage serve as inputs of the second stage (in general, some of them may leave production process). The second stage produces r final outputs of the production process.

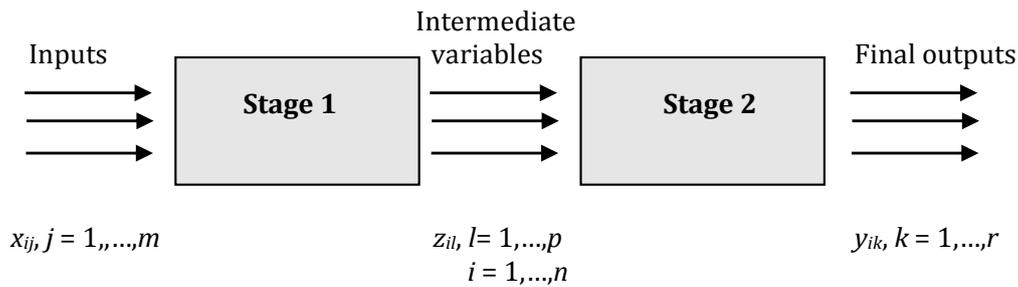


Figure 1: Two-stage model
Source: Own processing

Let us denote for the DMU_{*i*}: $x_{ij}, i = 1, \dots, n; j = 1, \dots, m$, the value of the *j*-th input of the first stage, $y_{ik}, i = 1, \dots, n; k = 1, \dots, r$, the value of the *k*-th final output of the second stage, and $z_{il}, i = 1, \dots, n; l = 1, \dots, p$, the value of the *l*-th output of the first stage and at the same time the value of the *l*-th input of the second stage. Individual efficiency scores of both stages θ_q^1 and θ_q^2 , and the overall efficiency score θ_q^0 for the DMU_{*q*} are defined as follows:

$$\theta_q^1 = \frac{\sum_{l=1}^p w_l z_{ql}}{\sum_{j=1}^m v_j x_{qj}}, \quad \theta_q^2 = \frac{\sum_{k=1}^r u_k y_{qk}}{\sum_{l=1}^p w_l z_{ql}}, \quad \theta_q^0 = \frac{\sum_{k=1}^r u_k y_{qk}}{\sum_{j=1}^m v_j x_{qj}}, \quad (2)$$

where $w_l, l = 1, \dots, p$, are the weights of the intermediate variables. Note that $\theta_q^0 = \theta_q^1 \theta_q^2$.

(Kao and Hwang, 2008) model maximizes overall efficiency score θ_q^0 of the unit under evaluation under the assumption that efficiency scores in both stages for all other units of the set do not exceed 1. This model is not linear in its objective function but can be easily transformed into a linear program using Charnes and Cooper transformation. The linearized version of this model is as follows:

$$\begin{aligned} \text{Maximize} \quad & \theta_q^{*KH} = \sum_{k=1}^r u_k y_{qk} \\ \text{Subject to} \quad & \sum_{l=1}^p w_l z_{il} \leq \sum_{j=1}^m v_j x_{ij}, \quad i = 1, \dots, n, \\ & \sum_{k=1}^r u_k y_{ik} \leq \sum_{l=1}^p w_l z_{il}, \quad i = 1, \dots, n, \\ & \sum_{j=1}^m v_j x_{qj} = 1, \\ & v_j > 0, w_l > 0, u_k > 0. \end{aligned} \quad (3)$$

Maximum efficiency score of the unit DMU_{*q*} in the first and second stages respectively can be derived using the following two optimization problems (conventional input-oriented DEA models with constant returns to scale technology):

$$\begin{aligned}
\text{Maximize} \quad & \theta_q^{*1} = \sum_{l=1}^p w_l z_{ql} & \theta_q^{*2} = \sum_{k=1}^r u_k y_{qk} \\
\text{Subject to} \quad & \sum_{l=1}^p w_l z_{il} \leq \sum_{j=1}^m v_j x_{ij}, & \sum_{k=1}^r u_k y_{ik} \leq \sum_{l=1}^p w_l z_{il}, & i = 1, \dots, n, \\
& \sum_{j=1}^m v_j x_{qj} = 1, & \sum_{j=1}^m w_l z_{ql} = 1, \\
& v_j > 0, w_l > 0, u_k > 0.
\end{aligned} \tag{4}$$

Note that optimal weights in model (3) and in both models (4) are not identical, i.e. using optimal weights derived by model (3) in (2) leads to worse (lower) efficiency scores than are those derived by (4).

3. A goal programming based model

Our idea is to formulate a model that minimizes deviations of efficiency scores of both stages from their ideal values given by models (4). We propose a goal programming model that either minimizes weighted sum of deviations or maximum deviation. The weights derived by this model may be used for calculation of efficiency scores of both stages using (2) and the final efficiency score of the two-stage process can be defined as a product of both efficiency scores, i.e. $\theta_q^0 < 1$. This value may be used for final ranking of all DMUs based on their results in both stages. The goal programming model that minimizes the weighted sum of deviations from maximum efficiency scores in both stages is the following:

$$\begin{aligned}
\text{Minimize} \quad & \alpha_1 d_1 + \alpha_2 d_2 \\
\text{Subject to} \quad & \sum_{l=1}^p w_l z_{il} \leq \sum_{j=1}^m v_j x_{ij}, \quad i = 1, \dots, n, \\
& \sum_{k=1}^r u_k y_{ik} \leq \sum_{l=1}^p w_l z_{il}, \quad i = 1, \dots, n, \\
& \sum_{l=1}^p w_l z_{ql} + d_1 = \theta_q^{*1} \sum_{j=1}^m v_j x_{qj}, \\
& \sum_{k=1}^r u_k y_{qk} + d_2 = \theta_q^{*2} \sum_{l=1}^p w_l z_{ql}, \\
& v_j > 0, w_l > 0, u_k > 0.
\end{aligned} \tag{5}$$

In model (5) d_1 and d_2 are deviational variables that express the distance of the both efficiency scores θ_q^1 and θ_q^2 from their theoretically maximum values. $\alpha_1 + \alpha_2 = 1$ are the weights expressing the importance of deviational variables in the objective function. Obviously, $\alpha_1 = 1$ ($\alpha_2 = 1$) leads to the model that maximizes efficiency score of the first (second) stage but its result need not be identical with results of models (3) or (4).

Let us denote (v^*, w^*, u^*) vectors of optimal weights computed by model (5). The efficiency scores of both stages and overall efficiency score using these optimal weights are as follows:

$$\theta_q^1 = \frac{\sum_{l=1}^p w_l^* z_{ql}}{\sum_{j=1}^m v_j^* x_{qj}}, \quad \theta_q^2 = \frac{\sum_{k=1}^r u_k^* y_{qk}}{\sum_{l=1}^p w_l^* z_{ql}}, \quad \theta_q^0 = \theta_q^1 \theta_q^2. \quad (6)$$

The DMUs can be ranked easily according to their overall efficiency scores $\theta_i^0, i = 1, \dots, n$.

Table 1: Data set for 24 non-life insurance companies in Taiwan

| | X1 | X2 | Z1 | Z2 | Y1 | Y2 |
|----------------|---------|---------|----------|---------|---------|---------|
| Taiwan Fire | 1178744 | 673512 | 7451757 | 856735 | 984143 | 681687 |
| Chung Kuo | 1381822 | 1352755 | 10020274 | 1812894 | 1228502 | 834754 |
| TaiPing | 1177494 | 592790 | 4776548 | 560244 | 293613 | 658428 |
| China Mariners | 601320 | 594259 | 3174851 | 371863 | 248709 | 177331 |
| Fubon | 6699063 | 3531614 | 37392862 | 1753794 | 7851229 | 3925272 |
| Zurich | 2627707 | 668363 | 9747908 | 952326 | 1713598 | 415058 |
| Taian | 1942833 | 1443100 | 10685457 | 643412 | 2239593 | 439039 |
| MingTai | 3789001 | 1873530 | 17267266 | 1134600 | 3899530 | 622868 |
| Central | 1567746 | 950432 | 11473162 | 546337 | 1043778 | 264098 |
| TheFirst | 1303249 | 1298470 | 8210389 | 504528 | 1697941 | 554806 |
| KuoHua | 1962448 | 672414 | 7222378 | 643178 | 1486014 | 18259 |
| Union | 2592790 | 650952 | 9434406 | 1118489 | 1574191 | 909295 |
| Shingkong | 2609941 | 1368802 | 13921464 | 811343 | 3609236 | 223047 |
| South China | 1396002 | 988888 | 7396396 | 465509 | 1401200 | 332283 |
| Cathay Century | 2184944 | 651063 | 10422297 | 749893 | 3355197 | 555482 |
| Allianz | 1211716 | 415071 | 5606013 | 402881 | 854054 | 197947 |
| Newa | 1453797 | 1085019 | 7695461 | 342489 | 3144484 | 371984 |
| AIU | 757515 | 547997 | 3631484 | 995620 | 692731 | 163927 |
| North America | 159422 | 182338 | 1141950 | 483291 | 519121 | 46857 |
| Federal | 145442 | 53518 | 316829 | 131920 | 355624 | 26537 |
| R.Sunalliance | 84171 | 26224 | 225888 | 40542 | 51950 | 6491 |
| Aisa | 15993 | 10502 | 52063 | 14574 | 82141 | 4181 |
| AXA | 54693 | 28408 | 245910 | 49864 | 0.1 | 18980 |
| Mitsui Sumito | 163297 | 235094 | 476419 | 644816 | 142370 | 16976 |

Source: Kao and Hwang, 2008

The results of our proposed model (5) will be illustrated on a case taken from (Kao and Hwang, 2008). The original data set is presented in Table 1. In this study, 24 non-life insurance companies in Taiwan are described by:

- Two inputs in the first stage (X1 – operation expenses, X2 – insurance expenses),
- Two intermediate variables (Z1 – direct written premiums, Z2 – reinsurance premiums), and
- Two final outputs (Y1 – underwriting profit, Y2 – investment profit).

The results of numerical experiments are presented in Table 2. The following models have been applied:

- Conventional input-oriented DEA model with constant returns to scale technology (1st stage).
- Conventional input-oriented DEA model with constant returns to scale technology (2nd stage).
- Conventional input-oriented DEA model with constant returns to scale technology (overall efficiency – inputs of the first stage and final outputs of the second stage).
- Kao and Hwang model (3).
- Model (5) with identical values of α weights, i.e. $\alpha_1 = \alpha_2 = 0.5$.

The efficiency scores calculated using the mentioned models are completed by ranking of DMUs (in parentheses).

Table 2: Results of numerical experiments

| | Stage 1 | Stage 2 | Overall | Model (3) | Model (5) $\alpha_1 = \alpha_2 = 0.5$ |
|----------------|------------|------------|------------|------------|--|
| Taiwan Fire | 0.993 (7) | 0.713 (7) | 0.984 (6) | 0.699 (3) | 0.699 (3) |
| Chung Kuo | 0.998 (6) | 0.627 (10) | 1.000 (1) | 0.625 (5) | 0.624 (5) |
| TaiPing | 0.69 (23) | 1.000 (1) | 0.988 (5) | 0.690 (4) | 0.690 (4) |
| China Mariners | 0.724 (21) | 0.432 (16) | 0.488 (14) | 0.304 (15) | 0.245 (18) |
| Fubon | 0.838 (13) | 1.000 (1) | 1.000 (1) | 0.767 (1) | 0.740 (2) |
| Zurich | 0.964 (8) | 0.406 (18) | 0.594 (13) | 0.390 (12) | 0.390 (9) |
| Taian | 0.752 (16) | 0.538 (13) | 0.470 (16) | 0.277 (17) | 0.261 (16) |
| MingTai | 0.726 (19) | 0.511 (15) | 0.415 (19) | 0.275 (18) | 0.275 (15) |
| Central | 1.000 (1) | 0.292 (23) | 0.327 (22) | 0.223 (20) | 0.223 (20) |
| TheFirst | 0.862 (11) | 0.674 (9) | 0.781 (10) | 0.466 (9) | 0.345 (11) |
| KuoHua | 0.741 (18) | 0.327 (22) | 0.283 (23) | 0.164 (23) | 0.144 (23) |
| Union | 1.000 (1) | 0.760 (6) | 1.000 (1) | 0.760 (2) | 0.760 (1) |
| Shingkong | 0.811 (14) | 0.543 (12) | 0.353 (20) | 0.208 (21) | 0.204 (21) |
| South China | 0.725 (20) | 0.518 (14) | 0.470 (16) | 0.289 (16) | 0.289 (14) |
| Cathay Century | 1.000 (1) | 0.705 (8) | 0.979 (7) | 0.614 (6) | 0.614 (6) |
| Allianz | 0.907 (10) | 0.385 (19) | 0.472 (15) | 0.320 (14) | 0.320 (12) |
| Newa | 0.723 (22) | 1.000 (1) | 0.635 (11) | 0.360 (13) | 0.234 (19) |
| AIU | 0.794 (15) | 0.374 (20) | 0.427 (18) | 0.259 (19) | 0.259 (17) |
| North America | 1.000 (1) | 0.416 (17) | 0.822 (9) | 0.411 (11) | 0.310 (13) |
| Federal | 0.933 (9) | 0.901 (5) | 0.935 (8) | 0.547 (8) | 0.521 (8) |
| R.Sunalliance | 0.751 (17) | 0.280 (24) | 0.333 (21) | 0.201 (22) | 0.200 (22) |
| Aisa | 0.590 (24) | 1.000 (1) | 1.000 (1) | 0.590 (7) | 0.590 (7) |
| AXA | 0.850 (12) | 0.560 (11) | 0.599 (12) | 0.420 (10) | 0.388 (10) |
| Mitsui Sumito | 1.000 (1) | 0.335 (21) | 0.257 (24) | 0.135 (24) | 0.073 (24) |

Source: own calculations

4. Discussion and Conclusions

The advantage of the proposed model comparing to Kao and Hwang model (3) consists in its higher flexibility. Both models aim at determination of weights of the inputs, intermediate variables and final outputs in order to maximize the efficiency of the unit under evaluation. Main difference consists in the objective function of both models. Model (3) maximizes overall efficiency, the proposed model (5) works in two steps. The first one is the calculation of particular efficiency scores in both stages independently and the second one is minimization of deviational variables from those efficiency scores. This approach allows minimization of the weighted sum of both deviations, minimization of maximum deviation or lexicographic approach.

In this paper, we have verified the applicability of model (5) on an example taken from original paper (Kao and Hwang, 2008). Table 2 presents results of two individual stages, overall efficiency and results of two-stage models. It is important to mention that is not possible comparing the results of one individual stage with the results of a network model. If a DMU is efficient in the first stage (i.e. produces high outputs with comparison to its inputs) this unit may not probably be efficient in the second stage because higher outputs of the first stage enter the second stage as inputs. On the other hand, it is possible a direct comparison of results of two-stage models,, in our case models (3) and (5). The results presented in Table 2 show that there is no DMU simultaneously efficient in both stages. An extreme situation occurs for Aisa and Mitsiu – they are efficient in one of the stages and are ranked as the best, and extremely inefficient in the other stage. Efficiency scores and ranking of the units according to models (3) and (5) is given in the last two columns of Table 2. There are not any significant differences in efficiency scores computed by these two models – in many cases are the results identical but final ranking of DMUs is quite different for part of the DMUs.

The presented results take into account identical importance of both deviational variable in objective function of model (5), i.e. $\alpha_1 = \alpha_2 = 0.5$. This setting was chosen for illustration purposes only. Experiments based on changing the weights may lead to different results and could be interested analyze the sensitivity of results with respect to parameters α . The robustness of the results and application of other goal programming principles in model (5) may be an excellent issue for a further research in this field.

Acknowledgements

The research is supported by the Czech Science Foundation, project 16-01821S, and by Internal Grant Agency of the Faculty of Informatics and Statistics, University of Economics, Prague, project F4/20/2018.

References

- BANKER, R. D., CHARNES, A. and COOPER, W. W. 1984. Some models for estimating technical and scale inefficiencies in data envelopment analysis. *Management Science*, 30(9): 1078–1092.
- CHARNES, A., COOPER, W. W. and RHODES, E. 1978. Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2(6): 429–444.

- CHEN, Y., LIANG, L. and ZHU, J. 2009a. Equivalence in two-stage DEA approaches. *European Journal of Operational Research*, 193(2): 600–604.
- CHEN, Y., COOK, W.D., LI, N. and ZHU, J. 2009b. Additive efficiency decomposition in two-stage DEA models. *European Journal of Operational Research*, 196(3): 1170–1176.
- DESPOTIS, D., KORONAKOS, G. and SOTIROS, D. 2016. Composition versus decomposition in two-stage network DEA: A reverse approach. *Journal of Productivity Analysis*, 45(1), 71–87.
- FARE, R. and GROSSKOPF, S. 2000. Network DEA. *Socio-Economic Planning Sciences*, 34(1), 35–49.
- HALKOS, G.E., TZEREMES, N.G. and KOURTZIDIS, S.A. 2014. A unified classification of two-stage DEA models. *Surveys in Operations Research and Management Science*, 19(1), 1–16.
- JABLONSKÝ, J. 2017. Benchmarking of countries at Summer Olympic Games 2016 using two-stage DEA models. In: PRAZAK, P.: *Mathematical Methods in Economics 2017 – Conference Proceedings*. University of Hradec Králové, 277–282.
- KAO, C. and HWANG, S.N. 2008. Efficiency decomposition in two-stage data envelopment analysis: An application to non-life insurance companies in Taiwan. *European Journal of Operational Research*, 185(1): 418–429.
- KAO, C. 2014. Network data envelopment analysis: A review. *European Journal of Operational Research*, 239(1): 1–16.
- KORONAKOS, G., SOTIROS, D. and DESPOTIS, D. 2018. Reformulation of Network Data Envelopment Analysis models using a common modelling framework. *European Journal of Operational Research*, <https://doi.org/10.1016/j.ejor.2018.04.004>.
- LI, H., CHEN, C., COOK, W.D., ZHANG, J. and ZHU, J. 2018. Two-stage network DEA: Who is the leader? *Omega*, 74(1): 15–19.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Tax Freedom Day of EU-28 Trend

Jakub Ječmínek¹, Lukáš Moravec², Gabriela Kukalová³ and Dana Bína Filipová⁴

¹*Department of Trade and Finance, Faculty of Economics and Management, Czech University of Life Sciences in Prague, Kamýcká 129, 165 21 Prague, Czech Republic, e-mail: jecminek@pef.czu.cz*

²*Department of Trade and Finance, Faculty of Economics and Management, Czech University of Life Sciences in Prague, Kamýcká 129, 165 21 Prague, Czech Republic, e-mail: moravec@pef.czu.cz*

³*Department of Trade and Finance, Faculty of Economics and Management, Czech University of Life Sciences in Prague, Kamýcká 129, 165 21 Prague, Czech Republic, e-mail: kukalova@pef.czu.cz*

⁴*Department of Trade and Finance, Faculty of Economics and Management, Czech University of Life Sciences in Prague, Kamýcká 129, 165 21 Prague, Czech Republic, e-mail: bina@acen.cz*

Abstract

Any tax, as a mandatory payment to the public budget, serves to finance public goods and services that are difficult to obtain in the free market. There are a number of methods that enable evaluate and compare the magnitude of the total tax burden in a particular country. A less known measure is Tax Freedom Day, which marks the day in a year when taxpayers have earned enough money to cover all tax bills of the country. According to the analysis available in this work, Tax Freedom Day in the EU-28 countries on average comes after 167 days into the year. In the Czech Republic, the Tax Freedom Day falls on 23rd June, 2018. The methodology of the Tax Foundation and the Liberal Institute of the Czech Republic were used for the computation.

Keywords: tax, tax burden, tax freedom day, taxation, tax quota, tax policy, European Union

JEL Code: H21, H26

1. Introduction

The amount of money that governments seek to collect from taxes differs across countries and is (or should be) based on needs of particular country. For instance, the island country Saint Lucia (with land area of 238 squared miles) needs disproportionately less money than Germany for education, health care, infrastructure and wages of civil servants. Nev-

ertheless, political conviction plays major role as well, because optimal tax structure, developed by several researchers, is mainly theoretical and hardly applicable in practice (Kubátová, 2009). There is only a small consensus on what tax structure should look like and for this reason taxes will always be difficult topic to discuss.

The Tax Freedom Day is a frequently discussed topic between the professional public and the non-professional one. Liberální institut (2018) states that the Freedom Day tax is an imaginary limit in the calendar year that divides the year into 2 periods. Until the arrival of Tax Freedom Day, taxpayers work for government, only after that day start working for themselves. Fraser Institute (2016) mentioned, that these taxes include everything from income taxes, payroll taxes, health taxes, sales taxes, property taxes, fuel taxes, profit taxes, to various “sin” taxes, and much more. Tax Freedom Day (“TFD”) is one method among others for evaluating tax burden in a particular country, which enables comparison between countries (Kaštan and Machová, 2009). TFD marks the day in a year when taxpayers have earned enough money to cover all tax bills of the country (Greenberg, 2017). Although tax payers have to pay taxes from whole year profit, TFD is a symbol for tax-free living. The Tax Freedom Day is computed by Liberální institut (Liberal Institute) (2017) and Deloitte (2018) in Czech Republic.

Given the available data and materials, there is not much research on Tax Freedom Day topic and questioning about the differences in results. MacKenzie and Tucker (2010) investigated how the days of fiscal freedom were correlated with ten key indicators of child wellbeing. In some research, Tax Freedom Day is being used as one of the economic indicators. Kumpikaite and Zickute (2013) used Tax Freedom Day as one of three major economic factors influencing the emigration level in Lithuania.

Tax Freedom Day is connected to total tax burden in a particular economy. As mentioned in European Commission (2017) the ration of tax collection (including social contribution) to GDP in EU-28 remain higher related to other well-developed countries. In 2014, the average EU-28 ratio was 38.8 percent whereas in the United States of America the ratio was 13 percentage points lower. EU-28 tax-to-GDP ratio has increased in value in the last decade from 39.0 percent in 2006 to 40.0 percent in 2016. However, economists mostly agree that increasing tax burden discourages economy and implicates higher deadweight loss (Kubátová, 2009).

Delgado Rivero (2009) investigated the convergence of the tax burden in the European Union in the framework of increasing economic integration and policies of fiscal harmonization, he used OECD data from the period 1965–2005. Šimková (2015) used the hierarchical clustering. Tax burden of European countries and its measuring possibilities investigated Machová (2009), where disadvantages of tax-to-GDP ratio are explored.

The study of Sineviciene (2016), who used data from the period 2003–2012, shows differences in the tax burden of individual EU countries. In terms of determining the tax burden in some particular countries, interesting research by Kaštan (2009), who concludes that there is currently no optimal measurement method, that could be used for international comparison.

Total tax burden includes direct and indirect taxes and social and health insurance. De Mooij and Ederveen (2003) found in its meta-analysis negative impact on corporate tax rate and inflow of foreign direct investments. In fact, one percentage point increase in corporate tax rate triggers 3.3 percentage point decrease in foreign direct investments, while other factors are held fixed. Taxation does matter even in labor supply decision; evidences from Germany suggest that 41 percent of representatives take taxation into consideration (Hayo, 2015). Increasing labor tax might shift profit and spending into the non-taxable forms and thus decrease economic efficiency (Mirrlees, 2010). In the matter

of indirect taxes (such as VAT) price elasticity of demand impacts revenue raised. Generally speaking, inelastic goods and services (i.e. luxury or necessity) tend to have low demand quantity change when VAT rate increases (Copenhagen Economics, 2008). However, it's more appropriate for tax system to be efficient rather than maximized.

Our research is focused on the total tax burden in the EU countries and its objective was to establish a Tax Freedom Day for each EU country. This paper yields to evaluate TFD based on methodology approach used by Tax Foundation and Liberal Institute of Czech Republic across EU-28 and compare different results. Evaluating TFD enables comparison of tax burden across EU-28.

2. Methodology and Data

Methodology of Tax Foundation includes total sum of taxes in numerator and net national income of United States of America in denominator (Greenberg, 2007). Specified equation is written as follows:

$$TFD_{TF,t+1} = \frac{\sum T_{t+1}}{NNI_{t+1}}. \quad (1)$$

Liberal Institute of Czech Republic uses reversed approach. In numerator total government spending (G) are captured, which enables deficit of state budget come into the computation. Gross domestic product (GDP) is in the denominator as benchmark (i.e. how much money is reallocated based on every dollar created in the economy) (Liberální institut, 2018).

$$TFD_{LI,t+1} = \frac{G_{t+1}}{GDP_{t+1}}. \quad (2)$$

Predicted variable for t+1 is computed through elementary forecasting function. The equation for forecast is:

$$y = a + bx, \quad (3)$$

where

$$a = \bar{y} - b\bar{x}, \quad (4)$$

and

$$b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}. \quad (5)$$

Forecasting based on ex post data do have its limitations; (i) we assume that future values will continue in linear trend, (ii) ex post data might not be accurate and reliable and thus mispredict forecasted values, (iii) linear trend forecast oversimplifies complex models. To test prediction error, MAPE (mean absolute percentage error) was built. Time series has been shortened by one year; this enables to compare empirical value with predicted and set MAPE.

$$MAPE = \frac{\sum | \frac{E_t}{Y_t} |}{N} * 100, \quad (6)$$

where E is forecast error at period t (quantified as actual minus forecasted value), Y is forecasted value at period t and N is number of observations.

Finally, value given by equation (1) and (2) is multiplied by 365 (days of the year), rounded and added to 1st January 2018. Data are obtained from EUROSTAT macroeconomic database, from time period 1995 to 2016 (annual).⁷

3. Results

Mean absolute percentage error tends to be across data sets, on average around 67%. Precise MAPE is shown Table 1.

Table 1: Mean absolute percentage error

| Item | MAPE |
|---|--------|
| Gross domestic product at market prices | 6.62% |
| Total government expenditure | 10.74% |
| Net national income | 5.03% |
| Total receipts from taxes and social contribution | 4.70% |

Source: own calculation

Highest MAPE value does have total government expenditure, which is due to outliers (false prediction of Greece and Cyprus). Based on MAPE, evaluated TFDs have $\pm 7\%$ error.

TFD is computed across 29 observations (EU-28 plus European Union as a whole) as time series of 22 years (22 plus 2 forecasted years). According to methodology of Tax Foundation, the longest wait for TFD does have Luxembourg (257 days, 15th September 2018) and the shortest Bulgaria (123 days, 3rd May 2018). In case of Luxembourg, the cause is obvious; lot of taxes in Luxembourg is collected from foreign investors and thus net national income is close to total tax revenue.

Findings of Liberal Institute methodology is quite different; minimum waiting time does have Lithuania, after 133 days (13th May 2018) whereas maximum is in France after 207 days (26th July 2018). Czech Republic's TFD is close to average, with waiting time of 174 days (23rd June) and 153 (2nd June 2018). Liberal Institute haven't computed TFD for 2018, but in 2017 TFD was on May 29th (after 149 days). Although comparison bases are not identical, TFD is expected to fall four days later this year than it was in 2017. Complete TFDs is listed in Table 2.

Methodology of Tax Foundation and Liberal Institute seems to be on average very similar. According to both methodologies, TFD on average falls on 16th June 2018, which is after 166 days, although redistribution of TFDs is different. Redistribution between computed TFD through Tax Foundation and Liberal Institute methodology is also due to national debt, which is included into the computation of Liberal Institute.

⁷ Due to large dimension, tables with predictions and TFD estimations are not enclosed in Appendix, but are fully accessible at Mendeley datasets: <http://bit.ly/TFDdatasets>

Table 2: Results of calculation

| GEO | Days (TF) | Days (LI) | Date (TF) | Date (LI) |
|-------------------------------|-----------|-----------|-------------------|--------------|
| European Union (28 countries) | 176 | 173 | 25 June 2018 | 23 June 2018 |
| Belgium | 212 | 198 | 31 July 2018 | 17 July 2018 |
| Bulgaria | 123 | 136 | 03 May 2018 | 17 May 2018 |
| Czech Republic | 174 | 153 | 23 June 2018 | 02 June 2018 |
| Denmark | 201 | 199 | 20 July 2018 | 18 July 2018 |
| Germany | 169 | 158 | 18 June 2018 | 08 June 2018 |
| Estonia | 148 | 143 | 29 May 2018 | 24 May 2018 |
| Ireland | 153 | 138 | 02 June 2018 | 18 May 2018 |
| Greece | 173 | 198 | 22 June 2018 | 17 July 2018 |
| Spain | 157 | 162 | 07 June 2018 | 11 June 2018 |
| France | 204 | 207 | 23 July 2018 | 26 July 2018 |
| Croatia | 140 | 166 | 21 May 2018 | 16 June 2018 |
| Italy | 192 | 182 | 11 July 2018 | 01 July 2018 |
| Cyprus | 145 | 155 | 26 May 2018 | 05 June 2018 |
| Latvia | 140 | 141 | 20 May 2018 | 22 May 2018 |
| Lithuania | 125 | 133 | 05 May 2018 | 13 May 2018 |
| Luxembourg | 257 | 155 | 15 September 2018 | 05 June 2018 |
| Hungary | 177 | 178 | 26 June 2018 | 28 June 2018 |
| Malta | 159 | 150 | 09 June 2018 | 30 May 2018 |
| Netherlands | 162 | 165 | 12 June 2018 | 15 June 2018 |
| Austria | 188 | 186 | 08 July 2018 | 05 July 2018 |
| Poland | 140 | 155 | 21 May 2018 | 04 June 2018 |
| Portugal | 167 | 181 | 17 June 2018 | 01 July 2018 |
| Romania | 124 | 134 | 05 May 2018 | 14 May 2018 |
| Slovenia | 174 | 178 | 24 June 2018 | 28 June 2018 |
| Slovakia | 139 | 150 | 20 May 2018 | 30 May 2018 |
| Finland | 189 | 200 | 08 July 2018 | 19 July 2018 |
| Sweden | 183 | 179 | 02 July 2018 | 28 June 2018 |
| United Kingdom | 150 | 165 | 30 May 2018 | 15 June 2018 |

Source: own calculation

4. Discussion and Conclusion

There is not any identical analysis in the TFD field, which would enable comprehensive comparison (i.e. same data sets, countries, methodology). For example, Tax Foundation computes TFD only for United States of America and uses data sets from Department of Commerce's Bureau of Economic Analysis. Anyway, TFD in the USA fell on April 23rd in 2017 (113 days into the year) that is shorter than every EU-28 country in 2018. If federal borrowing is added into the equation, TFD occurs 14 days later in the USA.

Although tax quota is widely used measurement of tax burden magnitude, other approaches should be taking into consideration as well. Tax quota and TFD should be created and interpreted altogether, rather than separately, to be able to have comprehensive view of the tax burden magnitude. Subject of next research will be relation between magnitude of tax burden (TFD and tax quota) and economic growth. It is expected that during

economic growth, Tax Freedom Day should fall on earlier date, because production of the economy is growing faster than government expenditures and public debt should be decreasing. After world economic crisis in 2008, Tax Freedom Day is going back into the first half of the year (Liberální institut, 2017). The earliest TFD happens in Bulgaria (TF, 123 days) and Lithuania (LI, 134 days) whereas the latest in Luxembourg (TF, 257 days) and France (LI, 207 days).

According to computation of Liberal Institute, computed TFD should occur four days later in 2018 than it was in 2017. However, different data sets and prediction error might implicate false comparison.

TFDs confirmed the hypothesis that taxation in European Union is relatively high comparing to USA with TFD occurring on average 166 days into the 2018.

The Czech Republic is relatively competitive jurisdiction relating the TFD within the group of EU countries and it might be a good policy to keep such a competitive level of taxation in case of any principal changes in tax system or tax mix. Moreover, the USA highly competitive position from the TFD point of view should be taken into account by the policy makers when changing the Czech and European tax policy approach.

Acknowledgement

This paper is a partial result of the research project No. 20171032 – Czech Tax Gap as a Consequence of Profit Shifting Quantification and its Factors Identification, supported by the Internal Grant Agency (IGA) of Faculty of Economics and Management, CULS Prague.

References

- COPENHAGEN ECONOMICS. (2008). Study on reduced VAT applied to goods and services in the Member States of the European Union. Taxation Papers Online]. Available at: https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_13_en.pdf. [Accessed 2017, December 16].
- DELGADO RIVERO, F. J. 2009. Tax Burden in the European Union: An Analysis of Beta, Sigma and Gamma Convergence. *Revista de Economia Mundial* 22: 141–165.
- DELOITTE. 2018. This year, Canadians celebrated Tax Freedom Day on June 7 [Online]. Available at: <https://www2.deloitte.com/cz/cs/pages/press/articles/cze-tz-dendanove-svobody-letos-pripadne-na-23-cervna-2018.html>. [Accessed: 2018, January 12]. In Czech.
- DE MOOIJ, R. and EDERVEEN, S. (2003). Taxation and foreign direct investment: A synthesis of empirical research. *International Tax and Public Finance*, 10 (6), 673–693.
- EUROPEAN COMMISSION. (2017). Taxation trends in the European Union: 2017 edition. Directorate General Taxation and Customs Union [Online]. Available at: https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_report_2017.pdf [Accessed: 2018, January 5].
- FRASER INSTITUTE. 2016. This year, Canadians celebrated Tax Freedom Day on June 7. [Online]. Available at: <https://www.fraserinstitute.org/blogs/this-year-canadians-celebrated-tax-freedom-day-on-june-7>. [Accessed: 2017, December 15].

- GREENBERG, S. 2017. What is Tax Freedom Day? Academic Search Complete [Online]. Available at: <https://files.taxfoundation.org/20170418101758/Tax-Foundation-TFD-2017.pdf>. [Accessed 2018, January 12].
- KAŠTAN, M. 2009. Ways of Tax Burden Measurement. *Taxes in the World*: 1–22.
- KAŠTAN, M. and MACHOVÁ, Z. 2010. Tax Burden in Eu Countries – A comparative study. *Bulletin of the Transilvania University of Brasov, Series V: Economic Sciences* 3(52), 263–270.
- KUBÁTOVÁ, K. 2009. Optimal Taxation: An Overview of the Current Theory. *Český účetní a finanční časopis*, 4 (3), p. 24–36. In Czech.
- KUMPIKAITE, V. and ZICKUTE, I. 2013. Regression Analysis of Economic Factors Influencing Emigration Rate in Lithuania. *Logos Universality Mentality Education Novelty (LUMEN 2013)*. *Procedia Social and Behavioral Sciences* 92: 457–461.
- LIBERÁLNÍ INSTITUT. 2018. Tax Freedom Day. [Online]. Available at: <http://www.dendanovesvobody.cz/>. [Accessed: 2018, January 10]. In Czech.
- MACHOVÁ, Z. 2009. Tax Quota and Tax Burden in the EU. *Taxes in the World*: 59–78.
- MACKENZIE, M. J. and TUCKER, D. J. 2010. Death and taxes: Child health and the state tax freedom race. *Children and Youth Services Review* 32(12): 1803–1806.
- MIRRLEES, J. 2010. *Dimensions of tax design: the Mirrlees review*. New York: Oxford University Press, 2010. ISBN 978–0–19–955375–4.
- SINEVICIENE, L. 2016. Tax Burden and Economic Development: The Case of the European Union Countries. *Entrepreneurship, Business and Economics* 2 (3-2): 283–298.
- ŠIMKOVÁ, N. 2015. The Hierarchical Clustering of Tax Burden in the EU27. *Journal of Competitiveness* 7 (3): 95–109.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Costs of State Intervention in the EU’s Financial Sector – Lessons from the Global Economic Crisis

Aleksandra Jurkowska¹

*¹Department of Banking, Faculty of Finance and Law, Cracow University of Economics,
Rakowicka 27, 31-510 Cracow, Poland, e-mail: jurkowska@uek.krakow.pl.*

Abstract

The paper aims to offer an answer to the question whether the costs of state economic interventionism, most frequently stressed by the opponents of this doctrine, accompanied government programmes designed to stabilise the financial sectors of EU and euro area member states. A review of world research studies and an analysis of selected macroeconomic indicators in particular countries, as well as an analysis of demographic trends lead to the conclusion that social costs are the currently recorded main adverse effects of this category of intervention.

Keywords: global financial crisis, economic interventionism, government aid, EU financial sector

JEL Code: E310, G210, G280

1. Introduction

Economic interventionism is an economic doctrine which accepts an active engagement of administrative bodies (mainly state organizations) in broadly understood economic processes. The role of the state in an economy has aroused hot debates for centuries. This issue was already raised by Plato and Aristotle, and undertaken in later periods by such classical school economists as J. Tobin, J.M. Keynes, R.J. Barro, and A.H. Hansen.

Economic interventionism is currently reflected in the implementation of government aid programmes aimed to support financial institutions facing insolvency during the last global financial crisis. The state’s engagement in rescuing financial entities is commonly justified by the fact that financial stability is regarded as a public good (Alińska, Wasiak, 2014).

2. Aims and Methodology

The paper aims to identify the costs of government intervention in the UE's financial sector during the global economic crisis. The core analysis covers the 2006–2016 period – the years preceding the global crisis, the first wave of the crisis (2007–2009), the second wave of the crisis (2010–2012) and the years after the aforementioned financial crisis. Identifying the costs of intervention is based on the selected phenomena which – in the opinion of the opponents of interventionism – can be most frequently associated with state intervention in the financial sector: deterioration in macroeconomic indicators (e.g. increased public debt to GDP ratios, or rising inflation rates), crowding-out effect, increased public debt service costs as a result of the spread convergence of Credit Default Swaps on government and financial entities' debt, moral hazard, and social costs. The conclusions of the analysis are based on a review of world research studies, an analysis of selected macroeconomic variables (public debt to GDP, inflation rates, an increase in money supply, bank loans and GDP, and cost of public sector debt servicing to GDP) in EU and euro area member states, as well as an analysis of European demographic trends.

3. Results

3.1. State interventions vs selected macroeconomic indicators in EU member states

During the financial crisis at the beginning of the 21st century state interventionism in EU member states (especially euro area countries) led to a drastic increase in budget deficit and public debt. In 2010–2012, following the introduction of the anti-crisis package aimed to provide financial support for, or nationalise banks, Europe was hit by a public finance crisis. In the euro area – in the conditions of decentralised fiscal policies – the mechanism for implementing public finance discipline was based on two solutions set forth by the Treaty of Maastricht (at a national level – solutions set forth by the Stability and Growth Pact, and at an international level – the no bailout clause which provides that one member state will not offer financial assistance to another). However, both solutions, to a large extent, have been ignored. Public debt to GDP in EU member states in 2006–2016 is presented in Table 1. The figures indicate a steady increase in the public debt to GDP ratio in practically all the analysed countries since 2008.

Despite rising internal debt ratios, EU countries were not hit by an inflationary spiral. The figures representing particular years (see: Table 2) indicate that during the first stage of the crisis inflation rates in the euro area fell below 2.00%, being below the average inflation target (set by the ECB below but close to 2.00%). In 2008, most countries outside the euro area recorded rising inflation rates, falling in 2009 to lower levels than those in 2006. In 2010–2011, most European countries recorded increased inflation rates, while in 2012 these rates started to drop. Four years later, the declines were even more visible.

Table 1: Public debt to GDP in EU member states in 2006–2016 (%)

| country/year | 2006 | 2008 | 2009 | 2010 | 2011 | 2012 | 2014 | 2016 |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| EU (28) | 60.1 | 60.7 | 72.7 | 78.3 | 81.0 | 83.7 | 86.5 | 83.2 |
| Euro area (19) | 67.3 | 68.6 | 78.4 | 83.8 | 86.1 | 89.4 | 91.8 | 88.9 |
| Austria | 67.0 | 68.4 | 79.6 | 82.4 | 82.2 | 81.7 | 83.8 | 83.6 |
| Belgium | 91.1 | 92.5 | 99.5 | 99.7 | 102.6 | 104.3 | 106.8 | 105.7 |
| Bulgaria | 21.0 | 13.0 | 13.7 | 15.3 | 15.2 | 16.7 | 27.0 | 29.0 |
| Cyprus | 58.7 | 45.1 | 53.8 | 56.3 | 65.7 | 79.7 | 107.5 | 107.1 |
| Czech Rep. | 27.7 | 28.3 | 33.6 | 37.4 | 39.8 | 44.5 | 42.2 | 36.8 |
| Denmark | 31.5 | 33.3 | 40.2 | 42.6 | 46.1 | 44.9 | 44.0 | 37.7 |
| Estonia | 4.4 | 4.5 | 7.0 | 6.6 | 6.1 | 9.7 | 10.7 | 9.4 |
| Finland | 38.2 | 32.7 | 41.7 | 47.1 | 48.5 | 53.9 | 60.2 | 63.1 |
| France | 64.4 | 68.0 | 78.9 | 81.6 | 85.2 | 89.6 | 95.0 | 96.5 |
| Greece | 103.6 | 109.4 | 126.7 | 146.2 | 172.1 | 159.6 | 179.0 | 180.8 |
| Spain | 38.9 | 39.5 | 52.8 | 60.1 | 69.5 | 85.7 | 100.4 | 99.0 |
| Netherlands | 44.7 | 54.7 | 56.8 | 59.3 | 61.6 | 66.3 | 68.0 | 61.8 |
| Ireland | 23.6 | 42.4 | 61.5 | 86.1 | 110.3 | 119.6 | 104.5 | 72.8 |
| Lithuania | 17.2 | 14.6 | 28.0 | 36.2 | 37.2 | 39.8 | 40.5 | 40.1 |
| Luxembourg | 7.8 | 14.9 | 15.7 | 19.8 | 18.7 | 22.0 | 22.7 | 20.8 |
| Latvia | 9.6 | 18.2 | 35.8 | 46.8 | 42.7 | 41.2 | 40.9 | 40.6 |
| Malta | 64.5 | 62.6 | 67.6 | 67.5 | 70.1 | 67.8 | 63.8 | 57.6 |
| Germany | 66.5 | 65.1 | 72.6 | 80.9 | 78.6 | 79.8 | 74.6 | 68.1 |
| Poland | 46.9 | 46.3 | 49.4 | 53.1 | 54.1 | 53.7 | 50.2 | 54.1 |
| Portugal | 69.2 | 71.7 | 83.6 | 96.2 | 111.4 | 126.2 | 130.6 | 130.1 |
| Romania | 12.3 | 13.2 | 23.2 | 30.2 | 34.4 | 37.3 | 39.4 | 37.6 |
| Slovakia | 31.0 | 28.5 | 36.3 | 41.2 | 43.7 | 52.2 | 53.5 | 51.8 |
| Slovenia | 26.0 | 21.8 | 34.6 | 38.4 | 46.6 | 53.8 | 80.3 | 78.5 |
| Sweden | 44.0 | 37.8 | 41.4 | 38.6 | 37.9 | 38.1 | 45.5 | 42.2 |
| Hungary | 64.1 | 71.0 | 77.2 | 79.7 | 79.9 | 77.6 | 75.2 | 73.9 |
| UK | 40.8 | 49.9 | 64.1 | 75.6 | 81.3 | 84.5 | 87.4 | 88.3 |
| Italy | 102.6 | 102.4 | 112.5 | 115.4 | 116.5 | 123.4 | 131.8 | 132.0 |

Source: Eurostat data

Table 2: Inflation rates measured by HICP^a in EU member states in 2006–2016

| country/year | 2006 | 2008 | 2009 | 2010 | 2011 | 2012 | 2014 | 2016 |
|------------------------|------|------|------|------|------|------|------|------|
| Euro area ^b | 2.2 | 3.3 | 0.3 | 1.6 | 2.7 | 2.5 | 0.4 | 0.2 |
| Bulgaria | 7.4 | 12.0 | 2.5 | 3.0 | 3.4 | 2.4 | -1.6 | -1.3 |
| Cyprus | 2.2 | X | X | X | X | X | X | X |
| Czech Rep. | 2.1 | 6.3 | 0.6 | 1.2 | 2.2 | 3.5 | 0.4 | 0.6 |
| Denmark | 1.8 | 3.6 | 1.0 | 2.2 | 2.7 | 2.4 | 0.4 | 0.0 |
| Estonia | 4.4 | 10.6 | 0.2 | 2.7 | X | X | X | X |
| Lithuania | 3.8 | 11.1 | 4.2 | 1.2 | 4.1 | 3.2 | 0.2 | X |
| Latvia | 6.6 | 15.3 | 3.3 | -1.2 | 4.2 | 2.3 | X | X |
| Malta | 2.6 | X | X | X | X | X | X | X |
| Poland | 1.3 | 4.2 | 4.0 | 2.6 | 3.9 | 3.7 | 0.1 | -0.2 |
| Romania | 6.6 | 7.9 | 5.6 | 6.1 | 5.8 | 3.4 | 1.4 | -1.1 |
| Slovakia | 4.3 | 3.9 | X | X | X | X | X | X |
| Slovenia | 2.5 | X | X | X | X | X | X | X |
| Sweden | 1.5 | 3.3 | 1.9 | 1.9 | 1.4 | 0.9 | 0.2 | 1.1 |
| Hungary | 4.0 | 6.0 | 4.0 | 4.7 | 3.9 | 5.7 | 0.0 | 0.4 |
| UK | 2.3 | 3.6 | 2.2 | 3.3 | 4.5 | 2.8 | 1.5 | 0.7 |

^a December to December.

^b Data for the euro area's changing composition.

Source: Eurostat data

Rising public debt ratios in European countries were not accompanied by a rapid increase in inflationary phenomena (in fact, from June to October 2009, the euro area faced the problem of deflation) because intervention activities did not lead to an excessive level of money supply. Interventions could have had the opposite effect: 1) directly – in the case of budget deficits being financed by central banks, and 2) indirectly – if the purchase of government debt instruments by the EBC had raised the liquidity of euro area commercial banks, translating to increased lending activities (considering the sequence of activities adopted by the EBC: increasing banks' liquidity → purchase of treasury instruments by banks → purchase of these instruments by the EBC – such a scenario seemed very likely). The financial independence of EU central banks and the EBC is based on the principle according to which the financing of budget deficits is prohibited (art. 123 TFUE, implemented at national levels through relevant acts). Thus, the above restrictions eliminate direct relations between public sector indebtedness and monetary aggregates.

In order to find out whether, and to what extent EBC interventions could have contributed to increased inflation rates, the author analyses the pace of an increase in money supply and bank loans (extended to the private sector) in euro area countries in 2003–2016. The data presented in Table 3 indicate that money supply and bank loans reached relatively high levels in 2003–2008 (money supply dynamics exceeded a reference value of 4.50%), while in the following years the respective values were considerably lower (in 2009, money supply measured by M3 decreased, while the bank loans market recorded a sharp decline in 2012–2014). It represented the cause as well as the effect of the downturn in economic activity and decreased demand for credit. Slight increases in money supply and bank loans were also due to the fact that a large portion of EBC resources designed for increasing the liquidity of commercial banks did not contribute to financing the real economy but rather to the repayment of banks' earlier loans (Europejski Bank Centralny, 2014). Moreover, some of the non-standard policy measures adopted by the European

Central Bank during the crisis were never implemented (OMT – Outright Monetary Transactions), while other measures (SMP – Securities Market Programme) were subject to full sterilization as a result of weekly open market operations (*fixed-term deposits*) (Rodríguez, Carrasco, 2014).

Table 3: Increases in money supply (M3), bank loans to the private sector and GDP in the euro area^a in 2003–2016 (%)

| variable/year | 2003– 2007 ^b | 2008 | 2009 | 2010 | 2011 | 2012 | 2014 | 2016 |
|------------------|----------------------------|------|------|------|------|------|------|------|
| M3 | 8.4 | 7.3 | -0,2 | 1.7 | 1.6 | 3.3 | 3.6 | 5.0 |
| Bank loans | 8.7 | 5.8 | 0.0 | 1.9 | 1.0 | -0.7 | -0.5 | 2.2 |
| GDP ^c | 2.1 | 0.4 | -4.4 | 2.1 | 1.6 | -0.9 | 1.3 | 1.8 |

^a Data for the area's changing composition.

^b Average values.

^c In real terms.

Source: ECB and Eurostat data

3.2. State intervention vs crowding-out effect

An in-depth analysis of the crowding-out effect was carried out by such analysts as F. Broner et al. (with regard to GIIPS countries, Germany and France; Broner et al., 2013), and by M. Crosignani (GIIPS countries and major euro area economies; Crosignani 2014). This problem was also discussed by R. Breton et al. (Breton et al., 2014).

Broner et al. showed that GIIPS countries recorded steady growth ratios in 2007; their public debt and deficits did not cause much concern, and government debt spreads (the difference between a 10-year yield in particular countries and that for German government bonds) were close to zero. In Q3 of 2009, spreads were still low, while the share of government internal debt in private sector portfolios in all GIIPS countries did not exceed 50% (in Greece and Ireland – below 30%). The situation changed dramatically at the end of the year – spreads increased considerably, reaching the level of 400–800 bps at the end of 2012 (spreads in Greece were much higher). Despite higher risk, residents increased their purchases of government debt instruments – at the end of 2012, such instruments accounted for more than 50% of private sector assets in all GIIPS countries, and in Spain and Italy – more than 70% and 60%, respectively. Simultaneously, the share of these instruments in foreign portfolios decreased. The above trends indicated the transfer of internal resources to the public sector, which contributed to the recession (such transfers were not recorded in Germany, undergoing slight changes in France). According to Broner et al., the last crisis recorded a phenomenon of “exporting” the crowding-out effect from EU countries with relatively low capital resources and high indebtedness ratios to those in which the said indicators reflected the opposite situation. It reduced the impact of the crowding-out effect on aggregated investments in GIIPS countries, strengthening the effect in the remaining EU member states. Although the calculations carried out by the above analysts with regard to the crowding-out effect in GIIPS countries are confirmed by empirical data, the considerations related to the export of the effect to other EU countries are purely theoretical.

The analysis of the crowding-out effect carried out by M. Crosignani covers GIIPS countries, Austria, Belgium, Denmark, Finland, France, Germany, Netherlands and UK. The author's conclusions basically confirm the views held by Broner et al.: GIIPS countries, during the crisis and after the crisis (from 2010 to the first half of 2013) recorded the

crowding-out effect because banks increased their engagement on the government debt market to the detriment of lending to the private sector, while this phenomenon did not occur in the remaining banking sectors covered by the analysis. Also, Crosignani's model leads to the conclusion that an increase in the supply of debt instruments attracts foreign investors, and the additional effect of governments' liberal approach to capital standards can be a phenomenon of regulatory "race to the bottom" on an international scale.

The data cited by Breton et al. (Breton et al., 2012) confirm the absence of the crowding-out effect in the old EU countries and euro area members. Lending institutions in all euro area countries increased their activities on the market of government assets, which, however, was accompanied by an even greater increase in lending volumes to the private sector.

3.3. The convergence of sovereign and financial institution CDS spreads

The results of research conducted by Acharya et al. (Acharya et al., 2013) lead to the conclusion that as a result of state intervention in the financial sector, sovereign CDS spreads and those of financial institutions behave in a similar manner (*sovereign-bank nexus*). This conclusion is confirmed by the convergence of the valuations of iTraxx SovX and iTraxx Financials indices in Q1 2009 (see: Fig. 1), when rescue packages were announced (the second convergence took place in 2010, when the market expected an effective solution to Greece's toxic assets).

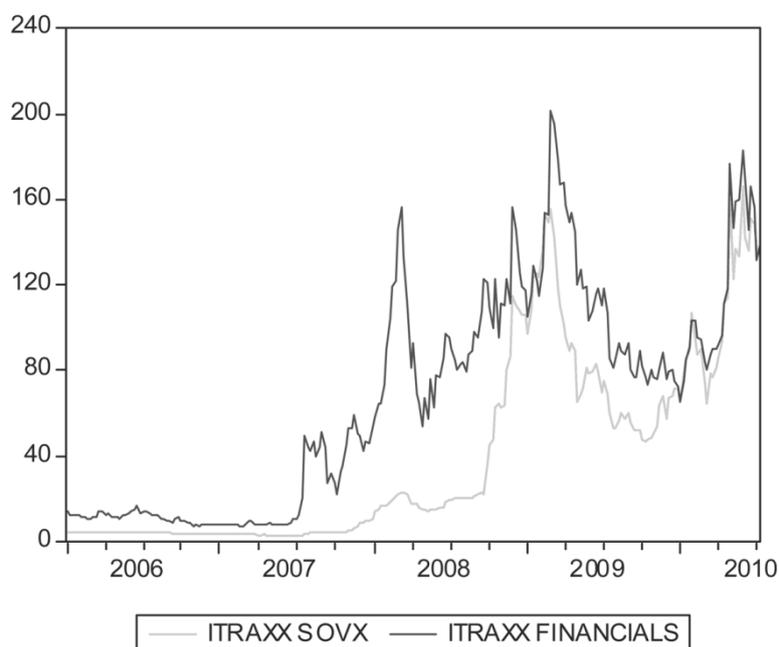


Figure 1: The values of iTraxx SovX and iTraxx Financials in 2006–2010

Source: Fontana, Scheicher, 2010, p. 28

According to Acharya et al, the convergence of spreads results from investors' expectations: they anticipate that government aid will have an adverse impact on a country's financial condition (consequently, it is likely to lead to the depreciation of banks' bond-secured assets, eventually leading to the market revaluation of banks).

Acharya et al. assume the existence of the mutual correlation between the public and private sector, while S. Dieckmann and T. Plank (Dieckman, Plank, 2011) believe that risk is transferred only from the private to public sector, and changes to sovereign CDS spreads are strongly affected by both local and global financial markets. The extent of this impact is determined by the position of a local market in the global system before crises, and EMU countries seem to be very sensitive to risk transfers.

Table 4: Cost of public debt servicing to GDP in EU countries in 2006–2016 (%)

| Country | 2006 | 2008 | 2009 | 2010 | 2011 | 2012 | 2014 | 2016 |
|----------------|------|------|------|------|------|------|------|------|
| EU (28) | 2.6 | 2.7 | 2.6 | 2.7 | 2.9 | 2.9 | 2.5 | 2.1 |
| Euro area (19) | 2.8 | 2.9 | 2.8 | 2.7 | 3.0 | 3.0 | 2.6 | 2.2 |
| Austria | 3.1 | 2.9 | 3.1 | 2.9 | 2.8 | 2.7 | 2.4 | 2.1 |
| Belgium | 4.1 | 4.0 | 3.8 | 3.6 | 3.6 | 3.6 | 3.3 | 2.9 |
| Bulgaria | 1.3 | 0.8 | 0.7 | 0.7 | 0.7 | 0.8 | 0.9 | 0.9 |
| Cyprus | 3.0 | 2.6 | 2.3 | 2.0 | 2.0 | 2.9 | 3.2 | 3.2 |
| Czech Rep. | 1.0 | 1.0 | 1.2 | 1.3 | 1.3 | 1.4 | 1.3 | 0.9 |
| Denmark | 1.8 | 1.4 | 1.9 | 1.9 | 2.0 | 1.8 | 1.5 | 1.4 |
| Estonia | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Finland | 1.5 | 1.4 | 1.3 | 1.3 | 1.4 | 1.4 | 1.2 | 1.1 |
| France | 2.5 | 2.8 | 2.4 | 2.4 | 2.6 | 2.6 | 2.2 | 1.9 |
| Greece | 4.4 | 4.8 | 5.0 | 5.9 | 7.3 | 5.1 | 4.0 | 3.2 |
| Spain | 1.6 | 1.5 | 1.7 | 1.9 | 2.5 | 3.0 | 3.5 | 2.8 |
| Netherlands | 2.0 | 2.0 | 2.0 | 1.8 | 1.8 | 1.6 | 1.4 | 1.1 |
| Ireland | 1.0 | 1.3 | 2.0 | 2.8 | 3.4 | 4.2 | 3.9 | 2.2 |
| Lithuania | 0.7 | 0.7 | 1.2 | 1.8 | 1.8 | 2.0 | 1.6 | 1.3 |
| Luxembourg | 0.2 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.4 | 0.3 |
| Latvia | 0.4 | 0.6 | 1.5 | 1.7 | 1.8 | 1.7 | 1.4 | 1.0 |
| Malta | 3.7 | 3.3 | 3.3 | 3.1 | 3.2 | 3.0 | 2.7 | 2.2 |
| Germany | 2.7 | 2.7 | 2.6 | 2.5 | 2.5 | 2.3 | 1.7 | 1.3 |
| Poland | 2.4 | 2.1 | 2.5 | 2.5 | 2.5 | 2.7 | 1.9 | 1.7 |
| Portugal | 2.8 | 3.1 | 3.0 | 2.9 | 4.3 | 4.9 | 4.9 | 4.2 |
| Romania | 0.8 | 0.7 | 1.5 | 1.5 | 1.6 | 1.8 | 1.6 | 1.5 |
| Slovakia | 1.4 | 1.3 | 1.4 | 1.3 | 1.5 | 1.8 | 1.9 | 1.6 |
| Slovenia | 1.4 | 1.1 | 1.3 | 1.6 | 1.9 | 2.0 | 3.2 | 3.0 |
| Sweden | 1.6 | 1.6 | 1.2 | 1.0 | 1.1 | 0.9 | 0.7 | 0.4 |
| Hungary | 3.9 | 4.0 | 4.5 | 4.1 | 4.1 | 4.6 | 4.0 | 3.2 |
| UK | 2.0 | 2.2 | 1.9 | 2.9 | 3.2 | 2.9 | 2.7 | 2.4 |
| Italy | 4.4 | 4.9 | 4.4 | 4.3 | 4.7 | 5.2 | 4.6 | 4.0 |

Source: Eurostat data

Having accepted the reasoning of Acharya, and Dieckmann and Plank, one should ask whether the convergence of sovereign CDS spreads and CDS spreads on financial institutions, which took place after announcing the launch of aid programmes for financial institutions in Europe, had a significant impact on increased public debt servicing costs. The increase in CDS sovereign spreads (e.g. spreads on German and Greek government bonds rose from approx. 0 bps in 2007 to 100 bps and 250 bps at the beginning of 2009, respectively; Datastream Thomson Reuters) justified a considerable increase in expected costs.

The relations between these costs and GDP in EU countries in 2006–2016 are presented in Table 4.

The data presented in Table 4 indicate that most EU countries recorded increased debt servicing costs in different years of the analysed period (the increases are marked in grey). However, none of the analysed countries recorded a substantial change in the resulting costs. The limited impact of this phenomenon can be justified in two ways. Firstly, higher spreads were temporary, affecting the interest rates of newly issued bonds (possibly lower interest rates of previously issued bonds compensated for price decreases), as well as variable-rate bonds. Secondly, public debt servicing costs – apart from interest rates – are affected by such parameters as hitherto debt levels and debt balance changes (Molendowski, Stanek, 2012). As a result, the most indebted countries were the ones which were the most vulnerable to the consequences of the convergence of spreads.

3.4. State intervention vs moral hazard

Moral hazard should be understood as excessive risk-taking resulting from the awareness of mechanisms which protect decision-makers against full responsibility for their actions. Currently, the inclination of financial institutions to moral hazard is mainly viewed as the effect of deposit-guarantee schemes and government rescue programmes for systemically important institutions (the “too big to fail” doctrine; TBTF). The consequences of this phenomenon include ineffective allocation of resources or the imitating of risky behaviour by a large group of entities (Stern, Feldman, 2004). This inclination to “imitation” is explained by Acharya (Acharya, 2001). He believes that the implementation of rescue schemes is more likely in the case of failures on a massive scale (*too-many-to-fail guarantee*), which increases the inclination of business entities to unify the structure of their investment portfolios. Therefore, this temptation concerns not only systemically important institutions but also small entities which behave like “members of the herd” (*systemic as part of the herd*). The occurrence of moral hazard prior to the crisis in the hope of receiving government aid is confirmed by a number of empirical studies. In this context, research on European banks was conducted, among others, by E. Nier and U. Baumann (Nier, Baumann, 2006) and T. Beck et al. (Beck et al., 2009). Both groups of researchers found evidence supporting the thesis that the possible beneficiaries of bailout schemes demonstrated an inclination to maintain lower capital buffers.

3.5. The social costs of interventionism

P. Szkudlarek points out (Szkudlarek, 2013) that public sector indebtedness, combined with current demographic trends, causes much concern about financing future pensions and health protection services in EU countries. From an economic perspective, two demographic trends are of key significance – longer life expectancy and decreasing populations. According to demographic projections, life expectancy is likely to increase in the coming years. According to GUs (Chief Statistical Office), life expectancy in the world and Europe in 2045–2050 will reach more than 77 years and nearly 83 years, respectively (Główny Urząd Statystyczny, 2017). In the most economically advanced regions life expectancy for both genders may considerably exceed 83 years, while in less advanced regions – 75 years. According to GUS projections, all continents (except Europe) will record increased population numbers, while Europe’s population is expected to fall to 696.6 million by 2060 (in 2010 – 738 million). The two processes will result in a considerable increase in

Europe's old-age-dependency ratio: in 2060, one hundred working-age people will correspond to more than 51 people above the age of 65 and 27 people below the age of 14. In the context of the size of public debt in some EU member states, the efficient servicing of future old age pensions and health protection schemes will be conditioned by creating a budget surplus, which will be a very difficult task.

4. Discussion and Conclusions

Increased public debt in EU member states, resulting from the implementation of bailout programmes for the financial sector, did not directly affect inflation rates for the following reasons: 1) restrictions set out in Article 123 TFUE, prohibiting the financing of budget deficits by the central banks of member states and by the EBC; 2) limited impact of the purchase of treasury bonds by the EBC on lending activities and the supply of money in the euro area (a considerable proportion of resources allocated by the EBC for supplying liquidity to commercial banks did not contribute to the real economy, and part of such operations were sterilised). Public debt servicing costs to GDP in the analysed period increased in most EU countries, which can be attributed to their general internal indebtedness rather than the transfer of risk from the private to public sector. The convergence of iTraxx SovX and iTraxx Financials in Q1 2009 and in 2010 confirm the occurrence of the above mentioned transfer. However, it was a temporary trend and its impact was limited. On the other hand, the costs of government intervention include the crowding-out effect in GIIPS countries, moral hazard as well as the social costs resulting from a considerable decrease in funds for future pensions and health protection services in a united Europe. Presently, social costs seem to be the major negative effect of government intervention in the EU's financial sector.

The recent crisis has shown that if government interventions and the expansive monetary policy of central banks are accompanied by a drop in aggregate demand, inflation in the economy does not rise, but the money creation mechanism is impaired. With the decline in aggregate demand, the increased liquidity of the financial system (assuming the limited efficiency of sterilizing operations) does not translate into an increase in lending but an increased demand for financial instruments, especially treasury instruments. This in turn raises such negative consequences as the crowding-out effect (in countries particularly affected by the problem of the drop in aggregate demand) and the excessive indebtedness of the state at the expense of future generations. It is difficult to say today what would have happened to the EU financial system without government intervention since such a scenario had not been implemented. Assuming that without intervention, the scale of collapse in Europe would be much greater, on the basis of economic theory, the question arises of a set of tools that not only increase the liquidity of financial entities, but also restore their ability to efficiently mobilize and allocate capital. Such a set would have to provide for numerous structural solutions aimed at eliminating the barrier of aggregate demand. So far, the response of EU bodies to the crisis was mainly the imposition of new reporting and financial burdens on financial entities (related, among others, to the need to finance a bank resolution funds). After implementing post-crisis regulatory solutions, carrying out structural reforms may prove to be a much more difficult task than before the crisis.

Acknowledgements

Publication was financed from the funds granted to the Faculty of Finance and Law at Cracow University of Economics, within the framework of the subsidy for the maintenance of research potential.

References

- Acharya, V.V. 2001. A Theory of Systemic Risk and the Design of Prudential Bank Regulation, Working Paper, New York University, New York.
- ACHARYA, V.V., DRECHSLER, I., SCHNABL, P. A pyrrhic victory? – bank bailouts and sovereign credit risk. [Online]. Available at: http://pages.stern.nyu.edu/~idrechsl/ADS_4april2013.pdf. [Accessed 2014, May 07].
- ALIŃSKA, A., WASIAK, K. 2014. Czy stabilność systemu finansowego można uznać za dobro publiczne? [in:] *Finanse. Problemy. Decyzje*, part 1, “Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach. Studia Ekonomiczne” No. 198.
- BECK, T., HESSE, H., KICK, T., VON WESTERNHAGEN, N. 2009, Bank ownership and stability: evidence from Germany, Tilburg University, mimeo.
- BRETON, R., PINTO, C., WEBER, P.F. 2012. Banks, moral hazard, and public debts [in:] *Public debt, monetary policy and financial stability*. Banque de France Financial Stability Review, No. 16, April.
- BRONER, F., ERCE, A., MARTIN, A., VENTURA, J. 2013. Sovereign debt markets in turbulent times: Creditor Discrimination and Crowding-Out, IMF Working Paper, WP/13/270, IMF, December.
- CROSIGNANI, M. 2014. Why are banks not recapitalized during crises? A Political Economy Explanation, NYU Stern, April.
- Datastream Thomson Reuters.
- ECB data.
- Eurostat data. Available at: <http://www.ecb.europa.eu/press/pr/stats/md/html/index.en.html>. [Accessed 2018, January 28].
- DIECKMANN, S., PLANK, T. 2011. Default risk of advanced economies: An empirical analysis of credit default swaps during the financial crisis, *Review of Finance*, 2011.
- FONTANA, A., SCHEICHER, M. 2010. An analysis of euro area sovereign CDS and their relation with government bonds, Working Paper Series No. 1271, European Central Bank, December.
- MOLENDOWSKI, E., STANEK, P. 2012. Globalny kryzys finansowo-gospodarczy i strefy euro a sytuacja fiskalna nowych państw członkowskich (UE-10), *Acta Universitatis Lodzianis. Folia Oeconomica*, 273, 267–284.
- NIER, E., BAUMANN, U. 2006. Market discipline, disclosure, and moral hazard in banking, 15(3), 331–361.
- Europejski Bank Centralny. 2014. Raport Roczny EBC 2013.

Główny Urząd Statystyczny. 2017. Rocznik statystyki międzynarodowej 2017.

RODRÍGUEZ, C., CARRASCO, C.A. 2014. ECB Policy Responses between 2007 and 2014: a chronological analysis and a money quantity assessment of their effects, FESSUF Financialisation, Economy, Society and Sustainable Development, Working Paper Series No. 65, September.

STERN, G.H., FELDMAN, R.J. 2004. Too big to fail: the hazards of bank bailouts, Brooking Institution Press, Washington, D.C.

SZKUDLAREK, P. 2013. Kryzys finansów publicznych w Unii Europejskiej, Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania, Nr 32.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

An analysis of CO₂ hotspots in supply chains – a European case study

Tomasz Bartosz Kalinowski¹, Grażyna Wieteska², Agata Rudnicka³, Anna Wronka⁴, Adrian Solomon⁵, Antonio Diglio⁶, Carmela Piccolo⁷, Giuseppe Bruno⁸, S.C. Lenny Koh⁹ and Andrea Genovese¹⁰

^{1,2,3,4}*Faculty of Management, University of Łódź, Matejki 22/26, Łódź, Poland, e-mail: tbkalinowski@uni.lodz.pl, gwieteska@uni.lodz.pl, rudnicka@uni.lodz.pl, anna.wronka@uni.lodz.pl,*

⁵*South-East European Research Centre, 24 Proxenou Koromila Street Thessaloniki 54622, Greece, e-mail: asolomon@seerc.org,*

^{6,7,8}*University of Naples "Federico II", Department of Industrial Engineering, Corso Umberto I 40 - 80138 Napoli Italy, e-mail: antonio.diglio@unina.it, carmela.piccolo@unina.it, giuseppe.bruno@unina.it,*

^{9,10}*University of Sheffield, Management School Western Bank Sheffield S10 2TN United Kingdom, e-mail: s.c.l.koh@sheffield.ac.uk, a.genovese@sheffield.ac.uk.*

Abstract

One of the most important challenges for current supply chains is environmental protection. The scarcity of natural resources, declining biodiversity or air, soil and water pollution, push corporations to address environmental issues among their business goals. Due to this external pressure, SMEs need to take into account the environmental impact of their operations and make informed decisions on their processes and supply chains, thereby becoming more energy efficient and environmentally sustainable.

The study was performed within the TrainERGY (Training for Energy Efficient Operations) Project (<http://www.trainergy-project.eu/>), which focuses on developing an open-innovation and co-creation framework for improving competences in energy efficiency and sustainability.

The aim of the paper is to characterize sustainable supply chains in terms of CO₂ hotspots. The article presents an analysis of supply chains of different products based on case study research from 4 European countries. The comparative analysis of gathered data allowed the identification of both the CO₂ hotspots in the analysed supply chains along with the effect of activities and inputs that are part of the manufacturing processes. Finally, ways of tackling the recognized carbon dioxide hotspots are recommended.

Keywords: supply chain, sustainability, CO₂, decarbonisation, environmental aspects of supply chain management

JEL Code: M10, M11, M14, M19

1. Introduction

Both environmental and social issues are noneconomic aspects of business activities that are continuously gaining relevance as a focal point of sustainable development. Any business process may be the source of environmental impacts.

The problem of environmental issues in supply chains is being addressed through the concept of the green supply chain (Sarkis, 2014) or the sustainable supply chain, oriented towards ecological aspects like greener partners selection (Wu and Barnes, 2016) eco-efficiency (Michelsen, 2006; Verfaillie and Bidwell, 2000) or environmental performance (Gualandris and Kalchschmidt, 2016). It is equally seen in the environmental policies and projects set in place by individual entities and across whole supply chains (e.g. Carter and Rogers, 2008; Kleindorfer et al., 2005; Seuring and Muller, 2008a; Seuring and Muller, 2008b). A focus on supply chains is a step towards the broader adoption and development of sustainability, since the supply chain considers the product from initial processing of raw materials to delivery to the customer. However, sustainability also must integrate issues and flows that extend beyond the core of supply chain management: product design, manufacturing by-products, by-products produced during product use, product life extension, product end-of-life, and recovery processes at end-of-life (Linton et al., 2007).

Recent years have revealed the rising problem of CO₂ emission as a global challenge that has to be addressed by all sectors, including business. The debate about possible solutions focuses on supply chains, as the path of the life cycle of products generate enormous emissions. From this perspective, supply chain environmental management is needed. Environmental considerations in the whole supply chain are crucial for the sustainability of the global economy. It is also a demanding issue for corporations that are attempting to lower the amount of CO₂ in their processes and products. There are different approaches to CO₂ measurement related to the whole supply chain. Knowledge about what causes these emissions should be regarded as the starting point for further greening of logistic processes in supply chains. In the article, a possible scenario for CO₂ management – the identification of and possible improvements to its hotspots – will be presented.

The aim of the paper is to characterize sustainable supply chains in terms of CO₂ hotspots. The article presents an analysis of supply chains of different products based on case study research from 4 European countries with the use of the Supply Chain Environmental Analysis Tool (SCEnAT). The comparative analysis of gathered data allowed the identification of the CO₂ hotspots in analysed supply chains, along with the effect of activities and inputs that are part of the manufacturing processes. Finally, ways of tackling the recognized carbon dioxide hotspots are recommended.

2. CO₂ emissions as an environmental aspect in the modern approach to supply chain management

CO₂ emissions are one of the most crucial environmental issues facing us today. It is estimated that it is the cause of half of the man-made greenhouse effect (Jaber, Glock and El Saadany, 2013). The effective reduction of CO₂ is the most important issue for those policy makers and practitioners who are responsible for the implementation of laws and regulations. This is supported by numerous initiatives and documents (such as policy papers

and legal acts), with the goal of working out a commonly-accepted compromise and set of standards, such as New Sustainable Goals of UN Programme or COP 21.

Environmental hotspots are the key processes (or actions within processes) generating the highest emissions in supply chains (De la Fuente et al., 2017). They are the most critical stages in the productive chain (Lopez et al., 2018). In this paper, a CO₂ hotspot is understood as a process (or action), that is a source of the highest CO₂ emission in analysed supply chain.

The scale and scope of any environmental impact differs depending on the type and size of the company and the complexity of its supply chain. Environmental considerations are the result of the tightening of legal regulations and other motivations identified by businesses, for example the expected benefits (Diabat and Govindan, 2011). Current supply chain management practices take into consideration environmental impacts and the ways to increase efficiency while reducing negative externalities (Diabat and Al-Salem, 2015). The environmental principles used at the stage of the design of the supply chain cover such areas as: product design, packaging, collection and transportation, recycling and disposal, and greening the internal and external business environment (Tsoulfas and Pappis, 2006). These elements are crucial for the better understanding and management of all aspects of CO₂ emissions of business operations.

A reduction of emissions can only be achieved by mutual, close cooperation of all organisations in the supply chain, both upstream and downstream. It needs accountability for both direct and indirect CO₂ emissions of the value stream of products – including raw material extraction (Oshita, 2012). Furthermore, all stakeholders, including customers, have to be included (Plambeck, 2012). Knowledge about the structure of supply chains is the basis for further reduction of CO₂ over the life cycle of a product (Wiedmann, 2009).

A proactive approach to the reduction of greenhouse gases can bring many benefits for a company and its whole supply chain e.g. reduced costs, higher revenues, better knowledge and control of the supply chain (measurement of emissions in the supply chain), improved public relations, scrutinised and rationalised supply chains, improved understanding and motivation among employers, better collaboration with policy makers and improved motivation among suppliers to reduce emissions (Plambeck, 2012). To make this possible, a set of tools and methods that help to assess the total emissions and recognise the hotspots in value chains needs to be introduced. It is worth mentioning such procedures and initiatives as: Greenhouse Gas Protocol, Carbon Disclosure Project, Carbon Trust or IPCC Guidelines. The focal idea of these initiatives and methodologies is the carbon footprint, defined as “a measure of the exclusive total amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product” (Wiedmann and Minx 2008). The most recent managerial undertakings to tackle the carbon footprint includes: identification of CO₂ emissions in the value chain, hotspot recognition, possible improvement scenarios analysis, strategies for the further reduction of emissions. The possible scenarios for the reduction of emissions may relate to changes in: production technology, product design, transportation and distribution system design. The procedure of the above-mentioned calculations will be presented below, using the Supply Chain Environmental Analysis Tool (SCEnAT).

In recent years, the trend of presenting the assessment of CO₂ emissions has been noticeable in the context of the life cycle of specific products, industries and countries. For example, Riva et al (2017) recognized CO₂ hotspots in the supply chain of Italian mozzarella cheese, using Ecoinvent v3.2 database and SimaPro 8.1 modeling software. Recanati, Marveggio and Dotelli (2018) identified environmental impact of chocolate supply chain using LCA. Lopes et al (2017) assessed carbon dioxide emissions in Brazilian bioethanol

supply chain in terms of different scenarios supporting lower total energy consumption, greater renewable energy usage and lower CO₂ emissions. Egilmez et al (2016) observed changes of carbon footprint in different industries in USA, between 1970–2011 using EORA database. Acquaye et al. (2017) applied multi-regional input-output (MRIO) model to identify direct and indirect environmental effects of electricity production and chemical industry in 33 countries between 1995 and 2009. Finally, Lopez et al. (2018) conducted a comparative study between Canadian and Swedish forest supply chains.

This paper builds on the existing research, however it provides a multi-sectoral insight into CO₂ hotspot identification with a use of unique methodology, described below.

3. Research methodology

In order to determine the environmental impact of analysed products and processes, a Virtual Learning Environment with the Supply Chain Environmental Analysis Tool (SCEnAT) – <http://www.trainergy-project.eu/virtual-learning-environment> – was used. The tool incorporates good practices and case studies illustrating the sustainability enablers, supported by decision-making tools for green supply chain development. It also enables the benchmarking of the analysed processes or supply chains against the industry average. This advanced analytical model is based on the original tool developed by Koh and others (Koh et al., 2012) and improved within further projects in which the authors of this paper were involved.

The SCEnAT methodology is based on Life Cycle Assessment and Environmental Input-Output LCA (Bochtis et al., 2015), combined with methods and techniques such as supply chain mapping, carbon measuring and supply chain performance evaluation using different key performance indicators (KPIs).

The data for the purpose of the presented analysis were gathered within an EU funded TrainERGY project. The project aimed at developing a virtual learning environment that would firstly support competences required for implementing energy efficient operations and secondly provide guidance in: monitoring and assessing companies' current decision-making strategies in relation to environmental concerns, adopt low carbon decision-making patterns, develop long-term plans for energy efficiency and environmental sustainability of their supply chains.

The conducted research was designed twofold. During the first phase a quantitative survey was conducted in four European countries. The research questionnaire focused on: (1) Relevance of the identified competences required for implementing energy efficient and sustainable operations; (2) Stage of advancement in use of the competences required for implementing energy efficient and sustainable operations; (3) Barriers and drivers for implementing energy efficient and sustainable operations.

The quantitative part of the study was conducted between October and December 2016. Non-probability convenience sampling was used for the purpose of selection of the surveyed companies and for all surveyed aspects (relevance, stage, barriers and drivers) a 5-point Likert scale was applied, ranging from 1 (minimum) to 5 (maximum). A total number of 134 valid questionnaires were collected with the following distribution among the participating countries: Poland – 56 questionnaires, The United Kingdom – 25 questionnaires, Italy – 28 questionnaires and Greece – 25 questionnaires. The survey can be further characterized by: (1) Business sectors, including: manufacturing (26.1%), construction (23.1%), retail/commerce (11.9%), food and winery (10.4%), transportation/logistics (9.0%), healthcare services (6.7%) and other (12.7%); (2) Size of the entity,

described by the number of employees, including: under 25 (41,0%), 26 to 50 (22.4%), 51 to 250 (26.1%) and more than 250 (10.4%). Construct reliability (overall and for every country) was assessed using Cronbach's alpha, where unidimensionality of a block of p variables Xn can be quantified when they are all positively correlated (when $\alpha > 0.7$) and Nunnally's criterion was fulfilled (Nunnally and Bernstein, 1994; Sheng and Teo, 2012).

The second phase of the study involved an in-depth analysis of selected entities, recruited from those participating in the quantitative research. Companies willing to cooperate, provided data that allowed to analyse their operations toward CO2 hotspots identification (e.g. processes or actions with the highest CO2 emission in the supply chain, critical emission points). In order to develop case studies demonstrating carbon emissions and potential intervention scenarios the following methodology was used (Koh et al., 2015; Kalinowski et al., 2015): (1) Developing a visual supply chain map using inputs and processes; (2) Critical emission calculations using the Hybrid LCA methodology; (3) Identifying low carbon interventions leading to reductions in CO2 emissions; (4) Supply chain performance evaluation and benchmarking. This paper, however, will primarily focus on the first and second step, with some insights into the third.

The entities undergoing the in-depth part of the study represented different business sectors, however, for the purpose of this paper, only production companies have been selected (Table 1).

Table 1: Characteristics of the research sample

| Company country code | Detailed description of operations | Analysed product |
|----------------------|--|---------------------------------------|
| 1 – PL | Construction of low-energy and passive houses | Polystyrene brick |
| 2 – PL | Window manufacturer | Single-chamber aluminium frame window |
| 3 – UK | Steel stock holder and die forgings manufacturer | Rings/flanges for pipework systems) |
| 4 – UK | Manufacturer of solid wall insulation | Recycled cotton/denim insulation |
| 5 – GR | Manufacturer of aluminium systems | One square meter of aluminium foil |
| 6 – GR | Manufacturer of building materials | Unit of cement (150 kg) |
| 7 – IT | Confectionery manufacturer | Sugar-covered toasted almond candies |
| 8 – IT | Cold automatic printed metal sheets manufacturer | Counter frame for blinding doors |

Source: Own study based on the research results.

4. Research Data and Results

In this section, the research data are presented. The tables below (2,3,4,5) display the results of the performed analysis for each case study. The first table concerns companies from Poland, with the following tables covering the countries: UK, Greece and Italy, respectively.

Table 2: Data for Polish case studies

| Company country code | Analysed product (unit of analysis) | Input type | Input | Quantity | Unit | GHG Intensity (kg CO ₂ eq/unit) | Total emissions | Proportion of emissions | | |
|--|-------------------------------------|-------------------|---------------------------------------|---|----------------------|--|-----------------|-------------------------|----------|----|
| 1 – PL | Polystyrene brick (single unit) | Direct Materials | Polystyrene | 18.74 | Kg | 3.4653 | 64.9397 | 62.48% | | |
| | | | Steam (foaming) | 30 | Mj | 0.099747 | 2.99241 | 2.84% | | |
| | | | Steam (forming) | 237.6 | Mj | 0.099747 | 23.6998 | 22.80% | | |
| | | Utilities | Electricity (foaming) | 6 | kWh | 0.53131 | 3.18786 | 3.07% | | |
| | | | Electricity (forming) | 12.57 | kWh | 0.53131 | 6.67856 | 6.43% | | |
| | | | Electricity (storage) | 0.125 | kWh | 0.53131 | 0.06641 | 0.06% | | |
| | | Logistics | In-bound transport | 17.99 | tkm | 0.13364 | 2.40418 | 2.30% | | |
| | | | Internal transport | 0.0056 | tkm | 0.13364 | 0.20847 | 0.20% | | |
| | | 2 – PL | Single-chamber aluminium frame window | Direct Materials (glass production (GP) and window production (WP)) | Liquid Hydrogen (GP) | 0.0000045 | m3 | 2.0774 | 0.000009 | 0% |
| | | | | | Liquid Nitrogen (GP) | 0.04 | m3 | 0.40767 | 0.016 | 0% |
| Soda Powder (GP) | 2.29 | | | | kg | 0.4418 | 1.012 | 0.01% | | |
| Silica Sand (GP) | 0.6 | | | | kg | 0.044043 | 0.027 | 0% | | |
| Steel (GP) | 0.000137 | | | | kg | 4.8454 | 0.00066 | 0% | | |
| Tin (GP) | 0.0000916 | | | | kg | 21.655 | 0.002 | 0% | | |
| Limestone (GP) | 4.05 | | | | kg | 0.016485 | 0.0668 | 0% | | |
| Aluminium frame (WP) | 13.36 | | | | kg | 773.83 | 10338.37 | 99.19% | | |
| Plastic film (WP) | 0.9 | | | | kg | 0.60297 | 0.542 | 0.01% | | |
| Polyvinylchloride (WP) | 0.9 | | | | kg | 2.1525 | 1.94 | 0.02% | | |
| Utilities (glass and window production) | Electricity (GP) | | | 1.2 | kWh | 1.1625 | 1.395 | 0.01% | | |
| | Gas (GP) | | | 35.6 | MJ | 1.0555 | 37.575 | 0.4% | | |
| | Fuel Oil (GP) | | | 0.738 | kg | 0.097995 | 0.0723 | 0% | | |
| Logistics (glass production (GP) and window production (WP)) | Electricity (WP) | | | 12.08 | kWh | 1.1625 | 14.043 | 0.14% | | |
| | In-bound road (GP) | | | 0.4352 | tkm | 0.16743 | 0.0723 | 0% | | |
| | In-bound rail (GP) | | | 1.202769 | tkm | 0.039603 | 0.0476 | 0% | | |
| | In-bound road (WP) | | | 2.3537 | tkm | 0.16743 | 0.394 | 0% | | |
| | | In-bound sea (WP) | 18.18 | tkm | 0.011326 | 0.206 | 0% | | | |

Source: Own study based on the research results.

Table 3: Data for English case studies

| Company country code | Analysed product (unit of analysis) | Input type | Input | Quantity | Unit | GHG Intensity (kg CO ₂ eq/unit) | Total emissions | Proportion of emissions |
|----------------------|--|--|--------------------------------------|----------|---------|--|-----------------|-------------------------|
| 3 – UK | Direct Materials | Unprocessed Steel | Steel Extraction | 1.0766 | Kg | 1.8899 | 2.03467 | 44.40% |
| | | | Electricity | 1 | Kg | 1.7 | 1.70000 | 37.10% |
| | | Utilities | Gas | 0.7511 | kWh | 0.5846 | 0.43909 | 9.58% |
| | | | Water | 18.969 | MJ | 0.0140 | 0.26557 | 5.80% |
| | | | Heat Treatment, Hot Impact Extrusion | 0.0010 | M3 | 0.0003 | 0.00000 | 0.00% |
| | Processing | Steel Recycling | 1 | Kg | 0.0169 | 0.01690 | 0.37% | |
| | | Diesel Burned in Building Machine | 1 | Kg | 0.0576 | 0.05760 | 1.26% | |
| | Recycling | HGV (Diesel) | 0.0092 | Vkm | 0.0576 | 0.05760 | 1.26% | |
| | | Non-HGV (Diesel) | 0.0151 | Vkm | 0.25783 | 0.00237 | 0.05% | |
| | | Diesel Consumption for Forklift Trucks | 0.0066 | Kg | 0.28699 | 0.00433 | 0.09% | |
| 4 – UK | INNO-THERM insulation material (recycled cotton / denim insulation) / 1 kg | Direct Materials | Polyester | 0.2 | kg | 3.0 | 0.60000 | 51.16% |
| | | | Wool | 0.4 | kg | 0.2 | 0.08000 | 6.82% |
| | | | Cotton | 0.4 | kg | 0.2 | 0.08000 | 6.82% |
| | | Utilities | Electricity | 0.412 | kWh | 0.5314 | 0.21894 | 18.67% |
| | | | Gas | 0.0139 | MJ | 0.0045 | 0.00006 | 0.01% |
| | Logistics | Road Transportation | 0.12 | tkm | 0.2578 | 0.03094 | 2.64% | |
| | | Rail Transportation | 0.1 | tkm | 0.0292 | 0.00292 | 0.25% | |
| | | Consumables | Anti Bacterial Fungicide Treatment | 0.4 | l | 0.4 | 0.16000 | 13.64% |

Source: Own study based on the research results.

Table 4: Data for Greek case studies

| Company country code | Analysed product (unit of analysis) | Input type | Input | Quantity | Unit | GHG Intensity (kg CO ₂ eq/unit) | Total emissions | Proportion of emissions |
|----------------------|-------------------------------------|------------------|------------------|----------|--------|--|-----------------|-------------------------|
| 5 – GR | Aluminium foil (1m ²) | Direct Materials | Zinc | 1.78 | Kg | 1.23 | 2.1894 | 5.09% |
| | | | Paper | 0.2 | Kg | 0.34 | 0.068 | 0.16% |
| | | | Ink | 0.02 | L | 0.67 | 0.0134 | 0.03% |
| | | | Chemicals | 0.12 | L | 0.22 | 0.0124 | 0.03% |
| | | Utilities | Electricity | 162 | kWh | 0.23 | 37.28 | 86.61% |
| | | | Water | 2.5 | L | 0.34 | 0.85 | 1.97% |
| | | | Oil | 0.12 | L | 0.78 | 0.0936 | 0.22% |
| | | Packaging | Services | 1.0 | kWh | 1.67 | 1.87 | 4.34% |
| | | | Paper carton | 0.9 | kg | 0.66 | 0.594 | 1.38% |
| | | | Plastic wrapping | 0.22 | kg | 0.34 | 0.0748 | 0.17% |
| 6-GR | Cement (unit=150 kg) | Direct Materials | Chemicals | 5.0 | L | 0.78 | 195 | 71.85% |
| | | | Fuels | 0.23 | L | 1.45 | 16.675 | 6.14% |
| | | | Gas | 325 | kWh | 0.78 | 12.675 | 4.67% |
| | | Utilities | Filtering | 156 | kWh | 1.23 | 9.594 | 3.53% |
| | | | Water | 187 | L | 0.67 | 6.265 | 2.31% |
| | | | Electricity | 40 | kWh | 1.12 | 2.240 | 0.83% |
| | | | Fuel | 0.23 | L | 1.45 | 16.675 | 6.14% |
| Packaging | Wrapping | 0.28 | kg | 0.89 | 12.282 | 4.53% | | |

Table 5: Data for Italian case studies

| Company country code | Analysed product (unit of analysis) | Input type | Input | Quantity | Unit | GHG Intensity (kg CO ₂ eq/unit) | Total emissions | Proportion of emissions |
|----------------------|--|------------------|--|------------------|----------------|--|-----------------|-------------------------|
| 7 – IT | Pack of sugar-covered toasted almond candies / 1 unit (pack) | Direct Materials | Almonds | 0.18 | kg | 0.88 | 0.15840 | 4.27% |
| | | | Dark liquid chocolate | 0.15 | kg | 2.10 | 0.31500 | 8.49% |
| | | | White liquid chocolate | 0.45 | kg | 4.10 | 1.84500 | 49.73% |
| | | Utilities | Sugar | 0.20 | kg | 0.51 | 0.10200 | 2.75% |
| | | | Electricity | 0.4633 | kWh | 0.64168 | 0.29733 | 8.01% |
| | | Packaging | Small Package | 0.05 | kg | 0.9404 | 0.04702 | 1.27% |
| | | | Boxboard | 0.70 | kg | 0.9404 | 0.65828 | 17.74% |
| | | Logistics | Almonds | 0.29772 | tkm | 0.25783 | 0.07676 | 2.07% |
| | | | Toasted almonds | 0.0234 | tkm | 0.25783 | 0.00603 | 0.16% |
| | | | Liquid chocolate (dark and white) | 0.2022 | tkm | 0.25783 | 0.05213 | 1.41% |
| | | | Sugar | 0.1208 | tkm | 0.25783 | 0.03115 | 0.84% |
| | | | Small package | 0.0011 | tkm | 0.25783 | 0.00030 | 0.01% |
| | | | Boxboard | 0.0073 | tkm | 0.25783 | 0.00190 | 0.05% |
| | | | Genuine almonds | 0.0234 | tkm | 0.25783 | 0.00603 | 0.16% |
| | | | Final product transportation | 0.438 | tkm | 0.25783 | 0.11293 | 3.04% |
| | | 8 – IT | Counter frame for blinding doors / 1 piece | Direct Materials | Coils | 5.55 | kg | 1.7555 |
| Wire netting | 2.4 | | | | kg | 1.8044 | 4.33056 | 5.60% |
| Side walls | 18.25 | | | | kg | 1.7555 | 32.0378 | 41.45% |
| Screws | 0.105 | | | | kg | 1.8044 | 0.18946 | 0.25% |
| Zinc coating | Zinc coating coils | | | 0.0673 | m ² | 4.4485 | 0.29938 | 0.39% |
| | Zinc coating pieces | | | 3.80 | m ² | 6.2079 | 23.5900 | 30.52% |
| Utilities | Electricity | | | 3.62 | kWh | 0.64168 | 2.32288 | 3.01% |
| Packaging | Wooden rods | | | 0.0048 | m ³ | 58.48 | 0.28304 | 0.37% |
| | Boxboard | | | 1.15 | kg | 0.9404 | 1.08146 | 1.40% |
| Logistics | Zinc coating sheet Transp. | | | 10.62 | tkm | 0.25783 | 2.73815 | 3.54% |
| | Wire netting Transp. | | | 0.0192 | tkm | 0.25783 | 0.00495 | 0.01% |
| | Screws Transp. | | | 0.0019 | tkm | 0.25783 | 0.00051 | 0.00% |
| | Wooden rod Transp. | | | 0.59 | tkm | 0.25783 | 0.15212 | 0.20% |
| | Boxboard Transp. | | | 0.029 | tkm | 0.25783 | 0.00748 | 0.01% |
| | Final product | | | 2.003 | tkm | 0.25783 | 0.51643 | 0.67% |

Source: Own study based on the research results.

5. Discussion of results and conclusions

The methodology used brings significant benefits for its users. Primarily, it promotes green thinking, raises awareness of all CO₂ hotspots across the supply chain and provides potential low carbon intervention solutions. It also assists managers when designing low carbon supply chains and building transparent B2B relationships. Finally, it helps to understand the impact of interventions on the supply chain's three bottom line KPIs (Koh et al., 2011).

In the case of Polish companies, three categories of input type were identified: direct materials, utilities and logistics. For the analysed supply chains, the biggest emission is related to direct materials: polystyrene (62.48%) and aluminium frames (99.19%). These materials determine the quality of the final products and are difficult to substitute. The manufacturing process of brick requires steam, which is also a significant CO₂ hotspot (22.80%).

In the United Kingdom, in the case of all analysed companies, the highest shares of emissions could be observed within direct inputs: unprocessed steel (44.40%) and polyester (51.16%). However, some significant emissions could also be observed in relation to utilities, especially electricity (18.67%).

In the case of the first Greek company, the biggest emission was related to electricity usage (87.00%). In this case, the emission was the result of energy demand for processing.

In the case of Italy, again, in all analysed companies, direct materials were the most substantial CO₂ hotspots. Relatively high emissions appeared in the process of packaging (the first company) and zinc-coating pieces (the second company).

The following conclusions can be reached from the case studies. First of all, the highest emissions were related mostly with direct inputs, especially those that have been highly processed within the in-bound supply chain or require extensive processing. The difficulty of the situation lies in the fact that, in most cases, the key hotspot concerns the material determining the competitiveness of the product. Therefore, if it is not possible to replace the key material, companies should instead concentrate on improving the acquisition and production processes in the context of CO₂ reduction. They should also make a simulation in which this material is excluded from the analysis. Then, in a more accurate way, the next most harmful supply chain hotspot will emerge.

Some manufacturers noted substantial emissions from utilities (electricity) or the specific processes (zinc coating). The reason for this was either high energy demanding production processes or old infrastructure that failed to meet current energy consumption standards. The location of the enterprises was not relevant for the degree of emissions. In addition, in the presented case studies, logistics (transport) was not a major source of emissions, which usually is a CO₂ hotspot. In this case, the main source of emission was the result of the manufacturing process, regardless of the type of commodity produced.

Enterprises should improve the energy efficiency of performed processes through investing in more energy efficient infrastructure (should the current one be substandard), taking joint actions leading to energy efficient operations in the supply chain, e.g. involving suppliers in the product design, conducting supplier development programs, leading open innovations – both product and process (developing new solutions with logistics' providers or clients for example) or/and implementing the ISO 50001 management system covering energy efficiency.

It should be emphasized that both the applied research methodology and the obtained results have limitations. Mainly due to narrow research sample, it is impossible to formulate universal conclusions and full comparative analysis of the identified CO₂ hotspots is impossible. Therefore, the paper should be treated as a pilot study and wider analyses are required in order to collect more comprehensive data.

Acknowledgements

The TrainERGY project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

This scientific work (publication / conference participation) is financed from financial resources for science in the years 2016–2018, granted by the Polish Ministry of Science and Higher Education for the implementation of the co-financed international project.

References

- ACQUAYE, A., FENG, K., OPPON, E., SALHI, S., IBN-MOHAMMED, T., GENOVESE, A. and HUBACEK, K. 2017. Measuring the environmental sustainability performance of global supply chains: A multi-regional input-output analysis for carbon, sulphur oxide and water footprints. *Journal of Environmental Management* 187:571–585.
- BOCHTIS, D., LAKOVOU, E., VLACHOS, D. and AIDONIS, D. 2015. *Supply Chain Management for Sustainable Food Networks*, New York: John Wiley & Sons.
- CARTER, C.R. and ROGERS, D. S. 2008. A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management* 38(5): 360–387.
- DALLA RIVA, A., BUREK, J., KIM, D., THOMA, G., CASSANDRO, M. and DE MARCHI, M. 2017. Environmental life cycle assessment of Italian mozzarella cheese: Hotspots and improvement opportunities. *Journal Of Dairy Science* 100(10):7933–7952.
- DE LA FUENTE, T., ATHANASSIADIS, D., GONZALEZ-GARCÍA, S. and NORDFJELL, T. 2017. Cradle-to-gate life cycle assessment of forest supply chains: Comparison of Canadian and Swedish case studies. *Journal of cleaner production* 143:866–881.
- DIABAT, A. and Al-SALEM, M. 2015. An Integrated Supply Chain Problem with Environmental Considerations. *International Journal of Engineering Production* 164: 330–338.
- DIABAT, A. and GOVINDAN, K. 2011. An analysis of the drivers affecting the implementation of green supply chain management. *Resources, Conservation and Recycling* 55(6): 659–667.
- EGILMEZ, G., BHUTTA, K., ERENAY, B., PARK, Y.S. and GEDIK, R. 2017. Carbon footprint stock analysis of US manufacturing: a time series input-output LCA. *Industrial Management & Data Systems* 117(5):853–872.
- GUALANDRIS, J. and KALCHSCHMIDT, M. 2016. Developing environmental and social performance: the role of suppliers' sustainability and buyer-supplier trust. *International Journal of Production Research* 54(8): 2470–2486.
- JABER, M.Y., GLOCK, Ch.H. and EL SAADANY, A.M.A. 2013, Supply chain coordination with emissions reduction incentives. *International Journal of Production Research* 51(1): 69–82.
- KALINOWSKI, T.B., RUDNICKA, A. and WIETESKA, G. 2015. Developing Sustainable Supply Chains in Greece, Italy, Poland and United Kingdom – Research Results: proceedings of the 20th International Symposium on Logistics. University of Nottingham, 5–8 July. Italy, Universita Di Bologna: 259–267.
- KLEINDORFER, P.A., SINGHAL, K., and WASSENHOVE, L.N. 2005. Sustainable operations management. *Production and Operations Management* 14 (4): 482–492.
- KOH, S.C.L., GENOVESE, A., WIETESKA, G., RUDNICKA-REICHEL, A. and KALINOWSKI, T.B. 2015. *Supply Chain Environmental Analysis Tool, Enhanced Version SCEnAT+, User Manual*, PrESS project internal documentation.
- KOH, S.C.L. and others, 2011. *Supply Chain Environmental Analysis, a new system for delivering a low carbon supply chain*, The Center for Low Carbon Futures.

- LINTON, J.D., KLASSEN, R. AND JAYARAMAN, V. 2007. Sustainable supply chains: An introduction. *Journal of Operations Management* 25(6): 1075–1082.
- LOPES, J.M., LEAL JUNIOR, I.C. and DE ALMEIDA GUIMARÃES, V. 2016. Impact of modal choice in energy consumption and carbon dioxide emissions: analysis of Brazilian bioethanol supply chain. *Brazilian Journal of Operations & Production Management* 13:138–148.
- LOPEZ, I.N., VASILAKI, V., STOJCESKA, V., GONZALEZ-GARCÍA, S., KLEYNHANS, Ch., TASSOU, S., MOREIRA, M.T. and KATSOU, I. 2018. An environmental evaluation of food supply chain using life cycle assessment: A case study on gluten free biscuit products. *Journal of cleaner production* 170:451–461.
- MICHELSSEN, O., MAGERHOLM FET, A. and DAHLSTRUD, A. 2006. Eco-efficiency in extended supply chains: A case study of furniture production. *Journal of Environmental Management* 79(3): 290–297.
- NUNNALLY, J.C. and BERNSTEIN, I.H. 1994. *Psychometric theory*. New York: McGraw-Hill.
- OSHITA, Y. 2012. Identifying Critical Supply Chain Paths that Drive Changes in CO₂ Emissions. *Energy Economics* 34(4): 1041–1050.
- PLAMBECK, E. L. 2012. Reducing Greenhouse Gas Emissions through Operations and Supply Chain Management. *Energy Economics* 34: 564–568.
- RECANATI, F., MARVEGGIO, D. and DOTELLI, G. 2018. From beans to bar: A life cycle assessment towards sustainable chocolate supply chain. *Science of the Total Environment* 613:1013–1023.
- SARKIS, J. 2014. *Green Supply Chain Management. Series: Technologies for Sustainable Life*. New York, New York: Momentum Press, eBook.
- SEURING, S. and MÜLLER, M. 2008a. From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production* 16(15): 1699–1710.
- SEURING, S. and MÜLLER, M. 2008b. Core issues in sustainable supply chain management – A Delphi study. *Business Strategy and the Environment* 17(8): 455–466.
- SHENG, M.L. and TEO, T. S. 2012. Product attributes and brand equity in the mobile domain: The mediating role of customer experience. *International Journal of Information Management* 32: 139–146.
- TSOULFAS, G.T. and PAPPIS, C.P. 2006. Environmental principles applicable to supply chains design and operation. *Journal of Cleaner Production* 14(18): 1593–1602.
- VERFAILLIE, H. A. and BIDWELL, R. 2000. *Measuring Eco-Efficiency – A Guide to Reporting Company Performance*. World Business Council for Sustainable Development.
- WIEDMANN, T. and MINX, J. 2008. A Definition of Carbon Footprint. In: PERTSOVA, C.C. *Ecological Economics Research Trends*. Hauppauge: Nova Science Publishers.
- WIEDMANN, T. 2009. Carbon Footprint and Input-Output Analysis – An Introduction. *Economic Systems Research* 21(3): 175–186.
- WU, C. and BARNES, D. 2016. An integrated model for green partner selection and supply chain construction. *Journal of Cleaner Production* 112(3): 2114–2132.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

ECJ case law in matters of geographical indications and its influence on changes and interpretation of secondary European law

Hana Kelblová¹, Jana Mikušová²

*¹Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: kelblova@mendelu.cz,*

*²Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: xmikusov@mendelu.cz*

Abstract

The aim of this article is to generalize the principal trends in the practice of ECJ in matters of EU geographical indications and identify cases where a judgment of ECJ had a direct effect for the amendment of regulations, which regulate the use and protection of geographical indications at the European level. The article is based on analysis of relatively recent judgments in Feta and Budweiser and aims to derive and formulate the main evaluation criteria and method of interpretation performed by ECJ in matters of geographical indications for agricultural products and foodstuffs.

Key words: geographical indications, ECJ case law, secondary law

JEL Code: K15

1. Introduction

The European Union currently provides protection of geographical indications of agricultural products and food for several reasons: increasing food quality, protection of traditional manufacturing, consumer protection, protection of domestic (i.e. EU) agriculture and rural sustainability⁸. The agriculture policy directly intertwined with the consumer protection policy in this topic and the protection of geographical indications appears to be a means of changes to the common agricultural policy focusing on food quality, rather than quantity.

⁸ Art. 13 and 39 TFEU

Food safety is already mentioned in the Treaty establishing the European Community (hereinafter referred to as TEC)⁹ and the implementation of the reform of food law, simplify, unify and streamline requirements fragmented into a number of sub-regulations should lead to ensure consumer protection and avoid creating obstacles to free trade. Food quality and safety is a constant theme of the common agricultural policy. These basic requirements of the market also access other social demands, such as animal welfare, climate change, food security and affordability, sustainability, territorial development of regions, fairness of salaries of employees in rural areas, motivating young people to remain in the country and continue agricultural activities, support for traditional specialties like.¹⁰ One of the tools to fulfil these requirements is to protect the names of food and agricultural products, wines and spirits, which are connected with the place of their production and know-how of its producers. To create such a tool, the EU made specific systems for protecting geographical indications, which guarantee consumers the quality of the place of production or farming methods. Compliance with the rules of these protective systems is controlled by either state or private certification bodies.

According to DG Agriculture statistics, outside wines, there were 1 169 products registered as Protected Designation of Origin (PDO) or Protected Geographical Indication (PGI) in the EU at the end of 2014. The great majority of them (92%) are represented by agricultural products intended for human consumption, almost equally distributed between PDO and PGI. The Member State with the highest number of protected products is Italy (with a total of 262 PDO+PGI products), followed by France (with 216 products) and by other Southern European countries (Spain 174, Portugal 124 and Greece 101) and Germany (with 78 products). The market for GI products is significant, especially in the United States, Europe and more affluent countries, with the estimated value €54.3 billion worldwide, and they represent 15% of total European food and drinks exports. 60% of sales of European GI products took place in the country where these products originate, while 20% took place in other EU countries and a further 20% were exported outside of the EU (Chever T., Renault C., Renault S., Romieu V. (2012). The geographical indication is a type of property that has to be taken into account while appraising the value of an enterprise on the financial / capital market – the process of gathering the information on the capital market by the enterprise and its transition to a supervision agency has been described by (Kyncl, 2015)

2. Material and Methods

The analysis is based on the accessible case law about the geographical indications decided by CJEU. The database of the European Commission DOOR and Bacchus were also used. These databases are open sourced. To reach the goal of the article, there were selected two cases that are significant for the analysis, namely case Feta and Budweiser on which the changes of the perception and interpretation of the secondary law are described. In the methodological procedures, the standard methods of research work were used, such as the analysis and synthesis of the case law.

⁹ Art. 153 TEC

¹⁰ Green Paper on agricultural product quality. Available from: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:ag0002> Accessed 18th December 2017.

3. The concept of Geographical Indications

Concept of all intellectual property rights is based on the exclusive rights of a single holder, but the concept of geographical indications is based on a completely different principle which is the possibility that any producer who placed their production in a particular geographic location, could label its products with responding GIs, if it complies with certain pre-established rules.¹¹ Thus, there is no single holder of exclusive rights to GIs (Phillips, J. 2006).

It can be concluded that the rights to GIs are actually a kind of collective or group rights of intellectual property, but it is practically possible that there exist a sole producer – the applicant for the grant of rights to geographical indications, who only produces a product that can be marked. Practically it happens that due to historical, social and economic circumstances and developments, geographical indication has only one or two holders. An example from the Czech Republic is „Budweiser Budvar“ registered geographical indication, of which the sole holder is the Budweiser Budvar NC, however, the holder of geographical indication „Budweiser“ is also the second brewery based in Budějovice¹², and in 2003 the Protected Geographical designation "BUDWEIS BEER" was registered by the European Commission.

The national systems of protection of geographical indications coexists with the system of protection on EU level, which means that even if the geographical indication is not protected at EU level, it enjoys the protection at the national level and it is a task especially of the Court of Justice of the European Union (CJEU) decisions to regulate the balance between the requirement of free movement of goods and the protection of intellectual property rights.

The conclusions formulated by the case law of the CJEU are very important for EU Member States, including the question of whether they should maintain and develop their national systems of protection of geographical indications. The European case law shows that the EU does not intend to replace national laws regulating GIs in Member States by its legislation. However, as stated in the opinion of the CJEU in Case Gorgonzola¹³ as soon as a geographical indication is registered at European level in the Commission register its protection at the national level must end (with the exception of temporary national protection). The existence of national systems of protection for geographical indications, however, remains justified since the EU system of protection does not apply to GIs for non-agricultural products and not on all food and agricultural products, only to those that meet specific conditions. The bearer of a geographical indication of a Member State may also choose to retain only national protection because it exports goods thus referred only to non-EU markets or is unwilling to bear the cost of registering at a European level, because its products have only local significance.

¹¹ In the case of geographical indications for food in European law, the rules are set out in the so-called Product specification

¹² IPO Online Database of Czech designations of origin and geographical indications, Available online at http://isdv.upv.cz/portal/pls/portal/port-lets.ops.det?popk=66&plang=cs&s_naz=&s_maj=&s_prv=&s_uz=&s_vyr=pivo&s_spc=, cited March 22, 2017

¹³ Case C-87/97 Consorzio per la Tutela del Formaggio Gorgonzola v Käserei Champignon Hofmeister GmbH&Co. KG and Eduard Bracharz GmbH [1999], paragraph 18, available from <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A61997CJ0087>

4. Generic geographical indications and decisions Feta

The process of genericization of GIs describes the situation where the consumer is gradually changing the perception of the designation which then becomes a general name for product or service (generic name). This process takes place over an extended period of time and is caused by inactivity of the designations' holder to geographical indication or their associations.

Designation's holder to GIs should consistently pay attention to the protection of its geographical indications being genericized, to be aware of its use in a general sense – eg. in the media, among the competitors, in dictionaries. If the designation's holder fails, it may lead to the degradation of the perception of the geographical indication in the minds of consumers who begin to perceive that sign as a generic name for a certain type of goods or services. It can happen only in a particular country or several countries simultaneously or only in a separate region. The conversion process of geographical indications to the generic name is defined in several judgments of the CJEU – Feta cheese.¹⁴

Detailed characterization of the decision-making process of the CJEU in the case of **Feta II** will be analysed here, not only because of the illustrations of the conditions of genericization of the geographical indications, but also to describe the long process of recovery (“claw back”) of the geographical indication “Feta”, that was carried by the Greek government and the European Commission.

In 1994, Greece has requested pursuant to Council Regulation (EEC) No 2081/92 on the registration of the name “Feta” as a designation of origin, the European Commission approved its request in Regulation (EC) no. 1107/96.

By judgment of 16 March 1999 in *Denmark and Others v. Commission* C-289/96 and C-293/96 and C-299/96 (collectively called Feta I), the ECJ annulled the authorization of the above mentioned Regulation registering “Feta” as a protected designation of origin arguing that registering the name disregarded the fact that the name (Feta) is also used for a long period in some other Member States. Furthermore, European Commission did not taken due account of all the factors to be taken into account when considering whether Feta is a generic name.

Following that judgment the European Commission erased Feta from the register of protected designations of origin and protected geographical indications, however the Commission subsequently sent a questionnaire to Member States concerning the production and consumption of cheeses known as feta, and how well known that name was amongst consumers in each Member State. Information obtained on the basis of a questionnaire, were submitted to the Scientific Committee and on April 24, 2001 there was issued an opinion that the name feta is a generic name. On October 14, 2002, the Commission adopted the contested regulation and “Feta” was once again registered as a protected designation of origin. The justification contained in this Regulation is used by the ECJ in its judgments.

In 2002, however, Germany and Denmark sued the European Commission and the ECJ then in 2005 ruled in *Joined Cases C- 465/02 (the plaintiff Germany) and C- 466/02 (the plaintiff Denmark)*, known collectively as *Feta II*. Interveners on the side of the plaintiffs were France and the United Kingdom, the defendant Commission was supported by the Hellenic Republic as intervener.

¹⁴ *Joined cases C-465/02 and C-466/02 Federal Republic of Germany (C-465/02) and the Kingdom of Denmark (C-466/02) v. Commission of the European Communities [2005] ECR I-09115 – Feta I*, available from <http://curia.europa.eu/juris/liste.jsf?language=en&num=C-465/02#>

The ECJ had to deal with the claim of Germany and Denmark, where Germany claimed that the word “Feta” comes from Italian, it means a slice and it was adopted in the Greek language in the 17th century and the name “Feta” is used throughout the Balkans and the Middle East to refer to a cheese in brining and further argued by a non-geographical nature of the word feta. Germany finally claimed that the quality and characteristics of feta are not essentially or exclusively connected to the geographical environment, and even there is no link between the geographical area of production and the geographical area of preparation. Denmark pointed out that the geographical area defined by the Greek Government (mainland Greece and the department of Lesbos) covers almost the whole of Greece, and the Greek government did not bring any argument to justify, how the excluded regions differ to the rest of the regions¹⁵. Intervener France also stated that due to subsidies from the European Community French cheese producers have managed to adapt traditional methods to industrial production and these dairies produce between 10 thousand and 12 thousand tonnes of feta cheese per year.

The ECJ stated that the name “Feta” is a traditional non-geographical indications within the meaning of Regulation (EEC) No 2081/92 and shall indicate the product or a foodstuff “originating in a region or a specific place”, further the regulation requires that the quality or characteristics of the agricultural product or foodstuff were predominantly or exclusively connected to the geographical features that include natural and human factors, and the production, processing and preparation of that product take place in the defined geographical area. That area of origin must present homogenous natural factors which distinguish it from the neighbouring areas¹⁶.

To verify these facts, the ECJ analysed the Greek legislation, namely the Greek Ministerial Decree no. 313025 of 11st January 1994 recognizing the protected designation of origin “Feta” which stated that the name “Feta” is recognized as a protected designation of origin for white cheese soaked in brine traditionally produced in Greece from sheep’s milk or a mixture of sheep’s milk and goats’ milk. The decree defines the geographic area as the only mainland Greece and the department of Lesbos, excluding the island of Crete and other Greek archipelagos, namely the Sporades, the Cyclades, Dodecanese and the Ionian Islands. Territories excluded from the geographical area cannot be considered marginal, therefore areas designated for the production of feta does not cover the entire territory of Greece¹⁷.

Furthermore, the ECJ examined whether the given area has homogenous natural features which distinguish it from the neighbouring areas. The ECJ used the above mentioned Greek Decree, which defines the geographical area, especially in relation to the geomorphological conditions, namely the mainly mountainous and sub montane character of the area in relation to climatic conditions, namely mild winters, warm summers and long periods of sunshine as well in relation to botanical terms, namely the typical flora of the Balkan Highlands¹⁸. On this basis, the ECJ held that the area has homogenous natural conditions and that it was not artificially defined.

Finally, the ECJ also comment at the last plea ie. that “Feta” is a generic name. It stated that “in determining whether a name is generic or not, all factors must be taken into consideration, in particular, the existing situation in the Member State in which the name originates and in areas of consumption, the existing situation in other Member States, and also the relevant national or Community laws.

¹⁵ Sec. 43 of the judgment C-465/02 and C-466/02

¹⁶ Sec. 48-50 of the judgment C-465/02 and C-466/02

¹⁷ Sec. 54 of the judgment C-465/02 and C-466/02

¹⁸ Sec. 57 of the judgment C-465/02 and C-466/02

“According to the information sent by the Member States, those cheeses actually bearing the name “Feta” on Community territory generally make explicit or implicit reference to Greek territory, culture or tradition, even when produced in Member States other than Greece, by adding text or drawings with a marked Greek connotation. The link between the name “Feta” and Greece is thus deliberately suggested and sought as part of a sales strategy that capitalises on the reputation of the original product, and this creates a real risk of consumer confusion.”¹⁹

The Commission admitted that feta is produced in Member States other than Greece, namely Denmark (production started in the 30s of the 20th century using cow’s milk, according to non-traditional methods), Germany (from 1972) and France (from 1931), in addition thus made cheese was even legally imported into Greece, at least until 1988, when Greece by the Ministerial Decree no. 2109/88 established the definition of the geographical area of production based on traditional methods, and in 1994 already aforementioned Greek Ministerial Decree further codified all the rules applicable to feta cheese²⁰. This legislation created a new situation in which the production of cheese using cow’s milk and non-traditional methods can no longer lead to genericization of the name Feta. Production of the cheese remained concentrated in Greece and more than 85% of the annual consumption of feta per capita in the European Community takes place in Greece. Based on these facts, the ECJ held that the name “Feta” is not generic and dismissed the action of plaintiffs at this point.

5. The case Budweiser

Another significant case law of the CJEU regarding geographical indications, pays particular attention to the interpretation of the secondary legislation and finding a balance between the European system of direct protection and national protection systems (von Kapff 2011) and indicates that examination of the relationship between the systems of the protection of geographical indications and protection at the national level is of a certain importance because it suggests the limits of national legislation regulating the Member States’ legislation GIs and responsibilities of the Member States relating to the protection of registered GIs in their jurisdiction.

The system of protection for geographical indications in the EU (ie. a system *sui generis*) consists of four regulations, which should not be transposed into national law, nor would they be covered by a separate national legislation. These are the four regulations regulating the protection of geographical indications for food and agricultural products, spirits, wines and aromatized wines.

The question arises whether the system *sui generis* EU applies only to GIs registered at EU level, ie. in the register kept by the European Commission²¹, or even to the GIs for food and agricultural products that are not registered at the EU level. Another question is whether there is a complementarity of European regulations with the regulations existing at national level in Member States.

Unfortunately, the actual texts of the four above-mentioned regulations do not provide a clear interpretation that would answer the above questions. The answer to these questions can be found in the decisions of the CJEU. The CJEU commented these issues in

¹⁹ Sec. 21 of the judgment C-465/02 and C-466/02

²⁰ Sec. 78 of the judgment C-465/02 and C-466/02

²¹ The DOOR database is available online at <http://ec.europa.eu/agriculture/quality/door/list.html?locale=en>

the decision *Budweiser I*²² and especially in the *Budweiser II*²³, which also completed a long-standing debate about the use of the trademark "Bud" for beer. This decision is crucial for determining the availability of national protection in case of a geographical indication which was not registered at the EU level. The decision also represents a milestone in interpreting the boundaries of sui generis system of protection of GIs.

The proceedings before the CJEU in case of *Budweiser II* in 2007 was triggered by a request for a preliminary ruling submitted by the Austrian Handelsgericht Wien in a dispute between Budweiser Budvar, National Corporation (Czech Republic), and Rudolf Ammersin GmbH, a firm established in Vienna (Austria), which operated in distribution of beverages. The company Budweiser Budvar requested that Ammersin would be forbidden to market a beer bearing the mark 'American Bud', produced by the brewery Anheuser-Busch Inc. (United States), on the grounds that, on the basis of bilateral agreements between the Czech Republic and Austria the usage of the name 'Bud' in Austria is reserved for beer produced in the Czech Republic.

The most important task for the court was to clarify the issues of maintaining the national protection of geographical indications "Bud" as well as protection of the designation bilaterally extended to the territory of another EU Member State (Austria), namely whether the Regulation No. 510/2006²⁴ has exclusive effect and the simultaneous (national) protection of GIs falling within its material scope cannot therefore be applied.

The CJEU dealt with two sets of questions, each concerned a different situation depending on how the designation 'Bud' in the Czech Republic is protected. The first set of questions hypothesized that this designation is protected in the Czech Republic as a "mere" simple and indirect indication of geographical origin, ie. as an indication of the product, which characteristics are not directly linked to the specific geographical origin. In accordance with the statement of the Czech Republic, the CJEU stated that such designations may be protected in the Member State of origin and also in other Member States based on Article 30 of the TEC²⁵, although they do not precisely state the geographic name of a place. It is sufficient if the designation is capable of informing the consumer in the Member State of origin, so that the designated product (beer) comes from a particular place, and if that name in the Member State of origin is not already generic. It is not important whether the designation in the Member State of origin is used by a single or multiple businesses. It is up to the national court, pursuant to its domestic law, to choose the appropriate evidence to determine whether those conditions are met (eg. Survey taken among consumers in the Czech Republic).

In the second set of questions to the CJEU assumed that the designation 'Bud' in the Czech Republic as a protected designation of the product for which it is given a link between their characteristics and their geographic origin. Respective to this question, the CJEU stated that the protection of geographical indications set by the Council Regulation (EC) No. 510/2006²⁶, is exclusive and precludes a national law protecting such geographical indications, as well as bilateral extension of this protection to another Member State. The CJEU relied this conclusion on the arguments concerning the functioning of the internal market, particularly to the efforts to ensure the quality of the designated food and agricultural products, which could be compromised if it were maintained national system

²² Case C-216/01 *Budweiser Budvar National Corporation v Rudolf Ammersin GmbH* 2003

²³ Case C-478/07 *Budweiser Budvar National Corporation v Rudolf Ammersin GmbH*, ECR 2009 I-07721

²⁴ Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs (OJ L 93, 31.3.2006, p. 12)

²⁵ Article 30 of the EC Treaty protects industrial and commercial property

²⁶ *Ibid* 34

of protection of those designations, which could operate under less stringent conditions than European protection system.²⁷

Decision on Budweiser II is remarkable from several points of view. Before this decision the prevailing general opinion that those GIs unregistered at EU level, but only at national level are not subject to the relevant European regulations and are therefore protected only at national level. The experts had different opinions on whether the European system of direct protection for geographical indications has exclusive effect, ie. the geographical indications registered in the EU precludes national protection or not, ie. both systems can operate in parallel.²⁸ ECJ in its decision Budweiser II used its conclusions in case Budweiser I but admit that the first decision was taken in a different legal situation. The court stated that the designation “Bud” is registered with WIPO as qualified designations of origin under the Lisbon Agreement since 1975 ie. it falls within the scope of Regulation No. 510/2006²⁹, effective from 31st March 2006. The Court also stated that the decision Budweiser I was adopted before the date of accession of the Czech Republic into the EU and that Austria is not a signatory to the Lisbon Agreement. The CJEU concluded that the designation “Bud” was not registered under the Regulation No. 510/2006 or under the transitional provisions on access.³⁰ Only designations “Budweiser beer”, “Českobudějovické beer” and “Budweiser měštanský” were registered.

Furthermore, the ECJ considered the question of the exclusive nature of Regulation No. 510/2006, which would preclude the application of national protection, including protection under bilateral international treaties. The court noted that the preamble to the Regulation No. 510/2006, as well as its predecessor Regulation No. 2081/92 emphasize a unified approach to the protection of geographical indications and also the principles of the common agricultural policy. If there would maintain the protection of geographical indications at the national level, thus designated foodstuffs would meet less stringent requirements than required by Regulation No. 510/2006. There would then be risk that ... “quality, which constitutes the essential function of rights conferred pursuant to Regulation No 510/2006, could not be guaranteed. That also carries the risk, in the internal market, of jeopardising the aim of fair competition between producers of products bearing those indications or symbols and, in particular, would be liable to harm rights which ought to be reserved for producers who have made a genuine effort to improve quality in order to be able to use a geographical indication registered under that regulation.”³¹ As the Advocate General stated in his opinion, since no directive has been adopted in tandem, harmonising any national systems. Had the intention been for those to remain in force, notwithstanding that ‘uniformity’, there would have been a harmonisation, as there was with trademarks.³² CJEU emphasized that the aim of the Regulation No. 510/2006 is not to be an additional system of protection to the national rules, like that of the trademarks, but to provide a uniform system of protection that will be for these indications exhaustive.³³

²⁷ Information on the case C-478/07, available at <https://isap.vlada.cz/dul/judesd.nsf/63a0a9f051709984c1257ad3002d875f/75ad64f365d72093c125779700475efa?OpenDocument>, accessed on 10th January 2018

²⁸ Opinion of Advocate General Damaso Ruiz-Jarabo Colomer in Case C-478/07 Budweiser Budvar National Corporation v Rudolf Ammersin GmbH 2009, para. 95, footnote 52, available <http://curia.europa.eu/juris/document/document.jsf?text=&docid=72927&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=586025>

²⁹ Ibid 34

³⁰ See Sec. 104 of the judgment in Case C-478/07

³¹ Sec. 112 of the judgment in Case C-478/07

³² Ibid 38, para 111

³³ Sec. 114 of the judgment in Case C-478/07

Furthermore, the CJEU stated that the system for registering geographical indications at the European level differs from other systems of registration of other industrial property rights, as it is based on powers shared between the Member State concerned and the Commission, since the decision to register a designation may be taken by the Commission only if the Member State concerned has submitted to it an application for that purpose and such an application may be made only if the Member State has checked that it is justified³⁴. National procedure forms an essential part of the decision-making process at EU level.

Art. 17 of the Regulation No. 2081/92 introduced a so-called Simplified registration procedure for national designations legally protected in the Member State which sought their registration. If an application is registered through this system within six months, the national protection is maintained during the transitional period of five years. This special scheme was subsequently canceled³⁵ and the Commission laid down new transitional provisions regarding the protection of geographical indications existing in the ten acceding countries by the Regulation No. 918/2004³⁶. These transitional provisions are particularly relevant for the decision *Budweiser II*, since the name “Bud” existed at that time in Czech Republic as a geographical indication. Regulation no. 918/2004 provided that the national protection of geographical indications can be maintained if the application for registration is submitted to the Commission within six months and it will last until a final decision by the Commission. However, the Czech authorities did not take advantage of this simplified procedure in the case of the designation “Bud”, therefore, the national protection was not allowed. In this respect, the CJEU concluded that the protection scheme under Community law has exhaustive (exclusive) character, so that the application of national law and bilateral agreements are excluded.

6. Conclusion

The two above presented cases forms an important part of the law on protection of the geographical indications. The impact on the interpretation of the secondary law is unexceptionable and it lead to changes in the secondary law and had a big impact on the national level protection.

In the case *Feta*, the CJEU interpreted the way of genericization of the designations and describe the most important features of PDO and PGI with the needs for thorough examination of the application.

The CJEU decision in the case *Budweiser* shows that the court did not argue with precise interpretation of specific provisions of the Regulation No. 510/2006 (now replaced by Regulation on quality schemes), but rather considers the risks that would result in the opposite solution, ie. if this regulation was not exclusive in nature. The CJEU somewhat illogically argued that Member States would not be able to ensure the quality of the designated goods while maintaining the national protection of geographical indications,

³⁴ Sec. 116 of the judgment in Case C-478/07

³⁵ Art. 1 of Council Regulation (EC) No 692/2003 of 8 April 2003 amending Regulation (EEC) No 2081/92 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs, OJ L 99, 17.4.2003, p. 1–7

³⁶ Commission Regulation (EC) No 918/2004 of 29 April 2004 introducing transitional arrangements for the protection of geographical indications and designations of origin for agricultural products and foodstuffs in connection with the accession of the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia, OJ L 163, 30.4.2004, p. 88–89

on the other hand, the Member States at national level provide protection for geographical indications registered by the European Commission under Regulation No. 510/2006 (Mantrov 2014). It should be noted that the protection of geographical indications at the national level is not harmonized by European directives, so that national systems of protection of geographical indications of individual Member States is really different.

Despite the fact that this decision concerns the interpretation of Regulation No. 510/2006, conclusions can be made here on the interpretation of other regulations regulating GIs at European level, ie. The Regulation on the common organisation of the market in wine, the Regulation on spirit drinks and Regulation on aromatized wines (Mantrov 2014). It can be concluded that the main considerations for the ECJ decision on Budweiser II were rather political nature rather than the legal (Gragnani 2012).

Some EU Member States, eg. Denmark, Sweden and Finland have a GI protection through the regulation of unfair competition, others such as Germany, Latvia, Lithuania have a sui generis protection of geographical indications. However, exclusive nature of regulation has a direct impact on countries such as Estonia, Bulgaria, Romania, the Czech Republic, Slovakia, Poland, Croatia, Portugal, Slovenia, Hungary, which have an established system of registration of GIs with their national authorities.

It can be said that the European law on GIs differs from other areas of intellectual property rights in the EU³⁷, where the European and national legal regulations coexist with the national legislation of each Member State being sufficiently harmonized through the implementation of European directives. The hallmark of fragmentation and disunity prevails on the protection of GIs on the contrary and the possibility of registering geographical indications as collective mark.

After the decision Budweiser II the exclusive nature of European protection of geographical indications is clear and national protection cannot be provided. This state obviously undermines the unified system of intellectual property protection in the EU.

References

- GRAGNANI, M. (2012): The law of Geographical Indications in the EU. *Journal of Intellectual Property Law and Practice* 7 (4) pp. 280.
- CHEVER T., RENAULT C., RENAULT S., ROMIEU V. (2012): Value of production of agricultural products and foodstuffs, wines, aromatised wines and spirits protected by a geographical indication (GI), Available online at http://ec.europa.eu/agriculture/external-studies/2012/value-gi/final-report_en.pdf. Accessed 20th December 2017.
- JEHORAM, T.C. and van NISPEN, C.J.J.C. and HUYDECOPER, T. and HUYDECOPER, J.L.R.A. (2010): *European Trademark Law: Community Trademark Law and Harmonized National Trademark Law*, Kluwer Law International, ISBN 978-90-411-3157-7, p. 553.
- von KAPFF in GIELEN, C., von BOMHARD, V. (2011): *Concise European Trademark and Design Law*. Kluwer Law International, ISBN 978-90-411-2407-4, p. 47.
- KYNCL, L. *Financial Market Supervision in the System of Financial Law*. In Jiří Blažek. *System of Financial Law : Financial Markets*. 1st ed. Brno: Masaryk University, Faculty of Law, 2015. s. 277-291, 15 s. ISBN 978-80-210-7828-4.

³⁷ Community trademarks, industrial designs, plant variety, they have a uniform European patent protection in the EU and are also protected on the national level. Copyrights are protected by European directives.

- MANTROV, V. (2014): EU Law on Indication of Geographical Origin Theory and Practice. Springer International Publishing Switzerland, ISBN 978-3-319-05689-0 p. 315-319.
- PHILLIPS, J. (2006): Trade Marks at the Limit. Edward Elgar Publishing, ISBN 978-1-84542-738-2, p. 40–44.
- Commission Regulation (EC) No 918/2004 of 29 April 2004 introducing transitional arrangements for the protection of geographical indications and designations of origin for agricultural products and foodstuffs in connection with the accession of the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia, OJ L 163, 30.4.2004, p. 88–89.
- Council Regulation (EC) No 692/2003 of 8 April 2003 amending Regulation (EEC) No 2081/92 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs, OJ L 99, 17.4.2003, p. 1–7.
- Opinion of Advocate General Damaso Ruiz-Jarabo Colomer in Case C-478/07 Budweiser Budvar National Corporation v Rudolf Ammersin GmbH 2009, para. 95, footnote 52, available <http://curia.europa.eu/juris/document/document.jsf?text=&docid=72927&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=586025>, Accessed 8th December 2017.
- Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs, OJ L 93, 31.3.2006, p. 12.
- Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007, OJ L 347, 20.12.2013, p. 671–854.
- Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs, OJ L 343, 14.12.2012, p. 1–29.
- Green Paper on agricultural product quality. Available from: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:ag0002>. Accessed 18th December 2017.
- IPO Online Database of Czech designations of origin and geographical indications, Available online at http://isdv.upv.cz/portal/pls/portal/portlets.ops.det?popk=66&plang=cs&s_naz=&s_maj=&s_prv=&s_uze=&s_vyr=pivo&s_spc=. Accessed 22nd December 2017.
- Regulation (EC) No 110/2008 of the European Parliament and of the Council of 15 January 2008 on the definition, description, presentation, labelling and the protection of geographical indications of spirit drinks and repealing Council Regulation (EEC) No 1576/89, OJ L 39, 13.2.2008, p. 16–54.
- European Union, Directorate-General for Agriculture and Rural Development (2014): Agriculture In The European Union Markets Statistical Information, Update December 2014.
- Available online at http://ec.europa.eu/agriculture/markets-and-prices/market-statistics/pdf/2014/full-report_en.pdf. Accessed 10th January 2018.

21st International Scientific Conference
“Enterprise and Competitive Environment”, 22–23 March 2018,
Brno, Czech Republic

The importance of CSR for recruiting skilled workers in the German healthcare system

Michael D. Koehler¹

*¹Department of Economics, Faculty of Business and Economics, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: koehler@platon-management.de*

Abstract

Recent studies show that there is an acute shortage of skilled workers in almost every industry in Germany. Especially in the German health care sector, more and more companies are looking for specialists and managers. Another special aspect is that the market players in the German health care system are very heterogeneous. From large companies with several thousand employees such as clinic groups, such as Helios or Asklepios to small family businesses, the competition for qualified employees is in full swing. In the coming years, the shortage of skilled workers in nursing care will become a constant companion for companies. As a result, the cost of recruiting new employees will continue to rise. Large companies particularly invest in marketing and the promotion of young talent in order to present themselves as an attractive employer. Small companies do not usually have these financial resources at their disposal, and it is becoming increasingly important for them to present themselves as an attractive employer. The conduct of the company's management towards customers, employees and society shapes the corporate culture. Corporate social responsibility (CSR) can also be part of this corporate culture.

So how can small and medium-sized enterprises (SMEs) present themselves as attractive employers in the health care sector and retain their sought-after employees in the long term? On the one hand, SMEs especially cannot risk having top performers drift away and thus lose know-how, while on the other hand recruiting and retaining employees becomes a challenge for SMEs.

The impact of Corporate Social Responsibility (CSR) on healthcare workers has not been explored to date. The aim of this paper is to show, by means of a study, that potential employees feel addressed by a credible strategy of CSR in companies.

Keywords: SME, CSR, Recruiting

JEL Code: M140, I110, A110

1. Introduction

More than any other issue, the shortage of skilled workers is determining the current labour market, economic policy, and societal debate in Germany, and calls for reflection on the future of Germany as a leading global economy (Bertelsmann Foundation, 2017). Exactly how large this shortage of skilled workers and the possible consequences and measures for business and society is a subject of controversial debate.

1.1. Skilled Workers

The term skilled worker is defined in Germany by “level of qualifications” required in the 2010 Occupational Classification Code (KldB 2010) (German Federal Employment Agency, 2017). In this system, skilled workers are assigned a level 2 because the requirements for this kind of work are much more complex and/or have a more technical orientation compared to lower-level assistant and semi-skilled occupations. This means that a skilled worker requires well-founded technical knowledge and skills that ensure the proper performance of these occupations. Such qualifications are generally only obtained with two to three years of vocational training (German Federal Employment Agency, 2017).

1.2. Shortage of skilled workers

According to a 2017 study by Ernst & Young, (Barth & Englisch, 2017) there is particular demand for skilled workers in the areas of production (50 percent) and sales/customer service (25 percent). Technical occupations in the so-called “MINT” areas (mathematics, computer science, sciences and technology) along with many occupations in the nursing care and healthcare system are especially affected. The shortage in the healthcare professions applies to positions requiring university degrees and those that do not. This trend will continue in 2018. In the recent study of two thousand SMEs completed by Ernst & Young in November/December 2017, SMEs in every industry currently consider the shortage of skilled workers to be the biggest threat to their own companies (Marbler, 2018).

The potential shortage of skilled workers covers the entire range of activities, specialist fields, and occupations. The largest bottlenecks are occurring in the service sector (60%, especially health and care work), but also in the manufacturing sector (manufacturing and research and development) (Ehrentraut, 2015).

1.3. The Healthcare Market

According to the latest survey, at the end of 2015 about 5.5 million people were employed in the German healthcare system, representing one in every seven German jobs. Of these, 77% worked in outpatient and in semi-inpatient/inpatient facilities (Statistisches Bundesamt, 2017). The methodological starting point for demarcating healthcare personnel is the OECD’s definition of healthcare, which is also the starting point for calculating healthcare expenditure and medical expenses (James, et al., 2017). The care sector employs around 1.1 million people. Of these, 730,000 are in inpatient care and 355,600 in outpatient facilities. They provide care to about 2.9 million people (Statistisches Bundesamt, 2017).

1.4. Demographic change

Another factor is the consequences of demographic change. Even just taking into account this subject alone, recent studies indicate that bottlenecks in the labour market are likely to worsen in the next few years especially as the German baby boomer generations, i.e. those born in the 1950s and 60s begin to retire (Ehrentraut, 2015). Two opposing tendencies are coming to a head, particularly in the German care sector. On the one hand, the number of people in need of care will continue to rise over the next few years, (Bundesministerium für Gesundheit, 2016) while on the other hand those currently providing baby boomers with care will also be retiring over the next few years (Statistisches Bundesamt, 2017). As a result of this development, healthcare SMEs in particular are challenged with developing new strategies to retain and/or recruit employees. Small and medium-sized enterprises only have limited financial resources at their disposal (Schäfer, 2011).

1.5. CSR

This paper was based on the partial results of a Delphi study within the framework of a dissertation on the importance of corporate social responsibility (CSR) in small and medium-sized enterprises (SMEs) in the German healthcare system. It provides suggestions for dealing with urgent future issues and develops strategies for future personnel work in companies.

Therefore, the question should be clarified as to what the author understands by CSR. There is no standard definition of the term "CSR" within academia (Nemitz, 2014), but there is a common ground for the basic ideas of the varying definitions. CSR is envisioned as a concept that addresses the effects of entrepreneurial activities on the environment and society, thereby deriving how the future should be responsibly developed. CSR thus has the goal of connecting enterprises with society in a constructive manner (Hofielen, 2017). Since the late 1990s, the social aspect of corporate responsibility has come to be treated as of equal importance to commercial and environmental objectives (Hardtke & Kleinfeld, 2010). It provides the canon of values for the company or for the entrepreneur in the case of SMEs (Hardtke & Kleinfeld, 2010) (Schäfer, 2011).

2. Methodology and data

This paper was developed on the basis of an intensive literature analysis and Internet research as a basis for his Delphi study on the topic: the importance of CSR for SMEs in the health care sector. Partial aspects could be the attractiveness, customer loyalty or social standing of a CSR in order to strengthen the attractiveness of the employer. The Delphi method was chosen because it is a systematic, multistage survey procedure with feedback and adaptations that is able to assess future events, trends, social developments and the like in less explored or new areas as well as possible. The Ryota Ona described this method as the cornerstone of futurology (Häder, 2013).

According to (Kreuzhof, Nicolai, & Heybrock, 2016), the following 9 levels describe the typical features of a classic Delphi study design:

- *1st Literature survey:* After an extensive Internet and literature analysis, research was conducted into the current state of research and knowledge be-

tween CSR and Long-Term Care. Here it emerged that the effects and significance of CSR in care institutions have not yet been comprehensively researched.

- *2nd Question/Thesis:* Here, the first very open questions about the CRS were asked. Here, too, the importance of CSR in everyday nursing facility life was discussed.
- *3rd Interview of Experts:* in these interviews, quantitative and qualitative questions were discussed on the basis of an interview without final evaluation. This resulted in a questionnaire with 15 criteria
- *4th 1st Delphi:* a total of 50 people from the management and employees were surveyed here. These employees met the criteria of an expert a) by formal qualification: at least one advanced training within the last 3 years with at least 100 hours and b) by sufficient professional experience: at least 5 years of uninterrupted work in nursing.
- *5th Interim balance sheet:* After this 1st Delphi the final questions were worked out. Which meet the scientific criteria in terms of reliability, objectivity and validity.
- *6th Survey:* the questionnaire created for the research question will be presented in detail in the future dissertation, this also applies to the points:
- *2nd Delphi, 8th Comments / Review, 9th Conclusion*

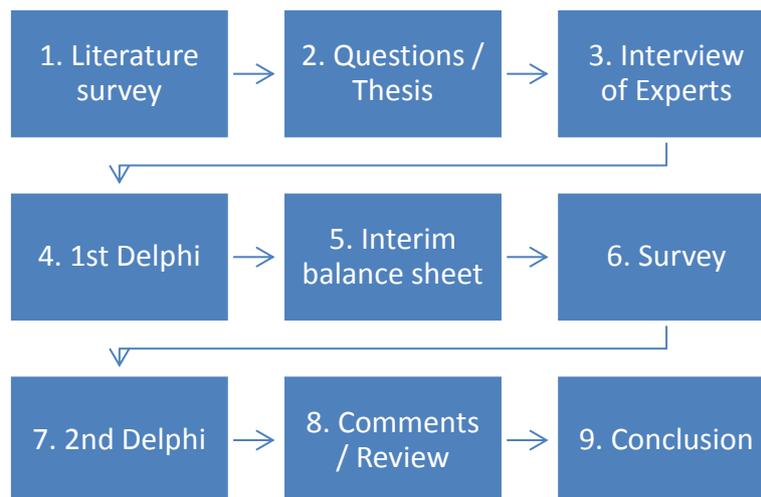


Figure 1: 9 Steps of Delphi

After a first skilled worker survey, three fields of action were determined for further investigation.

- Firstly: What impact does CSR have on a company's reputation?
- Secondly: What impact does this have on the attractiveness of employers? This will be discussed in more detail below.
- And thirdly: What strategies can support implementation of CSR for healthcare SMEs? This will be explained in the context of the dissertation.

Subsequent to this survey and in accordance with the 3-stage Delphi study interview of skilled workers, interviews were conducted with employees and owners/managing directors stemming from owner-managed SMEs.

In the first round, 50 participants were interviewed. Of these, interviews were conducted with 4 owners/managing directors, 6 middle management employees, and 40 skilled workers. A total of 25 questions were asked on the subject of employers and CSR. A Likert rating scale was used. This means that one only indirectly learns from a direct question whether the respondent agrees with or rejects a statement. In response to the criticism that this leads to interpretation problems, it can be argued that if the questions are reliably asked, this will also lead to valid results and is well suited to arriving at predictions as to the actual behaviour/opinion of respondents (Borg, 2003).

Results:

To the question: Are you familiar with the term corporate social responsibility (CSR)?

Answers:

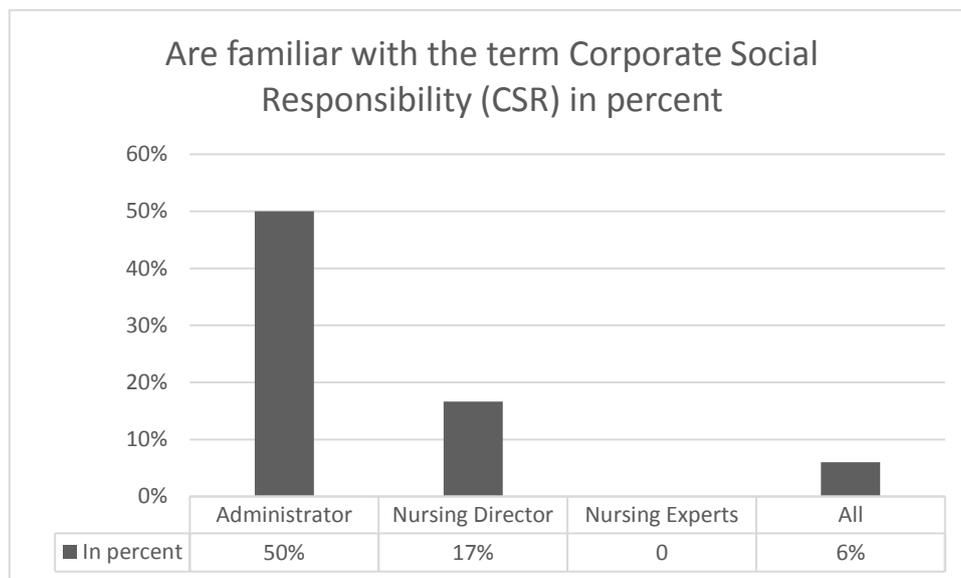


Figure 2: CSR definition

From this it can be deduced that the term has not yet become sufficiently established in Germany. When queried about certain keywords related to social responsibility, sustainability, and value creation in Germany, the picture is completely different.

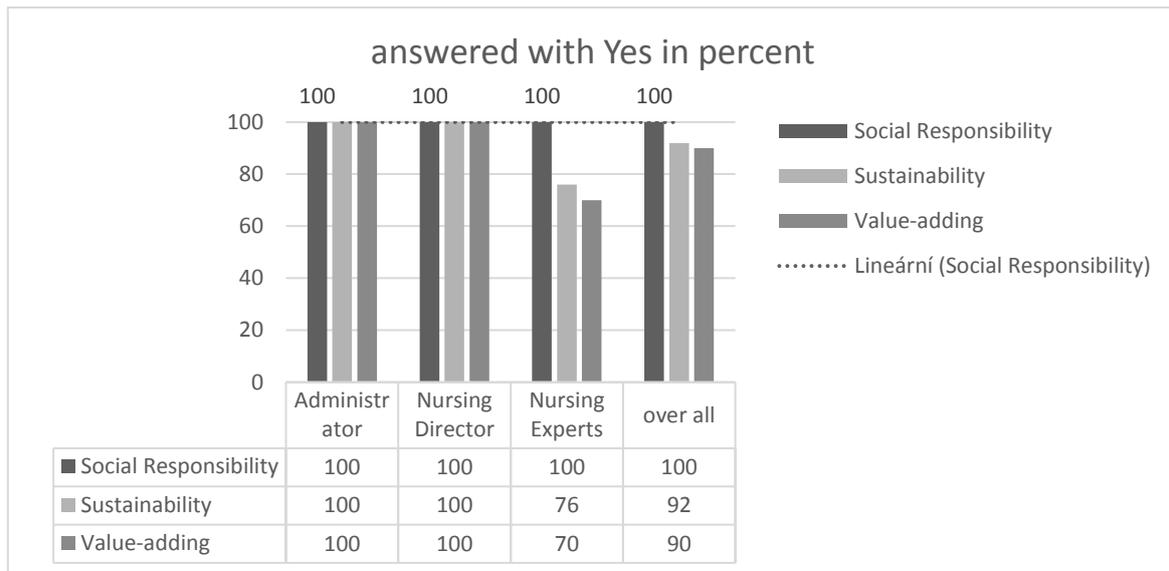


Figure 3: Further definition

It can be deduced from this that the subject of CSR has a large presence in companies, regardless of the definition. After a description of what should be understood by CSR, another subject area was addressed. This involved the personal behaviour of respondents. Question 2.1 dealt with private consumer behaviour as per the criteria of CSR (How important is it to you in your private decisions when purchasing products or services; how important is the selection according to the criteria of sustainability and social responsibility?). And Question 2.2 dealt with the willingness to pay a higher price for this (Would you be willing to pay a higher price for it?).

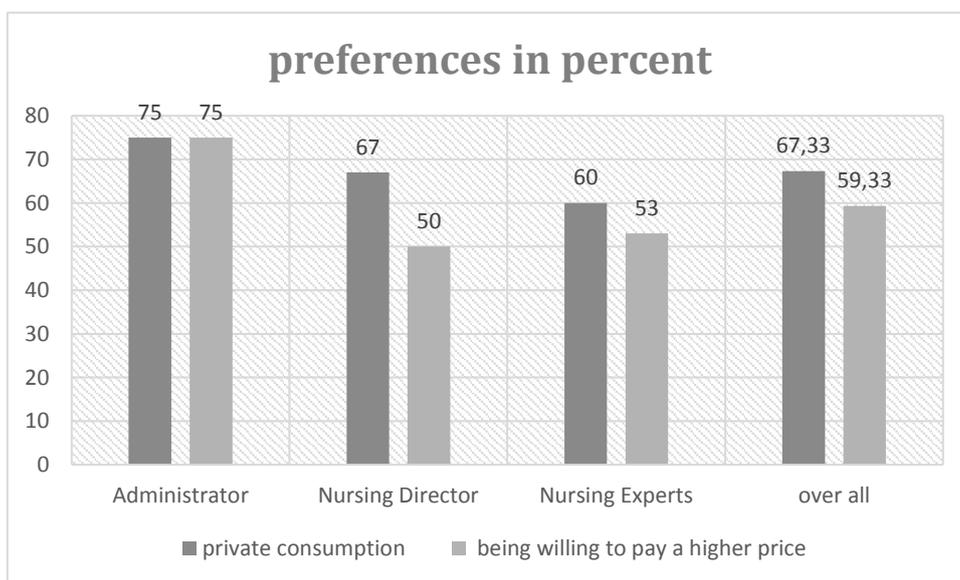


Figure 4: Private Preferences in %

This shows a clear willingness to link one’s consumer behaviour with responsibility to society as a whole. However, also evident is the difference between the employee and the management level. How these differences are related should be investigated further. It is only possible to make assumptions based on the data. Aspects to consider here are personal preferences, the level of education, and also the available income.

The next block of questions deals with the attractiveness of both employer selections. This concerned the importance of individual measures for selecting an employer.

3 Which CSR objectives does your company pursue and which priorities are important to you in your choice of employer?

3.1 Projects for employees to improve further education and training

3.2 Projects for employees to improve career opportunities

3.3 Programs for efficient use of resources.

3.4 Observance of social and ecological criteria when selecting products or external services

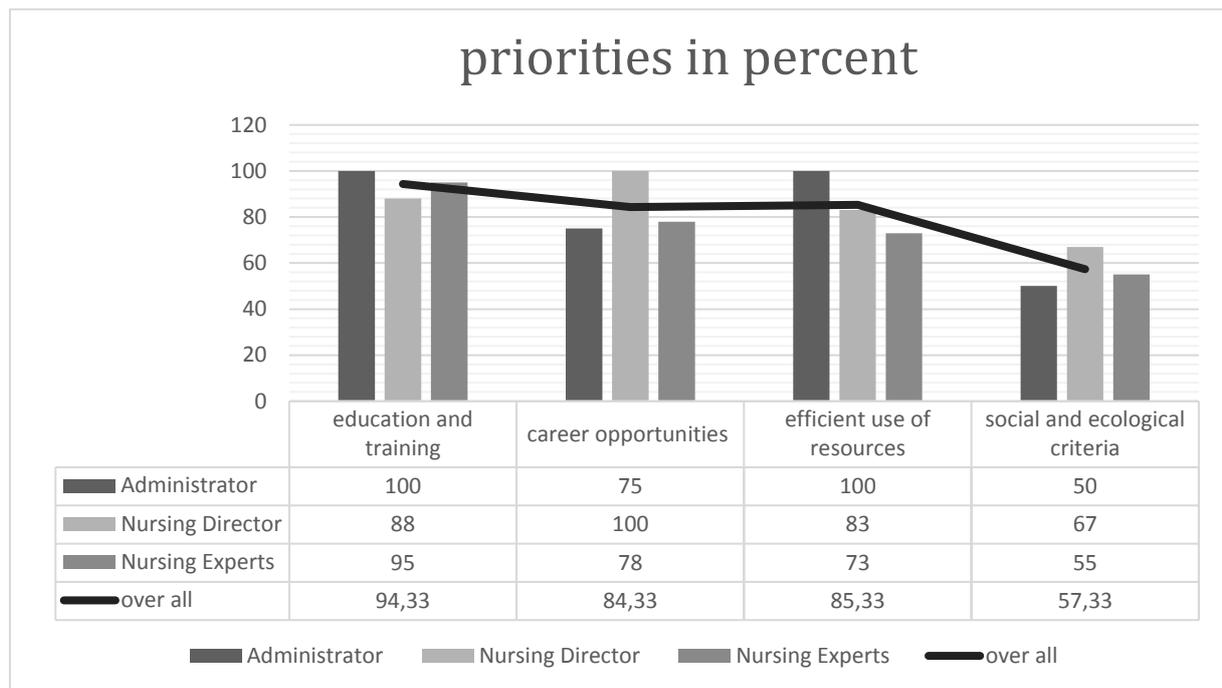


Figure 5: Priorities

Responsible conduct combined with employee orientation. The focus of the SMEs surveyed is on the employees and their future, whereby environmental aspects tend to be of secondary importance.

The considerable importance with respect to their own or potential employees is reflected in the high level of encouragement, which is aimed at increasing personnel development. The promotion of training and further education in their own company and the establishment of exit opportunities are considered to be the most important factors for increased employer attractiveness. This is also consistent with the statements of preceding studies (Schäfer, 2011).

The last block of questions presented here explicitly deals with selecting an employer based on implemented CRS measures.

4 How important is your choice of employer to you:

4.1 whether the company has implemented CSR?

4.2 Will the company create new jobs?

4.3 whether the company offers extensive services?

4.4 Are there any measures to promote energy efficiency?

4.5 Are there any measures to reduce resource consumption?

4.6 Are there any measures to intensify recycling activities?

4.7 Will it create additional social benefits for employees?

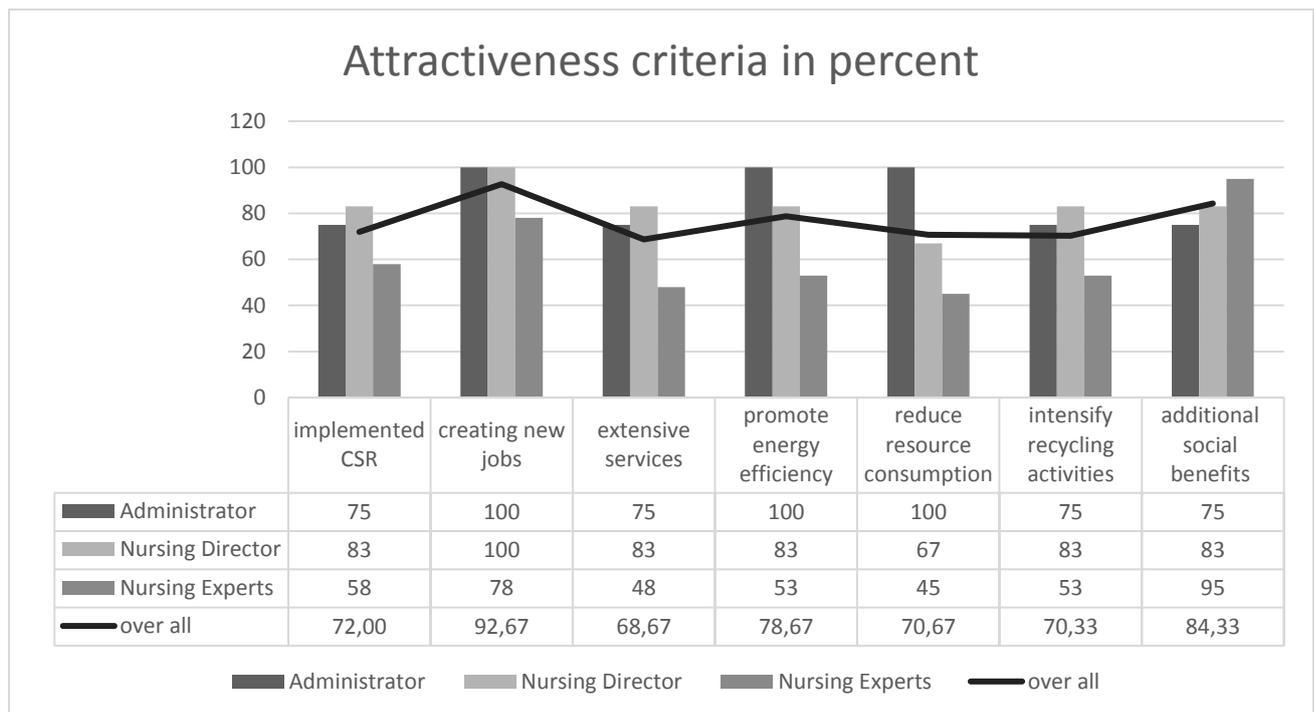


Figure 6: Attractiveness criteria

Here, too, the focus is on personnel policy, but the responsible use of resources is also an important criterion of employer attractiveness across all groups. It is striking that at the skilled worker level, additional social benefits are valued higher for employees than for managers. This is also a reason to conduct further studies/surveys. Explanatory models to investigate may be the particular attractiveness of occupational pensions or supplementary health insurance benefits for older employees, and for younger employees additional contributions to the sports club or fitness centre. And finally, the German payroll tax system can increase the net salary of part-time employees or co-earners through tax-free benefits.

3. Results

As described, demographic change and the shortage of skilled workers are among the most important recruitment subjects for German SMEs (Ehrentraut, 2015) (Marbler, 2018), especially with regard to the German healthcare system (Ehrentraut, 2015). This not only has effects for society and the economy, but also has a serious impact on the future personnel policy of medium-sized enterprises in the healthcare sector. Against this background, they face the challenge of attracting suitable junior staff, and add to that competition with large companies or corporations such as clinics and medtech companies, which are also seeking skilled workers (Marbler, 2018). As described, the situation is being increasingly exacerbated by demographic trends. However, many SMEs underestimate the need for action and still lack the appropriate strategies to attract potential skilled workers (Bollessen, 2014). In the future, the competitiveness of companies will increasingly be defined by the availability of sufficiently qualified personnel. The personnel policy challenges consist of recruiting and retaining employees in the long term (German

Federal Employment Agency, 2016). Preserving the capacity to work until retirement is increasingly becoming the focus of considerations.

The majority of surveyed skilled workers in the first Delphi survey stated that their company's societal commitment is largely derived from ethical considerations, its convictions, or the company's tradition. SMEs are putting the canon of values characterising the "honourable merchant" into practice. Themes that relate to in-house process optimisation or the value chain were considered less important, and this result is also consistent with previous studies (Schäfer, 2011).

Successes especially in the field of "soft factors" are reported as a result of these entrepreneurial efforts in the area of societal engagement. According to the respondents, the societal engagement of their company significantly improves employee motivation and workplace atmosphere, thus enhancing the attractiveness of the company as an employer.

The evaluation of the survey leads to the conclusion that implementation of CSR can achieve a more positive external effect, such as an image improvement and thus an improved reputation. In addition to the pure personnel policy aspects, however, there should also be a further engagement with respect to resource consumption or to reduction of pollutant emissions. Implementation of CSR in practice is also relevant in this case.

4. Discussion and conclusions

Referring to the introductory question: How can small and medium-sized enterprises (SMEs) present themselves as attractive employers in the health care sector and retain their sought-after employees in the long term? Can it be postulated that these results show that even small companies can succeed in positioning themselves as an attractive employer in the labour market and in attracting skilled workers if, first of all, the company takes on social responsibility, secondly, invests sustainably in personnel development and ultimately operates in the market in an economically value-adding manner, in short, if CSR is not just a term but also means living entrepreneurship?

It is therefore important that measures such as corporate social and personnel policies are not taken in isolation, but within the framework of a long-term oriented corporate strategy, so CSR as part of the corporate culture is an important instrument of strategic employer marketing. Only then will the investment and implementation in CSR to increase the attractiveness of employers be sustainable and will also bring KMUS a verifiable economic advantage.

5. References

- BARTH, H. & ENGLISCH, P., 2017. *Mittelstandsbarometer Januar 2017*, München: Ernst & Young GmbH.
- Bertelsmann Stiftung, 2017. *Faire Fachkräftezuwanderung nach Deutschland*. Bielefeld: Verlag Bertelsmann Stiftung.
- BOLLESSEN, D., 2014. *Der Fortschreitende Fachkräftemangel infolge des demographischen Wandels*. Hannover: Diplomica Verlag.
- BORG, I., 2003. *Führungsinstrument Mitarbeiterbefragung*. 3. überarbeitet und erweiterte Auflage ed. Göttingen: Hogrefe Verlag.

- Bundesagentur für Arbeit, 2016. *BA 2020: Fachkräfte für Deutschland*, Nürnberg: Bundesagentur für Arbeit.
- Bundesministerium für Gesundheit, 2016. *Daten des Gesundheitswesens*, Berlin: Referat Öffentlichkeitsarbeit.
- EHRENTRAUT, D. O., 2015. *Arbeitslandschaft 2040*, München: Vereinigung der Bayerischen Wirtschaft e. V.
- HÄDER, M., 2013. *Die Delphi-Technik in den Sozialwissenschaften: Methodische Forschungen Und Innovative Anwendungen (ZUMA-Publikationen)*. Wiesbaden: Westdeutscher Verlag GmbH.
- HARDTKE, A. & KLEINFELD, A. (., 2010. *Gesellschaftliche Verantwortung für Unternehmen*. Wiesbaden: Gabler-Verlag.
- HOFIELEN, G., 2017. CSR in Mikrounternehmen – anständig wirtschaften.: In: *CSR und Kleinstunternehmen*. Berlin: Springer-Gabler Verlag, p. 47 ff.
- JAMES, C., DEVAUX, M. & SASSI, F., 2017. *OECD Health Working Papers No. 103: Inclusive growth and health*, Paris: OECDpublishing.
- LOTTER, D., 2017. CRS und Kleinstunternehmen. In: *CRS und Kleinstunternehmen*. Berlin: Springer-Gabler Verlag, p. 13 ff.
- MARBLER, M., 2018. *Mittelstandsbarometer Januar 2018*, Stuttgart: Ernst& Young.
- NEMITZ, S., 2014. *CSR als Instrument zur Positionierung am Markt*. Saarbrücken: AK Akademikaverlag.
- SCHÄFER, H., 2011. *Das gesellschaftliche Engagement von Familienunternehmen*, Gütersloh: Bertelsmann Stiftung.
- SCHULZ, M. & Renn, O., 2009. *Das Gruppendelphi: Konzept und Fragebogenkonstruktion (German Edition)*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- SEN, S., 2011. *Corporate social responsibility in small and*, Lismore: Southern Cross University.
- Statistika, 2017. *Statistika: Das Statistik Portal*. [Online] Available at: <https://de.statista.com/statistik/daten/studie/164004/umfrage/prognostizierte-bevoelkerungsentwicklung-in-den-laendern-der-eu/>.
- Statistisches Bundesamt, 2017. *Gesundheit: Personal*, Wiesbaden: Statistisches Bundesamt.
- Statistisches Bundesamt, 2017. *Pflegestatistik 2015: Pflege im Rahmen der Pflegeversicherung*, Wiesbaden: Statistisches Bundesamt.
- Stiftung Familienunternehmen / Bertelsmann Stiftung, 2007. *Das gesellschaftliche Engagement von Familienunternehmen*, Stuttgart: Bertelsmann Stiftung.
- WUNDER, T., 2017. *CSR und strategisches Management*. Heidelberg: Springer Verlag.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Comparison of trading systems based on technical analysis using real and random data

Andrea Kolková¹

¹Department of Entrepreneurship, Faculty of Economics, VŠB – TU Ostrava, Sokolská 33, 702 00 Ostrava, Czech Republic, e-mail: andrea.kolkova@vsb.cz

Abstract

With growing digitization, not only in the financial markets, technical indicators are more accessible to more and more traders. In addition, the ever-shortening investment horizon often leads to a shift away from fundamental analysis and emphasizes the use of technical analysis. Currently, there is still discussion on the effectiveness of technical analysis in contrast to the validity of effective market theory. While practitioners compose, most trading systems just based on technical indicators and price action, the academic community is increasingly inclined to the theory of random asset development. The aim of the paper is to analyse the differences the effectiveness of technical analysis indicators of real assets with the application of the same indicators to randomly generated values. The CFD derivatives are used for the application, namely currency pair, exchange index and cryptocurrency. Random values are then generated. The output of the article is to evaluate the performance of trading systems based on selected indicators of technical analysis by comparing real asset data and randomly generated data.

Keywords: Technical Analysis, Forex, Index, Cryptocurrency, Sharpe Ratio, ADX, MACD, Moving Average, Stochastic Oscillator

JEL Code: G11, G12, G15

1. Introduction

Technical analysis has increasingly become the center of disputes in recent years among academics and practitioners of technical analysis. Kirpatrick and Dalhquist (2016), for example, evaluate the importance of technical analysis topics for practitioners and academics, and while among practitioners the questions of technical analysis (Stochastic Oscillator, MACD, Charting) were highlighted, academics were much more interested in theory of portfolios, models underlying fundamental analysis (discounted cash flow models,

dividend discount model). Furthermore, the Effective Markets Hypothesis is far more supportive among academics than among practitioners who have ranked it on second place in the least interesting financial themes.

While the academic community is still more inclined to apply the theory of efficient markets, practitioners are still applying technical analysis. Its representation, as the sole method of trading, is declining slightly. In 1992, Taylor and Allen (1992) conducted a forex market survey for London traders, and 90% said they used the technical analysis, 60% considered it to be the same or more important than the fundamental one. Gehrig (2003) states that amongst the short-term traders are only supporters of technical analysis at 53.5%. Chaboud et al. (2009) reported that algorithmic traders accounted for 60% of total trading volume in 2008. It is obvious that technical analysis, based on its logic, is mostly used by practitioners engaged in trading for shorter periods of time. This is also illustrated by Gehrig (2003).

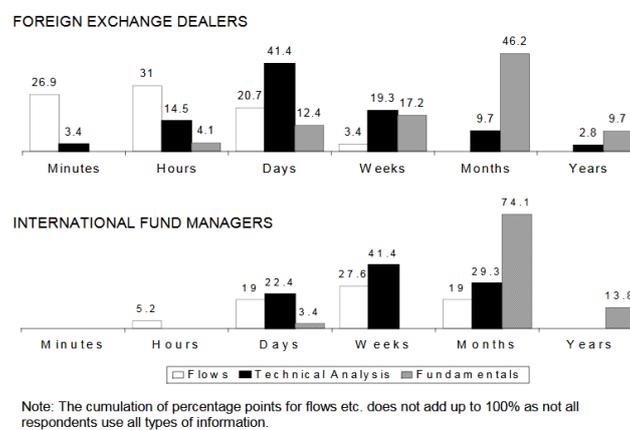


Figure 1: The importance of fundamentals, charts and flow forecasting horizons
Source: Gerigh, 2003

The aim of the paper is to analyse of differences the effectiveness of indicators of technical analysis of real assets with the application of the same indicators to randomly generated values. The CFD derivatives are used for the application, namely on the currency pair, the exchange index and the cryptocurrency. Subsequently, random values of the normal distribution are generated. The output of the article is to evaluate the performance of business systems based on selected indicators of technical analysis by comparing real asset data and randomly generated data.

2. Technical analysis

Instruments for technical analysis can be divided into graphic tools (so-called Charting) and indicators of technical analysis. Indicators of technical analysis can be broken down according to various aspects. Veselá and Oliva (2015) divide the indicators into trend, price, volume, sentiment indicators, and indicators of market breadth and performance. Elder (2006) breaks down indicators into graph analysis and computer technical analysis. Different breakdowns can be found also with individual brokers, or with specific trading platforms, as Kolková (2017) reports, Metatrader specifies indicators for trend indicators, oscillators and volume indicators. In this post, cross-sectional indicators will be used. For

back testing there were selected these indicators, the Average Movement Directional Index (hereafter ADX), Stochastic Oscillator, Exponential Moving Average (hereafter EMA), Double-exponential moving average (hereafter DEMA), Zero lag exponential moving average (hereafter ZLEMA), Simple moving average (hereafter SMA) and Moving Average Convergence – Divergence (hereafter MACD). These indicators have defined business systems. The ADX indicator was set by J. Welles (Wilder, 1978), and its essence consists in calculating two indicators based on the Average True Range (ATR) indicator by its smoothing through the moving average, in this case a 14-day exponential,

$$+DI\ 14 = \frac{EMA(+DI, 14)}{ATR} \cdot 100, \quad (1)$$

$$-DI\ 14 = \frac{EMA(-DI, 14)}{ATR} \cdot 100. \quad (2)$$

From these two indicators the ADX indicator itself is then quantified. However, this indicator is not able to determine the direction of the trend, but only its strength. Therefore, it is not suitable for the use either in a separate back-test or for this post. When composing an ADX-based trading system, therefore, the system defined by Achelis (2001) is applied, and the purchase signal defines the value of the +DI sign over the value of -DI, the opposite situation is the option with a sales signal. The author of the **Stochastic Oscillator** is George Lane (1984). In this paper, a business strategy based on the oscillating of the indicator in the 80 and 20-point band is used, and the overlapping of the band from the top is then the short position signal, the overlap from the bottom to the long position. The calculation is given by two equations in the shapes,

$$\%K = \frac{\text{uzavírací kurz} - \text{minimální kurz za \%K period}}{\text{maximální kurz za \%K period} - \text{minimální kurz za \%K period}}, \quad (3)$$

$$\%D = \frac{3 - \text{denní suma}(\text{uzavírací kurz} - \text{minimální kurz za \%K period})}{3 - \text{denní suma}(\text{maximální kurz za \%K period} - \text{minimální kurz za \%K period})}. \quad (4)$$

Another group of indicators used is moving averages, which can be differentiated according to the length of the time period, which can range between 5 and 200 trading days. Various lengths of trading days have already been tested in Kolkova (2017), where for example SMA was a system based on 20 daily averages as the system generating the most profitable signals. In this paper, moving averages are therefore also based on 20 daily averages. EMA indicator is given by:

$$EMA_{dnes} = (EMA_{vččer} \cdot (1 - ep)) + (P_{dnes} \cdot ep), \text{ where} \quad (5)$$

ep is an exponential percentage, or a smoothing factor. DEMA is calculated as,

$$DEMA = 2 \cdot EMA(x, 20) - EMA(EMA(x, 20), 20) \cdot v, \text{ where} \quad (6)$$

x are the values of the asset. ZLEMA is similar to an EMA, as it has more weight than recent observations, but tries to remove lag by subtracting data before $(n-1) / 2$ periods to minimize the cumulative effect. The SMA is defined by:

$$SMA = \frac{P_M + P_{M-1} + \dots + P_{M-(n-1)}}{n}, \text{ where} \quad (7)$$

M is the length of the period (in this case 9 or 20); P is the individual value of the exchange rate. All trading systems based on moving averages declare the buy signal or the long-distance signal by crossing the line of the moving average and the bottom-up course. The entry into the short position is realized by a crossover of the moving average and the course from the top. The last of the indicators tested is MACD. This indicator was developed by Gerald Apple (2005). It is determined by the difference between two moving averages. The MACD then oscillates around the zero line. This paper uses the baseline version of the difference between the 26 day and 12 day EMA indicators. This draws a MACD curve, yet it is still necessary to draw a 9-day EMA curve, called a signaling curve. The MACD indicator is used in the trading system, where the signals generate a crossover of the MACD curve with the signaling curve. In the case of crossing from below, it is a signal to buy (long position), otherwise the investor can enter a short position.

3. Methodology and Data

To evaluate the effectiveness of the given trading systems, the annual yields and the Sharpe ratio are selected. Another quantified quantity is the number of trades and also the number of sell or buy transactions, which should not differ significantly in a well-chosen period of time. If that were the case, it would be evidence of poorly selected data that copied only one trend. At least 10 thousand values of the given asset are subjected to the test, respectively the random walk. Of course, except for cryptocurrencies where the number of historical values of daily exchange rates cannot reach 10 thousand due to the short history of the asset. A long test period ensures a sufficient diversity of source data and can better match actual market development. All values used were the daily values of the underlying assets and were used in the form of OHLC.

3.1. Rating criteria

The Sharpe ratio was designed by William Forsyth Sharpe (1966), the Nobel Prize winner, and is now considered the best-known rate of performance. It starts with the concept of mean – variance models and therefore we only need a mean value and a standard deviation for its construction. The Sharpe ratio is calculated as the proportion of the return on the asset less the risk-free rate and the standard deviation of the yield according to the relation,

$$S = \frac{E(R-R_f)}{\sigma}, \text{ where} \quad (9)$$

R is the return on the asset, R_f is the risk-free yield, E (R – R_f) represents the expected yield above the benchmark, which is the risk-free yield in this contribution, and σ is the standard deviation. . The Sharpe Ratio is referred to as the performance measure of trad-

ing systems that takes into account the risk profile of the investment. The higher this indicator is the better is the investment (Kresta, 2016). The criticism of the Sharpe ratio is based, in particular, on the use of a standard deviation that quantifies not only the risk of devaluation of the investment but also the evaluation, which cannot be assessed negatively. The base model, designed in 1966, was modified by Sharpe in 1994 who replaced the risk-free yield by a benchmark. The risk-free yield is a special case of this benchmark.

As a risk-free return, the interest rate on 10-year government bonds for 31.12 2017 is set in this post at 1.5%. The source for the calculation are the daily dates of the official exchange rate list of the Prague Stock Exchange and the daily reference prices of the electronic trading platform MTS Czech Republic. The calculation is based on the average of average reference prices (quotes) for the purchase and sale of bonds. The statistical framework for defining long-term interest rates is based on the principles that have been specified and implemented by the European Central Bank together with the European Commission.

3.2. Testing data

Random walk values were calculated based on the generation of 10,000 random number values of normal probability distribution (so-called White Noise). These scores were the increase or decrease of the resulting random walk. Figure 1 represents the result of the random asset simulation development. Figure 2 shows the development of the Standard and Poor's 500 index from 1950 to January 2018. Figure 3, which remarkably resembles the random walk shown in Figure 1, represents the values of the EUR / USD forex pair from 1971 again to January 2018. Figure 4 illustrates the development of Bitcoin cryptocurrency, which has a shorter history and therefore this chart captures values from 2010 to the present.

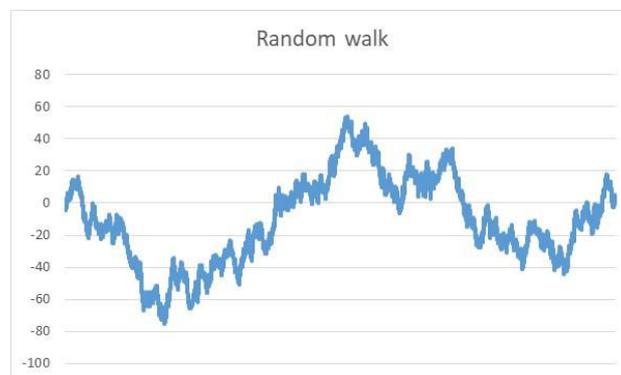


Figure 2: random walk
Source: own

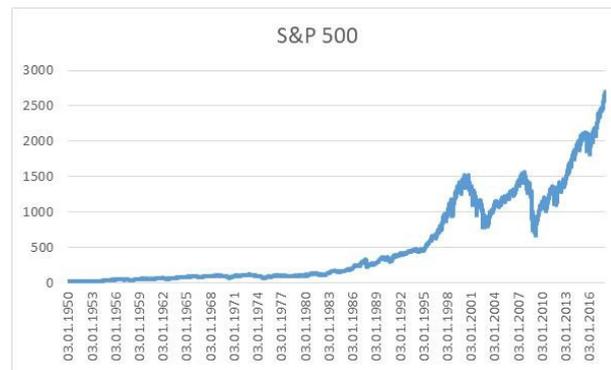


Figure 3: S&P 500

Source: own



Figure 4: EUR/USD

Source: own

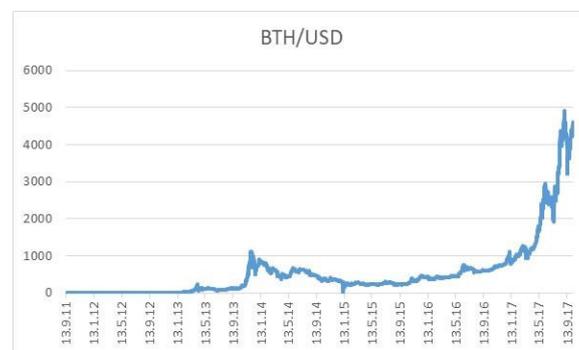


Figure 5: BTH/USD

Source: own

The statistical program R with the TTR, Quantmod, DescTools and RDCOMClient packages was used for calculations of technical indicators. Statistical statistic R, SPSS and Excel were also used for statistical analysis of assets. Statistical data analysis results are summarized in Table 1.

Table 1: Descriptive Statistics

| | | Discrete returns of EUR/USD | Discrete returns of BTC | Discrete returns of S&P 500 |
|----------------|------------|-----------------------------------|-------------------------------|-----------------------------------|
| N | Statistic | 12305.0 | 2726.0 | 17110.0 |
| Range | Statistic | 0.118240 | 2.107841 | 0.361121 |
| Minimum | Statistic | -0.059791 | -1.336758 | -0.257339 |
| Maximum | Statistic | 0.058449 | 0.771083 | 0.103782 |
| Mean | Statistic | 0.000046 | 0.002198 | 0.000251 |
| | Std. Error | 0.000057 | 0.001344 | 0.000074 |
| Std. Deviation | Statistic | 0.006319 | 0.070181 | 0.009698 |
| Variance | Statistic | 0.000040 | 0.004925 | 0.000094 |
| Skewness | Statistic | 0.078356 | -3.324311 | -1.476736 |
| | Std. Error | 0.022079 | 0.046889 | 0.018725 |
| Kurtosis | Statistic | 4.841812 | 69.776832 | 37.816168 |
| | Std. Error | 0.044155 | 0.093744 | 0.037447 |

Source: own

4. Results

The resulting final wealth values for forex trades are defined in pipelines, while the value of the index in points, the resulting value of the total assets in random development, of course has no units. Transaction costs are abstracted. Therefore, the final wealth variable is only suitable for comparing different indicators of the same asset. For cross-asset comparison, it is not appropriate and it is better to declare results using annual yield or Sharpe ratio. Tables 2–5 define back-test results according to the selected technical indicators.

Table 2: Results of Back-testing

| | ADX | | | Stochastic Oscillator | | |
|---------------------------------------|----------|----------|-----------|-----------------------|-------------|-----------|
| | EUR/USD | SP500 | RND | EUR/USD | SP500 | RND |
| Final wealth* | -0.47429 | 1763.151 | -47.43436 | -24.3276 | 627.069937 | -838.3012 |
| Total number of signals | 1048 | 1452 | 1242 | 732 | 1237 | 472 |
| Sell signal | 524 | 726 | 392 | 375 | 618 | 240 |
| Buy signal | 523 | 725 | 393 | 357 | 619 | 232 |
| Annual return | -3.228% | 5.924% | -10.216% | -9.316% | 7.663% | -11.722% |
| Sharpe Ratio | -0.14666 | 0.000173 | -0.011469 | -0.39938 | 0.000269297 | -0.008477 |
| Risk-free rate | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% |
| *in pips (currency) or points (index) | | | | | | |

Source: own

The back-test using the ADX indicator showed that only the Standard and Poor's-backed trades would achieve positive annual returns. A similar result is achieved by using the Stochastic Oscillator. Random walks are the worst in both cases. When Sharpe ration is evaluated, the random development of the underlying asset is assessed better than the ADX and Stochastic Oscillator indicators on the forex market.

Table 3: Results of Back-testing

| | EMA | | | DEMA | | | ZLEMA | | |
|---------------------------------------|----------|----------|-----------|----------|-------------|-----------|----------|----------|----------|
| | EUR/USD | SP500 | RND | EUR/USD | SP500 | RND | EUR/USD | SP500 | RND |
| Final wealth* | -1.04448 | 1856.781 | -10.3403 | -0.31031 | 183.780033 | -22.55589 | -0.16776 | 327.0298 | -17.7278 |
| Total number of signals | 1370 | 1982 | 1365 | 2234 | 2913 | 1926 | 2354 | 3129 | 2058 |
| Sell signal | 686 | 991 | 682 | 1117 | 1456 | 963 | 1177 | 1565 | 1030 |
| Buy signal | 685 | 991 | 683 | 1117 | 1456 | 963 | 1177 | 1564 | 1029 |
| Annual return | -2.824% | 5.291% | 1.292% | -0.907% | 1.741% | -27.920% | -0.594% | 2.846% | 2.634% |
| Sharpe Ratio | -0.11582 | 0.000383 | -0.000189 | -0.05066 | 1.99669E-05 | -0.023108 | -0.04294 | 0.000107 | 0.000851 |
| Risk-free rate | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% |
| *in pips (currency) or points (index) | | | | | | | | | |

Source: own

Moving averages back-tests always declare a negative yield when using a forex pair, which is always positive when using the stock index, which also corresponds to the ADX Stochastic Oscillator. Surprisingly positive yield has been achieved by using the DEMA and ZLEMA indicators as well as white noise. Even in the case of indicators based on moving averages, the random development of the asset is more advantageous than the forex market. For the ZLEMA indicator, white noise is even the most advantageous asset.

Table 4: Results of Back-testing

| | MACD | | | | | | |
|---------------------------------------|----------|----------|-----------|----------|-------------|-----------|----------|
| | EUR/USD | SP500 | RND | BTH/USD | LTC/USD | DASH/USD | XRP/USD |
| Final wealth* | -0.5887 | 1834.09 | -430.7428 | 3722.03 | 111.38 | 268.34 | 0.43519 |
| Total number of signals | 928 | 1297 | 808 | 133 | 135 | 44 | 37 |
| Sell signal | 464 | 647 | 404 | 66 | 68 | 22 | 19 |
| Buy signal | 464 | 648 | 404 | 67 | 67 | 22 | 18 |
| Annual return | -2.030% | 6.451% | -12.742% | 2.553% | 3.080% | 2.738% | 5.534% |
| Sharpe Ratio | -0.11513 | 0.000208 | -0.006953 | 0.000128 | 0.006008665 | 0.0013751 | 0.034189 |
| Risk-free rate | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% |
| *in pips (currency) or points (index) | | | | | | | |

Source: own, Kolková, 2018

In addition, cryptocurrencies are evaluated by means of MACD and SMA pointers. Kolková (2018) takes the results of these back-tests from previous research. In this research, not only the most known Bitcoin (hereafter BTC), but also Litecoin (hereafter LTC), Dash, and Ripple (hereafter XRP) were tested. Tested cryptocurrencies were always used in pair with USD. The tests showed that, at approximately the same times, the highest annual yield would have been the Standard and Poor's 500. Cryptocurrencies were tested in a shorter period, but from the beginning of their history on daily values, they also reached positive returns ranging from 5.5% (BTC) to 5.5% (XRP). When evaluating the MACD using the Sharpe Ratio, random development has been exceeded only by forex trading on EUR / USD.

Table 5: Results of Back-testing

| | SMA | | | | | | |
|---------------------------------------|----------|----------|-----------|----------|-------------|-----------|----------|
| | EUR/USD | SP500 | RND | BTH/USD | LTC/USD | DASH/USD | XRP/USD |
| Final wealth* | -1.04448 | 319.8404 | -51.1585 | 5853.11 | 309.26 | 657.17 | 0.93072 |
| Total number of signals | 1371 | 1819 | 1188 | 347 | 331 | 249 | 283 |
| Sell signal | 686 | 909 | 594 | 173 | 166 | 125 | 141 |
| Buy signal | 685 | 909 | 594 | 174 | 165 | 124 | 142 |
| Annual return | -2.824% | 6.153% | 0.048% | 0.554% | 2.059% | 2.189% | 3.422% |
| Sharpe Ratio | -0.11582 | 0.000489 | -0.001428 | -0.00015 | 0.002592257 | 0.0009483 | 0.018523 |
| Risk-free rate | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% |
| *in pips (currency) or points (index) | | | | | | | |

Source: own, Kolková, 2018

Using SMA, we can see that a positive walk has also been achieved by a positive annual appreciation.

In the indicators, it is also apparent that the share of sell signals and buy signals is approximately the same. For some indicators (like moving averages), the same number is the logical basis of the trading system philosophy. With oscillators this does not necessarily have to be the case, however, if the ratio were significantly different, it would probably be because the chosen period was too short and only the same trend had been established.

Based on Sharpe's SMA-rated ratio, only the forex trades have been surpassed by white noise again.

5. Discussion and Conclusions

The aim of the paper is to analyse differences the effectiveness of indicators of technical analysis of real assets with the application of the same indicators to randomly generated values. It has not been proved that the randomly generated values produced significantly worse results than all real assets. Random Walk even exceeded the trading performance of ZLEMA, EMA, and SMA on forex trades.

Thus, the effectiveness of technical analysis cannot be clearly demonstrated, because even the random walk achieves similar performance to actual assets. Kresta (2016) also achieved a similar result, where the DJIA index was tested, and the results showed that at 5% of the significance level, the development of DJIA on moving average trading systems, Bollinger Bands, RSI, could not be predicted. Testing the PX index has produced ambiguous results.

The use of indicators alone and as a single element in the business system in practice cannot be recommended. Kolkova (2017) used a combination of indicators and the results were clearly better than using the indicators alone, however these trading systems did not achieve more profitable trades than 60%. Veselá and Oliva (2015) reached 9.09% on the basis of a combination of annual returns, which confirms previous research.

Dymova at all (2016) adapted moving average on fuzzy logic. As a result, this system is suitable for use in practice.

Incorporating fuzzy logic into the construction of classical indicators may thus seem to be a suitable direction of research. Other suggestions for adding business systems can be seen by including modern elements of money management.

Other research options can be seen in the resolution of geographic space, as stated de Souza et. al. (2018) in summary of the profitability of technical analysis around the world according to researchers from 1961 to 2016 more positive results of technical analysis can be seen in countries like Malaysia, Thailand and Taiwan, or Mexico, Bangladesh, Brazil, Argentina. On the other hand, results that are more negative can be found in US, Japanese, India and South Africa.

Technical analysis is one of the oldest analytical procedures (Veselá, 2015) and is a very popular tool for practical merchants, often the only one. This work has, together with other Kresta (2016), Kolková (2017), Dymová (2016), de Souza et.al. (2018), pointing to the low efficiency of this tool as the only means for creating business systems.

References

- ACHELIS, S. B. 2001. Technical analysis from A to Z. New York: McGraw Hill.
- APPEL, G. 2005. Technical analysis: power tools for active investors. New York: FT Press.
- DE SOUZA, M.J.S., RAMOS, D.G.F., PENA M.G., et al. 2018. Examination of the profitability of technical analysis based on moving average strategies in BRICS. *Financial Innovation*, 2018, 1–18.
- DYMOVA, L. SEVASTJANOV, P. and KACZMAREK, K. A forex trading expert system based on a new approach to the rule-base evidential reasoning. *Expert Systems with Applications* 51: 1–13.
- ELDER, A. 2006. *Trading for a living*. New York, John Wiley and sons, Ltd.
- GERIGH T., and MENKHOFF, L. 2003. *Technical Analysis in Foreign Exchange – The Workhorse Gains Further Ground*. *Diskussionspapiere der Wirtschaftswissenschaftlichen Fakultät* 278. Hannover, Universität Hannover.
- CHABOUD, A., CHIQUOINE, B., HJALMARSSON, E., et. al. 2009. *Rise of the machines: Algorithmic trading in the foreign exchange market*, working paper, Federal Reserve System.
- KIRKPATRICK, Ch. D. and DAHLQUIST, J.R. 2016. *Technical analysis: the complete resource for financial market technicians*. Third edition. Old Tappan: Pearson Education.
- KOLKOVÁ A. 2017. Back-test of efficiency by combining technical indicators on the EUR/JPY. In: 11th International Scientific Conference on Financial Management of Firms and Financial Institutions. 6th – 7th September 2017. Ostrava: VŠB-TU of Ostrava, Faculty of Economics, Department of Finance.
- KOLKOVÁ A. 2018. The Use of Cryptocurrency in Small and Medium Enterprises. In: The 6th International Conference Innovation Management, Entrepreneurship and Sustainability. Prague: University of Economics. In print.
- KRESTA A. 2016. Kvantitativní metody investování s aplikacemi v prostředí Matlab. *SAEI*, vol 43. Ostrava: VŠB-TU Ostrava.
- LANE, G. C. 1984. Lane's stochastics. In: *Technical Analysis of Stocks and Commodities*, 2 (3), 80.
- SHARPE, W. F. 1966. Mutual Fund Performance. *Journal of Business*. 39 (S1): 119–138.

- TAYLOR, M.P. and ALLEN, H. 1992. The Use of Technical Analysis in the Foreign Exchange Market. *Journal of International Money and Finance*, 11(3), 304–314.
- VESELÁ, J. and OLIVA, M. 2015. *Technická analýza na akciových, měnových a komoditních trzích*. Praha: Ekopress.
- WILDER, J.W. 1978. *New Concept in Technical Trading system*. New York.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Level Of Bioeconomic Entrepreneurship’s Development In Poland

Agnieszka Komor¹, Dariusz Perło² and Dorota Perło³

¹*Department of Management and Marketing, Faculty of Agrobioengineering, University of Life Sciences in Lublin, Akademicka 13, 20-950 Lublin, Poland, e-mail: agnieszka.komor@up.lublin.pl*

²*Faculty of Social Sciences and Humanities, Lomza State University of Applied Sciences, Akademicka 14, 18-400 Lomza, Poland, e-mail: dariusz@perlo.pl*

³*Department of Econometrics and Statistics, Faculty of Economics and Management, Bialystok University, Warszawska 63, 15-062 Bialystok, Poland, e-mail: dorota.perlo@uwb.edu.pl*

Abstract

In the work, an original proposal was presented concerning the construction of a synthetic indicator, which would serve to assess regional diversification of the level of bioeconomic entrepreneurship’s development with the application of the taxonomic reference method – TOPSIS. Moreover, application possibilities and limitations were presented of the suggested tool on the example of NUTS 2 level regions (e.g. voivodeships) in Poland.

Keywords: bioeconomy, entrepreneurship, taxonomic indicator

JEL Code: C31, R12, Q57

1. Introduction

Globalization as well as the increasing number of challenges related to environmental pollution evoke the need to search for new paths of local and regional development. The answer to these challenges is the development based on the concept of bioeconomy, which relies upon renewable resources and knowledge.

The aim of the article is to present the original proposal of a synthetic indicator, which would serve to assess regional diversification of the level of bioeconomic entrepreneurship’s development. Application possibilities and limitations were presented of the suggested tool on the example of NUTS 2 level regions (e.g. voivodeships) in Poland, with particular attention to two regions with rich natural values, but simultaneously a relatively low level of economic development i.e. Lubelskie and Podlaskie voivodeships. This indicator can be applied by territorial self-government units when creating their growth strategies, identifying smart specializations, searching for partners from other regions (e.g. in order to create integrated marketing product together with other territorial self-

government units, or introduce cluster initiatives of an inter-regional reach). It can also constitute an important guidance for enterprises from various bioeconomic sectors as well as its co-operants in order to select a place for conducting economic activity. The proposed indicator constitutes a tool of a universal character, as thanks to it, it is possible to conduct the analysis of a group of sectors constituting a part of bioeconomy in regions with various taxonomic levels, irrespective of their locations.

It should be noticed that rural areas, areas valued for their natural beauty or the peripheral ones are predestined to develop in bioeconomic direction [Komor, 2014]. Due to this, the following hypothesis was formulated 'Lubelskie and Podlaskie voivodeships are marked with a relatively high level of bioeconomic entrepreneurship's development', which was verified by means of quantitative research methods.

The calculations were made on the basis of quantitative research methods, i.e.: statistical analysis and the TOPSIS method, with the application of cross-sectional data of 2015, aggregated at the level of Polish voivodeships (NUTS 2).

2. Methodological foundations

Due to the lack of a generally accepted definition of bioeconomy, there are problems with defining sectors which constitute it. Thus, in the first stage of the research, the trial was conducted to identify the types of economic activities constituting the components of bioeconomy. E. Ratajczak claims that it is possible to adopt two methodological terms aiming to determine subsectors constituting bioeconomy. In the resource approach, the amount of utilized biological/biomass resources is included as well as the number of products manufactured with the use of biotechnology or biological resources and the consumption based on resources and/or biological technologies. In the process approach, the scale of biological processes used in various areas of activity is highlighted (Ratajczak, 2013, p. 3).

In the article, the methodology of identifying sectors constituting bioeconomy according to the Bioeconomy Information System project and the Observatory Project (BISO) was adopted. The introduced methodology allows to study wide range of sectors, included in bioeconomy, which can be divided into three groups: biomass production sector (agriculture, forestry, fishery); industrial sector wholly based on bioproducts (e.g. production of food, feed, paper and products from paper, products from wood, cork, straw and wicker); sectors partially belonging to bioeconomy, which production is partly based on bioproducts with the use of other resources (e.g. production of chemicals and chemical products, furniture, rubber products and plastics). Within the adopted methodology, in order to precisely determine subsectors constituting bioeconomy, the transposition of the above classification was conducted into the division compliant with the Polish Business Activity Classification (PKD 2007)³⁸. Within the article, the following parts according to PKD 2007 were included into the research (Dammer, Piotrowski, Carus, 2014, p. 31–32):

- section A (all chapters), i.e. chapter: 01: Agricultural crops, animal husbandry, hunting, including service activities, 02: Forestry and logging, 03: Fishery;

³⁸ PKD 2007 was elaborated on the basis of statistical classification of economic activity NACE Rev2.

- section C, chapters: 10: Manufacture of food products, 11: Manufacture of beverages, 12: Manufacture of tobacco products³⁹, 13: Manufacture of textile products, 14: Manufacture of products from wood, cork, straw, wicker, 17: Manufacture of paper and products from paper, 20: Manufacture of chemicals and chemical products, 21: Manufacture of basic pharmaceutical substances as well as medicines and other pharmaceutical products, 22: Manufacture of products from rubber and plastics, 31: Furniture production, 32: The remaining manufacture of products (e.g.: wooden toys production);
- section D, chapter 35: Production and distribution of electricity, gas, water vapor, hot water and air conditioning supply;
- Section E, chapter 38: Waste collection, treatment and disposal activities; resources recovery;

These are the sectors connected mainly with production, i.e. agriculture, forestry, hunting and fishery as well as with industrial processing. Moreover, the industries connected with energy production and waste management are also included. It is worth noticing that the service activities were not mentioned here, e.g. professional, scientific or technical (Section M according to PKD 2007), including scientific research and development works in biotechnology as well as technical research and analysis (among others, related to food quality). It seems that bioeconomic activity pertains also to other branches of industry, e.g. construction in the form of heating installations using renewable energy sources. It indicates a great diversity of bioeconomic activity as well as the difficulties in identifying the sectors it covers. However, due to the lack of accessibility to statistical data, the method of identifying subsectors was adopted that compose bioeconomy according to the BISO project.

In quantitative research, two key research methods were adopted: statistical and taxonomic analysis. The first one served to analyze the precise indices (observable) describing the development of bioeconomic entrepreneurship by means of the measures of position, diversity and asymmetry (Sobczyk, 2000, p. 52–61). However, the second one – taxonomic method called TOPSIS – serves to assess the diversification of Lubelskie and Podlaskie voivodeships regarding the acquired development of bioeconomic entrepreneurship's level compared to the other NUTS 2 level regions in Poland. The starting point of the taxonomic research is to determine the classification subject and its field (Hellwig, Siedlecka, Siedlecki, 1997). The subject of classification, defined as a countable set of n elements (objects, ω_i , $i = 1, 2, \dots, n$) of an arbitrary nature are sixteen voivodeships in Poland. The field of classification determined as a set of properties, which characterize the elements of a set of objects, constitute the observable X_1, X_2, \dots, X_m variables defining the level of bioeconomic entrepreneurship's development. On the basis of the TOPSIS method, the synthetic development indicator was created – aggregating all the individual features. The selected taxonomic method, belonging to a group of reference methods, is based on the pattern and anti-pattern of development⁴⁰. The set of indicators describing a particular immeasurable feature should contain only those volumes, which have a substantive connection with it. On the basis of the substantive and statistical analysis, the selection of

³⁹ One of the development goals, which basis is the concept of bioeconomy, is the improvement of the quality of life, including, among others, the improvement in human living conditions as well as health and physical condition (Godlewska-Majkowska, Komor, 2014). Thus, including the manufacture of tobacco products in bioeconomy can be considered a controversial issue.

⁴⁰ Similar calculations were also conducted on the basis of the non-model method – according to the synthetic feature [Kolenda, 2006] as well as the soft modeling method (Wold, 1980). The obtained results are very similar to those acquired by the TOPSIS method.

diagnostic features was conducted (Table 1.), the character of their impact on entrepreneurship's development was determined as positive – stimulants, or negative – destimulants (Panek, 2009, Młodak, 2006, p. 17). The accuracy of the selected diagnostic variables was examined on the basis of the Alfa Cronbach's test (Cronbach, 1951). The acquired value of the test equals 0.8328 and signals a positive verification as the value of Alfa Cronbach's test should fall within 0.7 and 0.9. The variables are then accurate and coherent. Too low value (below 0.7) would mean a small dependence between the variables and thus a lack of cohesion. Too high (above 0.9), on the other hand, may suggest a certain excess of variables and indicate that their number should be reduced (some of them are replaced by others). Then, all the features were led to comparability by their normalization⁴¹. The synthetic value q_i was calculated from the formula:

$$q_i = \frac{d_i^-}{d_i^- + d_i^+}, \quad (1)$$

where:

$d_i^- = \sqrt{\sum_{k=1}^m (z_{ik} - z_k^-)^2} = \sqrt{\sum_{k=1}^m (z_{ik} - 0)^2}$ – distance from the anti-pattern of development,

$d_i^+ = \sqrt{\sum_{k=1}^m (z_{ik} - z_k^+)^2} = \sqrt{\sum_{k=1}^m (z_{ik} - 1)^2}$ – distance from the pattern of development,

$z^+ = (1, 1, \dots, 1)$ – pattern of development,

$z^- = (0, 0, \dots, 0)$ – anti-pattern of development,

z_{ik} – normalization value of $x_{ik} \in X_k$

$k = 1, 2, \dots, m ; i = 1, 2, \dots, 16.$

The synthetic q_i measure is normalized. It takes the value within limits. The larger the values of a synthetic indicator, the higher the position in the ranking of a voivodeship. The calculations were carried out with the use of the Excel program.

On the basis of the formulas on the arithmetic mean of the reference synthetic measure (q_i) and its standard deviation (s), it is possible to conduct a division into classes, which would include the following divisions:

Class I: $q_i + s$ and more,

Class II: $\langle q_i ; q_i + s \rangle$,

Class III: $\langle q_i - s ; q_i \rangle$,

Class IV: below $q_i - s$.

The division into classes is useful in graphic visualization of objects as well as the analysis of results obtained by a taxonomic method.

⁴¹ The detailed description of the TOPSIS method can be found, among others, in publications: (Hwang, Yoon, 1981, Perło, Roszkowska, 2017).

3. The potential of bioeconomic entrepreneurship's development

The development of bioeconomic entrepreneurship was diagnosed on the basis of 21 observable variables (Table 1). Two categories of indicators are of a key significance. The first one aggregates variables showing the volume of bioeconomic entities in the form of the entities that are new, existing and removed from the REGON registry (table 1., lp. from 1 to 15). They present the levels and perspectives of bioeconomic entrepreneurship's development. The conducted statistical analysis allows to draw optimistic conclusions, indicating a higher increase in the number of new enterprises than those which end up their economic activity. This kind of situation takes place either at the level of the national average as well as in Lubelskie and Podlaskie voivodeships. In most regions, including those constituting the subject of the analysis, the number of bioeconomic enterprises is smaller than the national average, which is proven by a positive asymmetry coefficient. Among the four studied sections, the biggest share constituted the companies belonging to industrial processing (68%) as well as those conducting agricultural activity (26%). The remaining two sections represented only 6%.

The second group of indicators shows the volumes proving the level of bioeconomic entrepreneurship's development (Table 1., lp. from 16 to 21). These are: work efficiency in sections A, C, D and E as well as the size of electricity production and its structure (section D). In the studied voivodeships, work efficiency in all sections was lower than the national average and constituted respectively in Lubelskie voivodeship: 51% (A), 90% (C), 66% (D) and 99% (E) of the national average and in Podlaskie voivodeship: 88% (A), 93% (C), 67% (D) and 81% (E) of the national average. The analyzed regions are marked with a relatively lower level of GDP *per capita* and due to this, the results pertaining to work efficiency are not surprising. A positive phenomenon is also the increase in work efficiency in sections D and E in 2015 as compared to the previous year. The dispersion of all the Polish regions in terms of work efficiency is moderate. However, the situation on the market for electricity is totally different. The average share of renewable energy in the total electricity production in Poland in 2015 amounted to 26.8%, with the very strong regional dispersion at the level of 99%. It is also visible in relation to the studied voivodeships. In Podlaskie, the renewable energy constituted 70.1% of the total energy production and in Lubelskie – only 5.3%. However, it does not mean that Podlaskie is the leader in renewable energy production. The high index results from a very low relative electricity production level in total, which can be seen on the basis of the following index analysis, i.e. the relation between the electricity production and its consumption. Poland is a self-sufficient country in this field. The national average in 2015 amounted to 101%. However, in this case, a strong regional diversification can also be observed. Lubelskie and Podlaskie voivodeships produce only, respectively 30.6% and 42.7% of the total electricity consumption. On the other hand, it can be concluded that electricity from renewable sources constitutes a very significant supplement in essential electricity shortages of the studied regions and also has a considerable impact on the development of low-emission economy, which is strongly correlated with the development of bioeconomic entrepreneurship.

Table 1. The list of indices characterizing the development of bioeconomic entrepreneurship.

| O.n. | symbol | Index meaning* | (D/S) impact ⁴² |
|------|--------------|---|-------------------------------|
| 1. | BIO01 | Newly registered entities in sections A, C (chapters: 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 31, 32), D and E (chapter 38) per 100 thousand inhabitants in working age | S |
| 2. | BIO1A | Newly registered entities in section A | S |
| 3. | BIO1C | Newly registered entities in section C (chapters: 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 31, 32) | S |
| 4. | BIO1D | Newly registered entities in section D | S |
| 5. | BIO1E | Newly registered entities in section E (chapter 38) | S |
| 6. | BIO02 | Deregistered entities in sections A, C (chapters: 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 31, 32), D and E (chapter 38) | D |
| 7. | BIO2A | Deregistered entities in section A | D |
| 8. | BIO2C | Deregistered entities in section C (chapters: 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 31, 32) | D |
| 9. | BIO2D | Deregistered entities in section D | D |
| 10. | BIO2E | Deregistered entities in section E (chapter 38) | D |
| 11. | BIO03 | Entities registered in sections A, C (chapters: 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 31, 32), D and E (chapter 38) | S |
| 12. | BIO3A | Entities registered in section A | S |
| 13. | BIO3C | Entities registered in section C (chapters: 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 31, 32) | S |
| 14. | BIO3D | Entities registered in section D | S |
| 15. | BIO3E | Entities registered in section E (chapter 38) | S |
| 16. | BIO4A | Work efficiency in section A (gross added value of section A in PLN per employer) | S |
| 17. | BIO4C | Work efficiency in section C (gross added value of section C in PLN per employer) | S |

⁴² D – a destimulant means a negative impact on bioeconomic entrepreneurship's development; S – a stimulant means a positive impact on bioeconomic entrepreneurship's development.

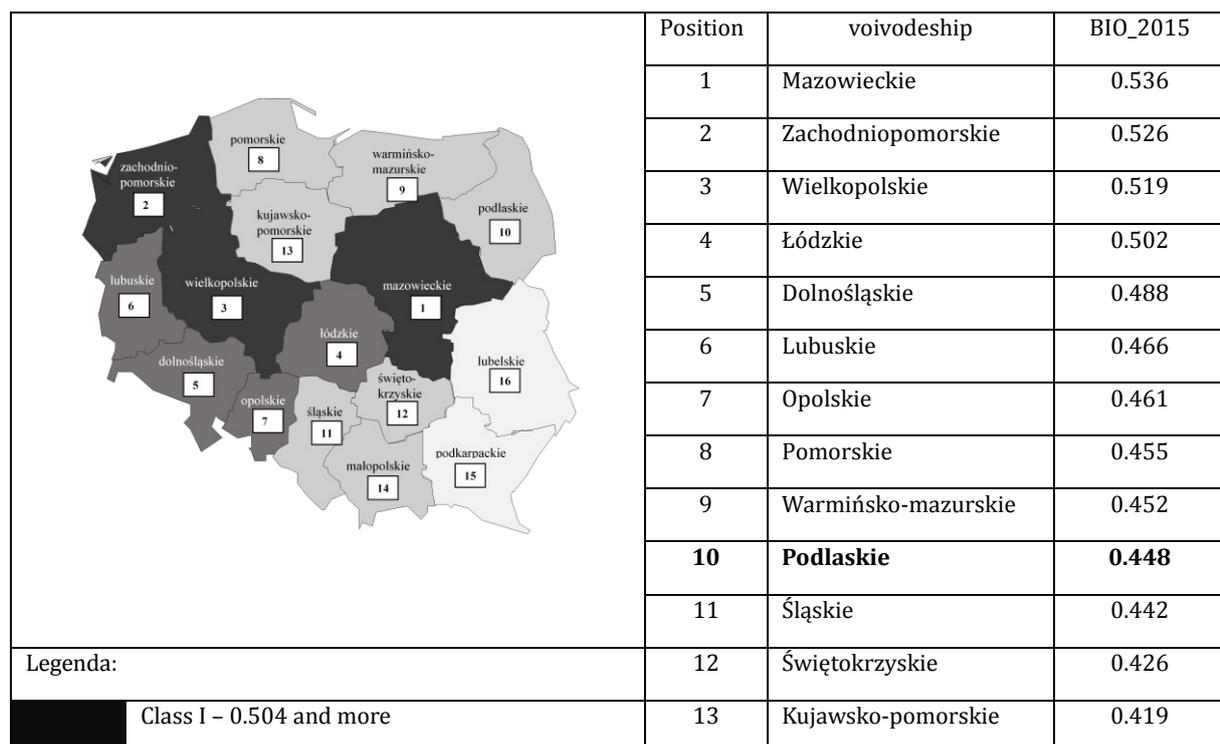
| | | | |
|-----|--------------|---|---|
| 18. | BIO4D | Work efficiency in section (gross added value of section D in PLN per employer) | S |
| 19. | BIO4E | Work efficiency in section (gross added value of section E in PLN per employer) | S |
| 20. | BIO05 | Share of renewable energy in electricity production in total (%) | S |
| 21. | BIO06 | Relation between electricity production and its consumption (%) | S |

*The unit of indices with an ordinal number from 1 to 15 is the number of economic activities per 100 thousand inhabitants in working age.

Source: Own elaboration

The analysis of individual indices characterizing the development of bioeconomic entrepreneurship does not allow to draw clear conclusions. Due to this, on the basis of the TOPSIS method, the index was elaborated that aggregates all the individual features included in Table 1.

The ranking of Polish regions as well as the division into classes in terms of development level of bioeconomic entrepreneurship is included in Picture 1. Lubelskie voivodeship belongs to IV – the last class regarding bioeconomic entrepreneurship's development and Podlaskie to III – the penultimate class. In 2015, as compared to 2014, Podlaskie voivodeship rose by 3 positions in the ranking and Lubelskie voivodeship maintained the same position. The promotion of Podlaskie voivodeship in the ranking in terms of bioeconomic entrepreneurship's development (BIO) is caused by the growth tendency of some diagnostic features, such as, e.g. the number of entities registered in sections A, C, D and E per 100 thousand inhabitants in working age, or the relation of electricity production to electricity consumption.



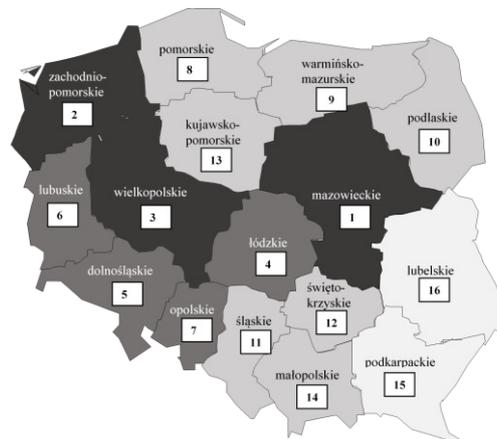
| | | | |
|----------------------------|-----------|------------------|--------------|
| Class II – (0.459; 0.504) | 14 | Małopolskie | 0.419 |
| Class III – (0.413; 0.459) | 15 | Podkarpackie | 0.406 |
| Class IV – below 0.413 | 16 | Lubelskie | 0.377 |

*Change of position in 2015 as compared to 2014 calculated as a difference between the position in 2014 and in 2015

Picture 1: Division of voivodeships into classes according to synthetic variable BIO (the development of bioeconomic entrepreneurship)

Source: own calculations on the basis of BDL data (<http://stat.gov.pl>, November 2017)

Division into classes is strongly linked with the level of economic development and is also the resultant of the total entrepreneurship's development. Thus, the obtained results are not surprising. High level of bioeconomic entrepreneurship's development is characteristic to those regions, which are economic leaders, such as: Mazowieckie, Wielkopolskie, Pomorskie, Dolnośląskie. Similar correlations can also be observed in Picture 2 presenting the relationship between the synthetic measure's value BIO_2015 of Polish voivodeships and gross domestic product *per capita* (in current prices in PLN). The Pearson's linear correlation coefficient of those variables is quite high and amounts to 0.7896, when the level of relevance equals 0.0003. It means that voivodeships with stronger economy are also on average marked with higher level of development of bioeconomic entrepreneurship. Lubelskie and Podlaskie voivodeships belong to the III quarter that includes the regions with the lowest GDP *per capita* and bioeconomic entrepreneurship's development index.



Picture 2. The value of synthetic variable BIO (development of bioeconomic entrepreneurship) and the level of gross domestic product per capita (PLN, current prices) in 2015.

Source: own elaboration on the basis of Local Data Bank's data (<http://stat.gov.pl>, November 2017) as well as own calculations.

Bioeconomy is a relatively new field of production activity. The development of bioeconomic entrepreneurship is determined by various, often specific, conditions. Identifying key factors influencing, to the greatest extent, its development and then applying proper instruments resulting in its enhancement can later become an impulse to more dynamic regions' development, also the peripheral ones, such as Lubelskie and Podlaskie voivodeships⁴³. A special chance to boost the development of bioeconomic entrepreneurship in the studied voivodeships lies within a well-developed institutional infrastructure

⁴³ The trial to identify factors influencing the level of bioeconomic entrepreneurship's development was undertaken in the publication (Godlewska-Majkowska, Komor, Perło, 2017).

in the form of science and technology parks and universities, which constitute an indispensable element directing and enhancing this activity.

4. Conclusions and recommendations

Bioeconomy constitutes a new concept of the resource efficient development based on knowledge as well as renewable biological resources management. The development of bioeconomic entrepreneurship is determined by numerous conditions, including, among others, activity of business support institutions, such as parks.

The article presents the proposal of a synthetic indicator's construction suited for assessing regional diversification of the development level of bioeconomic entrepreneurship. It allows to conduct analyses of the group of sectors constituting bioeconomy in the regions with various taxonomic levels, which provides a valuable clue for designing the activities with strategic character either for territorial self-government units as well as entrepreneurs.

Application limitation of the proposed tool is the validity and accessibility of statistical data, the part of which is wrapped in statistical mystery in Polish regions. This drawback, however, can be mitigated through correcting the index by including additional factors that constitute it. In spite of this, it should be noticed that the indicator of bioeconomic entrepreneurship's level is composed on the basis of a relatively broad range of data. A certain application restriction of the suggested indicator is also a system of data extraction, within which data pertaining to enterprises can be presented according to the seat of their Management Board and not their real location.

The conducted quantitative research indicated the negative verification of the proposed hypothesis. In Lubelskie and Podlaskie voivodeships, bioeconomic entrepreneurship is developing, but its level is relatively lower than the national average. It is greatly determined by the level of economic development, including the total level of entrepreneurship's development. Due to this, the studied voivodeships in terms of the constructed synthetic indicator, take on the final positions in the ranking. It means that bioeconomic enterprises operating in Lubelskie and Podlaskie voivodeships demand a strong and comprehensive support offered, among others, by park institutions.

Among the directions for future quantitative research, there is a trial to implement the indicator of bioeconomic entrepreneurship's development at lower taxonomic levels than NUTS 2 as well as a trial to apply the proposed tool for the analysis in other countries, e.g. in order to conduct inter-regional comparisons within the European Union. It also seems interesting to transfer from the statistical approach to the dynamic one by a proper modification of sub-indices in order to determine the direction and strength of changes in terms of the level of bioeconomic entrepreneurship's development.

References

- CRONBACH, L. J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika*. vol. 16. no. 3. p. 297–334.
- DAMMER, L., PIOTROWSKI, S., CARUS, M. 2014. Study on: Methodology framework for the bioeconomy observatory. w: *Bioeconomy Information System and Observatory*

- Project (BISO) – Set up of the Bioeconomy Observatory. FP7 Grant Agreement No. 341300. Nova Institute for Ecology and Innovation. European Commission.
- GODLEWSKA-MAJKOWSKA, H., KOMOR, A. 2014. Biogospodarka a zarządzanie marketingowe w wybranych jednostkach samorządu terytorialnego. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu. Gospodarka i przestrzeń*. nr 341. p. 23–36.
- GODLEWSKA-MAJKOWSKA, H., KOMOR, A., PERŁO, D. 2017. Czynniki warunkujące rozwój przedsiębiorczości biogospodarczej (na przykładzie województwa lubelskiego i podlaskiego), Białystok: Fundacja Promocji Rozwoju Podlasia.
- HELLWIG, Z., SIEDLECKA, U., SIEDLECKI, J. 1997. Taksonometryczne modele zmian struktury gospodarczej Polski. Warszawa: IRiSS.
- <http://stat.gov.pl>, (listopad 2017).
- Hwang, C.L., Yoon, K. 1981. *Multiple Attribute Decision Making: Methods and Applications*. New York: Springer-Verlag.
- KOLENDA, M. 2006. Taksonomia numeryczna. Klasyfikacja, porządkowanie i analiza obiektów wielocechowych. Wrocław: Wydawnictwo Akademii Ekonomicznej im. Oskara Langego we Wrocławiu.
- KOMOR, A. 2014. Specjalizacje regionalne w zakresie biogospodarki w Polsce w układzie wojewódzkim. *Roczniki Naukowe SERiA*. t. XVI, z. 6.
- MŁODAK, A. 2006. *Analiza taksonomiczna w statystyce regionalnej*. Warszawa: Difin.
- PANEK, T. 2009. *Statystyczne metody wielowymiarowej analizy porównawczej*. Warszawa: Szkoła Główna Handlowa w Warszawie.
- PERŁO, D., ROSZKOWSKA, E. 2017. The application of soft modelling and TOPSIS method for the analysis of competitiveness of companies in urban functional areas in Poland. *OPTIMUM. Studia Ekonomiczne*. 5(89).
- RATAJCZAK, E. 2013. Rolnictwo i leśnictwo w świetle koncepcji biogospodarki. IX Kongres Ekonomistów Polskich. Warszawa: PTE at: <http://www.pte.pl/kongres/referaty/Ratajczak%20Ewa/Ratajczak%20Ewa%20-%20ROLNICTWO%20I%20LEŚNICTWO%20W%20ŚWIETLE%20KONCEPCJI%20BIOGOSPODARKI.pdf>, (12.10.2016.).
- SOBCZYK, M. 2000. *Statystyka*. Lublin: Wydawnictwo UMCS.
- WOLD, H. 1980. *Soft Modelling: Intermediate between Traditional Model Building and Data Analysis*. Banach Centre Publication 6. Mathematical Statistics.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Cross-cultural management in the context of EU policies

David Kosina¹

*¹Department of Applied Economics, Faculty of Arts, Palacký University in Olomouc,
Křížkovského 511/8, 771 47 Olomouc, Czech Republic, e-mail: david.kosina@upol.cz*

Abstract

With increasing level of globalization and economic integration, both organizations and individuals are confronted with the need to effectively communicate across national and organizational cultures. With the support of new technologies, global interaction has become practically omnipresent in many industries and the application of cross-cultural education and management may play an important role in the competitiveness of organizations. Cultural diversity and cooperation belong to the traditional principles applied through the policies of the European Union. Both the cooperation among the member states' cultures and the intercultural dialogue and cooperation with third countries are promoted and intercultural aspects are embedded in various EU initiatives and programs. The aim of this article is to provide an overview of the EU policies related to cross-cultural management and their implementation through public programs and initiatives. To fulfill this objective, there were used two lines of research. First, a review of secondary sources has been carried out. As the second line, there were analyzed selected EU documents.

Keywords: Cross-cultural management, Intercultural competences, Education, Language policy, Intercultural dialogue, European Union

JEL Code: Z18, M14

1. Introduction

“Software of the mind” – that is how Hofstede (2010) termed culture. His simile suggests that the nature of the differences between national and organizational cultures may seem very intangible and at the same time significantly influence behaviors of individuals and societies. However, rich body of Hofstede's research and of other followers of the dimension based approach to the analysis of cultural differences proves that these aspects significantly influence human interaction and that reconciliation of intercultural dilemmas (Trompenaars & Hampden-Turner, 1999) is the way to increase global competitiveness.

Increasing level of global economic integration, especially in relation to continuous development and easy accessibility of communication technologies brings new challenges related to the management in global, cross-cultural environment that means, in a physical

or virtual environment where there is an interaction between representatives of various national and organization cultures. This applies especially to the knowledge-based sectors where there may be present a professional exchange between several national cultures at the same time. Global environment brings several management related issues, such as language barrier, decision-making specifics, stereotypes and prejudices and the ability to manage across cultures became one of the decisive factors of successful performance (Greblikaite et al, 2016)

In the European space, the process of European integration itself comes also into the play. Each enlargement of the European Union can be perceived as a small culture shock and the cohesion at the level of social interaction is less strong in comparison with the economic cohesion (Nicolae & Mihai, 2013).

Despite the courageous plans from the beginning of the millennium, the European share on global GDP is decreasing and similarly behave also other traditional economic centers. On contrary, the position of China as the new global giant is increasing (White paper on the future of Europe, 2017). This fact reminds us that in our eyes stable and the only true western approach can have an alternative in intellectual traditions of other cultures (Zeng, 2016) and to thrive successfully, it is at least reasonable to become familiar with concepts which significantly influence acting of our global counterparts.

Cross-cultural management relies on the so-called intercultural competences – a set of cognitive, affective, and behavioral skills that can be acquired and further developed through experiential acquisition (Brewer, 2015) or through a directed training. Despite some recently emerging disintegration trends, cultural diversity and cooperation are traditional principles on which the European cooperation has been built and the highest representatives of the European Union openly acknowledge “Unity in Diversity” as one of the key principle of the European integration project (Strengthening European Identity through Education and Culture The European Commission’s contribution to the Leaders’ meeting in Gothenburg, 2017). But where lies the current intersection of EU policies and the global intercultural challenges? To which extent and how is this dimension reflected in the EU policies and how is it included in the European approach to education and training? The aim of this contribution is to provide an overview how are the cross-cultural management related issues and intercultural communication reflected in policies and initiatives and programs of the European Union.

2. Methodology and Data

To fulfil the objective of this contribution, there were used two lines of research. Firstly, in order to obtain a basic overview of the subject, a review of secondary sources has been carried out. The sources for the review were identified using electronic full-text databases ProQuest and EBSCOhost. These databases were chosen based on their focus, robustness and reliability. The research parameters are summarized in table 1. When assessing the relevance of the search results, the term “culture” and its derivatives were assessed primarily with respect to the definition provided by the Cambridge dictionary as “the way of life, especially the general customs and beliefs, of a particular group of people at a particular time” (“Cambridge dictionary”, 2018) and not as the expression of human activity comprising art, music, theatre and literature. The review of secondary sources provided the basic picture about the so-far carried out research and contributed to identification of the documents which were then analyzed separately within the second methodological line.

Table 1: Secondary research – search criteria

| | |
|-------------------|---|
| Databases | ProQuest, EBSCOhost |
| Language | English |
| Search strings | Cross-cultural management, Cross-cultural management AND European Union, Intercultural policy AND European Union, intercultural dialogue |
| Publication years | 2004–2017 |

Source: Author

As the second method, the analysis of selected official EU documents was carried out. The documents were chosen based on to the relevance to the objective of the article. When pre-selecting the documents for this line of research, also the findings of the analysis of secondary sources have been taken into account. The analysis focused in particular on the documents of EU primary and secondary law, non-binding EU documents and relevant program documents. The analysis of the EU documents provided deeper insight to the evolution and current state of the implementation of cross-cultural aspects into the EU policies. The analyzed documents are summarized in Table 2.

Table 2: List of analyzed EU documents in alphabetical order

| |
|---|
| Consolidated version of the Treaty on European Union (2012) |
| Consolidated version of the Treaty on the Functioning of the European Union (2012) |
| Decision concerning the European Year of Intercultural Dialogue (2006) |
| Erasmus + Programme guide 2018 (2017) |
| Europe 2020, a strategy for smart, sustainable and inclusive growth (2010) |
| European agenda for culture in a globalized world (2007) |
| Green paper promoting learning mobility of young people (2009) |
| Joint declaration between the European Commission and People's Republic of China (2007) |
| Presidency conclusions of Lisbon European Council, 23-24 March 2000 (2000) |
| Recommendation on key competences for lifelong learning (2006) |
| Regulation establishing the program 'Erasmus +' (2013) |
| White paper on the future of Europe (2017) |

Source: Author

Where it was relevant, also the information provided on the official web pages of the institutions of European Union was taken into account.

3. Results

The basic general principles related to the multicultural European society are embedded in the primary law of the EU. The Treaty on European Union (TEU) in its Article 3, paragraph 3 mentions the respect to Europe's cultural and linguistic diversity and the commitment to protect and develop the European cultural heritage. The Treaty on the Functioning of the European Union (TFEU) in Article 167 explicitly mentions the necessity of the Union's contribution to the flowering of national cultures and also the necessity to

maintain national and regional diversity. In the same article, this general premise is further developed and the term “culture” is used jointly to describe both the collection of customs and beliefs and specific expressions of human activity. In Article 167, TFEU also reminds the necessity of cooperation with third countries and organizations and specifically emphasizes the cooperation with the Council of Europe. That way the primary law of the EU provides the basic framework for culture-related policies within the Union. When trying to further categorize the EU’s approach to intercultural issues, there can be identified three basic directions of the European policies: the Intercultural dimension of EU external relations represented by the Intercultural dialogue, language policy and education policy. The last two mentioned are in some aspects closely related and often overlap.

3.1. Intercultural dialogue

Intercultural dialogue can be defined as “the exchange of views and opinions between different cultures”. (“Intercultural dialogue”, 2018) The concept of cultural dialogue was developed during the 1990s by the Council of Europe as a framework for preventing conflicts and promoting co-existence of different cultures. Later, the concept was adopted by several other international organizations as a set of policy concepts, in 2002 the intercultural dialogue was also introduced by the European Commission. (García Agustín, 2012) A first significant milestone of these policy concepts was the European Year of Intercultural Dialogue 2008 where about €10 million were allocated to co-fund several projects on the European level and level of the EU member states. (Swiebel, 2008)

Three years later, based on the joint declaration of the European Commission and the Peoples Republic of China from 2007, which provided the framework for a structured policy dialogue on cultural affairs, the year 2011 was declared as the EU-China Year of Youth. As a part of this action, there was provided a special financial allocation within the program Youth in Action, focused specifically on cooperation with China. One year later, this action was followed by second China-focused thematic year – the EU-China Year of Intercultural Dialogue 2012 which provided a background for conferences, seminars, workshops and festivals on the EU level, on the level of EU member states. (“EU China Year of Intercultural Dialogue”, 2014)

Also, several EU actions which respond to the European refugee crisis can be put under the umbrella of Intercultural Dialogue. As a specific example of such actions may serve special call of the program Creative Europe – Refugee Integration Projects 2016, under which 12 projects focused, among other things, on intercultural awareness were funded by the total amount of more than €2.3 million. (“Creative Europe – Cross-sectoral – Refugee Integration Projects 2016”, 2016.)

3.2. Language policy

The official web page of the European Parliament (“Fact Sheets on the European Union”, 2018) openly acknowledges the relation of the language and culture and directly connects the European language policy with intercultural understanding and European intercultural dialogue. This approach can be traced back to the White paper on education and training (1995) which can be considered the first EU document connecting EU’s language policy to intercultural understanding. (Dombi, 2010) The close connection between the knowledge of foreign languages and intercultural awareness is then reminded in the Eu-

European action plan for language learning and linguistic diversity (2003). In the Recommendation of the European Parliament and of the Council on key competences for lifelong learning (2006) there is defined a framework of eight key competences of lifelong learning necessary for facing the global challenges, among which are also the communication in foreign languages and cultural awareness. In the detailed definition of the communication in foreign languages as one of these key skills, there is also explicitly mentioned the connection between languages and intercultural understanding.

3.3. Education and lifelong learning

European policies related to education and lifelong learning provide the most practical instruments related to intercultural issues and cross-cultural management. The European council presidency conclusions from March 2000 proposed a new strategy, also known as Lisbon agenda, aiming to transform the European Union to the most competitive global economy by 2010. The conclusions propose the creation of a framework of basic skill to be acquired as a response to education and training to globalization and shift to knowledge-based economies. This document mentions the intercultural dimension only indirectly. However, the knowledge of foreign languages is explicitly mentioned as one of these basic skills.

The most operative level of EU education and lifelong learning policy is the program level providing a funding base for implementation of the specific projects. On the EU-wide level, this dimension is currently represented by the Union's program Erasmus+ for the period 2014–2020. This program is the successor to the previous Lifelong Learning Program (LLP) providing learning and education opportunities for 2007–2013. The article 5 of the Regulation establishing the Erasmus + program (2013) mentions as one of the specific objectives "to improve the teaching and learning of languages and to promote the Union's broad linguistic diversity and intercultural awareness". The program itself is divided into 3 key actions covering the education and training areas addressed in the previous LLP program under separate sub-programs. The topic of intercultural awareness and understanding are included in all key activities of the program as a supplementary dimension of project outcomes.

4. Discussion and Conclusions

Both lines of research showed that the cross-cultural management related issues are present already at the level of EU primary law. This topic is further permeating three most relevant policy areas. First, the External dimension is represented in the Intercultural Dialogue – the set of policies developed by the Council of Europe and later adopted by several transnational organizations including the European Union. Second main area touching the analyzed topic is the language policy of the EU. The third major area is the education and lifelong learning. On all these levels, the cross-cultural management related issues are represented primarily by intercultural awareness which, as is explained below, is only the first phase of the acquisition of intercultural competences.

The programs aiming to life-long learning can be considered as the most operative EU policy level focusing on the issues related to cross-cultural issues. Currently, these programs are mainly grouped under the umbrella of the program Erasmus +. However, also in the program documents of Erasmus+ it is the intercultural awareness which is explicitly mentioned.

The cultural awareness (Zakaria, 2017) or cultural knowledge (Bennet, 2015) is considered as the first step of the three-level model of the development of intercultural competences. The remaining two steps are the cultural sensitivity and cultural adroitness (Zakaria, 2017), in the Benett's terminology called affect and action (2015).

Based on the results of the research, we can conclude that within the policies of the EU the cross-cultural dimension is present mainly in the form of the cultural awareness. This approach complies with the public role of the EU in creation and development of cohesion among the nations of the member states. However, we argue that to be culturally aware or knowledgeable is not the sufficient level of acquisition of intercultural competences. We believe that in order to be truly successful in the global competitive environment and to be able to manage cross-culturally the remaining levels of intercultural competences have to be achieved. Therefore, the organizations operating in the global environment themselves should take the concrete actions to fully develop these competences with their teams and incorporate them into their organizational culture.

Acknowledgements

This contribution was supported by the Palacky University grant IGA_2018_002 The interpenetration of Eastern and Western thinking in the global economy and management.

References

- BENNETT, J. (Ed.). (2015). *The Sage encyclopedia of intercultural competence* (1 ed.). London: Sage.
- BREWER, P. 2015. *International virtual teams: engineering global communication*. Hoboken (New Jersey): Wiley.
- Cambridge dictionary [Online]. 2018. Retrieved 2018-02-26, from <https://dictionary.cambridge.org/dictionary/english/culture>.
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a European agenda for culture in a globalizing world, 2007. European Union.
- Consolidated version of the Treaty on European Union, (2012). European Union.
- Creative Europe – Cross-sectoral – Refugee Integration Projects 2016 [Online]. Education, Audiovisual and Culture Executive Agency. Retrieved from https://eacea.ec.europa.eu/creative-europe/funding/creative-europe-cross-sectoral-refugee-integration-projects-2016_en.
- Decision concerning the European Year of Intercultural Dialogue, 2006. European Union.
- DOMBI, J. 2010. European Language Policy On Plurilingualism And Intercultural Communication [Online]. Bulletin of the Transilvania University of Brasov, Series IV: Philology, 3(52), 163–166.
- Erasmus + Programme Guide: Version 1 (2018): 25/10 /2017, 2007. European Commission. Retrieved from <http://ec.europa.eu/programmes/erasmus->

plus/sites/erasmusplus2/files/files/resources/erasmus-plus-programme-guide_en.pdf.

EU China Year of Intercultural Dialogue: Activities organised and/or co-funded by the EU [Online]. (2014). Retrieved from http://ec.europa.eu/assets/eac/culture/tools/documents/eu-china-year/annex-ii_en.pdf.

EUROPE 2020 A strategy for smart, sustainable and inclusive growth, 2010. European Commission.

Fact Sheets on the European Union: Language policy [Online]. 2018. European Parliament. Brussels: European parliament. Retrieved from http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuId=FTU_3.6.6.html.

GARCÍA AGUSTÍN, Ó. 2012. Intercultural Dialogue: Visions of the Council of Europe and the European Commission for a Post-Multiculturalist Era. *Journal of Intercultural Communication*, (29).

GREBLIKAITE ET AL. 2016. Cultural integration and cross-cultural management challenges in the Central European Countries: Lithuania and Poland [Online]. *European Integration Studies*, vol. 0(issue 10).

Green Paper – Promoting the learning mobility of young people, 2009. European Commission.

HOFSTEDE, G.HOFSTEDE, . & MINKOV, M. 2010. *Cultures and organizations software of the mind: intercultural cooperation and its importance for survival*. New York: McGraw-Hill.

Intercultural dialogue [Online]. 2018. European Commission. European Commission. Retrieved from https://ec.europa.eu/culture/policy/strategic-framework/intercultural-dialogue_en.

Lisbon European council 23 and 24 March 2000: Presidency conclusions, 2000. European Union. Retrieved from http://www.europarl.europa.eu/summits/lis1_en.htm.

NICOLAE, B. & MIHAI, L. 2013. European Union Enlargement As A Cultural Shock. The Role Of Intercultural Teams' Management In Increasing European Cohesion. *Annals of the University of Oradea, Economic Science Series*, 22(1), 1384–1390.

Consolidated version of the Treaty on the Functioning of the European Union, 2012. European Union.

Promoting Language Learning and Linguistic Diversity: An Action Plan 2004–2006, 2003. European Commission.

Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning, 2006. European Union.

Regulation (EU) No 1288/2013 of the European Parliament and of the Council of 11 December 2013 establishing 'Erasmus+' : the Union programme for education, training, youth and sport and repealing Decisions No 1719/2006/EC, No 1720/2006/EC and No 1298/2008/EC Text with EEA relevance, 2013.

Strengthening European Identity through Education and Culture The European Commission's contribution to the Leaders' meeting in Gothenburg: Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of regions, 2017. European Commission.

- SWIEBEL, J. 2008. Intercultural dialogue and diversity within the EU [Online]. *Euro-times*, 6, 101–112.
- TROMPENAARS, F. & HAMPDEN-TURNER, C. 1999. *Riding the waves of culture: understanding cultural diversity in business*. London: Nicholas Brealey Pub.
- White paper on education and training: Teaching and learning – Towards the learning society, 1995. European Commission.
- White paper on the future of Europe: Reflections and scenarios for the EU27 by 2025 2017. European Commission.
- ZAKARIA, N. 2017. *Culture matters: decision-making in global virtual teams*. Boca Raton: Taylor & Francis Group.
- ZENG, M. 2016. *Balance: the art of Chinese business*. Reading: Paths International Ltd.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Administrative Liability related to Food Fraud. A case of Poland

Aleksandra Kowalska¹, Jarosław Kowalski²

¹Department of Quality and Knowledge Management, Faculty of Economics, Maria Curie-Skłodowska University, pl. Marii Curie-Skłodowskiej 5, 20-031 Lublin, Poland, e-mail: aleksandra.kowalska@umcs.lublin.pl

²Office of Legal Advisor Jarosław Kowalski, ul. Jutrzenki 12/62, 20-538 Lublin, Poland, e-mail: kontakt@kancelaria-kowalski.pl

Abstract

The horsemeat scandal of 2013 proved that EU food law had a blind spot since it was designed to deal with food safety accidents rather than food fraud/ adulteration. It turned out that the interpretations of Regulation (EC) 178/2002 differed considerably among the Member States. Vulnerability to fraud of commonly long and complex multinational food supply chains is continuously growing. The point is to develop effective EU and national food law which ensures the protection of health and life as well as economic interests of consumers and fair trade practices. This contribution presents a background to food fraud issue and the outcome of the discussion over legislation concerning food fraud/ adulteration. The aim of the study is to frame criminal and administrative liability related to food fraud/adulteration and to identify weak points of the process of imposing pecuniary penalties by food control authorities in Poland. The analysis is based on EU and national food law provisions, annual reports and administrative decisions regarding food fraud/adulteration delivered by food control institutions in Poland and critical literature review.

Keywords: food law, administrative liability, criminal liability, food fraud, food adulteration, food control, pecuniary penalties, Poland

JEL Code: D20, K23, K42

1. Introduction

Governments, consumers and competitors will be facing the problem of food fraud as long as it is profitable to fraudsters. Moreover, vulnerability of food supply chains to fraud is growing as a result of the dynamic development of global trade, the lengthening food supply chains, the greater anonymity of the food market, the growing market pressure to reduce food prices, incoherent food laws within countries, inadequate legislation, ineffective activities of public food control institutions and so on (Marvin, Bouzembrak, Janssen,

et al., 2016; Kowalczyk, 2015; Spink and Moyer, 2011). Since food fraud is seemingly becoming a bigger and more frequent problem, there is a range of organizational, regulatory, industrial and non-governmental activities relating to food fraud that continue to take place (Spink, Moyer and Speier-Pero, 2016). For efficient management of food fraud, the focus of countermeasures and control systems has to be shifted from intervention and response to prevention and vulnerability reduction or elimination. When a food fraud event occurs, the point is to mitigate/reduce its consequences (Spink, Ortega, Chen, et al., 2017).

The horsemeat scandal of 2013 proved that European Union (EU) food law had a blind spot since it was designed to deal with food safety accidents rather than food fraud (Van der Meulen, Boin, Bousoula, et al., 2015). The priority in this law is to protect human health and life (Regulation 178/2002). Lotta and Bogue (2015) claim that despite both the economic and social importance of food fraud, a harmonized definition does not exist in the EU legislation.

This contribution presents the background to food fraud issue and the outcome of the discussion over legislation concerning food fraud/ adulteration. The aim of the paper is to frame criminal and administrative liability related to food fraud/adulteration and to identify weak points of the process of imposing pecuniary penalties by food control authorities in Poland.

2. Food adulteration, food fraud and wider food crime

According to Spink, Ortega, Chen, et al. (2017) food fraud is illegal and intentional deception for economic gain using food. The deception can be adulteration, substitution, dilution, stolen goods, tampering, diversion and grey market product, smuggling, unauthorized product or refilling, misrepresentation or mislabeling, and intellectual property rights counterfeiting. Fraudsters have no intention to cause harm, although, food fraud incidents can create adulteration of food with public health threats (Spink, Ortega, Chen, et al., 2017; Spink and Moyer, 2011).

Food fraud started when food became a subject of trade (Kowalczyk, 2016), but only during the last few years it became possible to detect food fraud/ adulteration due to the advancement of distinct analytical technologies (Huck, Pezzei and Huck-Pezzei, 2016). On the other hand, fraudsters commonly demonstrate technological expertise and actively seek to avoid detection (Primrose, Woolfe and Rollinson, 2010).

It seems to be crucial to explain two terms which are strongly linked to food fraud, i.e. economically motivated adulteration (EMA) of food and food crime. The U.S. Food and Drug Administration (FDA) defines EMA as the fraudulent, intentional substitution or addition of a substance in a product for the purpose of increasing the apparent value of the product or reducing the cost of its production, i.e., for economic gain (Spink and Moyer, 2011). The Elliot Review (2014) states that food crime can be described as an activity organized by individuals or groups who knowingly set out to deceive, and or injure, those purchasing and consuming food. Manning and Soon (2016) identify the following types of food crime: adulteration, counterfeit, diversion, over-run, simulation, tampering, theft, malicious poisoning, bioterrorism, or sabotage, misleading indications (words/pictures), and packaging size. This extends beyond the product-oriented types of food fraud to consider wider organizational fraud associated with accounting, organizational “secrets”, unique processing standards, etc. (Manning and Soon, 2016). PAS 96 (2014) using a different approach identifies several forms of deliberate acts against food and food supply.

The guide describes main threats to food authenticity and safety that need to be considered when undertaking TACCP (Threat Assessment Critical Control Point) system, namely: EMA, malicious contamination, extortion, espionage, counterfeiting, cybercrime.

Food fraud is a big business nowadays (Shears, 2010). Food fraud acts can be extremely profitable for fraudsters. Food fraud events can negatively impact sales, brand equity, market capitalization; violate regulations; and even lead to the criminal prosecution of corporate leaders (Spink, Moyer and Speier-Pero, 2016). Moreover, globalization is amplifying the scope and scale of food fraud events. A good example of food fraud incident that had a massive economic impact is the horsemeat scandal of 2013. EU countries were forced to widespread product recalls, costly authenticity testing, and the effective halting of almost all ground beef sales (Spink, Ortega, Chen, et al., 2017).

Horsemeat scandal was a wake-up call for European Commission (EC) which finally developed the EU Food Fraud Network and the System for Administrative Assistance & Food Fraud (AAFF) in 2015 to strengthen cooperation between the Member States, Switzerland, Norway, Iceland and EC in preventing and mitigating cross-border fraudulent practices in the food and feed chain. Starting from the end of 2015 a dedicated IT application known as the Administrative Assistance and Cooperation System (AAC) has been made available for the members. Previously, the Rapid Alert System for Food and Feed (RASFF) was the only viable tool for exchanging information on food safety issues, however the horsemeat crisis did not show any profiles of public health risks, thus falling outside the scope of the system (Kowalska, 2017; EC, 2016). EC developed four key operative criteria to distinguish whether a case should be considered as food fraud or other non-compliance, namely: (1) Violation of EU law, (2) Intention, (3) Economic gain, (4) Deception of customers (EC, 2016).

Food fraud may not include “adulteration” when it involves acts such as tax-avoidance, smuggling, etc., but food fraud often leads to adulterated food products (Spink, Moyer, 2011). Lipp (2011) states that food adulteration is intentional replacement of an ingredient that is specifically motivated, for example economically or ideologically motivated, whereas food contamination is unintentional and often technically unavoidable. However, both can lead to potential public health risks, product recall, and manufacturers’ liability (Spink and Moyer, 2013). The term “nonauthentic” is commonly used to describe adulterated food product. Food adulteration tends to be economically motivated and is achieved through the addition, substitution or removal of food ingredients (Moore, Spink and Lipp, 2012).

The question is whether food adulteration is always an intentional act. Bansal, Singh, Mangal, et al. (2017), from India, where the problem with adulterated food products is relatively huge, state that “food adulteration can be defined as lowering the quality of food by intentional or unintentional substitution of food with some inferior foreign particle or by removal of some value added food substitute from main food item”. Food Safety and Standards Act of India (FSSA) defines “adulterant” as any material which is or could be employed for making the food unsafe or substandard or misbranded or containing extraneous matter. According to the US Federal Food, Drug and Cosmetic Act (FFDCA), food shall be deemed to be adulterated if: a) it bears or contains any poisonous or deleterious substance which may render it injurious to health; b) absence, substitution, or addition of constituents increased its bulk or weight, reduced its quality or strength, or made it appear better or of greater value than it is; c) it bears or contains a color additive which is unsafe, and so on (Bansal, Singh, Mangal, et al., 2017). Silvis, van Ruth, Fels-Klerx, et al. (2017) define adulteration of food in the narrow sense as the preparation of foods for sales by replacing valuable with less valuable ingredients or constituents. Adulteration of

food can be definitely dangerous as it may be toxic and effect health, it could deprive nutrients required to maintain proper health, it may cause intoxication or problems such as allergy in sensitized individuals (Bansal, Singh, Mangal, et al., 2017).

In the current study we will focus on the food adulteration aspects, since Polish legislative means concentrate on them.

3. The laws and regulations covering food fraud/ adulteration at Union and Polish level

Food cannot be substituted. Consumers' health, frame of mind, work performance, and quality of life is conditioned with his/her diet. As a matter of fact, an average Polish consumer buys foodstuffs every day and spends most money on food (24.2% of the total expenditure in 2016) (CSO, 2017). EU food law is relatively broad, restrictive and not easy to applicate by food business operators. Food law is a set of EU and national legal norms referring to all stages of food supply chain and regulating a separated area of our life (Paliwoda, 1997). Article 5 of Regulation 178/2002 (hereinafter: the General Food Law or GFL), a constitution of EU food law, sets the general objectives of this law, namely: protection of human life and health (a superior goal), the protection of consumers' economic interests, including fair practices in food trade, taking account of the protection of animal health and welfare, plant health and the environment. Regulation 1169/2011 on the provision of food information to consumers provides a basis for consumers to make informed choices. Food label seems to be most effective tool of communication between food producer and consumer. Thus, strict regulatory system of labelling in the EU countries makes for a bigger consumers' protection. Article 8 of GFL states that food law shall aim at the prevention of: fraudulent or deceptive practices; the adulteration of food; and any other practices which may mislead the consumer in order to protect consumers' interests. However, there is no definition of food adulteration in this fundamental legal provision.

Food adulteration is defined in two main Polish laws, which are: the Act on the Safety of Food and Nutrition (2006) which lays down rules and procedures in order to ensure food and nutrition safety regarding any health implications for consumers (Food and Nutrition Safety Act, hereinafter: FNSA), and the Act on Commercial Quality of Agricultural and Food Products (2000) which regulates quality issues and their economic implications for consumers (hereinafter: ACQAFP).

Under Article 3 of FNSA, adulterated foodstuff is determined as a foodstuff whose composition or other properties were changed without informing consumer about it, or a foodstuff changed in order to conceal its intrinsic composition or other properties, and affecting the safety of the foodstuff. Under Article 3 of ACQAFP, adulterated agricultural and food product is defined as a product whose composition does not comply with the provisions of regulations regarding commercial quality of individual foodstuffs, or a product changed (including mislabeling) in order to conceal its intrinsic composition or other properties, as long as the mentioned non-compliances or changes significantly violate consumer interests. The business operator that places adulterated food on the market, carries administrative, criminal and/or civil liability for the action (ACQAFP, FNSA).

FNSA introduces in Article 103: (1) criminal sanctions against operators that produce or place on the market adulterated foodstuffs; (2) administrative sanctions against operators that do not withdraw adulterated foodstuffs from the market (pecuniary penalties). The penalties are imposed by responsible provincial sanitary inspector. The amount of them depends on: the degree of harmfulness, the degree of culpability, the

scope of infringement, the producer's activities to date and the production volume of the operator (FNSA).

There are two national institutions which are empowered to carry out inspection and supervision of commercial quality of agri-food items on the domestic market, and at import and export stage. The Agricultural and Food Quality Inspection (IJHARS) takes both control and preventive actions for issues that could affect consumers' safety and food authenticity along the whole food supply chain, excluding retail trade, which is in the hands of the Trade Inspection (IH).

The provincial inspector of IJHARS is entitled to issue administrative decisions concerning: a) prohibition of the placing adulterated food on the market, appropriate treatment or destruction of adulterated food, etc. (Article 29 paragraph 1 ACQAFP); and b) financial penalties imposed due to the detection of food adulteration (Article 40a ACQAFP). The financial penalties may also be imposed by the chief inspector of IJHARS and the provincial inspector of IH. The first group of sanctions is preventive in nature (police sanctions which are supervision measures), and the second one is repressive *sensu stricto*. While imposing the financial penalty, an inspector of IJHARS, and or IH, takes account of the following circumstances: the gravity and the scope of infringement, the producer's activities to date, its sales volumes and the value of revenue, and worth of controlled agri-food items (ACQAFP). The administrative decisions issued on the basis of Article 29 ACQAFP have been available to the public on IJHARS webpage since December 8, 2008, and the administrative decisions issued on the basis of Article 40a ACQAFP have been made public on the webpages of JHARS and IH since November 30, 2015 (ACQAFP). The decision of IJHARS regarding adulterated agri-food items contain the following elements: number and date of the decision regarding detected food adulteration, legal basis of the decision, the name of adulterated product, the number of production batch and the date of production, batch volume, confirmed irregularities, and the name of an entity which places the food on the market. The public is not informed about the details of actions undertaken in relation to the detection.

4. Methodology and Data

The discussion over administrative liability related to food fraud/adulteration is based on the analysis of EU and national food law provisions, data collected from administrative decisions regarding food fraud/adulteration delivered by provincial inspectors of IJHARS, and critical literature review.

Material encompasses IJHARS administrative decisions regarding adulterated agri-food items from 2013 to 2017 (n=427) publicized on the IJHARS webpage and included in the search module that allows an individual to filter information. Working on IH administrative decisions is much more arduous. The IJHARS decisions are concise and organized in a standardized table, and gathered on one website, www.ijhar-s.gov.pl (most of them are one page long). Whereas IH decisions usually exceed ten pages and are publicized on 16 IH provincial branches websites (but the decisions are publicized with detailed reasoning of imposing financial penalty). Therefore, it was decided to use analysis of the IH decisions from 2008–2012 (n=376) publicized by Płocki (2017).

5. Results

From the perspectives of people applying the rules of food law, regulations relating to the liability are of a great importance. Comparing three types of liability with capacity to apply in the food law, i.e. criminal, administrative and civil liability, it can be said that the liabilities have their own distinctive features and there are various groups of natural people/legal entities which are entitled/obliged by law. In legal theory, legal liability is considered as bearing negative consequences of events and conditions subjected to negative normative qualification, which can be attributed to a given subject in given legal regulations (Korzycka, Wojciechowski, 2017). Similar definition of legal liability can be found in general introduction to Criminal Law by J. Warylewski (2015) who claims that legal liability is bearing negative legal responsibilities of a given legal condition or a behaviour of an entity. There are three functions provided by civil, administrative and criminal liabilities, these are: repressive, preventive and compensative functions. Civil liability performs compensative function, criminal and administrative liability perform preventive and repressive functions, whereas preventive function is leading the way in administrative liability (Korzycka, Wojciechowski, 2017).

The term “liability” is inextricably linked to the term “sanction”. A sanction is usually perceived as a number of negative (unfavourable) consequences stipulated in a specific legal norm that any person failing to fulfil his or her obligations or who exceeds his or her authority resulting from legal provisions is subject to (Korzycka, Wojciechowski, 2014). Legal sanctions perform the same functions as liabilities do. From the angle of food law, prevention is the most important since a superior goal of food law is a protection of human health and life. Repressive sanctions should be applied especially if a food business operator persistently violates legal provisions and preventive sanctions are not nagging enough. The application of compensative sanction is a consequence of material injury or human harm.

Since the aim of food fraudsters is not to harm people, the authors concentrate on administrative and criminal liabilities which through performing preventive and repressive functions most significantly impact food fraud/ adulteration mechanism. Article 55 of Regulation 882/2004 states that EU countries shall lay down the rules on sanctions applicable to infringements of feed and food law and the sanctions provided for must be effective, proportionate and dissuasive (Regulation 882/2004). In 2017 Regulation 882/2004 was replaced by Regulation 2017/625 whose provisions on penalties applicable to infringements of food law are more precise. It is new that Member States shall ensure that financial penalties for violations of Regulation 2017/625, perpetrated through fraudulent or deceptive practices, reflect, in accordance with national law, at least either the economic advantage for the operator or a percentage of the operator's turnover. By 14 December 2019 (when all the rules of the Regulation come into force), Member States shall notify the penalties provided for to the EC (Regulation 2017/625).

Most food adulteration cases detected by IJHARS in 2013–2017 constituted a violation of food labelling laws. A crucial share of Food Fraud (FF) cases exchanged in the AAC system in 2016 also dealt with mislabelling. The irregularities most often were about truthless composition of food product (Kowalska, 2017). Analysis of the 427 IJHARS decisions from 2013–2017 show that most irregularities occur in meat and meat products (32% of the decisions), flour, cereal and bakery products (19%), and delicatessen products (11%). Analysis of IH annual reports from the past 10 years show that meat and meat products and butter are highly vulnerable to adulteration (Płocki, 2017). The highest number of FF cases exchanged in the AAC system in 2016 also concerns meat and meat

products (27% of all 176 FF cases). Moore, Spink and Lipp (2012) analysed food fraud issues that have been publically reported in English from 1980 to 2010 and stated that olive oil, milk, honey, saffron, and orange juice were the most common targets for adulteration reported in scholarly journals.

Since the information on financial penalties imposed on food business operators that produce or place on the market adulterated agri-food items has been available to the public from the end of 2015, it is reasonable to analyse separately 2016–2017 IJHARS decisions. Financial penalties (laid down in Article 40a ACQAFP) significantly dominate amongst IJHARS sanctions concerning food adulteration (figure 1). Moreover, there is a clear downward trend in the volume of IJHARS decisions concerning prohibition of placing adulterated food on the market, appropriate treatment or destruction of adulterated food made under Article 29 ACQAFP (figure 2). The idea is to make food fraud/adulteration unprofitable. Moreover, financial penalties are the income to the state budget.

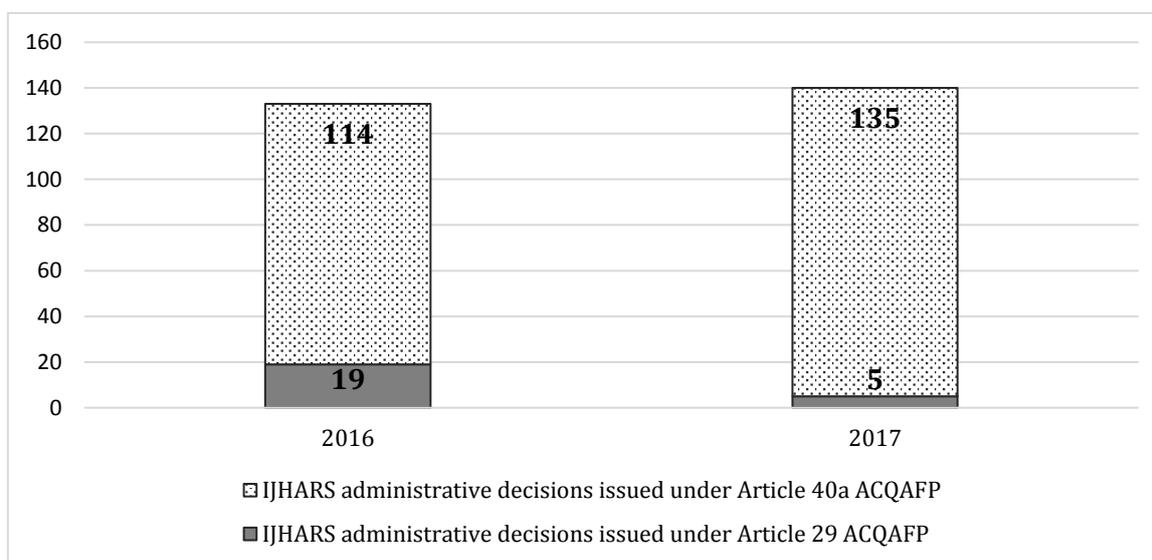


Figure 1: Combined results of IJHARS inspections regarding adulterated agri-food products in 2016–2017 having regard to a legal basis
Source: www.ijhar-s.gov.pl

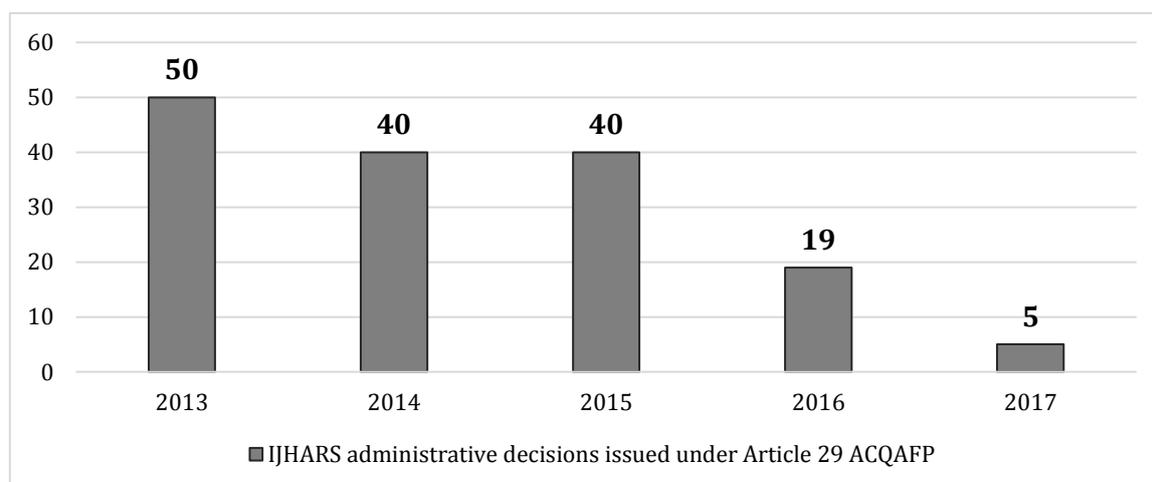


Figure 2: IJHARS administrative decisions regarding adulterated agri-food products issued under Article 29 ACQFP in 2013–2017
Source: www.ijhar-s.gov.pl

6. Discussion and Conclusions

Polish legislator adopted a mixed model of liability for infringements of food law based on the possibility to apply sanctions referred to in both criminal and administrative law. Differences between criminal and administrative liability are very distinctive. In the general part of the Criminal Code, important elements are defined, such as the concept of crime, rules and conditions for criminal liability, exclusion of criminal liability, penalties and penalties limitation (Rogalski, 2014). Administrative law lacks such detailed and systematic definitions. Depending on the Act, we deal with different, often heterogeneous terminology.

Another difference is a clear, transparent and closed catalog of penalties, which according to the Criminal Code are: fine, restriction of freedom, deprivation of freedom, 25 years imprisonment and life imprisonment, a fine cannot exceed 1,080,000 PLN (The Criminal Code 1997). In case of administrative responsibility, there is no single law regulating sanctions in a holistic and uniform manner.

Criminal liability is always based on the principle of guilt. Administrative responsibility is most often an objective liability, independent of the degree of guilt.

Criminal law generally provides for the responsibility of natural persons. The exception is the Act of 2002 on the liability of collective entities for acts prohibited under penalty that also provides for the liability of legal persons (The Act on the Liability..., 2002). In the case of administrative liability, the responsible entity may be both a natural person and a legal person. Moreover, the liability for administrative tort may be borne by both the entity that committed such an infringement, as well as another entity that is connected with the perpetrator with a legal relationship (Rogalski, 2014).

In administrative law, a fine is imposed for breaching a legal order that is not an offense within the meaning of the penal code. This penalty is not imposed on behalf of the state by an independent court, but by a state administration body by an administrative procedure that does not ensure impartiality of the decision.

Criminal liability, unlike administrative liability, is subject to a limitation period. In administrative law, despite many demands, there are no provisions regulating the subject matter (Rogalski, 2014).

Criminal and administrative liability in the Polish food law have also mutual features, such as two instance procedures (Adamiak and Borkowski, 2017). Both criminal procedural law and administrative law provide for the possibility of appealing to a higher instance, which in the case of criminal proceedings is a higher court, and in the case of administrative proceedings – the Provincial Administrative Court (WSA). Criminal proceedings, including proceedings in misdemeanor cases, outside the preparatory stage are proceedings that can be considered contradictory to the elements of inquisition. In the case of administrative proceedings aimed at applying sanctions to the entity, there is no adversarial process, which is only visible before the WSA (Skorupka, 2017).

Korzycka and Wojciechowski (2014) claim that the advantage of administrative sanctions in comparison with criminal law sanctions, is a simpler imposition procedure, the possibility of imposing sanctions on entrepreneurs and not only natural persons, as well as the imposition of sanctions irrespective of guilt. The procedure imposing administrative sanctions is also shorter and less costly. Korzycka and Wojciechowski (2014) see some doubt as to the repressive administrative sanctions: (1) there are no provisions regulating the concurrence of administrative and criminal liability; (2) while the imposition of administrative sanctions irrespective of the guilt seems reasonable, exemptions from sanctions in circumstances specified by law should also be provided for.

Płocki (2017), on the basis of analyses of administrative decisions issued in the years 2008–2012 by the IH, stated that the main drawback of the system of administering fines is the interpretive non-uniformity of provincial inspectors of IH, resulting in the punishment being not entirely commensurate with the offense and circumstances that accompanied it.

Since two Polish laws govern the issue of food adulteration, the suggestion is to draw the line between the regulations in order to facilitate legal classification of the act. Future national food law development should aim to provide for clear and transparent process of imposing financial penalty due to the detection of food adulteration. The system of penalties for adulterating food should be coherent and uniform. The value of revenue of the perpetrator should become a fundamental criterion taken into account while considering the amount of financial penalty. Otherwise, the penalties do not play repressive and preventive role; the largest producers will still place adulterated food on the market, and the smallest food producers will not be able to survive in the market. Polish administrative law should also develop towards systematizing legal terminology.

In 2013 it turned out that EU food law was designed to deal with food safety accidents rather than with intentional tempering with the food supply and the interpretations of GFL differed considerably among the EU countries. There were both countries which ordered a recall of beef products adulterated with horsemeat (Germany, Netherlands, Italy, Greece, and Portugal), and countries which did not feel competent to impose the recall based on Article 19 GFL (that states about obligatory recall that results from non-compliances with the food safety requirements) or other (national) law provisions, i.e. France and Spain (Van der Meulen, Boin, Bousoula, et al., 2015).

Since food fraud/ adulteration problem is continuously growing, law-makers around the world seem to be obliged to get involved in more specific legislation considering food adulteration, food fraud and wider food crime. It is not enough to focus on food safety, health and life of consumers while food fraud/ adulteration might not harm consumers' health. The point is to develop such a legal framework that provides a stronger protection of consumer (in terms of his economic interest) and entrepreneur (in terms of fair trade practices), and to harmonize this law. The proposal here is to define food fraud and food adulteration in the EU common law and especially take into account intentionality of the action.

References

- ADAMIĄK, B. and BORKOWSKI, J. 2017. *Administrative Procedure Code Commentary*. 15th edn. Warsaw: C.H. Beck.
- BANSAL, S., SINGH, A., MANGAL, M., MANGAL, A.K., and KUMAR, S. 2017. Food adulteration: Sources, health risks, and detection methods, *Critical Reviews in Food Science and Nutrition* 57(6): 1174–1189.
<http://dx.doi.org/10.1080/10408398.2014.967834>.
- BSI, THE BRITISH STANDARDS INSTITUTION. 2014. PAS 96:2014. Guide to protecting and defending food and drink from deliberate attack [Online]. Available at: <http://www.food.gov.uk/sites/default/files/pas96-2014-food-drink-protection-guide.pdf>. [Accessed 2016, February 10].

- CSO, CENTRAL STATISTICAL OFFICE. 2017. Household budget survey in 2016 [Online] Available at: https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5486/9/11/1/budzety_gospodarstw_domowych_w_2016.pdf. [Accessed 2018, February 5].
- EC, EUROPEAN COMMISSION. 2016. The EU Food Fraud Network and the System for Administrative Assistance & Food Fraud. Annual report 2016 [Online]. Available at: https://ec.europa.eu/food/sites/food/files/safety/docs/food-fraud_network_activity_report_2016.pdf. [Accessed 2017, June 8].
- ELLIOT REVIEW. 2014. Elliott Review into the integrity and Assurance of Food Supply Networks – Final Report. A national Food Crime Prevention Framework. London: HM Government.
- HUCK, CH.W., PEZZEI, C.K. and HUCK-PEZZEI, V.A.C. 2016. An industry perspective of food fraud, *Current Opinion in Food Science* 10: 32–37.
- KORZYCKA, M. and WOJCIECHOWSKI, P. 2014. Administrative Sanctions in the Management of Food Safety, *European Food & Feed Law Review* 4: 216–222.
- KORZYCKA, M. and WOJCIECHOWSKI, P. 2017. Food law system. Warsaw: Wolters Kluwer SA.
- KOWALCZYK, S. 2015. Authenticity of food products in the Polish market checked during 2005–2012, *Annals of the National Institute of Hygiene* 66(1): 27–34.
- KOWALCZYK, S. 2016. Food safety and quality. 1st edn. Warsaw: PWN SA.
- KOWALSKA, A. 2017. The EU Information Exchange Systems for Food Fraud, *Entrepreneurship and Management* vol. XVIII no 9 part 1: 71–85.
- LIPP, M. 2011. A Closer Look at Chemical Contamination [Online]. Available at: <http://www.foodsafetymagazine.com/magazine-archivel/augustseptember-2011/a-closer-look-at-chemical-contamination/>. [Accessed 2015, December 28].
- LOTTA, F. and BOGUE, J. 2015. Defining Food Fraud in the Modern Supply Chain. *European Food & Feed Law Review* 10 (2): 114–122.
- MANNING, L. and SOON, J.M. 2016. Food Safety, Food Fraud, and Food Defense: A Fast Evolving Literature, *Journal of Food Science* 81(4): 823–834. <http://dx.doi.org/10.1111/1750-3841.13256>.
- MARVIN, H.J.P., BOUZEMBRAK, Y., JANSSEN, E.M., VAN DER FELS-KLERX, H.J., VAN ASSELT, E.D., and KLETER, G.A. 2016. A holistic approach to food safety risks: Food fraud as an example, *Food Research International* 89 (1): 463–470. <http://dx.doi.org/10.1016/j.foodres.2016.08.028>.
- MOORE, J.C., SPINK, J. and LIPP, M. 2012. Development and application of a database of food ingredient fraud and economically motivated adulteration from 1980 to 2010, *Journal of Food Science* 77(4): 118–126. <http://dx.doi.org/10.1111/j.1750-3841.2012.02657.x>.
- PALIWODA, J. 1997. Remarks about food law. Warsaw: FPPDR.
- PŁOCKI, R. 2017. Food safety in terms of its adulteration. Szczytno: Police Academy.

- PRIMROSE, S., WOOLFE, M., ROLLINSON, S. 2010. Food forensics: methods for determining the authenticity of foodstuffs, *Trends in Food Science & Technology* 21 (12): 582-590. <https://doi.org/10.1016/j.tifs.2010.09.006>.
- Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety (OJ L 31, 1.2.2002).
- Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules (OJ L 165, 30.4.2004).
- Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers (OJ L 304, 22.11.2011).
- Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products (OJ L 95, 7.4.2017).
- ROGALSKI, M. 2014. Penal vs. administrative liability, *Ius Novum Special Issue*: 66-80.
- SILVIS, I.C.J., VAN RUTH, S.M., VAN DER FELS-KLERX, H.J., and LUNING, P.A. 2017. Assessment of food fraud vulnerability in the spices chain: An explorative study, *Food Control* 81: 80-87. <http://dx.doi.org/10.1016/j.foodcont.2017.05.019>.
- SHEARS, P. 2010. Food Fraud – A Current Issue but an Old Problem, *British Food Journal* 112(2): 198-213. <https://doi.org/10.1108/00070701011018879>.
- SKORUPKA, J. 2017. Rules of criminal trial, [in:] *Criminal trial*, ed. D. GRUSZECKA, K. KREMENS, K. NOWICKI, and J. SKORUPKA. Warsaw: Wolters Kluwer SA.
- SPINK, J., ORTRGA, D.L., CHEN, Ch., and WU, F. 2017. Food fraud prevention shifts the food risk focus to vulnerability, *Trends in Food Science & Technology* 62: 215-220. <http://dx.doi.org/10.1016/j.tifs.2017.02.012>.
- SPINK, J. and MOYER, D.C. 2011. Defining the Public Health Threat of Food Fraud, *Journal of Food Science* 76(9): 157-163. <http://dx.doi.org/10.1111/j.1750-3841.2011.02417.x>.
- SPINK, J. and MOYER, D.C. 2013. Understanding and Combating Food Fraud, *Food Technology magazine* 67(1): 30-35.
- SPINK, J., MOYER, D.C. and SPEIER-PERO, C. 2016. Introducing the Food Fraud Initial Screening model (FFIS), *Food Control* 69: 306-314. <https://doi.org/10.1016/j.foodcont.2016.03.016>.
- The Act on Commercial Quality of Agricultural and Food Products as of December 21, 2000 (Dz.U. 2000 No 5 Item 44, as amended).
- The Act on the Liability of Collective Entities for Acts Prohibited Under Penalty as of October 28, 2002 (Dz.U. 2002 No 197 Item 1661, as amended).
- The Act on the Safety of Food and Nutrition as of August 25, 2006 (Dz.U. 2006 No 171 Item 1225, as amended).

The Criminal Code as of June 6, 1997 (Dz.U. 1997 No 88 Item 553, as amended)

VAN DER MEULEN, S., BOIN, G., BOUSOLA, I., CONTE-SALINAS, N., PAGANIZZA, V., MONTANARI, F., FUENTES, V.R., and VAN DER MEULEN, B. 2015. Fighting Food Fraud. Horsemeat Scandal; Use of Recalls in Enforcement throughout the EU, *European Food & Feed Law Review* 1: 2-13.

WARYLEWSKI J. 2015. *Criminal Law General Part*. Warsaw: Wolters Kluwer SA.
www.ijhars.gov.pl [Accessed 2018, February 6].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Factors influencing the early retirement decision-making process

Aneta Krejčová¹ and Pavel Žiaran²

¹Department of Economics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: xkrejco7@mendelu.cz

²Department of Economics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: pavel.ziaran@mendelu.cz

Abstract

The focus of this research is on the Czech older workers and the factors that influence them while choosing the retirement. The aim is to compare the older workers who are looking for the early retirement and who are not, and find out the differences of these two groups with the focus on their psychological and physiological aspects, educational background and financial situation. The analyses are based on the secondary data obtained from SHARE database.

The question asked in this research is what are the factors that have an impact on the decision-making process while considering the early retirement. The two groups of the Czech older workers (in total N=850) are exposed to factors (life satisfaction, self-perceived health, job satisfaction, etc.) and compared to each other. The significant variables have been determined by using the logit model and for the comparison has been used nonparametric statistical tests. The evaluation of the findings was done by testing for significant differences. Results have shown that there are differences between observed groups, especially for factors connected to health, life satisfaction, and education.

Keywords: early retirement, the elderly, seniors, EU SHARE, older workers

JEL Code: J26, J28, J14

1. Introduction

Our population is aging. It is a fact on which countries have to count. Therefore, it is crucial for countries to identify the factors which influence older workers while considering the early retirement. There is no doubt that their decision can have an impact on several things, e.g. the state budget of pension system if the policies are not set down properly. At the same time, there are advantages, but also disadvantages for older workers who do decide for the early retirement. Among the drawbacks for the early retiree belong finan-

cial problems and psychological problems (Paul & Townsend, 1992). Some benefits that offer the early retirement are the possibility of better health, time for travel, the opportunity to start a new career (Daugherty, 2017).

The importance of the early retirement decision-making process caught our attention and that's why this paper concentrates on the individual factors influencing the early retirement behavior.

2. Literature Review

2.1. The Early Retirement in Time

Decades ago the early retirement was encouraged by public policies. The reason was a high youth unemployment rate in most of the countries around the world. During the 90s and 80s was developed many early retirement schemes. In the 1990s was the early retirement tendency questioned because of its influence on the budget of pension systems. The practice of the early retirement scheme, however, stayed common for many years after the 90s (Heuvel, 2006).

Early retirement nowadays is considered as an undesirable threat to sustainable pension systems. The problem of most of the countries (esp. European countries) is persistent high unemployment rate of older workers, which is related to the demographic situation in these countries. Therefore, European Union stresses the importance of active aging and delaying retirement.

2.2. The Factors of Early Retirement

There are a lot of factors having an impact on early retirement decision. Beehr (1986) divides these factors into two groups. The first group includes all the factors connected to the personality of a senior, therefore, they are named as personal factors. Another group of factors is called environment factors.

The personal factors are represented by Type A behavior, skill obsolescence, health and economic well-being (Paul & Townsend, 1992). Type A behavior is based on Andrew Goldsmith's Theory, which describes Type A personality as a person who sets high goals, works at a maximum pace, does not like to waste time, practice multitasking and is very competitive and under a permanent stress (Tirado, 2012).

Skill obsolescence appears when a person feels like its skills are out of date (CEDEFOP, 2012). Kaufman (1974) defines skill obsolescence as 'degree to which professionals lack the up-to-date knowledge or skills necessary to maintain effective performance in their current or future work roles'. According to the European Centre for the Development of Vocational Training (CEDEFOP), the skill obsolescence can be divided into two main types (2011). The first type is a physical skill obsolescence and the second type is economic skill obsolescence, the skills which used to be required at work are no longer important (CEDEFOP, 2010).

Paul and Townsend (1992) stated that health conditions can be considered as a good predictor variable of early retirement. Leinonen et al. (2016) state that people who evaluate their health as bad are in all probability to retire sooner.

The last factor included in the personal factor is economic well-being. In accordance with the Italian National Institute of Statistics (2017), there are variables that assistance to measure economic well-being such as income, wealth, expenditures, housing situation.

The second group Environment factors include the realization of job-related goals, desired family state, leisure activities.

3. Methodology and Data

Data used in this paper are from an interdisciplinary and an international panel database SHARE which stands for Survey of Health, Ageing and Retirement in Europe. The data are for free along with brochures and all documentation.

The first wave is dated back to 2004. The main aim is to get insights on the aging of people over 50 years old. The questionnaire is inspired by the US Health and Retirement Study (HRS) and the English Longitudinal Study of Ageing (ELSA). The advantage of the similarities among the mentioned surveys is the possibility of comparison by using the so-called harmonized SHARE available at <https://g2aging.org>.

The database consists of micro data that include the health condition of respondents, socioeconomic status and social life and family structure. Thanks to this can be described the aging process quite in detail.

The Czech Republic has participated in this survey since 2007 (Wave 2). This paper is based on Wave 6 done primarily in 2015. The number of Czech respondents' partners of this wave is 4858 which makes 0.12 % of the Czech people older than 50 years (ČSÚ, 2017). For the work with data is used statistical program IBM SPSS Statistics. The respondents younger than 50 years (e.g., some partners) and those who did not respond, did not know how to respond or refused to respond to a variable Current job (ep005_) were eliminated from the analysis (n=876). Regarding the other variables, the analysis composed of missing values and 'do not know' responses. The final sample after removing the non-responses was 876 respondents. The paper uses variables from different modules which are merged according to respondents' ID code.

The sample used here is selected by the variable called Current Job (ep005_) and the respondents who are employed or self-employed are included in the analyses. The variable Look for early retirement is recoded into a binary categorical variable where responses 'yes' is coded as 0 and response 'no' is coded as 1. Respondents are grouped into two groups according to gender. The two groups are then compared to each other by using the nonparametric tests.

3.1. Variable Description

The used variables are described in Table 1. The variables were chosen according to the factors mentioned above. The first part of the table contains variables which are significant in the logit model. The second part of the table includes the variables which are not significant but are used.

Table 1: Significant Factors in Logit Model

| Significant Factors | Measure | Name in SHARE |
|-----------------------------|--|---------------|
| Satisfied with the job | Scale: 1 "Strongly agree"; 4 "strongly disagree" | ep026_ |
| Number of chronic diseases | Scale: 0 "none" | chronic_mod |
| Household income per member | Scale | computed |

| | | |
|---|---|----------|
| Depression scale | Scale: 0 “Not depressed”; 12 “Very depressed” | eurod |
| Level of Education | Scale: see Table 2 | computed |
| Current job requires using a computer | Scale: 1 “Yes”; 5 “No” | it001_ |
| (Main) job physically de- manding | Scale: 1 “Strongly agree”; 4 “strongly disagree” | ep027_ |
| Feel left out of things | Scale: 1 “Often”; 4 “Never” | ac016_ |
| Self-perceived health | Scale: 1 “Excellent”; 5 “Poor” | sphus |
| Total hours worked per week (main) job | Scale | ep013_ |
| Sports or activities that are vigorous | Scale: 1 “More than once a week”; 4 “Hardly ever, or never” | br015_ |
| Quality of life and well-be- ing index | Scale | casp |

Source: Variables from Börsch-Supan (2017)

The original model was also composed of following variables: Employee or a self-employed in (main) job; Term of (main) job; Is household able to make ends meet; Kind of industry working in; Little freedom to decide how I do my work in (main) job; Salary or earnings are adequate in (main) job; Satisfied with activities; Time pressure due to a heavy workload in (main) job; Number of children; Poor (main) job security; Receive recognition for work in (main) job; Mobility index (high: has difficulties); Do the things you want to do; Use of internet in past 7 days; How satisfied with life; Poor prospects for (main) job advancement; Computer skills; Receive support in difficult situations in (main) job; Opportunity to develop new skills in (main) job; Afraid health limits ability to work before regular retirement in (main) job; Gender; Partner/Spouse in Household; Activities of daily living index.

As regards the statistical significance of variables in the model, owing to the empirical importance, we leave in the model those variables with the p value of 0.1.

3.2. The Logistic Regression Model

A logit model is used when the response has one of only two possible values. Logit models are based on binomial distribution Y_i , which can be written:

$$Y_i \sim B(n_i, \pi_i) \quad (1)$$

with number of observations n_i and probability π_i .

3.3. Recoding of the Variable Education

International Standard Classification of Education 1997 (ISCED 97) is recoded according to categories used in the Czech Republic (see Table 2). This recoding is similar to the ones used by researchers and is relevant.

Table 2: Recoded ISCED 97

| ISCED CODE | Education level | Czech education level |
|------------|--|-----------------------|
| ISCED 0 | Pre-primary level of education | Lower education |
| ISCED 1 | Primary level of education | Lower education |
| ISCED 2 | Lower secondary level of education | Lower education |
| ISCED 3 | Upper secondary level of education | High school education |
| ISCED 4 | Post-secondary, non-tertiary education | High school education |
| ISCED 5 | First stage of tertiary education | University degree |
| ISCED 6 | Second stage of tertiary education | University degree |

Source: authors' recoding, variables from Börsch-Supan (2017)

4. Results

This section consists of the logit model, which is used to find out the important factors of the early retirement decision-making process, and the comparison of two groups of respondents and their factors early retirement.

4.1. Logit Model

The table below shows the factors which are significant according to the logit model in the early retirement decision-making process. The variable Look for early retirement is used as the dependent variable. The variables included in the table are independent variables. The Nagelkerke R-squared is for this model 74,4 %.

Table 2: Logit model, dependent variable Looking for early retirement. Parameters of the Model: Nagelkerke R²= 74,4 %, Correct prediction: 88,6 %

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|--|--------|------|------|----|------|--------|
| Constant | -16.21 | 8.23 | 3.88 | 1 | 0,05 | 0.00 |
| <i>Variables significant</i> | | | | | | |
| 1 Satisfied with the (main) job | -4.72 | 1.51 | 9.82 | 1 | 0.00 | 0.01 |
| 2 Number of chronic diseases | -1.77 | 0.81 | 4.73 | 1 | 0.03 | 0.17 |
| 3 Household income per member | 0.00 | 0.00 | 3.14 | 1 | 0.08 | 1.00 |
| 4 Total hours worked per week (main) job | 0.10 | 0.06 | 3.35 | 1 | 0,07 | 1.11 |
| 5 Current job requires using a computer | 0.56 | 0.31 | 3.18 | 1 | 0.08 | 1.75 |

| | | | | | | | |
|-----------------------------|--|-------|------|------|---|------|-------|
| 6 | Depression scale | 0.65 | 0.28 | 5.38 | 1 | 0.02 | 1.92 |
| 7 | Self-perceived health | 1.44 | 0.82 | 3.08 | 1 | 0.08 | 4.22 |
| 8 | Job physically demanding | 2.24 | 0.90 | 6.27 | 1 | 0.01 | 9.43 |
| 9 | Feel left out of things | 2.75 | 0.98 | 7.84 | 1 | 0.00 | 15.63 |
| 10 | Level of education | 2.97 | 1.27 | 5.50 | 1 | 0.02 | 19.51 |
| <i>Acceptable variables</i> | | | | | | | |
| 11 | Sports or activities that are vigorous | 0.69 | 0.45 | 2.32 | 1 | 0,13 | 1.99 |
| 12 | Quality of life and well-being index | -0.11 | 0.08 | 2.18 | 1 | 0,14 | 0.90 |

Source: authors' calculations, data from Börsch-Supan (2017)

The results of the logit model show, that the more the seniors are unsatisfied with their job the more likely they choose to retire earlier. Same relation has the dependent variable with the variable chronic disease. The household income per member is included in the model, but the influence of this variable is very low. The more hours older workers work the lower probability of early retirement. The impact of variable Current job requires using computer has the same relationship as the previous variable. Depression of this sample is in general low, therefore, the relation between this variable is the more depressed workers are the more likely they stay at work longer. Similarly, the healthier the employees feel, the more likely they are to stay at work longer. The higher values of variables Job physically demanding, feel left out of things and level of education the lower likelihood of retiring earlier.

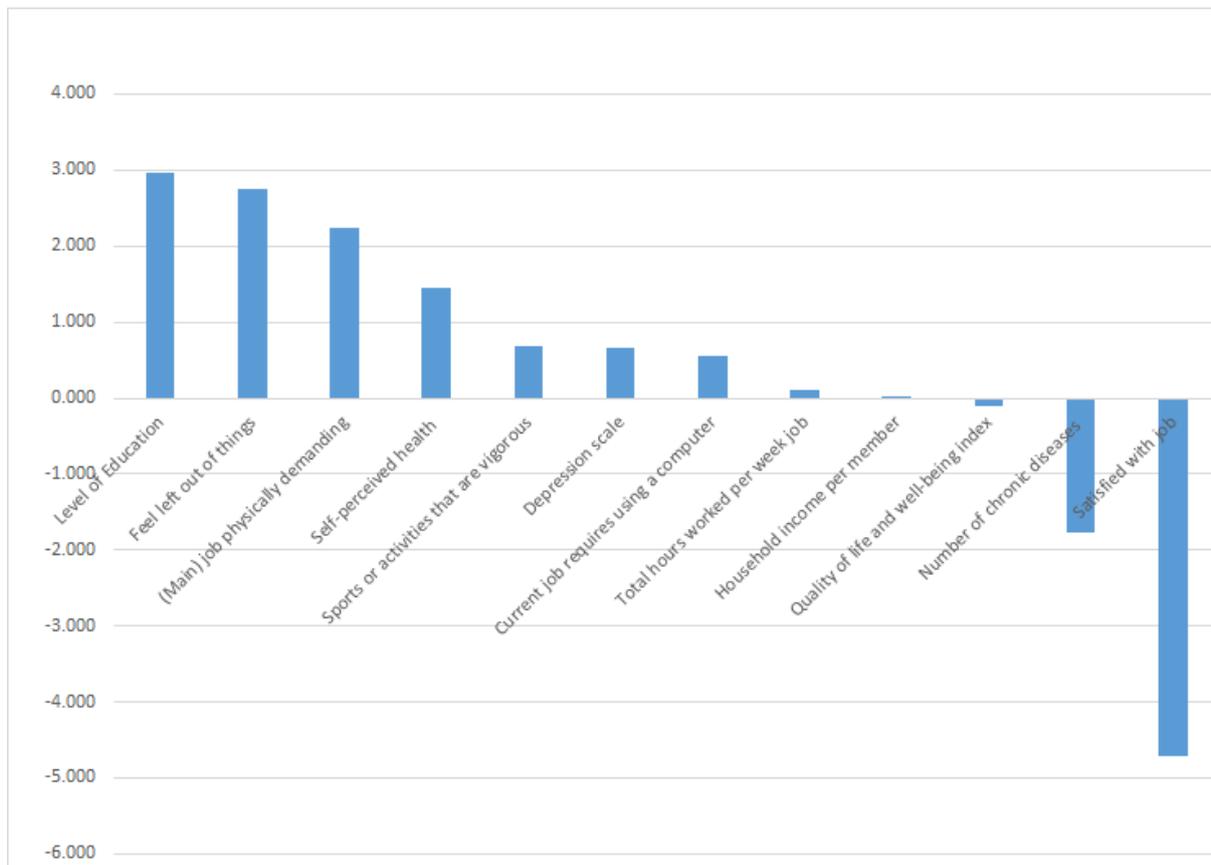


Figure 1: Significant factors with their regression coefficients of the logit model (dependent variable Looking for early retirement)

Source: authors' calculations, data from Börsch-Supan (2017)

4.2. Factors Influencing Early Retirement

The factors were also used to compare two groups of respondents. Groups were grouped according to gender. The groups were compared by using nonparametric test (Independent-Samples Mann-Whitney U Test). The results are shown in the following Table.

Table 3: Independent-Samples Mann-Whitney U Test; Categories: female and male

| | Null Hypothesis (H_0) | Sig. | Decision |
|---|---|--------|------------------|
| 1 | The distribution of Quality of life and well-being index is the same across categories of gender. | 322.00 | Retain the H_0 |
| 2 | The distribution of Satisfied with job is the same across categories of gender. | 553.00 | Retain the H_0 |
| 3 | The distribution of Self-perceived health is the same across categories of gender. | 1.00 | Reject the H_0 |
| 4 | The distribution of Number of chronic diseases is the same across categories of gender. | 16.00 | Reject the H_0 |

| | | | |
|----|---|--------|------------------|
| 5 | The distribution of Household income per member is the same across categories of gender. | 702.00 | Retain the H_0 |
| 6 | The distribution of Current job requires using a computer is the same across categories of gender. | 3.00 | Reject the H_0 |
| 7 | The distribution of Depression is the same across categories of gender. | 0.00 | Reject the H_0 |
| 8 | The distribution of Job physically demanding is the same across categories of gender. | 0.00 | Reject the H_0 |
| 9 | The distribution of Feel left out of things is the same across categories of gender. | 420.00 | Retain the H_0 |
| 10 | The distribution of Education level is the same across categories of gender. | 71.00 | Retain the H_0 |
| 11 | The distribution of Sports or activities that are vigorous is the same across categories of gender. | 0.00 | Reject the H_0 |
| 12 | The distribution of Total hours worked per week job is the same across categories of gender. | 0.00 | Reject the H_0 |

Source: authors' calculations, data from Börsch-Supan (2017)

The variables Quality of life and well-being index, Satisfied with the (main) job, Household income per member, Feel left out of things and Level of education have the same distribution across categories of gender. It means there is no significant difference between men and women. The difference was found in the following factors: Self-perceived health, Number of chronic diseases, Current job requires using a computer, Depression scale, Job physically demanding, Sports and activities that are vigorous, Total hours worked per week.

5. Discussion and Conclusions

This paper explores the factors which have an impact on early retirement decision-making process. According to other researches, the factors are divided into two groups: personal factors and environment factors. Based on this, we chose variables and analyzed them. The data used in this paper are from SHARE database. The sample consists of responses collected in Wave 6. The analysis is made for the Czech Republic data.

We have found ten factors which are significant in the logit model. Among these factors belong Satisfaction with the (main) job, Number of chronic diseases, Household income per member, Total hours worked per week (main) job, Requirement of a use of PCs at work, Depression level, Self-perceived health, Physical demand of job, Feelings of being left out of things and Level of education. The results of this research can be used by the policy makers and companies to avoid early retirement.

We are aware of a size of our sample, which is not large. There, we see the possibility of better explanatory power in the future. The problem is, that the number of respondents that are economically active has a decreasing tendency in the SHARE database. Therefore, the previous waves could be analyzed and compared with each other. The observation of the found factors across waves could be also suitable for analysis.

Another comparison could be with other countries and their steps to prevent older workers retire earlier. In consonance with other researches on this subject, the factors differ across countries within the European Union.

References

- BEEHR, T.A. (1986). The process of retirement: A review and recommendations for future investigation. *Personnel Psychology*, 39, 31–55.
- BÖRSCH-SUPAN, A. (2017). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w6.600
- BÖRSCH-SUPAN, A., S. GRUBER, C. HUNKLER, S. STUCK, J. NEUMANN (2017). easySHARE. Release version: 6.0.0. SHARE-ERIC. Data set DOI: 10.6103/SHARE.easy.600
- CEDEFOP. *Preventing skill obsolescence*. Luxembourg: Publications Office of the European Union, 2012. ISSN 1831–2411.
- CEDEFOP. *Skill mismatch in Europe*. Luxembourg: Publications Office of the European Union, 2010. ISSN 1831–2411.
- CEDEFOP. *Working and ageing: guidance and counselling for mature learners*. Luxembourg: Publications Office of the European Union, 2011. ISBN 9789289608510.
- ČSÚ. Czech Demographic Handbook. *Czech Statistical Office* [online]. Prague, 2017 [cit. 2018-02-25]. Available at: <https://www.czso.cz/csu/czso/czech-demographic-handbook-2016#>
- DAUGHERTY |, Greg. The Pros and (Mostly) Cons of Early Retirement. Investopedia [online]. New York: IAC Publishing, 2017 [cit. 2018-02-25]. Available at: <https://www.investopedia.com/articles/personal-finance/073114/pros-and-mostly-cons-early-retirement.asp>
- HEUVEL, Nick van de. Active ageing: early retirement and employability : special issue. Brussels: VIONA Stuurgroep Strategisch Arbeidsmarktonderzoek, 2006. ISBN 9789044119664.
- ISTAT. Economic well-being. Italian National Institute of Statistics [online]. Rome, 2017 [cit. 2018-02-25]. Available at: <https://www.istat.it/en/well-being-and-sustainability/well-being-measures/12-dimensions-of-well-being/economic-well-being>.
- KAUFMAN, H.G. (1974). *Obsolescence and professional career development*. New York: Amacom.

LEINONEN, Taina, Mikko LAAKSONEN, Tarani CHANDOLA a Pekka MARTIKAINEN.

Health as a predictor of early retirement before and after introduction of a flexible statutory pension age in Finland. *Social Science & Medicine* [online]. 2016, 158, 149–157 [cit. 2018-02-13]. DOI: 10.1016/j.socscimed.2016.04.029. ISSN 02779536. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0277953616302039>.

PAUL, RJ; TOWNSEND, JB. Some pros and cons of early retirement. *Review of Business*. 14, 1, 43, 1992. ISSN: 00346454.

TIRADO, Bernardo. Working With a Type A Personality. *Psychology Today* [online]. New York [cit. 2018-02-19]. Available at: <https://www.psychologytoday.com/blog/digital-leaders/201201/working-type-personality>.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Phenomenon of Conscious Business – Which is Ahead – Practice or Academia? A Literature Review.

Jaroslava Kubátová¹

*¹Department of Applied Economics, Faculty of Arts, Palacký University Olomouc,
Křížkovského 12, 771 80 Olomouc, Czech Republic, e-mail: jaroslava.kubatova@upol.cz*

Abstract

In January 2018 The Conscious Business World Summit was held. About 5.000 participants took part personally or online. This event proves that many people have started thinking about business in a new way which is called conscious business. It is not only entrepreneurs but also customers, business partners and other stakeholders who have been asking questions about the purpose of business and its role in the society. The shift is strong but different in different parts of the world. And to our knowledge, there is no systematic reflection of this development in academic and scientific literature. Thus the main goal of this paper is to provide an overview of the current literature on the topic of conscious business and to start description and analysis of the current development of conscious business, its roots, and reflection in the literature. The outcome is a summary of important publications on the topic of conscious business. We focus on academic literature as well as on non-academic literature, i.e. sources written by business practitioners and we ask which is ahead – practice or academia? The purpose of the paper is to start systematic research into the phenomenon of conscious business and to spread it not only among researchers but also among business students who are to become future business leaders.

Keywords: conscious business, conscious capitalism, conscious company, conscious leadership

JEL Code: A13

1. Introduction

Many questions and doubts have recently emerged about major institutions in society including businesses. For different reasons businesses are seen as a source of societal problems. At the same time, some businesses and their leaders, as well as employees, customers, and other stakeholders have started thinking about business in a new way, which is called conscious business or conscious capitalism.

Conscious business is a still-evolving and from the academic point of view not well-defined term. In general it refers to business practices intended to make the world a better place. Profit is also important for conscious businesses but it is neither their main nor only purpose. Even though researchers have not provided a generally accepted definition and theory of conscious business yet, there are publications which are being successfully spreading the concept. Many companies have started following the principles of conscious business quite quickly (Sisodia, Sheth and Wolfe, 2014) – Ikea, Patagonia, LinkedIn, Amazon, Starbucks or Toyota to mention at least a few.

2. Methodology

The main goal of this paper is to provide an overview of the current literature on the topic of conscious business. Web of Science, EBSCOhost, and Scopus were chosen for the literature search. These databases were chosen due to their status as the most comprehensive databases in social sciences. Google Scholar has been chosen as an important supplement. Even though it is not considered as a fully reliable scientific source, it contains titles which are not indexed in the previous three databases but can be very influential. The second goal of the paper is to compare the search results and to answer the question: Which is ahead – practice or academia?

The term conscious business is widely used; however, another very close term – conscious capitalism – is often used too. Sometimes they are used in the same text (see for example Mackey and Sisodia, 2014) without clarification if they are synonyms or not. In this research both terms conscious business and conscious capitalism are used as key phrases. As already mentioned above, the terms are used without being clearly defined and distinguished. However, the term conscious capitalism is already an officially registered trademark in the U.S.A. As a result, when searching for conscious business, the search results contain sources with the term conscious capitalism and vice versa. We searched for English written sources as English is a common scientific language. And we searched for publications from 2005 to 2017. We aim to current literature and in 2005 Aburdene published the *Megatrends 2010: The Rise of Conscious Capitalism*. The book was a bestseller and considerably contributed to the popularization of the concept. The search criteria are summarized in table 1.

Table 1: Search criteria

| | |
|-------------------|--|
| Databases | Web of Science, EBSCOhost, Scopus, Google Scholar |
| Key phrase | Conscious business, conscious capitalism (topic, title, key words) |
| Language | English |
| Publication years | 2005–2017 |
| Search conducted | January 15–19, 2018 |

Source: author

3. Search results and their analyses

In this part of the paper the search results and their analyses are provided. The above-described search methodology was applied. EBSCOhost, Scopus and Web of Science have similar even though not identical search tools, whereas Google Scholar is different and

also the numbers of search results are not comparable. For this reason we first present the results from EBSCOhost, Scopus and Web of Science and their analysis and then the results and analysis from Google Scholar.

3.1. EBSCOhost, Scopus, Web of Science

The search results (in numbers) from EBSCOhost, Scopus and Web of Science are shown in table 2. WoS is used as an abbreviation for Web of Science. In the columns entitled CB the results for the phrase conscious business are shown, and in the columns entitled CC the results for the phrase conscious capitalism are shown.

Table 2: EBSCOhost, Scopus, and WoS search results

| Database | EBSCOhost | | Scopus | | WoS | |
|--------------------|-----------|----|--------|----|-----|----|
| | CB | CC | CB | CC | CB | CC |
| Key phrase | | | | | | |
| No. of results | 4 | 3 | 27 | 30 | 15 | 13 |
| – Article | 4 | 3 | 15 | 17 | 7 | 8 |
| – Book | – | – | – | – | – | 1 |
| – Book chapter | – | – | 2 | 3 | 2 | 2 |
| – Conference paper | – | – | 10 | 1 | 6 | 2 |

Source: author

3.1.1. Results analysis

The databases EBSCOhost, Scopus, and Web of Science are widely recognized research databases. The numbers of search results in any of them did not exceed thirty. For the phrase conscious business EBSCOhost found four academic articles. Two of them deal with greener production, one with software piracy and one with the need for social for-profit entity legislation. For the phrase conscious capitalism EBSCOhost found three articles. Two of them deal with the philosophy of conscious capitalism and one with the problem of racism in urban education.

Scopus returned the highest numbers of results for both phrases conscious business (27) and conscious capitalism (30). Eleven results for conscious business deal with ecological and green topics, whereas only two deal with the concept of consciousness in business. On the other hand 14 results for the phrase conscious capitalism deal with the phenomenon. But seven of them are from the same journal – California Management Review 2011, 53(3). Moreover, five of them are responses to another article published in the same journal. Based on what criteria the articles for this journal are chosen remains a question.

The results for the key phrase conscious business in Web of Science are also mainly eco and green oriented. Only one journal article deals with the perspective of conscious business in organizations. On the other hand, the results for the phrase conscious capitalism are works which deal with the phenomenon in a broader and more general way.

There are several limitations of the search results and its comparison. The databases contain different sources. Some of them are the same, some of them are different. Thus some of the search results in the particular databases are also the same and some are different. Every database has slightly different search tools. The numbers of the search results are quite small. Moreover, too often, particularly when searching for conscious business, the results are publications dealing only with social and environmental responsibility which can be confusing for researchers who would just have been starting in the field of conscious business. But on the other hand, it perfectly reflects present confusion

and the necessity to clarify the difference between conscious business and corporate social responsibility. And it is also important to mention, that the access to the databases is subject to a subscription.

3.2. Google Scholar

Unlike the three above mentioned databases, Google Scholar is a public bibliographic database of scholarly literature. Even though it has also many limitations (Walters, 2009) nowadays it has been considered a relevant database for academic research (Engert, Rauter and Baumgartner, 2016). However, the search results from Google Scholar are not well comparable with the results from the three previous databases. When using the same search criteria, Google Scholar returns 2.320 results for the phrase conscious business and 1.690 for conscious capitalism. Google Scholar does not offer a tool to determine how many among them are books, academic articles, etc. But Google Scholar can rank the results based on their relevance. Google Scholar uses a combined ranking algorithm (Beel and Gipp, 2009) weighting the full text, the author, the publication or the number of citations. For the purpose of this paper only five most relevant results for both key phrases are presented. The results for the phrase conscious business are shown in table 3. A short annotation and a critical note accompany every search result.

Table 3: Google Scholar search results – Conscious business

| Key phrase | Conscious business | |
|--|--|---|
| Result | Short annotation | Note |
| 1. Kofman, F. 2006. Conscious business: How to build value through values. | Kofman explains that when doing business we need to ponder the most fundamental questions pertaining to human existence and let the insights guide our business choices. He also suggests ways how to do so. | Kofman is a strong proponent of conscious business. On his initiative, Conscious Business Academy offering free online courses was established within LinkedIn. |
| 2. Sisodia, R.S. 2009. Doing business in the age of conscious capitalism. | The paper describes how the context for business has changed fundamentally in the past two decades, calling for a new approach to business that reflects rising levels of consciousness of all stakeholders. | Sisodia is an important promoter of conscious business/capitalism. He is a founder of Conscious Capitalism, Inc. |
| 3. Mackey, J. and Sisodia, R.S. 2013. Conscious capitalism: Liberating the heroic spirit of business. | The authors explain the features and benefits of conscious capitalism and give concrete examples of successful conscious businesses. | The book is a typical example when the terms conscious business and conscious capitalism are used interchangeably. |
| 4. Zappalà, G. 2010. Beyond corporate responsibility: The spiritual turn and the rise of conscious business. | It is a crucial report explaining why the current society is turning towards spirituality and consciousness including conscious business. | This result was ranked high in Google Scholar. Only when reading it, it turns out it is the third from three follow-up research reports. |

| | | |
|--|---|---|
| 5. Yüksel, H., 2008. An empirical evaluation of cleaner production practices in Turkey. <i>Journal of Cleaner Production</i> , 16(1), pp. 50-57. | The main purpose of the article is to investigate cleaner production practices in Turkey. It deals with environmentally conscious business. | The article was ranked high in Google Scholar. However, environmental consciousness is a very small part of conscious business. |
|--|---|---|

Source: author

The search results for the phrase conscious capitalism are shown in table 4. Again, a short annotation and a critical note accompany every search result.

Table 4: Google Scholar search results – Conscious capitalism

| Key phrase | Conscious capitalism | |
|---|---|--|
| | Result | Note |
| 1. Mackey, J. Sisodia, R.S. 2013. <i>Conscious capitalism: Liberating the heroic spirit of business</i> . | See table 3, No. 3 | Ditto |
| 2. Buras, K. 2011. Race, charter schools, and conscious capitalism: On the spatial politics of whiteness as property (and the unconscionable assault on black New Orleans). | An often cited article criticizing inequitable distribution of resources by policy actors under the banner of conscious capitalism. | An example of the risk of a misuse of the phenomenon of conscious capitalism. |
| 3. Fyke, J. P. and Buzanell, P. M. 2013. <i>The ethics of conscious capitalism: Wicked problems in leading change and changing leaders</i> . | The authors prove the benefits of conscious leadership and conscious capitalism training and point out some problems at the same time. | A very practical study based on which is shown how beneficial – although not a panacea – conscious capitalism can be. |
| 4. Aburdene, P. 2005. <i>Megatrends 2010: The Rise of Conscious Capitalism</i> . | In this book the author presents the rise of conscious capitalism as an important megatrend of the first decade of 21 st century. | The book was a bestseller and the term conscious capitalism was widely spread thanks to it. It has been often cited till nowadays. |
| 5. Schwerin, D. A. 2011. <i>Conscious capitalism. Principles for Prosperity</i> . | The author wrote the book after 30 years of business practice. He states that business has to reflect the interdependence of life and the importance of harmonious relationships. | The book was first published in 1998 in Butterworth-Heinemann, Boston. (Václav Havel is cited in the book.) |

Source: author

3.2.1. Results analysis

Google Scholar found a hundred times more results for the key search phrases than EBSCOhost, Scopus or Web of Science. Among five most relevant results for conscious business there are two books. The author of the most relevant book Fred Kofman is a business practitioner, currently a vice president at LinkedIn. He as well as LinkedIn does a lot to foster the practice of conscious business, for example they offer free online conscious business lectures.

Rajendra S. Sisodia is an academician; however, he cooperates strongly with business managers, particularly with John Mackey, the founder of Whole Foods. Their book was published first in 2013 and again with a new preface in 2014. This book was a result for both the search phrases, which proves that the terms conscious business and conscious capitalism are very close each other.

From an academic point of view, it is very important that the study by Gianni Zappalà appears as a highly relevant search result. In this study and in its two previous studies a broad spiritual context of the changing business paradigm is explained. The fifth article deals with a particular part of conscious business – clean production. Unlike the first four search results, this one was found also in EBSCOhost and Web of Science.

Among five most relevant results for conscious capitalism there are three books. The first result was already commented above. The second result, an article, was found also in EBSCOhost and Scopus. And the third result, also an article, was found also in Scopus. Both of them deal with certain problems of conscious capitalism, thus are a very good supplement to the books which presents the phenomenon mainly in a positive way. The book by Patricia Aburdene (2005) plays an important role in the development of the ideas of consciousness in business and it is good to see Google Scholar ranked it among the most relevant sources. The fifth result, the book by David A. Schwerin (2011), shows that the term conscious capitalism was used in a book title already in 1998 when this book was first published. In the book David A. Schwerin argues that in the 21st century the businesses will evolve spiritually to become conscious companies. The book was published again in Routledge in 2011 when the forecast has been already an emerging reality. Comparing the practice of conscious business and the search results which are supposed to reflect the reality, Google Scholar provides much more relevant results.

4. Other important thematic literature

The intention to conduct the literature review came after some deeper study of the phenomenon of conscious business. In this part of the paper other sources which were not found in EBSCOhost, Scopus, and Web of Science or were ranked lower in Google Scholar are briefly mentioned. These sources were found by the author when conducting the research. Alongside Google Scholar, Amazon (Books and Kindle) were used for the search. Using Amazon is not a typical academic search. The same search phrases and criteria were used for the search. The advantage of this search strategy is that also sources which relate to the topic but do not have the exact phrase in their title or keywords are offered.

The phenomenon of conscious business or conscious capitalism is mainly connected to the U.S.A. However, in 2017 a book *Conscious Business in Germany* (Stahlhofer, Schmidkonz and Kraft, 2017) was published. In this book the concept of conscious business is shortly introduced and several cases of German conscious companies are presented.

Conscious business (or conscious capitalism) is closely linked to conscious leadership. Without using literally these terms Whatley (2017) asks very serious questions and claims leaders to create so called islands of sanity. According to her “a culture focused on individual freedom can only result in narcissism, polarization, conflict, estrangement, and loneliness. What is the meaning of life when it is all about me?” she asks (Wheatley, 2017, p.69). On the other hand, Benett, Reilly, Gobhaiand and Welch (2009) focus on the role of the consumer. They point out that particularly consumers do not want to partner with profit-only oriented antisocial companies. Even though the book is focused mainly on corporate branding it advises to rethink the role of the corporation in the society.

Other sources are important to understand the broader philosophical and societal context of the business paradigm change. According to Gupta (2017), the social, economic, and cultural unrest and chaos that we are witnessing today is a living example of economics growing without corresponding growth in human consciousness. The process of consciousness shift can be described as a journey from I – Me – My approach to We – Us – Ours approach to life. The popularity of conscious business is related to an increasing interest in spirituality in the current society. As Kourie (2007) argues, humanity is witnessing a deeper longing for unity and understanding. Interest in spirituality is an indication of a deep-felt desire within the hearts of people to find unity and wholeness, both individually and in society. Pavlovich and Corner (2014) provide the evidence of the change. They found that spiritual practices increase conscious awareness which, in turn, shapes entrepreneurial intentions and venture characteristics focused on shared value.

In response to the growing interest in spirituality Bouckaert and Zsolnai (2011) published Handbook of spirituality and Business. They argue that the transition from a market-driven capitalist economy towards a values-driven post-capitalist economy is linked to a new interest in spirituality as the art of managing the non-material resources of humankind. However, spirituality remains a vague and confusing concept that needs clarification and they try to provide it.

Last but not least the title Firms of Endearment (Sisodia, Wolfe and Sheth, 2007; 2nd ed. 2014) has to be mentioned. The authors show on concrete examples that conscious approach towards business pays off even in terms of profit. Conscious businesses have to operate in the current financial system. To be sustainable and able to develop themselves also conscious companies have to be profitable. But the way of profit making and the way the profit is used is specific to them.

5. Discussion and Conclusions

The main goal of this paper was to provide an overview of the current literature on the topic of conscious business. Based on the results it is apparent that academia should pay more attention to the topic and to start academic research in the field. Conscious business has been a growing phenomenon, however, its reflection in academic literature has been quite modest so far. Our results presented in this paper have several limitations and each of them represents an area for further research.

The first limitation of the results is the non-existing definition of conscious business. Conscious capitalism is also often used to describe current changes in business. For this reason, we used both the terms as key search phrases. The second limitation is that not every relevant source uses at least one of these phrases in its title, keywords or even in the full text. For conducting a systematic literature review as a next step of the research, more search key phrases have to be used. The third limitation of the results is the time

span of the search (2005–2017). To our knowledge when starting the research the first important publication was from 2005. However, thanks to the search in Google Scholar we found that another book on conscious capitalism was published already in 1998. And also the focus on only English written literature limits the results.

For the search itself, we used the usual academic databases EBSCOhost, Scopus, and Web of Science. Their big limitations are the sources they contain. From an academic point of view, they contain high-quality academic works. But the numbers of search results we received would suggest that conscious business or conscious capitalism are marginal phenomena. But they are not.

Google Scholar which has been slowly accepting in academia provided a much more objective reflection of the development of conscious business or conscious capitalism in literature. It returned thousands of results and the most relevant among them were books and articles used not only in academia but also popular among general public including business leaders. Some of them are written by academicians, some of them by business practitioners. However, the question “Regarding conscious business, which is ahead – practice or academia?” can be definitely answered in favor of the practice.

The literature review presented in this paper is a good basis for future research on the phenomenon of conscious business. In the further research, a definition of conscious business has to be established. Conscious business then has to be examined as a broad social phenomenon, not only as a business practice.

Acknowledgement

This work was supported by Palacky University grant IGA_2018_002 The interpenetration of Eastern and Western thinking in the global economy and management.

References

- ABURDENE, P. 2005. *Megatrends 2010: The Rise of Conscious Capitalism*. Charlottesville, VA: Hampton Roads.
- BEEL, J. and GIPP, B. 2009. Google Scholar’s ranking algorithm: the impact of citation counts (an empirical study). *Proceedings of the IEEE international conference on Research challenges in information science RCIS 2009, Fez, Morocco*, 439–446.
- BENETT, A., O’REILLY, A., GOBHAI, C. and WELCH, G. 2009. *Good for business: The rise of the conscious corporation*. New York, NY: Palgrave Macmillan.
- BOUCKAERT, L. and ZSOLNAI, L. 2011. *Handbook of Spirituality and Business*. New York, NY: Palgrave Macmillan.
- BURAS, K. 2011. Race, charter schools, and conscious capitalism: On the spatial politics of whiteness as property (and the unconscionable assault on black New Orleans). *Harvard Educational Review* 81(2): 296–330.
- ENGERT, S., RAUTER, R. and BAUMGARTNER, R.J. 2016. Exploring the integration of corporate sustainability into strategic management: a literature review. *Journal of cleaner production* 112(4): 2833–2850.

- FYKE, J.P. and BUZZANELL, P.M. 2013. The ethics of conscious capitalism: Wicked problems in leading change and changing leaders. *Human Relations* 66(12): 1619–1643.
- GUPTA, S. 2017. The 'Indian Philosophy of Consciousness' and its Relevance to 21st Century Business Management. *Philosophy of Management* 16(1): 35–54.
- KOFMAN, F. 2006. *Conscious business: How to build value through values*. Boulder, CO: Sounds True.
- KOURIE, C. 2007. The "Turn" to Spirituality. *Acta Theologica Supplementarum*, 27(2): 19–38.
- MACKEY, J., SISODIA, R.S. 2013. *Conscious Capitalism: Liberating the Heroic Spirit of Business*. Boston, MA: Harvard Business Review Press.
- MACKEY, J., SISODIA, R.S. 2014. *Conscious Capitalism: Liberating the Heroic Spirit of Business*. With a New Preface by the Authors. Boston, MA: Harvard Business Review Press.
- PAVLOVICH, K., DOYLE CORNER, P., 2014. Conscious Enterprise Emergence: Shared Value Creation Through Expanded Conscious Awareness. *Journal of Business Ethics* 121(3): 341–351.
- SCHWERIN, D.A. 1998. *Conscious capitalism. Principles for Prosperity*. Boston, MA: Butterworth_Heinemann.
- SCHWERIN, D.A. 2011. *Conscious capitalism. Principles for Prosperity*. Abingdon on Thames, GB: Routledge.
- SISODIA, R.S., SHETH, J. and WOLFE, D. 2007. *Firms of Endearment: How World-Class Companies Profit from Passion and Purpose*. Upper Saddle River, NJ: Wharton School Publishing.
- SISODIA, R.S., SHETH, J. and WOLFE, D. 2014. *Firms of Endearment: How World-Class Companies Profit from Passion and Purpose*. 2nd ed. Upper Saddle River, NJ: Pearson Education.
- SISODIA, R.S. 2009. Doing business in the age of conscious capitalism. *Journal of Indian Business Research* (1)2/3: 188–192.
- STAHLHOFER, N.J., SCHMIDKONZ, C. and Kraft, P. 2017. *Conscious Business in Germany*. Berlin, GE: Springer.
- WALTERS, W.H., 2009. Google Scholar search performance: Comparative recall and precision. *Portal: Libraries and the Academy*, 9(1), pp. 5–24.
- WHEATLEY, M.J. 2017. *Who Do We Choose to Be? Facing Reality, Claiming Leadership, Restoring Sanity*. Oakland, CA: Berrett-Koehler Publishers.
- YÜKSEL, H. 2008. An empirical evaluation of cleaner production practices in Turkey. *Journal of Cleaner Production* 16(1): 50–57.
- ZAPPALÀ, G. 2010. *Beyond corporate responsibility: The spiritual turn and the rise of conscious business*. CSI Background Paper No. 6. Sydney, AU: Centre for Social Impact.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Private and Public Instruments in Pensioners’ Income Assurance and their Legal Regulation

Libor Kyncl¹

¹Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic; Havel & Partners s.r.o., attorneys-at-law, Nové Sady 25, 602 00 Brno, Czech Republic, e-mail: libor.kyncl@mendelu.cz

Abstract

The goal of this paper has been to summarize basic legal and economic features of selected private and public instruments in income assurance for ageing persons. It will outline some options that are available in order to assure their income after retirement given the circumstances of Czech law. The paper will discuss selected saving instruments and issues of property management and connect them with interest preferences of ageing persons. It shall involve first pillar of the state pension insurance in the Czech Republic, the third pillar – supplementary pension savings scheme in private participation funds. Instruments such as building saving scheme, bank deposits, real property investments and capital market instruments will be mentioned in their basic issues.

Keywords: Pensioners’ Income Assurance, Legal Regulation, Public Social Security, Pension Management Companies, Participation Funds, State Contributions, Taxation, Property Management

JEL Code: K11, K36, H55

1. Introduction

The goal of this paper will be to summarize basic legal and economic features of selected private and public instruments in income assurance for ageing persons. It will outline some options that are available for pre-retirement persons in order to assure their income after retirement given the circumstances of Czech law. The paper will expand the existing theories regarding legal issues of property management and connect them with interest preferences of ageing persons (Rašticová et al., 2013), incl. ex-management members.

The paper will outline the selected legal and economic features (liquidity, risks, basic issues of taxation, state contribution, commutability of payment and postponing of payment, options of provider change, obligatory nature of the payment, length, limitations by retirement age) of the first pillar of the official pension system in the Czech Republic, i.e. social security insurance discussed e.g. by (Aspalter, 2009), the third pillar, i.e. supplementary pension savings scheme in participation funds (existing since 1994, reformed since 2012–2013) along with other instruments that have been aimed at different goals but are also useful for pre-pensioners in order to save money for the retirement phase of life.

2. Overview of relevant literature

This paper involves four basic areas of legal, economic and social sciences literature sources that shall be mentioned below. It will also be based on the specific legal acts that are mentioned in the Results part and thus are **not** reviewed in this overview.

2.1. Literature Regarding Ageing Society

The existing papers and book by (Rašticová et al., 2013), (Mikušová, Rašticová, 2015) and (Rašticová, Kubíčková, Bédiová and Pavlíková, 2016) introduce the theories regarding the ageing society with aging seniors as its members. There seniors also involve the ex-management members as the ageing persons, very often completely active even in their late 60s and 70s. The aforementioned articles use slightly different methodology than this article. **They establish a partial conclusion that elders are seriously threatened by poverty which proves to be a true risk for majority of world's retired persons, it has been confirmed by the international statistics (ILO, 2014).**

2.2. Economic Sources on Corporate and Household Income and on Social Security

(Sirovátka, 2005) has applied the social indicators of poverty and social exclusion for the households which face the risks of income poverty based on the Czech Republic's structure of social security benefits by the state. They have not introduced private instruments for savings into their model and stucked with the public Bismarckian system.

On the other hand, (Antoniewicz, 1996) gives the example of USA and shows that subjects are deciding on the allocation of money on the basis of their housing and life needs and their satisfaction of these needs.

A person's income may be modelled using the methods and models that have been introduced by (Hřebíček, Soukopová, Trenz, 2014). This specific paper discusses creating the model of the income side of enterprises, it directly impacts the income of the manager having the profit premium plan and also the income of the corporation owner. The enterprise somehow adjusts the manager's income according to the management contract and to the decision of shareholders. It is a decision of a manager and owner that affects the distribution of income in the corporation – the similar applies to a household.

There are existing economic resources discussing the economic statistics of the social security system in European countries, such as (Aspalter, 2009). Aspalter discusses the evolution of pension system in Czech Republic, Poland, Hungary and Slovenia in a mutual comparison with regard to Ideal-Typical Welfare Regime Theory by Weber and Hekman.

He notes that all these countries still partly follow the Bismarckian system of the social security. Also, general statistics incl. Europe are provided by (OECD, 2017).

It is important to put the central European system which is rather protective for the social benefits recipients in contrary to the international comparison. International Labour Office estimates that 48% of people worldwide which are of pensionable age do not receive any pension at all. Some of the remaining 52% receive a pension income which is not adequate. (ILO, 2014) This resources clearly demonstrates the economic range of the social issues that have been mentioned by (Rašticová et al., 2013) in chapter 2.1.

2.3. Legal Sources and Acts Regarding Social Security

Legal Sources involve the property management and individual instruments for assurance of money in the retirement phase of life, such as (Mikušová, 2015). Also, another legal aspect for securing the money in the long term is the supervision of the financial market by (Kyncl, 2015). There is also a significant discussion regarding the demands of consumers (including ageing managers) for quality foodstuffs. Some of them involve the food with clearly declared geographical origin, such as in (Kelblová, 2014).

3. Methodology and Data

The paper will outline the basic **legal and economic features (liquidity, risks, basic issues of taxation, state contribution, commutability of payment and postponing of payment, options of provider change, obligatory nature of the payment, length, limitations by retirement age)** of the **first pillar of the official pension system in the Czech Republic (social security insurance)**, analyzed by (Aspalter, 2009), **the third pillar – supplementary pension saving scheme in participation funds** (existing since 1994, reformed since 2012–2013) along with other instruments that have been aimed at different goals but are also useful for pre-pensioners in order to save money for the retirement phase of life (building savings scheme, life insurance, bank deposit).

The discussed issue are based on a more general method of household on the allocation of money between deposits, bonds, equities, fund shares, housing and other types of assets along with liabilities (mortgages and credit) by (Antoniewicz, 1996). He shows the important aspect of the household's member selection of the asset (property) which the household invest in may also involve buying household's own house that is considered to be a separated issue and shall not be involved in this article.

This article demonstrates the different methods that ageing persons could use in order to avoid existing risk of poverty in their lives, (Rašticová, 2013) although it is apparent that these methods could not obviously be applied under all circumstances (ILO, 2017).

Given these sources, the current article applies general principles of property management to ageing persons. The options of the allocation of money in this article have been modified on Czech circumstances from (Antoniewicz, 1996) and adapted to the selection of instruments for saving the money for retirement phase of life.

The methodology does not involve any quantitative comparison of the aforementioned ways how to assure the income in the process of ageing.

4. Results (Comparison of Legal Instruments)

The results are organized by the type of legal instrument which is available for the ageing person in order to secure his/her income in the retirement phase of life.

Other instruments such as building saving scheme, bank deposits, real property investments and capital market instruments will be discussed in their basic issues.

The analyzed parameters shall be:

- A) **Liquidity of the instrument,**
- B) **Risks,**
- C) **Basic issues of taxation,**
- D) **State contribution,**
- E) **Commutability of payment and postponing of payment,**
- F) **Options of provider change,**
- G) **Obligatory / facultative nature of the payment,**
- H) **Length of the payment,**
- I) **Limitations by retirement age.**

4.1. The First Pillar – Pension Insurance Paid by the State as Social Security Contribution in PAYG System and its Benefits

The first pillar, the state-operated pay-as-you-go pension insurance scheme, has been introduced with the legal effect as of 1st January 1996 in the Act no. 155/1995 Sb., on Pension Insurance as amended.

- A) According to its economic definition, liquidity of the pension insurance does not depend on the will of the entitled person – only the fulfilment of the legal conditions activates the benefits provided from the pension insurance system.
- B) There are substantial risks for migrating management members working in countries outside the European Union – art. 48 of the Treaty on the Functioning of the European Union guarantees only recognizing of the insured periods while working in the EU. There may be substantial problems with ageing persons who have worked outside the EU in the countries without a bilateral or multilateral social security treaty with the Czech Republic for substantial amount of time (and therefore).
- C) The pension insurance benefits are generally tax exempt and therefore do not affect the both pre-retirement and post-retirement property taxation. On the other hand, all pension insurance is a social security contribution, i.e. a form of payroll taxation, as it is confirmed by OECD tax levels and tax structure statistics (OECD, 2017).
- D) 100% of pension insurance benefits is de facto the state contribution provided for the in the running system (pay-as-you-go).
- E) During the phase of pension insurance payment (both before and after the retirement), the commutability of payment is not available as the specific insurance rate is stipulated by the Pension Insurance Act. Postponing of payment may be granted in the conditions according to Act on Social Security Insurance (usually, upon written request to Social Security Office and after careful assessment of beneficiary's personal conditions in the administrative procedure).
- F) The administrator of the pension insurance scheme is currently the Czech Social Security Administration under the government department of the Ministry of Labour and Social Affairs, with part of the social benefits administered by the Labour

Office of the Czech Republic. As in majority of EU obligatory social insurance systems, there is no option to change the provider of the benefits and administrator of the insurance.

- G) It is an obligatory payment to the public agency. Unlawful non-payment of pension insurance may constitute an administrative tort according to Act no. 250/2016 Sb., on Torts, that could be also committed by corporations. It could be even criminal felony – according to art. 241 Czech Criminal Code, it also involves the employers – enterprises that are not paying pension insurance for their employees and statutory bodies.
- H) The length of the pension insurance is rather different from all other instruments. Because it is an obligatory sum paid to the state (by economically active persons), the ageing person **may not choose** how long he/she will pay the pension insurance. The payment of insurance is limited by its minimum for sole enterprises (natural persons). It could be paid from the moment of person's birth by gaining the enterprise in the inheritance procedure (even by *nasciturus*). **The Czech Republic also pays the pension insurance for children up to 18 years, students up to 26 years and for seniors to itself** (de facto it is a transfer between the Ministry of Finance account for State Exchequer, so called "Státní pokladna", and the Ministry of Labour and Social Affairs account for pension insurance system). If the insured persons with insurance payments paid by the state also have their own income, they pay pension insurance on the income.
- I) There are limitations of some old-age pension benefits by retirement age, however they do not apply for disability, widows', widowers' and orphans' pensions.

4.2. The Second Pillar – Retirement Savings Scheme

The second pillar, according to the Act no. 426/2011 Sb., on Retirement Savings Scheme has been abolished on 31st December 2015, therefore it has not been a part of this comparison. There has been a legal problem how to settle the money paid in 2nd pillar. In 2016, the participants of the scheme had the chance had the right to select the method of transfer of their money in 2nd pillar – to banking account, using post money order or transfer to the third pillar (below). If they did not request the refund until 30th November 2016, they are now entitled to request this money as a tax overpayment from their Financial Office.

4.3. The Third Pillar – Supplementary Pension Savings Scheme

There are two different schemes of the 3rd pillar, having national regulation:

- 1) **supplementary pension insurance according to Act 42/1994 Sb.** on Supplementary Pension Insurance with State Support as amended (could not be concluded yet),
- 2) **supplementary pension savings according to Act no. 427/2011 Sb.** on Supplementary Pension Savings as amended (also applicable for new contracts, too).

The 3rd pillar has not been affected by the abolishment of the 2nd pillar in the 2015 pension reform, the resources in the abolished pillar could be transferred to 3rd pillar.

- A) Liquidity of the money in the third pillar is very low – it may be withdrawn only after reaching the specific age according to the pension plan (usually 60 years of depositor's age). Before reaching the age, the cancellation is tied with the risks mentioned in G.

- B) The risks involve the risk of the pension company's default (while the Supplementary Pension Act stipulates the protection of depositors).
- C) The taxation involves the deduction of tax base for personal income tax (upper limit by 12000 CZK per year deduction of tax base, bottom limit gradually increasing due to combination with state contribution). There is a duty to repay the tax in case of supplementary pension savings contract cancellation. Also, the additional profit after the end of supplementary pension savings is taxed by the same tax.
- D) The state contribution is granted in case of deposits exceeding specific yearly limit (which has gradually been increased). When there is a cancellation of a contract, the stated contribution has to be returned by the pension plan holder.
- E) Commutability of monthly or different deposit is granted using the amendment of a contract, within the limit that has been allowed by the pension company.
- F) The option of provider change has been granted by the Supplementary Pension Savings Scheme Act of 2011, it had also been granted by 1994 Act after an amendment (which is still applicable to contracts signed until 2012). Currently, a fixed transfer fee is paid by the pension plan holder if the contract has not existed for more than 5 years.
- G) The obligatory nature of the payment is only relative after concluding the contract – it depends on the specific text of the contract and its Terms and Conditions. The payment itself may be postponed only until the end of the current month. When the contribution is paid, it could be paid in the lower amount; then it leads to the temporary lowering of the saved monthly sum or in non-participating at the savings scheme in that month; it depends on the specific contract as well as on terms and conditions.
- H) The length of the supplementary pension savings scheme may vary, while upholding the mentioned legal limits by Supplementary Pension Savings Act and the limits of a pension plan by the pension companies.
- I) Limitation by retirement age could be set by the pension plan but retired persons could save money in the scheme and collect state contribution or tax deductions, too.

4.4. The Non-Pension Instrument – Bank Deposit

- A) Bank deposit according to Banking Act no. 21/1992 Sb., is a resource with quick liquidity, the bank transfer could be executed any time – with the contractual sanctions for early debiting of term deposit based on the banking account contract.
- B) It has some risks, although limited by the deposit guarantee schemes that have been introduced by the Banking Act no. 21/1992 Sb. as amended. It involves a risk of the bank's default.
- C) Basic issues of taxation involve the taxation of bank balance premium by the withheld tax according to Income Taxes Act.
- D) Along with the Act no. 370/2017 Sb. on Payment System, which regulates the payment accounts (such as current account), there is no second act covering the deposit account and there are no direct state contributions existing in bank deposits.
- E) The payment commutability is granted by the fact that there has been no exact “depositing plan” concluded by the client – the process of transferring deposits to an account is purely voluntary. That means every individual payment could also be postponed at any time.

- F) The provider of payment services may be changed by the change in standing payment order or in payment order (even without the change of bank account) – although, there are legal mechanisms that enable the customers to transition their account from one bank to another (according to Czech Banking Association standard and according to Act no. 370/2017 Sb., on Payment System).
- G) The nature of the payment to the account is strictly facultative and could be ended, modified or re-newed at any time (though contractual sanctions may be activated).
- H) The length of the standing order is not limited by the Payment System Act, could be practically at least two payment order executions but could be limited to one execution after the first one. The number of executions is solely facultative.
- I) There are also no general limitations by the retirement age for bank deposits.

4.5. The Non-Pension Instrument – Life Insurance

The life insurance does not primarily aim at income assurance during the retirement but that has been omitted by the providers in some cases. According to Insurance Industry Act and according to art. 2758 and following Civil Code, the goal of insurance is to secure the insured persons against the loss of income of his/her heirs after his/her potential death. Secondary goal may be to collect the money in the case of survival through the insurance period. **A contracting party of insurance could be identical with an insured person (it is not a rule, the simplification used below).**

Specific case of life insurance no. FA/SR/ZP/211/2014 – 3 (John Doe vs. AXA životní pojišťovna a.s.) has been recently decided by the Czech Financial Arbitrator. In this case, the Financial Arbitrator has ruled that the insurance company had **incorrectly** informed its customer during the contract drafting and contract signing (through specific broker) that the goal would have been to assure the money revenue for the ageing time period. According to the financial arbitrator, this information has been misleading, and therefore illegal in the relation with consumer. It is not clear whether this case's outcome could be generalized, the decision depends on the specific structure of the contract drafting and informational documents provided the consumer. However it seems that in other cases, the consumers have been misled by brokers of the insurance company, too.

- A) Liquidity of life insurance is extremely limited, the money is available only after the end of the insurance period, after the cancellation of life insurance (which is clearly economically detrimental) or after the death of the insured person.
- B) The risks of the life insurance involve the risks of the instrument where the money has been invested in (mainly with investment life insurance). There is also a risk of non-participation at the market growth with capital life insurance. The next risk is a risk of the insurance company's default.
- C) The life insurance enables the deduction of tax base for personal income tax, also discussed by (Kyncl et al., 2013). It is limited by 12000 CZK per year deduction of tax base (in comparison with complimentary pension savings, it is provided from zero yearly insurance paid).
- D) There are no state contributions provided for a life insurance (in comparison to complimentary pension savings).
- E) Commutability of monthly or different insurance fee is granted using the amendment of a contract, within the limit set by the insurance company.
- F) There is no option of provider change, rather there is an option to cancel the previous life insurance and to conclude a new one – that is leading to a loss of tax deductions, re-taxation of these deductions.

- G) Life insurance is a facultative private instrument concluded by a contract. Postponing or lowering of the payment could be allowed according to contractual text, although the non-payment in first two months usually result in cancellation of the contract. The non-payment later may result in insurance fee enforcement once the insurance protection has been provided.
- H) Length of the insurance period and of the insurance protection is not legally limited by Civil Code (could be even one day). It is usual to conclude the insurance contract up to 65 years of age or later, with month, quarter or yearly insurance periods.
- I) There is a practical limitation of the payout of the money by retirement age – the tax limitation for the accountability of life insurance for tax base discounts is enabled only by the fact the life insurance period ends after 65 years of the insured person. Retired persons could insure and collect tax deductions, too.

4.6. The Non-Pension Instrument – Building Savings Scheme

Other private scheme for saving money has been Building Savings scheme provided by the Building Savings Banks that are also banks. Building Saving Scheme is discussed by (Radová, 2005), they have shown the number of over 6 mil. clients of this scheme with deposits exceeding 244 bil. CZK in March 2004 (while the Czech Republic had over 10 mil. inhabitants at that time). The use of building savings scheme practically has two phases, 1) building savings depositing in the form of building savings (banking) account contract according to Civil Code and 2) acquiring building savings (consumer) credit, under the definition of consumer credit according to art. 2 Act no. 257/2016 Sb. on Consumer Credit as amended.

- A) Liquidity of the buildings savings scheme during the building savings contract (before passing of 6 years) is very limited, the money is available only upon cancelling of the contract with specific penalties (and that brings substantial losses in the form of forfeiture of state contributions for all the time).
- B) The aforementioned also constitutes a risk for building savings scheme as, beyond the risks mentioned for the bank account, there is also a risk of default of the building savings bank.
- C) The scheme is levied by a bank balance premium withheld taxation.
- D) The account holder is entitled to receive the state contribution for his/her own contributions to the account. It is gained only according to the real amount of money credited to the building savings account yearly – the ex-ante plan is not relevant.
- E) The commutability of payment and postponing of payment is allowed but both of them limit the entitlement to a state contribution (which is credited to the account).
- F) Options of provider change are granted any time as the subject has an option to terminate an account any time and to create a new scheme. Length of pre-withdrawal term is limited by 6 years. On the other hand, the person could have only one building savings account reported to the Ministry of Finance for the state contributions.
- G) The building savings contributions are facultative, with the effect mentioned in A) and D). It also limits the credit financial standing of account holder. Once the building credit is provided, its repayment is obligatory.

- H) So far, its phase 1 has been regulated without the legally set limit of money use after the withdrawal of money from the building savings, i.e. after the end of the deposit duration, such as 6 years after initial contract concluding. Financing of the Building Savings Credit in the phase 2 could be provided only for housing purposes – it is strictly limited to the use of monetary resources for acquisition of residential property. Therefore the use of this instrument as a credit for ageing elder's financing is rather marginal, with the exception of saving the money for buying the retirement flat.
- I) There are no limitations by the retirement age for building savings scheme. Even retired persons could save money in the scheme and collect state contribution, too.

5. Discussion

As it has been shown in the previous results section, there are significant options for ageing managers and elderly persons that wish to prevent themselves from the substantial loss of income. **There is a slight issue in the society of the people having no social security provided (ILO, 2017) or the people with limited social security. The basic recommendation is to combine both the public and private resources (based on parts G)) for assuring their income under the ageing circumstances. That is a method to avoid risks discussed in parts B). As an outcome of parts I),** some savings instruments are not limited by retirement, retired persons could be encouraged to save money for themselves and for their heritage. **According to parts A), F) and G),** the highest liquidity and the biggest liberty of assets control is gained by using the bank deposit during the economic activity of a manager for depositing the money and its withdrawal during the retirement. In some other methods, **regarding F),** the option to change the provider of services legally exists but is practically unusable or risky due to the duty of returning the state contribution or repayment of previously received tax deductions (in complimentary pension savings, life insurance and building savings).

It is clearly identifiable from the discussion of (Hřebíček, Soukopová, Trenz, 2014) that the resources that shall be used by the ageing manager depend on an economic modelling on a manager income and held assets (such as housing, shares, funds, trusts etc.). **Households may be inspired by general recommendations for corporations.**

The options that have been mentioned in subchapters from 4.2 to 4.6 are subject to the supervision by the Czech National Bank, mentioned by (Kyncl, 2015). It is essential in the protection of third parties' assets and **for the trust of the clients. Trust is definitely required for the willingness of clients to invest money.**

6. Conclusions

The goal of this paper has been to summarize basic legal and economic features of selected private and public instruments in income assurance for ageing persons. It has outlined the options that are available for ageing persons in order to assure their income after retirement, mainly for ageing managers or professionals with monetary resources but the conclusions are applicable to the general public. This goal has been fulfilled according to the outlining of the facts and legal background, in the chapter 4 and discussion in chapter 5.

Selected legal and economic features (liquidity, risks, basic issues of taxation, state contribution, commutability of payment and postponing of payment, options of provider change, obligatory nature of the payment, length, limitations by retirement age) **have been discussed for the social security insurance** (1st pillar), **supplementary pension savings** (3rd pillar) along with other instruments that have been aimed at different goals but are also useful for pre-pensioners in order to save money for the retirement phase of life (**bank deposits, building savings and life insurance**). Specific case no. FA/SR/ZP/211/2014 – 3 which brought the legal issue of **different goal for these instruments** has been mentioned. Real property investments, capital market instruments and an abolished 2nd pillar – retirement saving scheme have been excluded due to complex nature of the analysis that would go beyond the scope of this article.

It is important to emphasize the possible amendments by legal acts, changes of corporate practice – the article complies with the usual market practice in January 2018.

References

- ANTONIEWICZ, R. L. A comparison of the household sector from the flow of funds accounts and the survey of consumer finances. Division of Research and Statistics, Division of Monetary Affairs, Federal Reserve Board, 1996.
- ASPALTER, C., JINSOO, K., SOJEUNG, P. Analysing the Welfare State in Poland, the Czech Republic, Hungary and Slovenia: An ideal-typical perspective. *Social Policy & Administration*, 2009, vol. 43, no. 2, p. 170–185.
- HŘEBÍČEK, J., SOUKOPOVÁ, J., TRENZ, O. Current Trends of Economic Modelling of Sustainable Corporate Performance and Reporting – Review and Research Agenda. In Nerudova, D. 17th International Conference Enterprise and Competitive Environment 2014. Amsterdam: Elsevier Science, 2014. Book Series: Procedia Economics and Finance, vol. 12, p. 234–242.
- ILO. World Social Protection Report 2014/15: Building economic recovery, inclusive development and social justice. Geneva: International Labour Office, 2014. xxiv + 337 pp. ISBN 978-92-2-128661-5.
- KELBLOVÁ, H. The New Community Regulation on Quality Schemes for Agricultural Products and Foodstuffs – Obligations and Opportunities for Producers. In Nerudova, D. 17th International Conference on Enterprise and the Competitive Environment 2014. Amsterdam: Elsevier Science, 2014. Book Series: Procedia Economics and Finance, vol. 12, p. 296–301.
- KYNCL, L. Financial Market Supervision in the System of Financial Law. In Blažek, J. System of Financial Law: Financial Markets. 1st ed. Brno: Masaryk University, Faculty of Law, 2015. p. 277–291, 15 pp. ISBN 978-80-210-7828-4.
- KYNCL, L. et al. Metoda a ekonomické limity regulace ve finančním právu. 1st ed. Brno: Masarykova univerzita, Právnická fakulta, 2013. 224 pp. Řada teoretická, Ed. S, č. 444. ISBN 978-80-210-6774-5.
- MIKUŠOVÁ, J., RAŠTICOVÁ, M. Employment Policy with Focus on Ageing Population In the Czech Republic as a Service of General Interest. In Innovation Management and Sustainable Economic Competitive Advantage: From Regional Development to Global

- Growth. Norristown: International Business Information Management Association (IBIMA), 2015, p. 4214–4225. ISBN 978-0-9860419-5-2.
- OECD. Tax levels and tax structures, 1965–2016. In: Revenue Statistics: 1965–2016. Paris: OECD Publishing, 2017. pp. 47–69.
- RADOVÁ, Jarmila; HLAČINA, Tibor. Vliv stavebního spoření na hospodaření domácností. In Proceedings „Vysoká škola jako facilitator rozvoje společnosti a regionu“ – International Conference 2005. Kunovice: European Polytechnical Institute Kunovice. 2005, pp. 227–238. ISBN 80-7314-052-7.
- RAŠTICOVÁ, M., KUBÍČKOVÁ, L., BÉDIOVÁ, M., ANTOŠOVÁ, V., BIRČIAKOVÁ, N., ABRAMUSZKINOVÁ PAVLÍKOVÁ, E. Analysis of the Standards of Seniors' Living: Case Study of the Czech Republic. In Knowledge for Market Use 2016: Our Interconnected and Divided World. Olomouc: Societas Scientiarum Olomucensis II., 2016, p. 405–409. ISBN 978-80-87533-14-7.
- RAŠTICOVÁ, M. et al. Age Management. Actual Challenges and Promising Solutions Regarding the Ageing European Population. 1. vyd. Brno: CERM, 2013. ISBN 978-80-7204-848-9.
- SIROVÁTKA, T., KOFROŇ, P., RÁKOCZYOVÁ, M., HORA, O., TRBOLA, R. Příjmová chudoba, materiální deprivace a sociální vyloučení v České republice a srovnání se zeměmi EU: (výzkumná zpráva z projektu Monitorování chudoby). Praha: Výzkumný ústav práce a sociálních věcí, 2005. 322 pp.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Facing the growing competition through the formation of strategic alliances – Taking into account the specific characteristics of the recycling industry

Benjamin Maier¹

*¹Department of Economics, Faculty of Business and Economics, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: benjamin.maier87@googlemail.com*

Abstract

Recycling has become an important part of the society, because recycling spare resources and reduces CO₂ emissions. However, the recycling companies have to deal with increasing legal requirements and regulations of the government, which are very costly.

The recycling companies` acquisition of raw materials from the customers of the producing industry has increased significantly in recent years. In addition, the demands of the customers of the producing industry have increased and changed dramatically. The changing and increasing demands of the customers lead to growing competition in the recycling sector. So far, the recycling and disposal of the producing industry has generally been carried out by two companies. The recycling of the metal scrap was carried out by a recycling company where the disposal of waste (garbage, foil, paper, etc.) was carried out by a disposal company. The last few years, however, the fact is that the producing industry wants the recycling and disposal from “one hand”. The customers only want one contact person. As a consequence, the recycling companies are now competing with the disposal companies in the already strong competition in this sector.

The objective of the paper is to show the customer demands and also to clarify, that the strategic alliances are a possibility to face the changing customer needs and the growing competition in the recycling sector.

Keywords: strategic alliances, growing competition, raw materials

JEL Code: E00

1. Introduction

Recycling is becoming more and more a focus of the society. The recycling companies contribute, that valuable raw materials are returned back to the material cycle. By using the

secondary raw materials, the mining of primary raw materials can be reduced, the resources can be spared and CO₂ emissions saved (D'heur, 2004), (Wirtschaftsvereinigung Stahl, 2016).

Steel is one of the most recycled materials. The recycling companies use appropriate aggregates and technologies to process the scrap for their subsequent use in the respective steelworks and foundries. The share of secondary raw materials in crude steel production has risen in recent years (Wirtschaftsvereinigung Stahl, 2016). The following illustration shows the share of secondary raw materials in the production of crude steel, aluminium and copper in Germany in 2013:

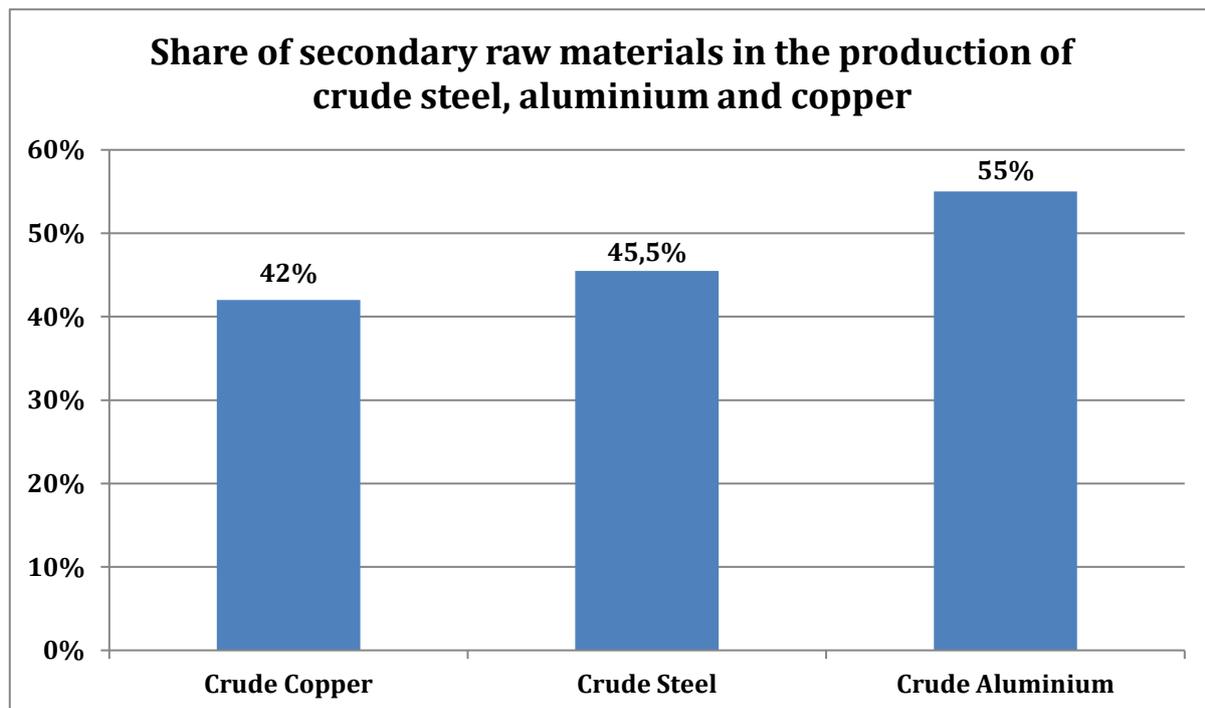


Figure 1: Share of secondary raw materials in crude steel production
Source: Statista (2015)

Frequently, the discussions of the society and the governments around the topic of recycling are forgetting, that the recycling companies are faced with a growing competition in this sector and also have to manage the increasing and changing customer behaviours.

2. Methodology and Data

The author first wants to show the growing competition in the recycling industry. Therefore the method of the literature research was used. In doing so, books were selected which specially deal with the topic of competition and requirements in the recycling sector. The databases and homepages of different organizations were also examined and evaluated.

In order to identify and to clarify the changing customer demands and needs, announcements of german private and public companies were analysed. The scope of the study was 30 announcements of private and 100 announcements of public companies.

Therefore the author used both, internal and external, sources of information for data collection. The internal sources are mainly announcements from private companies whose content can not be published due to confidentiality agreements. The external sources⁴⁴ of information were mainly used to get information about the announcements of public companies.

The paper should show, that the formation of strategic alliances is a possibility to handle the challenges of the growing competition and changing resp. increasing customer demands and needs. Therefore the method of expert interviews was used. In the course of the study five experts were requested and four of them were approved and realized.

3. Results

The literature research shows, that the competition of the recycling companies can be assigned to the form of the polypol. This form is characterized by the fact that many competitors meet many customers. Prices are thus regulated by supply and demand. In the form of the polypol, the margins are generally low. The following figure gives an overview of the different types of competition:

Table 1: Forms of Competition
Source: own description based on, Hutzschenreuter (2015)

| Competitors/ Customers | one | few | many |
|---------------------------|-----------------------|------------------------|------------|
| one | Bilateral Monopoly | Limited Monopsony | Monopsony |
| few | Limited Monopoly | Bilateral Oligopoly | Oligopsony |
| many | Monopoly | Oligopoly | Polypoly |

The recycling companies are also confronted with falling commodity prices, a growing margin pressure (Schmid, 2009), (bvse e.V., 2016). These facts are certainly reasons for the growing number of insolvencies in the recycling sector. Only in 2014, 94 companies from the recycling sector in Germany had to file for bankruptcy. About 985 employees were thereby affected (EUWID Europäischer Wirtschaftsdienst GmbH, 2015).

This enormous competition makes it necessary for the recycling companies to examine and adjust their value-added activities to the corresponding success factors in order to secure long-term market and competitive success. The decisive criteria need to be dominated by the companies in order to be able to take a leading position in the long term or to defend them (Wingert, 1997).

The literature research and the evaluation of the announcements show, that medium-sized recycling companies are often confronted with announcement conditions,

⁴⁴ Cp. Bundesverwaltungsamt, www.service.bund.de

which can hardly be accomplished by the medium-sized recycling companies. Due to unfair conditions, medium-sized recycling companies are only rarely able to participate in public announcements (bvse e.V., 2015).

The announcements of the public companies are often characterized by short announcement periods, as well as by the right to unilateral contract extensions at the same conditions. Because of the two-stage announcement procedures, the companies are subject to further disadvantages, since this creates a great pressure on the margins. On the other hand, the public and private companies expect from the recycling companies the latest vehicle technology, flexible pick-up rhythms, state-of-the-art weighing and identification systems. High contractual penalties are also imposed (bvse e.V., 2015). The figures below show the results of the evaluation of the announcements:

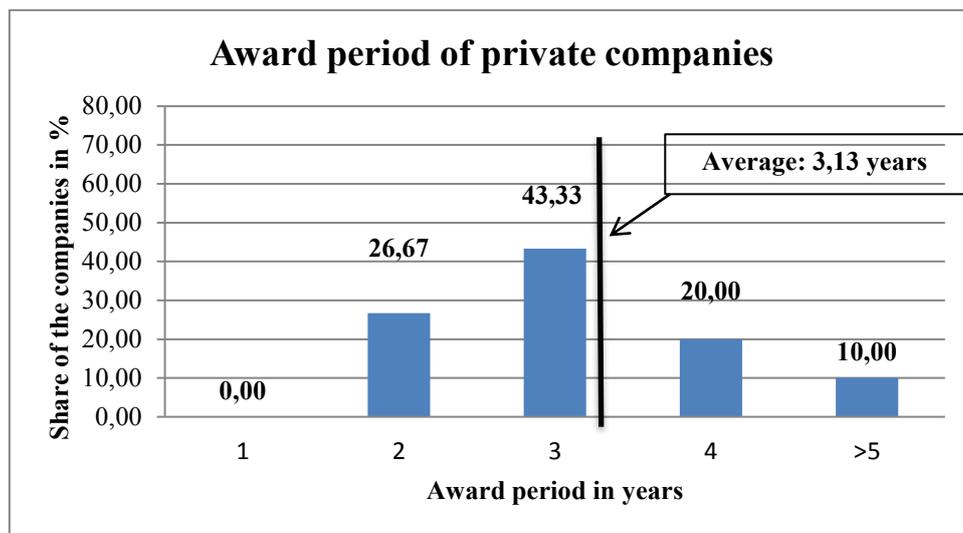


Figure 2: Award period of private companies
Source: own description

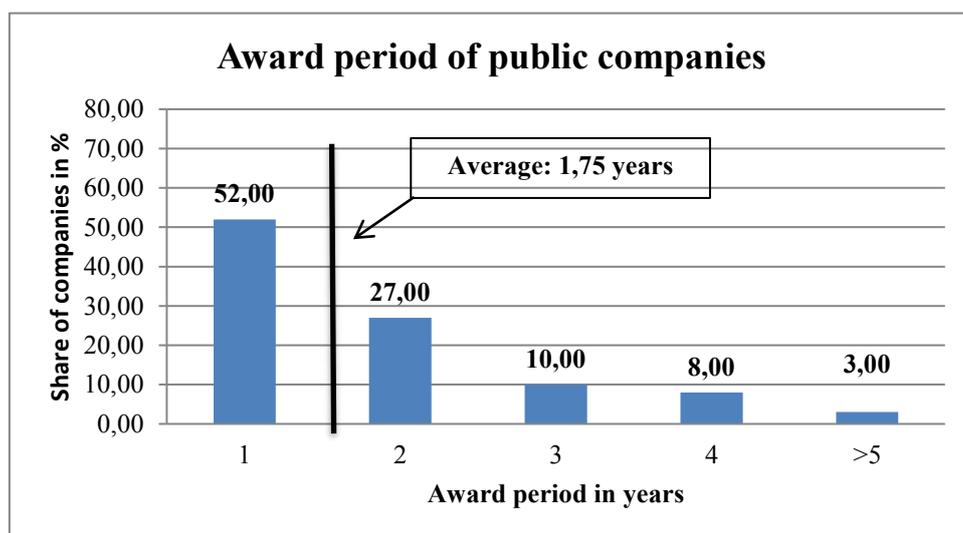


Figure 3: Award period of public companies
Source: own description

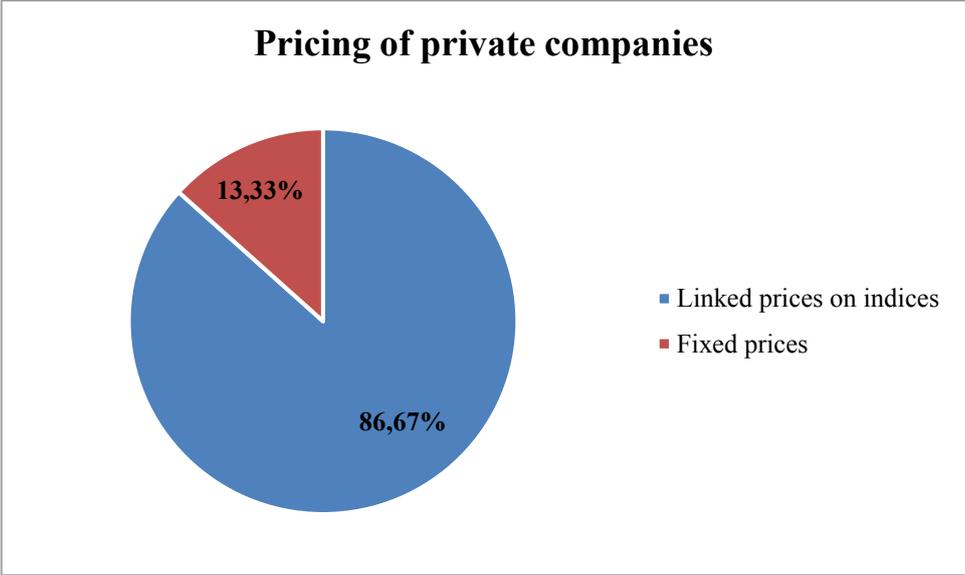


Figure 4: Pricing of private companies during the award period
Source: own description

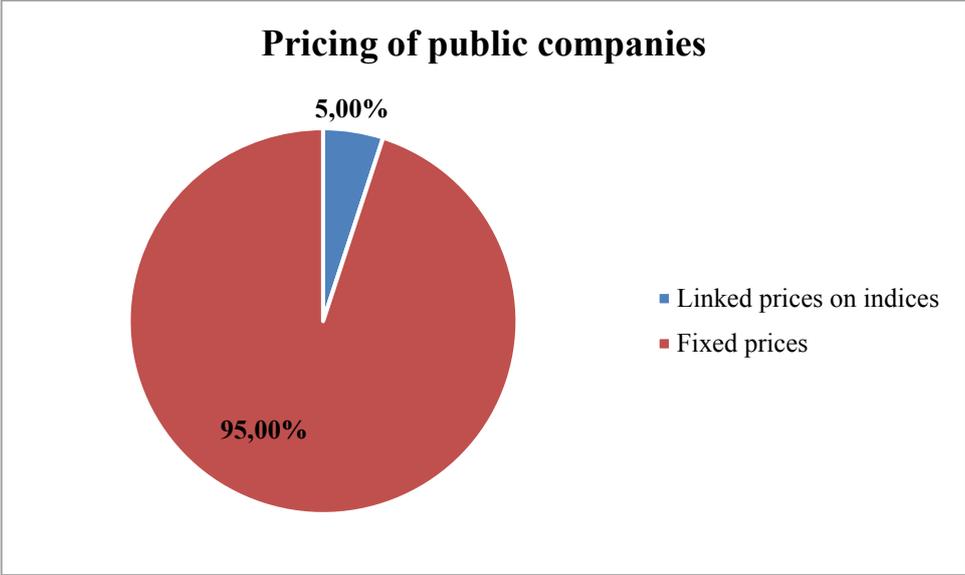


Figure 5: Pricing of public companies during the award period
Source: own description

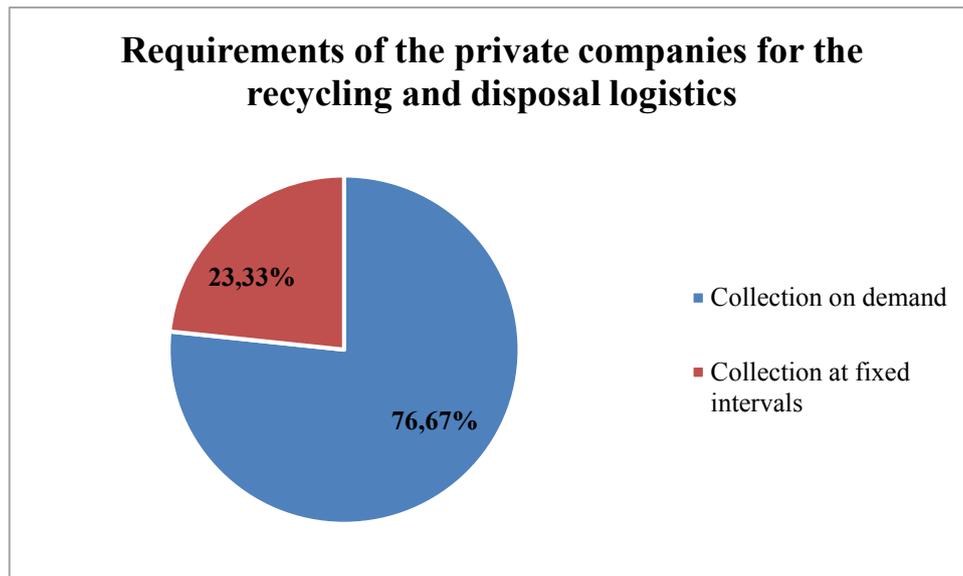


Figure 6: Requirements of the private companies for the recycling and disposal logistics
Source: own description

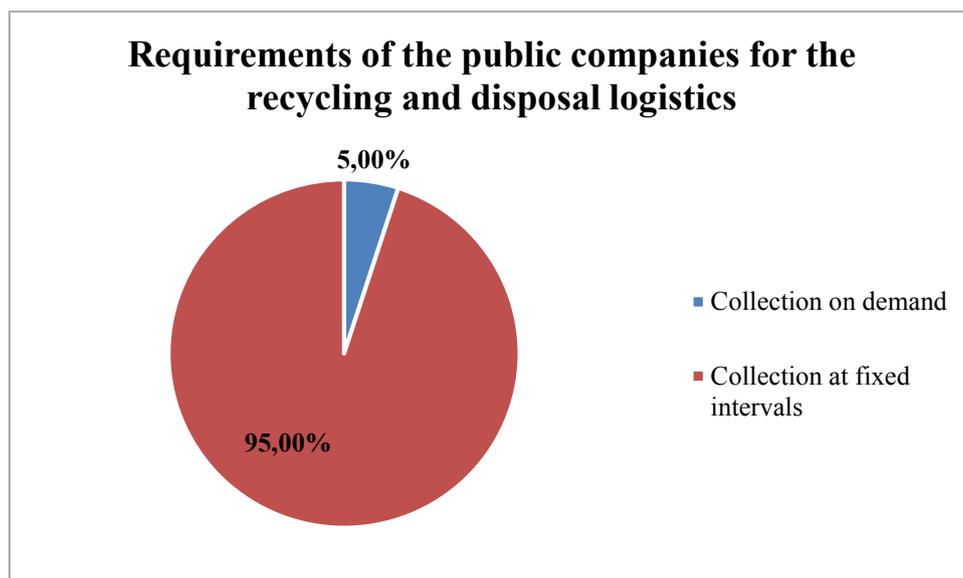


Figure 7: Requirements of the public companies for the recycling and disposal logistics
Source: own description

The current recycling industry is characterized by the fact that the recycling companies have either specialized in the recycling of waste or in the recycling of metals. This is reasoned by the fact, because in previous times the private companies had on the one hand a waste disposal company for collecting the waste and on the other hand a recycling company for collecting the scrap and metals.

Now the needs of the private manufacturing companies are changing. They demand a “one-hand solution”. The disposal of the waste and metals has to be carried out by only one recycling company. This fact leads to the described growing competition, because recycling and waste disposal companies additionally compete with each other.

The method of expert interviews was used to clarify, if the strategic alliances are a possibility to face the described challenges. First of all a brief overview of the surveyed experts is shown:

Table 2: Overview of the expert interviews
Source: own description

| Company | Contact | Requested | Declined | Realized |
|-------------------------------|-----------------------|-----------|----------|----------|
| ALBA Group | Drs. Schweitzer | X | X | X |
| IMT GmbH | Mr. Hammer | X | | X |
| ELG Haniel GmbH | Mr. Wierscholowski | X | | X |
| Thommen AG | Mr. Huber | X | | X |
| TSR Recycling GmbH & Co.KG | Mr. Althoff | X | | X |

Mr. Hammer is both positive and negative about strategic alliances. With the help of strategic alliances, competences can be bundled or created and costs can be reduced. Also the changing customer needs could be accomplished and you can use a cooperative competition. However, strategic alliances curtail the independence of individual companies.

The company I Metall Trading GmbH already has strategic alliances with other recycling companies in the areas of warehousing and material treatment and processing. The reasons for this were the avoidance of lengthy and expensive licensing procedures and bureaucracy.

Loyalty and uniform quality awareness are described by Mr. Hammer as basic requirements for a strategic partner. The decisive factor for success, which contributes to the success of a strategic alliance, Mr. Hammer sees in the mutual trust and the conviction that they are stronger together than alone.

Mr. Wierscholowski sees the formation of a strategic alliance as an opportunity to meet the future challenges, like growing competition and changing customer needs. But his company currently has no strategic alliance with another company. However, he does not exclude this for the future.

The encounter at eye level, trust and reliability are for him the basic requirements for a strategic partner. Furthermore, Mr. Wierscholowski sees a common, clearly and clearly defined goal as a decisive success factor, which contributes to the success of a strategic alliance.

Mr. Huber is clearly very positive about strategic alliance. The Thommen AG already has strategic alliances with other companies in the fields of logistics, central purchasing and operating resources. These alliances were formed on the basis of market development, like growing competition through changing customer behavior and because of the optimization of processes and procedures.

From the point of view of Mr. Huber, the basic requirements for a strategic partner are trust and system potential. He sees the success factor for the success of a strategic alliance in open and direct communication

Mr. Althoff is positive about the formation of strategic alliances to face the future challenges. The company TSR Recycling GmbH & Co.KG already has strategic alliances in the areas of purchasing and marketing. These alliances were formed to ensure sales security. Mr. Althoff sees the basic requirements for a strategic partner in the geographical availability as well as in the selection of the divisions in which his own company is not strong enough. In addition, the corporate culture must be mutually consistent. In his view,

the success factors that lead to the success of the strategic alliance are trust, honesty, fairness and the willingness to compromise.

4. Discussion and Conclusion

The research has shown that the competition in the recycling industry has intensified, not least because of changing and growing customer demands. The recycling and waste disposal companies have various possibilities to react to the previously mentioned challenges:

The first possibility of the recycling and waste disposal companies is, that they build additional expertise in unknown areas and invest in the required infrastructure (investments in new container systems and vehicle fleet, expansion of storage areas and storage capacities, ensuring marketing, acquiring know-how by recruiting specialists) for being able to offer the manufacturing companies a “one-stop recycling”. They thus enter into the hard competition with each other. The consequence of this strategy is a high risk due to high capital use, but also an opportunity to retain existing customers and to win new customers by offering the unique selling proposition “one-hand recycling”.

The second possibility is, that the recycling and waste disposal companies do not react to the changing customer demands and continue to concentrate on their core competency. The consequence of this strategy is a high risk, as this can lead to the loss of customers and in extreme cases to insolvency.

The third possibility, which is the focus of the paper, is to form a strategic alliance to complement each other. The disposal and recycling can be coordinated either through the waste-or metal recycling company. The result is, that the customers only have one contact and “one-hand recycling”, as desired. The consequence of this strategy is a low risk due to low capital use. By selecting a strong strategic partner, companies can continue to focus on their core competences and they are also able to avoid additional competition. Through the formation of a strategic alliance, the recycling and waste disposal companies can offer the additional benefit of “one-hand recycling” and thus stand out from the respective competition. New customer potentials can be developed. Likewise, with the help of the strategic alliance, an oligopolistic competition can be created from the polypolous competition form. This is a possibility for the recycling companies to expand their margins.

The expert interviews have also shown, that they favour to create a strategic alliance to face the customer needs and the growing competition.

The experts and also many other companies have therefore recognized that they can only be successful with a strategic partner and can only compete against the intense competition. Therefore, the importance of strategic alliances increases. The strategic alliances should be distinguished by a fair taking and giving between the partners in order to generate value for both partners (Kotler et al., 2011), (Ebinger, 2001).

Strategic alliances are not only concluded by large companies, because medium-sized companies are increasingly seeing a promising path in the development of strategic alliances. Due to the growing competition, it is therefore hardly surprising, that companies want to protect themselves against potential or current competitors by means of strategic alliances (Heck, 1999).

Implementing a strategic alliance is a major challenge for the involved companies. Strategic alliances often fail due to cultural or organizational reasons. The complexity of the organizational implementation is often underestimated by the companies. The risks are only considered inadequately and the opportunities remain unused (Heck, 1999).

The management often fails to develop realistic, operational and consistent concepts. The general opinion is, that strategic alliances can be implemented without further ado. Because of this, no special requirements are formulated and the implementation is often left to the middle management, which may be overwhelmed by the implementation. A lack of acceptance and motivation among the employees also makes it difficult to implement a strategic alliance (Heck, 1999).

These reasons often lead to the failure of a strategic alliance. Companies need to be aware, that the formation of a strategic alliance is a very complex project that should be considered with the utmost attention. In the future, the importance of strategic alliances will continue to grow and companies will invest even more in the establishment of operational and strategic relationship networks (Heck, 1999).

It can be conclusively summarized, that strategic alliances are a possibility for the recycling and waste disposal companies to face the changing customer needs and the growing competition. But it must also be taken into account that it is not easy to form a strategic alliance. This is also a serious challenge.

References

- bvse e.V. (2015) http://bvse.de/305/8983/bvse_gegen_mittelstandsfeindliche_Ausschreibungsbedingungen (quot. 2016-08-06)
- bvse e.V. (2016) http://bvse.de/33/9052/bvse_Mittelst__ndische_Unternehmen_st__rken (quot. 2016-08-02).
- D'heur, M. (2014): shared.value.chain: Profitables Wachstum durch nachhaltig gemeinsame Wertschöpfung, in: D'heur, M. (Hrsg.), CSR und Value Chain Management, Berlin/Heidelberg: Springer-Verlag, 58.
- EBINGER, F. (2001): Akteurskooperationen im ökologischen Produktlebenszyklus, in: Lutz, U., Nehls-Sahabandu, M. (Hrsg.), Praxishandbuch Integriertes Produktmanagement, Düsseldorf: Symposium Publishing GmbH,.
- EUWID Europäischer Wirtschaftsdienst GmbH (2015) <http://www.euwid-recycling.de/news/wirtschaft/einzelansicht/Artikel/etwas-weniger-insolvenzen-bei-entsorgungsunternehmen.html> (quot. 2016-08-22).
- HECK, A. (1999): Strategische Allianzen, Berlin/Heidelberg: Springer-Verlag.
- HUTZSCHENREUTER, T. (2015): Allgemeine Betriebswirtschaftslehre, 6. Auflage, Wiesbaden: Springer Fachmedien.
- KOTLER, P., ARMSTRONG, G., WONG, V., SAUNDERS, J. (2011): Grundlagen des Marketing, 5. Auflage, München: Pearson Education Deutschland GmbH.
- SCHMID, E. (2009): Koordination im Reverse Logistics, Diss., Wiesbaden: GWV Fachverlage GmbH.
- Statista. (2015) <http://de.statista.com/statistik/daten/studie/259779/umfrage/recyclinganteil-bei-der-produktion-ausgewaehlter-metalle-in-deutschland/> (quot. 2015-11-23).
- WINGERT, G. M. (1997): Wettbewerbsvorteile durch Lieferantenintegration, Diss., Wiesbaden: Betriebswirtschaftlicher Verlag Dr. Th. Gabler GmbH.

Wirtschaftsvereinigung Stahl (2016) <http://www.stahl-online.de/index.php/themen/energie-und-umwelt/recycling/> (quot. 2016-08-22).

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Material deprivation of older people in European Union countries in the context of the ageing society

Katarzyna Maj-Waśniowska¹, Agnieszka Wałęga²

*¹Department of Local Finance, Faculty of Finance and Law, Cracow University of Economics, Rakowicka Street 27, 31-510 Cracow, Poland,
e-mail: katarzyna.maj@uek.krakow.pl*

²Department of Statistics, Faculty of Management, Cracow University of Economics, Rakowicka Street 27, 31-510 Cracow, Poland, e-mail: agnieszka.walega@uek.krakow.pl

Abstract

The study addresses the issue of material deprivation of older people in the European Union. The discussed research problem concerned in particular the phenomenon of material deprivation in the context of demographic changes and the ageing process of the society, as well as the methods of measuring material deprivation. Its expression is the research hypothesis, according to which the level of material deprivation rate varies depending on the examined age group, as well as the differentiation of deprivation symptoms in individual countries of the European Union. In order to verify the hypothesis formulated in this way, the problem of an ageing population in the European Union countries and its effects up to 2080 as well as the income level differentiation depending on the type of household were analysed first. Next, the phenomenon of material deprivation and indicators used for its measurement were discussed; furthermore, with the use of agglomeration methods, EU countries were divided into relatively homogeneous groups in terms of symptoms of material deprivation. The analysis was carried out according to age and gender. The study showed the diversity of symptoms of material deprivation between separate groups of EU countries. These differences are particularly visible in single-person households of people below and over 65 years of age. It should be added that in the majority of countries, the material deprivation rate was higher for women, especially those over 65 years of age. In the context of the conducted research, it should be stated that the ageing of society will affect the level of the material deprivation rate in the future.

Keywords: ageing of the population in the European Union countries, material deprivation, poverty and social exclusion, the Europe 2020 strategy, symptoms of material deprivation.

JEL Code: I32, J11, J14.

1. Introduction

The problem of population ageing is one of the biggest challenges facing European Union (EU) countries. Population ageing is reflected in the growing share of older people combined with the decreasing share of people of working age in the total population. As a consequence, there is an increasing number of people in retirement age, whose material situation in comparison to people who are in working age is usually worse. In the case of a part of seniors, old age can mean poverty and living on the margins of social life. The broadly understood problem of poverty is one of the key elements of the European Union's policy. In the wake of the financial and economic crisis of 2008, one of the goals of the Europe 2020 Strategy was to reduce poverty and social exclusion by at least 20 million people by 2020. This objective was defined by the EU Council on the basis of three indicators that were agreed and developed under the open method of coordination for social protection and social inclusion. One of them is the material deprivation rate, that expresses the inability to afford some items considered by most people to be desirable or even necessary to lead an adequate life. Bearing in mind the above premises, a research problem was undertaken, which was formulated in the form of questions: What are the effects of the ageing of population in the EU and what is their impact on the level of meeting the life needs of older people? What is the level of material deprivation in EU countries and are there any differences in terms of its symptoms depending on the age group? On the basis of such a defined problem, a research hypothesis was put in place, according to which the level of material deprivation rate varies depending on the examined age group, as well as the differentiation of deprivation symptoms in individual countries of the European Union. Derivatives and hypotheses of the undertaken research problem are the main objectives of the study, which include: characteristics of the ageing process in the EU and its effects up to 2080, and analysis of material deprivation of older people, taking into account its symptoms.

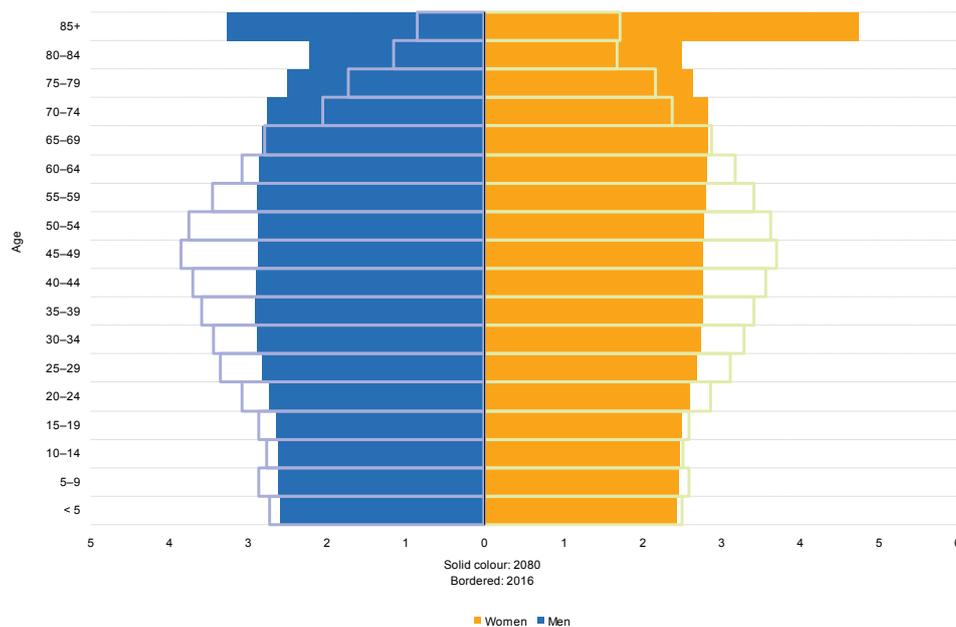
The structure of the study reflects the adopted research objectives. Firstly, changes in the age structure of the society in the EU were discussed. Next, the income distribution depending on the type of household was presented in a synthetic way, and the phenomenon of material deprivation and rated used to measure it were discussed. In the last part of the article, based on previous considerations, using agglomeration methods, EU countries were divided into relatively homogeneous groups in terms of symptoms of material deprivation. The analysis was carried out according to age and gender. The whole study ends with a summary that contains the most important conclusions from the research.

2. Trends in population ageing in the EU

The problem of population ageing, which began in Europe decades ago, is one of the greatest challenges facing European Union countries. Population ageing is a tendency which is visible in the transformations of the age structure of the population and is reflected in the growing share of older people combined with the decreasing share of people of working age in the total population. The growing percentage of older people in the population is the result of two overlapping processes: increasing life expectancy and so-called Second Demographic Transition (van de Kaa 1987) characterised by a decrease in the number of births and marriages, shifting of the mean ages at childbirth and family formation – towards older age groups, an increase in the number of divorces and informal relationships (Kubicki, 2010, p. 2).

The demographic ageing process is characterised by such traits as (Błędowski, Szatur-Jaworska, Szweda-Lewandowska et al. 2012, p. 6):

- Old-age feminisation, expressed by the number of women (Figure 1) increasing with the transition to successive age groups. In 2010, the average EU life expectancy for men was 76.9 years and for women 82.8. In 2015, it was respectively 77.9 years and 83.3 (Eurostat 2017a).
- Singularisation in old age, which is manifested by the high percentage of older people staying in households composed of one person;
- Double ageing, which means a faster than total rate of increase in the percentage of people aged 80 and more (table 1).



Note: 2016: estimate, provisional. 2080: projections (EUROPOP 2015)

Figure 1: The EU-28 population pyramids in 2016 and 2080 (% of the total population)

Source: Eurostat 2017b (online data codes: demo_pjangroup and proj_15npms)

As a result of demographic changes taking place in EU countries, the percentage of older people in the total population will increase significantly in the coming decades, when a larger percentage of the so-called post-war baby boom generation will reach retirement age. This, in turn, will lead to an increased burden with social protection expenditure on people of working age. The population pyramid (Figure 1) showing gender distribution and five-year age groups in 2016 is narrow at the bottom and resembles a parallelogram due to post-war baby-boom cohorts resulting from high fertility rates in several European countries in the mid-1960s the last century. This baby-boom generation is still a large part of the working-age population. The first of these large cohorts born over 20–30 years is now reaching retirement age. A convexity reflecting this boom will move up the pyramid, while the lower part corresponding to the working-age population and the base become narrower (figure 1). The increase in the relative share of older people in the population is also due to the prolonged average life expectancy. These changes are defined as “ageing at the top” of the population pyramid. On the other hand, the persistent low fertility rates over many years contributed to the ageing of population, which

resulted in a decrease in the share of young people in the total population. This process is called “ageing at the bottom” of the population pyramid.

Another aspect of population ageing is the progressive ageing of the older part of the population (the so-called double ageing), because the relative size of very old people is growing at a faster pace than any other age segment of the EU population. It is predicted that the percentage of people aged 80 or more in the EU-28 population will more than double in the period from 2016 to 2080, from 5.4% to 12.7% (table 1).

Table 1: Population structure by major age groups, EU-28, 2016-80, (% of total population)

| | 2016 | 2020 | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 |
|-------------|------|------|------|------|------|------|------|------|
| 0–14 years | 15.6 | 15.5 | 14.9 | 14.7 | 14.8 | 14.9 | 15.0 | 15.2 |
| 15–64 years | 65.3 | 64.2 | 61.2 | 58.3 | 56.7 | 56.1 | 56.2 | 55.6 |
| 65–79 years | 13.8 | 14.5 | 16.7 | 17.9 | 17.4 | 16.9 | 16.3 | 16.4 |
| 80+ years | 5.4 | 5.9 | 7.2 | 9.1 | 11.1 | 12.1 | 12.5 | 12.7 |

Note: 2016: estimate, provisional. 2020-80: projections (EUROPOP 2015)

Source: Eurostat 2017b (online data codes: demo_pjangroup and proj_15npms)

As a result of the population ageing process, an increasing proportion of the population, regardless of their will, will be forced to constantly define their identity and build a social position without resorting to traditional social roles (Beck 2002; Beck and Beck-Gernsheim 2002). In the case of some seniors, old age means or will mean poverty, and in the case of some, social exclusion may also occur. This exclusion may have a character of (Czapiński, Panek 2009, p. 337–352):

- structural exclusion – related to the place of residence (village), low education and low income correlated with it;
- physical exclusion – due to old age, disability;
- normative exclusion – resulting from addiction to alcohol or drugs, conflict with the law, loneliness and being a victim of discrimination;
- material exclusion – related to poverty.

From the point of view of the European Union’s social policy, which has been reflected in one of the objectives of the Europe 2020 strategy, i.e. reducing poverty and social exclusion by at least 20 million people by 2020, structural and material exclusion seems to be crucial. This is due to the fact that three indicators are used to measure the degree of achievement of the set goal⁴⁵, the level of which directly or indirectly depends on the amount of income. Therefore, the starting point for the analysis of poverty and social exclusion is the analysis of the level of income. From the point of view of the problem of material deprivation of the elderly and the population ageing process, it is particularly important that the median income of people over 65 in 2015 accounted for 93% of the similar value for people under 65. In six EU countries (Greece, Spain, France, Luxembourg, Hungary and Romania), the median income of people over 65 was equal to or higher than the median income of people under 65. The lowest median value of the income of older people (at the level of 60–75% of this indicator for people under 65) was recorded in Bulgaria, Estonia, Latvia, Lithuania and Malta (Eurostat 2017c). These relatively low rates may reflect the amounts of pensions, which are the most important element of the income of older people, in particular women (Lodovici et al. 2011; Kiaušienė and Vazonienė 2017, p. 428). Pension systems can play an important role in addressing

⁴⁵ These are: at-risk-of-poverty rate (after social transfers), material deprivation rate and the percentage of people living in households with very low work intensity.

the problem of poverty among older people. The European Commission (2016) underlines that pension systems as “the main source of income for around a quarter of the population, provide protection against poverty for most older Europeans”.

3. Material deprivations in the concept of measuring poverty and social exclusion

The phenomenon of material deprivation is an important element from the point of view of the European Union’s social policy, and in particular one of the objectives of the Europe 2020 strategy to reduce poverty and social exclusion. In most studies on poverty, it is assumed that people are poor when: “their resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities” (Townsend 1979). Poverty in this sense includes two basic elements: inability to participate, which may result from inadequacy of resources. Most quantitative research has until recently used income levels to measure poverty. However, this approach was increasingly challenged. Therefore, direct measures of deprivation are of increasing importance in research. Although non-monetary rates for monitoring living conditions or quality of life have a long history, their use for the analysis of poverty began with the use of non-monetary rates of deprivation in the context of poverty measurement (Townsend 1979). Townsend used these indicators to determine and confirm the income poverty threshold, and graphically presented the importance and scope of poverty due to the deprivation of everyday objects and activities widely recognised as significant. The availability of new rates has become a source of criticism of using income levels to measure poverty due to the inability to identify people who cannot participate in their societies due to a lack of resources (Ringen 1988). Since then, interest in Townsend’s indicators has increased, which resulted in numerous studies of material deprivation measures in OECD countries both in Europe and outside its territory. In Europe, widespread adoption of social exclusion / inclusion terminology reflected, among other things, the fear that exclusively focusing on income neglects an important part of the actual situation, while strengthening interest in material deprivation and, more broadly, a multi-dimensional approach to measuring poverty and exclusion (Nolan and Whelan 2007, Burchardt, Le Grand and Piachaud 2002, Boarini and Mira D’Ercole 2006, Bradshaw and Finch 2003). The interest in measuring and researching material deprivation in OECD countries outside Europe was visible, among others in Headey (2008) research for Australia; Jensen et. al. (2002) for New Zealand, or Blank (2008) for the United States (Kus, Nolan and Whelan, 2017).

At present, there is also a significant number of studies, including comparative ones for the EU, from countries covered by the European Community Household Panel Survey, and more recently, from the mid-2000s, also research using data from the EU Statistics on Income and Living Conditions (EU-SILC). A study by Fusco, Guio and Marlier (2010) was carried out in cooperation with Eurostat, with particular emphasis on the use of deprivation rates in the process of social integration of the EU. The material deprivation rate was adopted at the EU level by the European Commission in 2010 as one of the direct measures of poverty and social exclusion (Nolan and Whelan 2011, European Commission 2011).

Material deprivation refers to the inability for individuals or households to afford those consumption goods and activities that are typical in a society at a given point in time, irrespective of people’s preferences with respect to these items (OECD 2007). It

should also be emphasised that the causes of material deprivation are associated with low education, which is correlated with the level of income (Gibson and Asthana 1999). Three indicators are used to measure the phenomenon of deprivation in the EU. The material deprivation rate is an indicator in EU-SILC that distinguishes between individuals who cannot afford a certain good or service, and those who do not have this good or service for another reason, e.g. because they do not want or do not need it. The indicator adopted by the Social protection committee measures the percentage of the population that cannot afford at least three of the following nine items: to pay their rent, mortgage or utility bills; to keep their home adequately warm; to face unexpected expenses; to eat meat or proteins regularly; to go on holiday; a television set; a washing machine; a car; a telephone. The second rate is the severe material deprivation rate which is defined as the enforced inability to pay for at least four of the above-mentioned items. The last one is persistent material deprivation rate defined as the enforced inability to pay for at least three (material deprivation) or four (severe material deprivation) of the above-mentioned items in the current year and at least two out of the preceding three years. Its calculation requires a longitudinal instrument, through which the individuals are followed over four years (Eurostat 2016).

4. Methodology and Data

The study used data from 2010–2016 for 28 EU countries from EU-SILC survey (Eurostat databases)⁴⁶. The main variables used in the research were: mean equivalised net income (in PPS), severe material deprivation rate (in %) and variables regarding symptoms of material deprivation (nine previously mentioned needs).

The indicated variables were analysed in a section of age and sex. In the age section, the focus was on people and households of people aged 65 or over and people under 65.

In order to assess the differences in income in the age and gender section, the income gap ratio was used. Income gap represents the difference between average equivalised net income of people less than 65 years (or male) and of people 65 years or over (or female) as a percentage of average equivalised net income of people less than 65 years (male).

In order to check how income influences severe material deprivation rate, econometric modelling was applied. Due to the nature of analysed data (panel data with a balanced panel – data for 28 countries for a period of seven years – 2010–2016), models for panel data were used. General notation of the panel model (Maddala 2006, p. 644; Osińska 2007, p. 410):

$$y_{it} = \beta_0 + \beta_1 X_{it} + \alpha_i + v_t + u_{it}, \quad i=1, \dots, N, \quad t=1, \dots, T, \quad (1)$$

where: β_0 – absolute term; β_1 – parameter of the model; X_{it} – values observed on explanatory variable; α_i – individual effects, part of the variability of y variable, typical of i -th

⁴⁶ In the case of data regarding median equivalised net income in PPS for the European Union (EU-28), 2016 data were used, since only from this year, averaged data for 28 EU countries in the PPS are provided. In the case of grouping of countries in terms of similarity of material deprivation symptoms, data from 2010–2015 were used due to the fact that in these years, it was possible to obtain information on all variables for the EU-28.

unit (N effects); v_t – periodic effects, part of the variability of y variable, typical of t period (T effects); u_{it} – purely random distortive component.

In the course of the research, model parameters were estimated for people under 65 and those in many 65 years or more. First, parameters of a pooled model were estimated. The model assumes that all units in the model are similar; therefore, they can be described with a simple total regression model. Next, diagnostic testing was performed to determine whether there were any significant effects that would suggest the choice of a fixed effects model or a random effects model.

In order to group the European Union countries into homogeneous groups similar in view of the symptoms of material deprivation (nine indicators taken into account in the construction of severe material deprivation rate) hierarchical clustering analysis was performed. In the research Ward's agglomeration method with the Euclidean distance was used.

5. Results

Comparison of the median equivalised net income (in PPS) in the European Union countries using the income gap ratio between people under 65 and people aged at least 65 in most countries falls in favor of people under 65 (table 2). The largest differences in income of these two groups in 2015 were observed in the case of Estonia (35%), while the smallest in Greece (0.3%). In the age section, greater disproportions are noticeable in the group of women. Similar differences in terms of income are visible in two-person households (2 people under 65 and those in which at least one person is over 65 years of age)⁴⁷. The largest disparities in income were related to households in Estonia (38%), and the smallest in Slovenia (0.8%). A comparison of income by gender in a given age group indicates, on the other hand, smaller differences in incomes of women and men under 65 (2%). The same rate in the group of people aged at least 65 years was 10.8% in 2015.

Table 2: Income gap in European Union in 2015 (in %)

| Specification | Less than 65 years <i>versus</i> 65 years or over | | | Males <i>versus</i> females | | A<65 vs A>65 |
|---------------|---|-----------|----------|-----------------------------|------------------|--------------|
| | total | males | females | less than 65 years | 65 years or over | |
| EU-28 | 4.0 | -1.2 | 7.9 | 2.0 | 10.8 | |
| Best | 0.3 (GR) | -1.1 (AT) | -0.6(IT) | -0.1(MT) | 3.3 (NL) | -0.8(SI) |
| Worst | 35.2 (EE) | 27.6(EE) | 39.2(EE) | -4.2(RO) | 34.0 (RO) | 37.6(EE) |
| Poland | 6.0 | -0.9 | 10.6 | -1.7 | 10.0 | 15.7 |

Note: A<65 vs A>65 – two adults younger than 65 years versus two adults, at least one aged 65 years or over; values for EU-28 were calculated on the basis of data from 2016; a negative value of the rate means an advantage of the income of the examined group in relation to the reference group

Source: own calculations based on: Eurostat 2017d (online data codes: ilc_di03)

In order to confirm the impact of the income level on the level of severe material deprivation rate, model parameters for panel data were estimated. Separate models for people under 65 (model 1) and those aged 65 or more (model 2) have been estimated.

⁴⁷ Eurostat does not examine the variation in the level of income in households composed of one person (for those below and over 65).

In the case of all the models considered, residual variance test results as regards the significance of individual effects provided the basis for rejecting a null hypothesis that assumes the correctness of the OLS panel model in favour of an alternative hypothesis that recommends the use of a fixed effects model. In the case of both models, the Hausman test confirmed the correctness of the choice of the fixed effects model. Estimation results of model parameters are presented in table 3.

Table 3: Estimation results of model parameters for panel data

| Specification | Model 1 | Model 2 |
|---------------------------|------------|------------|
| <i>Constant</i> | 29.5346*** | 18.6368** |
| β_1 | -0.0012*** | -0.0007*** |
| Hausman test | FE | FE |
| LSDV-R ² (%) | 94.98 | 96.01 |
| Within-R ² (%) | 29.81 | 9.45 |
| LSDV F p-value | 7.08e-94 | 3.7e-102 |
| Brusch-Pagan test p-value | 5.76e-099 | 2.83e-107 |
| Test for constant p-value | 3.60e-066 | 1.84e-079 |
| AIC | 880.30 | 907.13 |
| HIQ | 918.79 | 945.62 |

Note: p-value <0,01 ***

Source: own calculations based on: Eurostat 2017d, 2017e (online data codes: ilc_di03 and ilc_mddd11)

The parameter estimates presented in Table 3 indicate a negative relationship between the variables studied. A higher income level implies a lower level of the severe material deprivation rate. A stronger impact of income on reducing the level of the surveyed indicator can be noticed in the case of people under 65 (model 1).

The differences in income (also among people under 65 and those aged 65) in European Union countries cause that countries also differ in terms of the intensity of the occurrence of symptoms of material deprivation. The countries were divided into two variants: in the group of people under 65 and those aged 65 or more in 2010 and 2015. Figure 2 presents selected dendrograms, in which the largest differences in the distribution of the European Union countries were observed.

In the case of households composed of one persons, people under 65 can be divided into two main groups in terms of symptoms of material deprivation. Countries such as: Bulgaria, Romania, Latvia, Lithuania, Greece, Croatia and Hungary form one group in which the highest percentage of households that cannot afford to meet the analysed needs has been observed (especially: to pay their rent, mortgage or utility bills; to keep their home adequately warm; to face unexpected expenses; to eat meat or proteins regularly), and thus in these countries it will be more difficult to reduce the level of material deprivation.

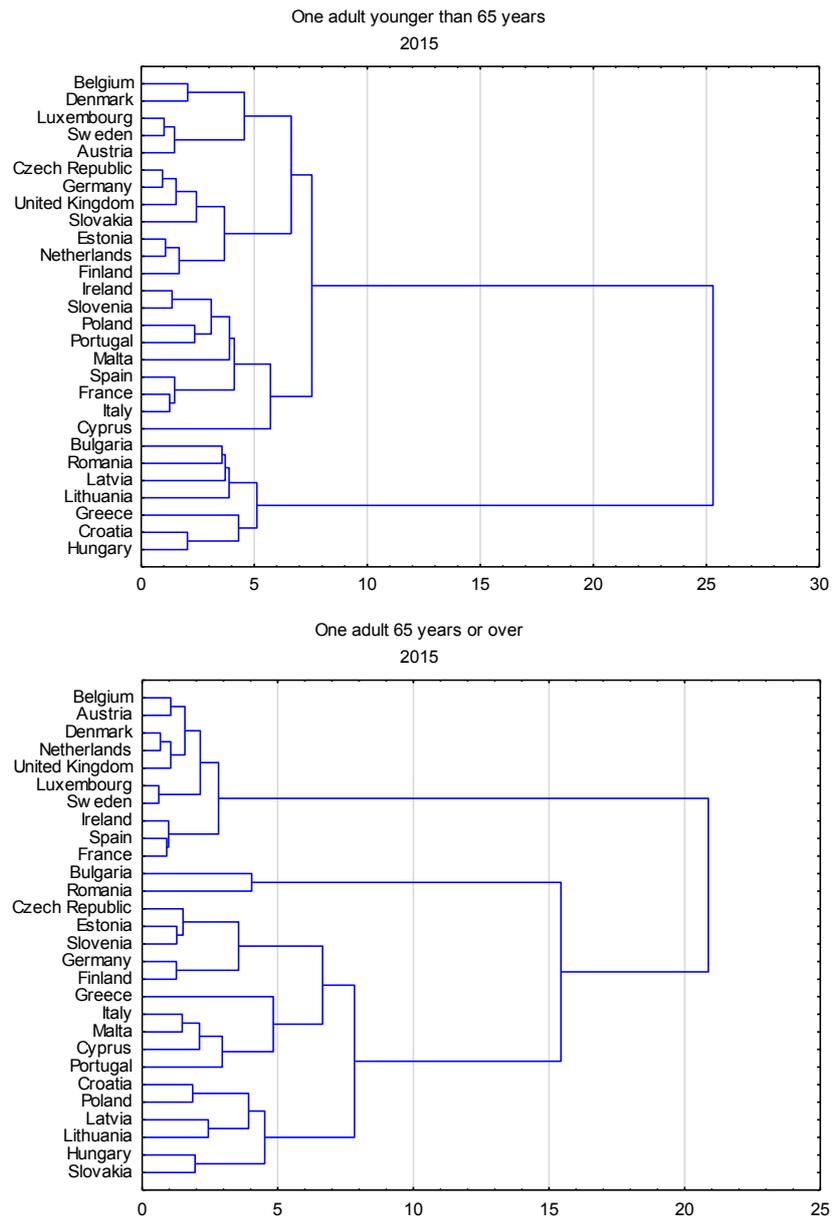


Figure 2: Dendrogram for one adult younger than 65 years and one adult 65 years or over
Source: own elaboration based on: Eurostat 2017f (online data codes: ilc_mdcs and ilc_mdcs)

In the case of households composed of one person aged 65 or more, the analysis of the dendrogram allows dividing the countries into three groups. Bulgaria and Romania are clearly different from other countries. In these countries, the percentage of people who cannot afford to meet the distinguished needs is the largest. This applies in fact to all distinguished symptoms except for the lack of a television set. A separate group was also formed by: Belgium, Austria, Denmark, Netherlands, United Kingdom, Luxembourg, Ireland, Sweden, Spain and France, where the examined symptoms of material deprivation are generally less frequent than in the case of other countries.

6. Discussion and Conclusions

One of the biggest challenges for the European Union's social policy in the coming years will be the ageing of society. Although it has been visible for decades, its effects will be particularly visible in the coming period. Three main reasons for these changes can be identified. First, the level of income is different for people under and over 65. In the EU-28 countries in 2016, the median equivalised net income (in PPS) of people aged 65 or more accounted for 96% of income of people younger than 65 years. The second factor affecting the financial situation of households is the singularisation in old age, which is reflected by the high percentage of older people remaining in single-person households. For example, in Poland, 49.3% of older people remain in single-generation households. Such households consist of two-person households run by marriages belonging to the same generation, or just households composed of one person. According to GUS forecasts, in 2030 as many as 53.3% of households composed of one person will be run by people over 65, of which 17.3% by persons aged 80 and more (Błędowski, Szatur-Jaworska, Szweda-Lewandowska et al. 2012, p. 6). Singularisation in old age and single-generationness of elderly households have a significant impact on the ability to independently meet the needs. The economic consequences of singularisation in old age particularly affect the population of women, due to the phenomenon of old-age feminisation, which is the third factor influencing the financial situation of older people. In the case of women, the worse situation of older women (65 years or more) is noticeable. For the EU-28 countries, the median equivalised net income (in PPS) for older and young women was 92% in 2016, and 101% for men.

An indicator that enables a multidimensional assessment of the ability to meet needs is the non-monetary rate of material deprivation. The conducted research confirms the impact of the level of income on the level of this rate, while the increase in income has a greater impact on the reduction of material deprivation in the case of people under 65. The analysed symptoms of material deprivation indicate the diversification of EU-28 countries in this respect, as evidenced by the division of countries into groups. Scandinavian countries proved the most egalitarian in terms of the material deprivation rate. Thus, it confirms that the adopted regime of welfare state and the social democratic welfare state have been tested in practice (Kowalski 2015). Generally, in countries with a high level of economic development, there are smaller problems with poverty. A different situation occurs in new EU members of Central and Eastern Europe and in the countries of the south of Europe. In Bulgaria and Romania, the symptoms of material deprivation are so strong that these countries form a separate group. This situation is particularly evident in single-person households of people aged 65 or above compared to those below 65. In the face of ageing societies, actions aimed at reducing the level of material deprivation and reducing the differences between older people and those under 65 years of age and in the context of cohesion policy in the European Union countries will be particularly important. In conclusion, it is also worth noting that the conducted research can be the basis for further in-depth analyses related to the issues raised. Particularly interesting is the issue of the so-called double ageing of society and its impact on the level of material deprivation rate and its symptoms.

Acknowledgements

Publication was financed from the funds granted to the Faculty of Finance and Law and Faculty of Management at Cracow University of Economics, within the framework of the subsidy for the maintenance of research potential.

References

- BECK, U. 2002. Społeczeństwo ryzyka. W drodze do innej nowoczesności. Warszawa: Wydawnictwo Naukowe SCHOLAR.
- BECK, U., BECK-GERNSHEIM, E. 2002. Individualization. Institutionalized Individualism and its Social and Political Consequences. London: Sage.
- BLANK, R. 2008. "How to Improve Poverty Measurement in the United States." *Journal of Policy Analysis and Management* 27(2), 33–54.
- BŁĘDOWSKI, P., SZATUR-JAWORSKA, B., SZWEDA-LEWANDOWSKA, Z., et. al. 2012. Raport na temat sytuacji osób starszych w Polsce. Warsaw: Instytut Pracy i Spraw Socjalnych.
- BOARINI, R. and MIRA D'ERCOLE, M. 2006. "Measures of Material Deprivation in OECD Countries." *OECD Social Employment and Migration Working Papers* 37. Paris: OECD.
- BRADSHAW, J. and FINCH, N. 2003. "Overlaps in Dimensions of Poverty." *Journal of Social Policy* 32(5), 13–25.
- BURCHARDT, T., LE GRAND, J. and PIACHAUD, D. 2002. "Degrees of Exclusion: Developing a Dynamic, Multidimensional Measure." In: *Understanding Social Exclusion*, edited by J. Hills, J. Le Grand, and D. Piachaud. Oxford: Oxford University Press, 30–43.
- CZAPIŃSKI, J., PANEK, T. (red.) 2009. *Diagnoza Społeczna 2009. Warunki i jakość życia Polaków*. Warszawa: Rada Monitoringu Społecznego.
- EUROPEAN COMMISSION. 2011. *Employment and Social Developments in Europe 2011*. Brussels: DG Employment, Social Affairs and Equal Opportunities.
- EUROPEAN COMMISSION. 2016. *Employment, Social Affairs & Inclusion. Pensions*. [Online]. Available at: <http://ec.europa.eu/social/main.jsp?catId=752&langId=en>. [Accessed: 14 February 2018].
- EUROSTAT, 2016. *Glossary: Material deprivation*. [Online]. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Material_deprivation. [Accessed: 10 February 2018].
- EUROSTAT, 2017a. *Mortality and life expectancy statistics*, [Online]. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Mortality_and_life_expectancy_statistics. [Accessed: 14 February 2018].
- EUROSTAT, 2017b. *Population structure and ageing*. [Online]. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing. [Accessed: 14 February 2018].
- EUROSTAT, 2017c. *Relative median income ratio (65+)- EU-SILC survey. Persons aged 65 years and over compared to persons aged less than 65 years*, [Online]. Available

- at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_pnp2&lang=en. [Accessed: 14 February 2018].
- EUROSTAT, 2017d. Mean and median income by age and sex – EU-SILC survey, [Online]. Available at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di03&lang=en. [Accessed: 14 February 2018].
- EUROSTAT, 2017e. Severe material deprivation rate by age and sex, [Online]. Available at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_mddd11&lang=en. [Accessed: 14 February 2018].
- EUROSTAT, 2017f. Economic strain and durables, [Online]. Available at: http://ec.europa.eu/eurostat/data/database?node_code=ilc_mdes05. [Accessed: 14 February 2018].
- FUSCO, A., GUIO A. C., and MARLIER E., 2010. Characterising the Income Poor and the Materially Deprived in European Countries. In *Income and Living Conditions in Europe*, edited by A. B. Atkinson and E. Marlier. Luxembourg: Publications Office of the European Union.
- GIBSON, A. and ASTHANA, S. 1999. Schools, markets and equity: access to secondary education in England and Wales, presentation at AERA Annual Conference. Montreal.
- HEADEY, B. 2008. "Poverty is Low Consumption and Low Wealth Not Just Income." *Social Indicators Research* 89, 23–29.
- JENSEN, J., SPITTAL, M., CRICHTON, S., et. al. 2002. "Direct Measures of Living Standards: the New Zealand ELSI Scale." Wellington: Ministry of Social Development.
- KIAUŠIENĖ, I. and VAZNONIENĖ, G. 2017, Economic possibilities of elderly people. In: *Enterprise and Competitive Environment: proceedings of the 20th Annual International Conference*. Mendel University in Brno, 9–10 March. Brno: Faculty of Business and Economics, Mendel University in Brno, 422–431.
- KOWALSKI, R. 2015. Czy istnieje środkowoeuropejski model państwa dobrobytu? In: *Liberalizm czy interwencjonizm? Kształtowanie się ładu społeczno-gospodarczego w Europie w latach 1989–2014*, edited by R.W. Ciborowski, R.I. Dziemianowicz, A. Kargol-Wasiluk and M. Zalesko, Białystok: Uniwersytet w Białymstoku, 74–84.
- KUBICKI, P. 2010. Ubóstwo i wykluczenie społeczne osób starszych, Ekspertyza przygotowana w ramach projektu "EAPN Polska – razem na rzecz Europy Socjalnej", Warszawa.
- KUS B., NOLAN, B. and WHELAN CH. T. 2017. Material Deprivation and Consumption. In: *The Oxford Handbook of the Social Science of Poverty*, edited by D. Brady and L. M. Burton, Oxford: Oxford University Press. [Online]. Available at: <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199914050.001.0001/oxfordhb-9780199914050-e-26>. [Accessed: 17 February 2018].
- LODOVICI, M. S., CREPALDI, C. and CORSI, M. 2011. The socio-economic impact of pension systems on the respective situations of women and men and the effects of recent trends in pension reforms. Report prepared by the EGGSI network for the European Commission. [Online]. Available at: http://ec.europa.eu/justice/genderequality/files/equal_economic_independence/pensions_report_en.pdf. [Accessed: 14 February 2018].
- MADDALA, G.S. 2006. *Ekonometria*. Warsaw: PWN.

- NOLAN, B. and WHELAN, Ch. T. 2007. "On the Multidimensionality of Poverty and Social Exclusion." In: *Inequality and Poverty Re-Examined*, edited by J. Micklewright and S. Jenkins. Oxford: Oxford University Press.
- NOLAN, B. and WHELAN, CH. T. 2011. *Poverty and Deprivation in Europe*. Oxford: Oxford University Press.
- OECD, 2007. Glossary of Statistical Terms. Material deprivation. [Online]. Available at: <https://stats.oecd.org/glossary/detail.asp?ID=7326>. [Accessed: 10 February 2018].
- OSIŃSKA, M. ed. 2007. *Ekonometria współczesna*. Toruń: Dom Organizatora.
- RINGEN, S. 1988. "Direct and Indirect Measures of Poverty." *Journal of Social Policy* 17(3): 51–66.
- TOWNSEND, P. 1979. *Poverty in the United Kingdom: A Survey of Household Resources and Standards of Living*. Harmondsworth: Penguin.
- VAN DE KAA, D. (1987). Europe's Second Demographic Transition, "Population Bulletin" No no. 1, 1–59.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Impact of the Amendment to the Accounting Act on the Financial Reporting of Micro Enterprises

Petra Manová, Monika Oberreistrová, Milena Otavová¹, Jana Gläserová²

¹*Department of Accounting and Taxes, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: milena.otavova@mendelu.cz*

²*Department of Accounting and Taxes, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: jana.glaserova@mendelu.cz*

Abstract

Since 2016 significant changes have been made to Act No. 563/1991 Coll. on Accounting based on the mandatory implementation of Directive 2013/34 / EU on annual accounts. Therefore the purpose of this article is, to assess the impact of these changes on microenterprises financial reporting and disclosure of financial information. The particular emphasis is given to assess the quantitative and qualitative reduction of the burden resulting from the implementation of a simplified accounting regime for these enterprises. Fulfilling the meaning of the European directive improving conditions for microenterprises will be evaluated.

Key words: Directive 2013/34 / EU, Act on Accounting, micro-enterprises, financial statements, disclosure of financial information

JEL Code: M19, M21

1. Introduction

In June 2013, the European Parliament and the Council issued Directive 2013/34/EU on the annual accounts, consolidated accounts and related reports of certain forms of businesses. This Directive was a substitute for the 4th and 7th Directives. Member States had to implement the Directive in the national accounting regulations with effect from 1st January 2016 at the latest. The purpose of this Directive was to increase the competitiveness and performance of SMEs and to enshrine the principle of “the green light to SMEs”. The aim is to improve the business environment, reduce the administrative burden on these businesses and encourage their internationalization. (Müllerová, 2014). For the first time, this Directive introduces on the basis of specified criteria the categorization of entities

and consolidations into the accounting regulation, defines public interest entities and payment reports for governments. It also represents an effort to reintroduce simple accounting, accounting only for income and expenditure, and for assets and liabilities (Explanatory Memorandum). The Directive in individual provisions permits a Member State to allow micro and small entities to make certain simplifications or exemptions from certain obligations that are otherwise binding without reservation for medium and large entities. At the same time, in some of its provisions, it allows Member States to demonstrate their own will when introducing them into national regulations, but the aim of this application must be to achieve the aims and requirements of the Directive. (Bušovová, 2016). As Hýblová (2015) points out, these variants will, to a certain extent, simplify the application of the Directive, but ultimately reduce the reporting capacity of financial statements because they do not provide users with comparable information. There are a number of options of reporting and valuation of items of financial statements, formal reporting, simplification of reporting for some types of entities, or options to deviate from the Directive (Hýblová 2017). The Member State has also an option to restrict the mandatory application of the principle of materiality to reporting and disclosure (Directive 2013/34 / EU). This applies in particular to micro enterprises, as reported also by Mejzlík (2015).

As part of the implementation of the Directive into the national accounting regulations of the Visegrad Group countries (V4), different procedures can be observed. In the Czech Republic, Poland and Hungary, the implementation alone required only one amendment to the Accounting Act, whereas in Slovakia, there were a number of steps taken in the years 2014–2016 before the Directive was fully implemented into national legislation. As for the categorization of entities themselves, some differences can also be found. The Czech Republic, as the only one, adopted the categorization of entities under the Directive in full (Froschová, 2015). The other V4 countries did not define medium enterprises. This suggests that the comparability of the financial statements will only be possible in the case of large enterprises. One of the Directive's partial objectives, namely the comparability of entities in the European Union, seems unattainable, as also reported by Deac in 2014. By adopting Directive 2013/34/EU the categorization of entities was broadened as micro entities were added. Classification into individual categories is based on three criteria: balance sheet total, net turnover, and average recalculated number of employees. For an entity to be put into a certain category, it must not exceed two of the three criteria. If an entity exceeds two criteria at the balance sheet date, it automatically falls into the higher category. An exception is public interest entities and selected entities that are automatically considered to be large entities.

Table 1: Categorization of entities under the Directive and Accounting Act 563/1992 Coll.

| Category of entities | Assets total | | Net turnover | | Average number of employees |
|----------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------|
| | EU Directive in thousands of EUR | Accounting Act (thousands of CZK) | EU Directive in thousands of EUR | Accounting Act (thousands of CZK) | |
| Micro | 350 | 9,000 | 750 | 18,000 | 10 |
| Small | 4,000 | 100,000 | 8,000 | 200,000 | 50 |
| Medium | 20,000 | 500,000 | 40,000 | 1,000,000 | 250 |
| Large | 20,000 | 500,000 | 40,000 | 1,000,000 | 250 |

Source: Prepared by the authors, based on EU Directive and the Act on Accounting in the Czech Republic

The reason for choosing the topic to be researched is to find out whether the administrative burden on micro-enterprises has actually been reduced related to accounting obligations. Another reason was to set a definition of a typical micro enterprise, because the criteria given in tab. No. 1 are too wide.

2. Material and methods

The main objective of the paper is to evaluate the impact of changes brought about by the implementation of Directive 2013/34/EU into the Act on Accounting in the Czech Republic with regard to financial reporting and disclosure of financial information, especially on micro enterprises. Special emphasis is given to assessing the quantitative and qualitative reduction of the burden on these enterprises resulting from the introduction of a simplified accounting regime. This will assess whether the Directive's goal to improve the conditions for micro enterprises was accomplished. The starting point of the survey is simplified accounting practices for micro enterprises that have been implemented in the Accounting Act under the Directive. The new classification of entities according to their size, including the determination of their accounting obligations, is crucial for this paper. Following the analysis of the Directive, alternative solutions for micro enterprises are identified. Subsequently, on the basis of the analysis of the national accounting regulation, specific solutions adopted by the Czech Republic are defined.

In the application part of the paper, it was also examined whether the Directive's objective of improving the business conditions for micro enterprises was achieved. Specifically, this means reduction in the administrative burden and consequent competitiveness. This part was carried out using a questionnaire where 654 micro enterprises were surveyed. The questionnaire survey focused on the characteristics of micro enterprises and the identification of impacts with a view to reducing their administrative burden. The collected data is clearly presented in the graphs including comments. The method of study is based on the specified objectives. The prerequisite for this paper was the collection of information sources on this issue. In addition to scientific methods, such as methods of description, comparison, analysis, the methods were based on the principles of logical thinking, especially the method of deduction. The method of synthesis was used for drawing conclusions.

3. Results and discussion

3.1. Distribution of entities by size in the Czech Republic

The distribution of entities by category in the Czech Republic as at 31st December 2016 is shown in Table 2. The table shows that micro entities account for almost 90% of the total number, and it is therefore possible to assume that the Directive will be more advantageous to these entities and help them reduce their administrative burden.

The total number of all entities as at 31st December 2016 also includes micro entities with audit obligations. Their estimated total number is 11,895. Their structure by legal form could not be determined, but it can be assumed that the largest number of audited micro entities are limited liability companies followed by joint stock companies. Overall, micro enterprises represent 90.3% of all enterprises in the Czech Republic.

Table 2: Structure of entities on the basis of categorization

| Form of entity | Total in the CR | Micro | Small | Medium | Large | Small audited | Micro in% expression |
|----------------|-----------------|---------|--------|--------|-------|---------------|----------------------|
| Inc. | 26,138 | 15,905 | 3,590 | 1,742 | 749 | 2,208 | 60.8 |
| Ltd. | 438,827 | 392,007 | 28,490 | 3,383 | 873 | 4,195 | 89.3 |
| L.P. | 729 | 543 | 67 | 302 | 22 | 19 | 74.5 |
| G.P. | 6,387 | 6,255 | 80 | 6 | 4 | 13 | 97.9 |
| Total | 472,076 | 414,710 | 32,227 | 5,161 | 1,648 | 6,435 | 87.8 |

Source: Based on the data from the Czech Statistical Office

3.2. Permissible variants under the Directive

In many cases, the Directive contains variant solutions to the accounting of individual situations, which are labelled with “allow or require” wording or references to national legislation. The variant solution has been achieved as a result of the fact that accounting directives are intended for countries that fall under two different systems of accounting regulation. Each European country has its own national regulatory system based on the legal system and the way of financing domestic companies. There are two types of accounting systems: the Anglo-Saxon type and the continental type. The Czech Republic ranks among the continental-type countries. The option of a variant solution can certainly contribute to facilitating the implementation of the Directive into the national legislation of the EU countries. At the same time, there is a practical risk arising from different ways of implementation within possible variant solutions, and a risk that another of the Directive’s objectives, which is to consolidate financial reporting, will not be reached.

The Directive, in the context of choosing variant solutions to individual situations in accounting, states that Member States should take into account the specific conditions and needs of their own markets. At the same time, if there was a situation in practice in which applying a provision of the Directive was in conflict with a true and fair view, the provision of the Directive would not be applied. However, there must be mandatory justification in the appendix and an explanation of the effect on the items of the financial statement. The Directive also requires that the balance sheet and profit and loss account be viewed in the light of the nature of the transaction in question, but subsequently it states that Member States may exempt companies from this requirement.

The variant solutions to individual accounting situations can be divided into two groups. The first group represents the area of the formal arrangement of the items of financial statements (Table 3) and the second group includes the valuation of asset and liability items as well as the use of accounting methods (Table 4).

Table 3: Variants in the formal arrangement of the items of financial statements

| Subject matter | Variant solutions |
|------------------------|--|
| Balance sheet models | Member States should require that one of the two defined balance sheet models be used. However, they may allow or require companies to modify these breakdown patterns and present short-term and long-term items of the balance sheet. |
| Profit and loss models | In the profit and loss account the possibility of cost classification by nature or function should be allowed. Member States should require that one of the defined breakdown patterns be used. They should also be able to allow businesses to submit a financial performance report instead of a profit or loss account. |

| | |
|---|--|
| Specific items of the balance sheet | If the specific nature of a business requires it, the breakdown, classification, and expert nomenclature of the balance sheet items and the profit and loss account shall be adjusted. This refers to enterprises belonging to a particular economic sector. |
| Aggregate of non-significant items of the financial statement | Member States may allow or require that balance sheet items and profit and loss accounts denoted by an Arabic numeral be aggregated if their amount is insignificant or if their aggregate contributes to greater transparency. |
| Compensation of individual asset, liability, cost and income items | Any compensation between asset and liability items or between cost and revenue items is prohibited. Components of assets and liabilities should be valued separately. Member States may, in special cases, allow or require enterprises to make offsetting between items, gross amounts must be given in the Appendix. |
| Presentation of the balance sheet Alternative presentation of the balance sheet | Member States shall prescribe one or two of the models for the breakdown of the balance sheet under the Directive. If they prescribe two patterns, they allow businesses to choose. Member States may allow or require enterprises to distinguish between short-term and long-term items in a breakdown which is different from the models of the balance sheets in the Directive if the content of the information provided is equivalent to the content of the information in the Directive. |
| Presentation of the profit and loss account Deviation from the presentation of the profit and loss account | Member States shall prescribe one or two models for the breakdown of the profit and loss account under the Directive. If they prescribe two patterns, they can allow businesses to choose. Member States may allow or require that a presentation of the financial performance statement be presented instead of the presentation of the profit-and-loss items in accordance with the Directive if the content of the information provided is equivalent to the content of the information under the Directive. |

Source: Based on the EU Directive

Table 4: Variants of valuation of asset and liability items and choice of accounting methods

| Subject matter | Variant solutions |
|--|---|
| Valuation of items of financial statements | Items recorded in the financial statements should be valued at purchase prices or production costs. Member States should be able to allow or require companies to re-evaluate their long-term assets in order to obtain more relevant information. |
| Alternative method of valuing fixed assets at revalued amounts | Items recorded in the financial statements are measured at purchase prices or production costs. Member States may allow or require the valuation of fixed assets at revalued amounts. |
| Interest capitalization | Member States may allow or require the inclusion of interest on borrowed capital to finance the production of fixed or short-term assets in the cost of production to the extent that such interest is attributable to the production period. |
| Cost formula | Member States may allow the purchase price or the cost of manufacturing goods of the same category and of all substitutable items, including investments, to be calculated on the basis of the weighted average prices, according to “first in – first out (FIFO)”, “last in – first out” (LIFO) or according to the method that takes into account generally accepted practices. |

Source: Based on the EU Directive

However, the Czech Republic did not implement some of the provisions of the Directive concerning simplification. They involve the possibility of preparing a short-form profit and loss account for medium-sized entities, because medium-sized entities have a statutory obligation to have audited accounts. Furthermore, the possibility of not reporting accruals by micro entities was not accepted. Obviously, the reason was to avoid the reduced administrative burden being redeemed by a decline in the quality of the information provided. The particular provisions of the Directive in the Act on Accounting are shown in the following table.

Table 5: Simplification for micro or small businesses in Czech accounting legislation

| Subject of simplification | Amendment to the Accounting Act | Amendment to the Directive |
|---|---------------------------------|--|
| Micro and small entities without an audit obligation do not have to compile an annual report. | Paragraph 1 § 21 | Article 19 Paragraph 3 Article 31 Paragraph 1 Article 36 Paragraph 1 |
| Micro and small entities without an audit obligation can keep accounts in a simplified manner. | Paragraph 3b § 9 | Article 36 Paragraph 1a |
| Micro and small entities without an audit obligation can prepare short form financial statements. | Paragraph 4 § 18 | Article 36 Paragraph 1b Article 36 Paragraph 2 Article 14 Paragraphs 1 and 2 |
| Micro and small entities without an audit obligation do not have to disclose a profit and loss statement. | Paragraph 9 § 21a | Article 36 Paragraph 6 Article 31 Paragraph 1 |
| Micro, small, and medium-sized entities are exempt from reporting non-financial information. | Paragraph 3 § 21 | Article 19 Paragraph 4 Article 36 Paragraph 6 |
| Micro entities will not use the fair value measurement. | Paragraph 7 § 27 | Paragraph 19 |

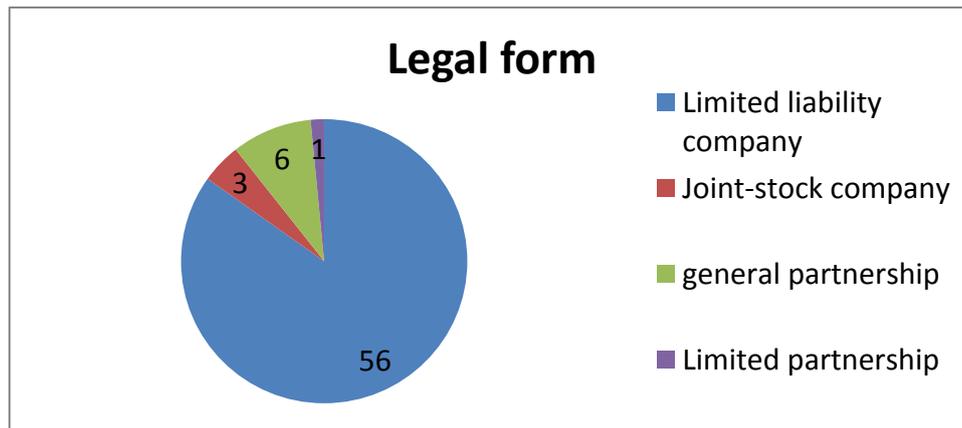
Source: Based on the EU Directive and the Act on Accounting in the Czech Republic

3.3. Results of the questionnaire survey

A total of 654 micro enterprises were surveyed in the questionnaire. Only 66 of them returned completed questionnaires, which is less than 10%. This low rate of return can be explained by the fact that the companies were asked to provide very sensitive information.

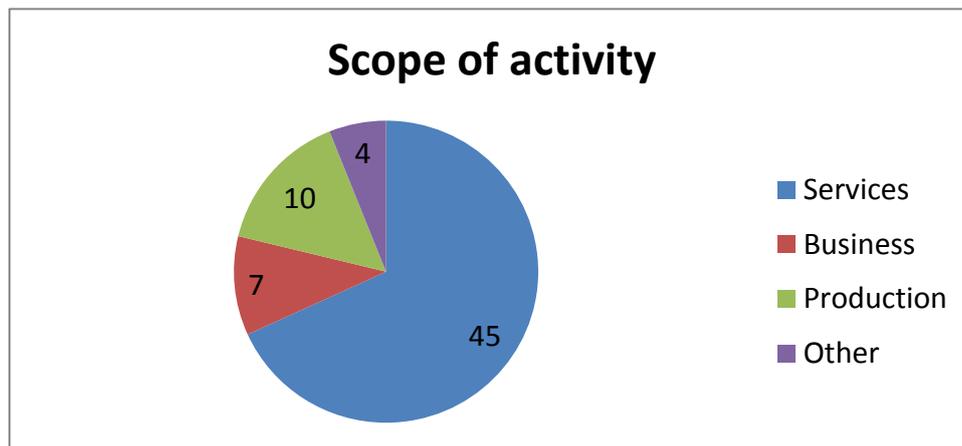
The results of the questionnaire survey can be divided into two parts, the answers about the properties of the micro enterprises in the sample and the answers about the impacts of their reduced administrative burden.

The graph below shows that the most common legal form of micro enterprises is a limited liability company. This trend is logical especially with regard to the number of limited liability companies out of the total number of enterprises in the Czech Republic.



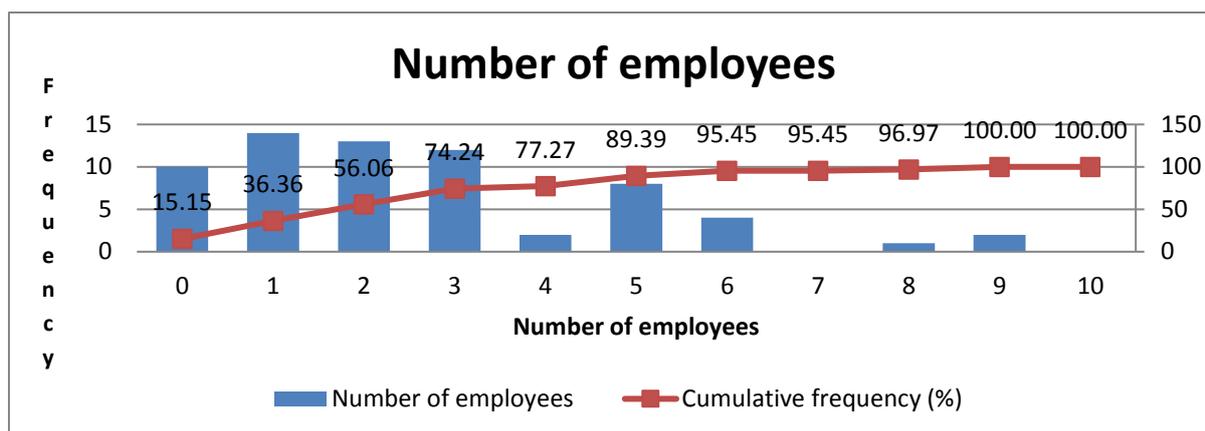
Graph 1: Properties of micro enterprises according to legal form
Source: Prepared by the authors

Graph 2 shows the subject of activity of the micro enterprises surveyed. The most frequent activity is services. We believe that services are a typical activity of a micro enterprise.

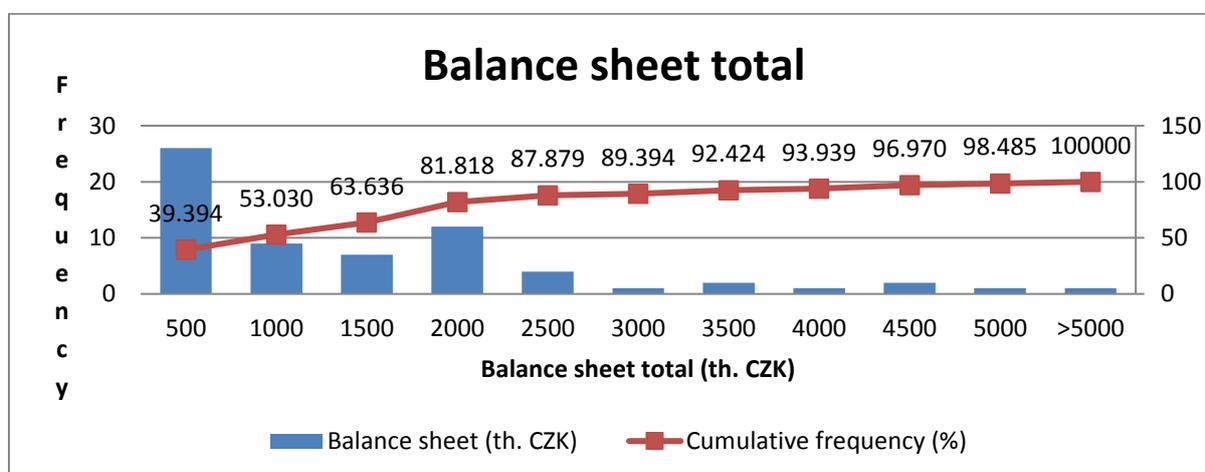


Graph 2: Scope of activity
Source: Prepared by the authors

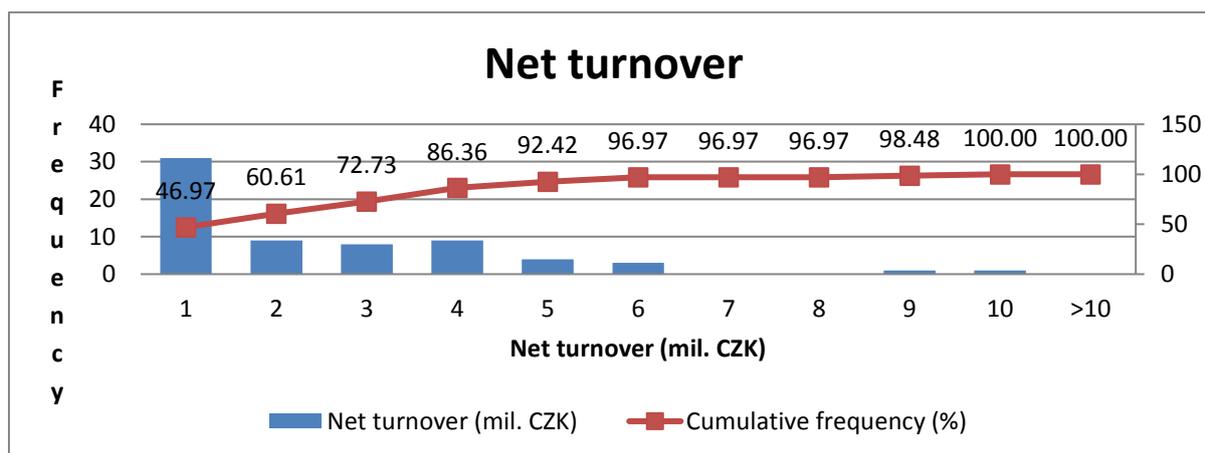
Graphs 3, 4 and 5 are made using the size criteria from the Directive. These are the average recalculated number of employees, balance sheet total, and net turnover.



Graph 3: Number of employees
Source: Prepared by the authors



Graph 4: Balance sheet total
Source: Prepared by the authors



Graph 5: Net turnover
Source: Prepared by the authors

From the graphs above, it is clear that almost 78% of micro enterprises have a number of employees ranging from 0 to 4. It can also be concluded that almost 82% of micro enterprises have the balance sheet total less than 2 million CZK. A net turnover of up to

4 million CZK is achieved by over 86% of micro enterprises. These percentages are considered significant because they account for over 75% of the occurrence. It can also be pointed out that these intervals characterize a typical representative of a micro enterprise on the basis of the respondents' answers. From this finding it can be inferred that the criteria of the Directive incorporated into Czech accounting legislation concerning categorization of micro enterprises are too benevolent, i.e. they are set too high. Thus, the majority of enterprises in the Czech Republic (almost 90%) belong to the category of micro enterprises, as shown in Table 2. Based on these findings, it seems appropriate to consider possible reduction in the criteria for the category of micro enterprises.

In the second part of the questionnaire survey, companies were asked whether micro enterprise accounting is conducted internally or externally, whether they consider the categorization of entities beneficial, what form they use to prepare the balance sheet, and whether this form of balance sheet for micro entities is considered sufficient. In connection with the disclosure of financial statements, micro entities were surveyed whether they send financial statements to the Collection of Documents and whether they voluntarily disclose the profit and loss statement. It was also investigated whether with the new Accounting Act they experience a reduction in administrative and financial burdens in accounting and whether they have competitive advantages after being categorized as a micro enterprise.

It was found that all microenterprises know the size category they belong to, but only 15% of them find the categorization of entities beneficial. Seventy-eight percent of respondents outsource all their accounting. At the same time, it is possible to state that 80% of the entities surveyed compose the short form balance sheet for micro entities, but only 62% of them believe that this form is sufficient. In connection with the disclosure of the financial statement in the Collection of Documents, there was an alarming finding that almost 45% of these entities do not know about this obligation. Other entities are aware of this obligation, but only 28% of them meet this obligation. However, none of the entities that send the financial statements to the Collection of Documents voluntarily disclose the profit and loss statement. Surprising was the finding concerning a reduction in the administrative and financial burden. None of the entities reported a reduction in these costs. Some even reported (those applying for bank loans) increased administrative burdens, as they prepare the long form financial statements for that purpose. At the same time, the entities surveyed confirmed that they did not have a competitive advantage over larger enterprises. One of the objectives of the Directive, i.e. a reduction in the administrative burden and simplification of the business environment for micro enterprises in the Czech Republic, was therefore not accomplished.

4. Discussion and conclusion

Although the Directive seeks to harmonize the financial reporting of entities, the question remains whether the application of this Directive will meet expectations. The option of using a short form balance sheet and profit and loss account in the financial statements by micro and small businesses appears to be a very good solution at first glance, given that the enterprises belonging to these categories account for over 90% of all entities in the Czech Republic. Also, the micro entities surveyed confirmed the usefulness of this option. Most of them really prepare short form reports. The advantage for these companies is that they no longer need to disclose a profit and loss statement in the Collection of Documents and they do not have to report in detail on profit achieved. However, it is also

necessary to consider whether the option of using short form statements and subsequent non-disclosure of the profit and loss statement in the Collection of Documents will not adversely affect the decision-making of users of financial statements due to incomplete information. As stated, most of the companies surveyed despite their statutory obligation do not disclose their statements in the Collection of Documents.

It is true even nowadays that micro enterprises have more difficult access to external sources of funding than large companies because of their higher risk. Therefore, short form reporting can become another obstacle to using external sources of funding. This leads to an increase in administrative burdens because financial institutions require long-form financial statements, including a cash flow statement.

It has been shown that micro entities, in most cases, hire external accounting companies, so they often do not know about the changes resulting from the Directive or say they did not feel the change.

The analysis of the Directive has shown that its main objective is to reduce administrative burdens mainly for micro enterprises. This can be considered an advantage that will simplify the situation for preparers of financial statements, but not for their users. The Directive does not contain requirements for reconciliation of financial statements, the creation of a general conceptual framework or the definition of individual items of financial statements. Another problem is the variant solutions labelled as “allow or require” if the provisions of the Directive offer more solutions, often leaving the choice to national accounting legislation.

When comparing the Directive with Czech accounting regulations, it must be concluded that the previously applicable Accounting Act contained an overwhelming majority of the provisions of the Directive.

Acknowledgements

This article was prepared as a result of an internal grant project IGA PEF_TP_2018005 Mendel University.

References

- DEAC, M. The New EU Accounting Directive – a Comparison of Reporting Requirements (May 1, 2014) [online]. Annals of “Constantin Brâncuși” University of Târgu-Jiu, 2014 [cit. 2018-02-8]. Dostupné z: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2775921
- Důvodová zpráva ke směrnici 2013/34/EU [online]. 2013 [cit. 2018-02-10]. Dostupné z: <https://www.kacr.cz/file/2014/d-cj1788-21082014-219939608-1-duvodova-zprava-vpr.doc>.
- FROŠOVÁ, L. 2015. Novela prováděcí vyhlášky k zákonu o účetnictví pro rok 2016 [online]. Dostupné z: <http://www.danarionline.cz/archiv/dokument/doc-d52176v63901-novela-provadeci-vyhlasky-k-zakonu-o-ucetnictvi-pro-rok-2016/>
- HÝBLOVÁ, Eva. Účetní výkaznictví malých a středních podniků [online]. Brno: Masarykova univerzita, 2017 [cit. 2018-02-10]. ISBN 978-80-210-8755-2.
- HÝBLOVÁ, Eva. Současný stav účetního výkaznictví malých a středních podniků. In prof. Ing. Tomas Klietnik, Ph.D.. 15th International Scientific Conference GLOBALIZATION

AND ITS SOCIO-ECONOMIC CONSEQUENCES. Zilina – Slovakia: ZU – UNIVERSITY OF ZILINA, The Faculty of Operation and Economics of Transport and Communications, Department of Economics., 2015. s. 240–246, 7 s. ISBN 978-80-8154-145-2.

MEJZLÍK, L. 2015. Novela zákona o účetnictví 2016 [online]. Praha. Dostupné z: <http://ffu.vse.cz/wp-content/uploads/2015/12/Mejzlik.pdf>

Müllerová, Libuše. (2014). Změní nová evropská směrnice české účetnictví? Český finanční a účetní časopis. 2014. 131-140. 10.18267/j.cfuc.400.

SMĚRNICE EVROPSKÉHO PARLAMENTU A RADY 2013/34/EU ze dne 26. června 2013 o ročních účetních závěrkách, konsolidovaných účetních závěrkách a souvisejících zprávách některých forem podniků, o změně směrnice Evropského parlamentu a Rady 2006/43/ES a o zrušení směrnic Rady 78/660/EHS a 83/349/EHS [online]. 2013 [cit. 2018-02-10]. Dostupné z: <https://www.kacr.cz/file/4195/http-eur-lexeuropa-2013-34.pdf>

Zákon č. 563/1991 Sb., o účetnictví, ve znění pozdějších předpisů.
<https://apps.odok.cz/kpl-detail?pid=KORN9N6EU93>

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Practical application of selected panel data techniques in analyzing sales capabilities of coal assortments.

Anna Manowska¹

¹Department of Electrical Engineering and Automation in Industry, Faculty of Mining and Geology, Silesian University of Technology, Akademicka 2a, 44100 Gliwice, Poland, e-mail: Anna.Manowska@polsl.pl

Abstract

The article presents an analysis of the possibilities of selling hard coal in reference to environmental regulations of the European Union. Analysis of this sale made it possible to develop a theoretical model for forecasting demand on the domestic market. Proper forecast of demand allows for flexible and dynamic adjustment of the level of production or inventory to changes taking place on the market. It also enables the adjustment of the assortment manufactured to the requirements and expectations of the recipients, which in turn translates into increased sales, the release of financial resources, a reduction of the company's operating costs, an increase in the financial liquidity of the mines

Keywords: sales of hard coal, mathematical modelling, environmental directives of the European Union

JEL Code: O14, C4, Q5

1. Introduction

The structure of the Polish energy mix is largely determined by mineral resources in our possession. Hard and brown coals are basic sources of primary energy in Poland due to rich deposits of these raw materials. However, the energy mix structure in Poland is undergoing a change which is connected with a decrease in the fossil fuels share in the energy mix in accordance with the environmental requirements of the European Union.

The Ministry of Energy has among its studies the energy mix structure until 2050, shown in figure 1.

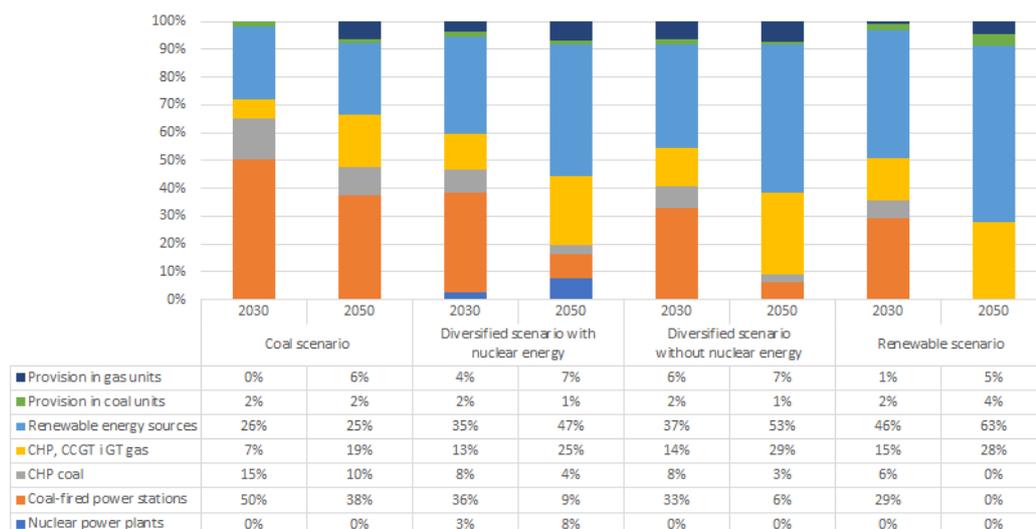


Figure 1: Scenarios of the energy mix in Poland
Source: individual study

Four scenarios of the energy sector development have been taken into account. The first, coal scenario, assumes that energy production is based on coal with the 26% share of the renewables; the second scenario, the so called diversified one, forecasts building nuclear power plants and the 47% share of the renewables in the mix; the third scenario, diversified one, does not include nuclear energy. It replaces nuclear power with gas and the renewables, which account for a 53% share in the mix. The fourth scenario, a renewable one, assumes total replacement of coal power plants by gas power plants and renewable sources, which account for a 63% share in the energy mix. More in: (Ecke et al., 2017).

The aim of the article is to analyze the directives of the European Union in the field of environmental protection, which contain requirements for reducing the emission intensity of EU countries, including Poland. The article presents mathematical models for warning forecasting in terms of hard coal production in Poland, which is the basic energy resource of the country and requires the implementation of measures improving its quality parameters.

2. Literature review – Environmental directives

The process of energy generation, transport and utilization leads to significant environmental pollution. In the past decade, concern for the environmental pollution has increased considerably. This issue is widely described in the literature (Kijewska et al., 2016, Korski et al 2016, Krzemień et al., 2013, 2016; Lutyński 2014, Strozik et al., 2016).

An essential element influencing the situation of the Polish coal sector is its regulatory environment. European directives transposed into the domestic legislative system are mainly aimed at decarbonisation actions, which shall result in significant reduction of the role of the qualitatively worst coals in economy. The impact of these regulations on the functioning energy and fuel sectors poses a challenge both for the mining industry as well as energy companies.

In order to provide suitable mechanisms helping to achieve the declared goals of the climate and energy package, a plethora of regulations have been introduced to implement the postulates of the '3x20' package. In particular these are (Malec et al., 2016):

- Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, called Directive EU ETS, Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, Euratom,
- Directives of the European Parliament and of the Council 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation 1013/2006, called Directive CCS,
- Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources,
- Directives on energy effectiveness and the Decision of the European Parliament and of the Council 2009/406/EC of 23 April 2009 on the Community's integrated approach to reduce greenhouse gases emissions in order to realize the Community's commitment to reduce greenhouse gases emission until 2020.

Apart from the legal regulations mentioned above, the energy sector and hard coal position as a fuel for electrical energy production are indirectly influenced by the following regulations:

- Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, Euratom, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006,
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe,
- Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment,
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC with further amendments,
- Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

The significant element resulting from the presented regulations is a decrease in coal share and an increase in the renewables share in the Polish energy mix. It requires high investments in order to build a new energy system adjusted to the diversified energy sector.

2.1. The quality of produced and used coals

The origins of qualified coal fuels go back to the first half of the 1990s (Zuzelski et al., 2007, Korzeniowski et al., 2012). Currently, hard coal supply to Polish customers is ensured by both domestic and foreign producers (Stala-Szlugaj, 2017). Coal from imports finds its recipients in a wide group of users: from commercial power industry, to heating plants and a group of individual consumers. The leading supplier of coal is Russia, the Czech Republic and the USA. The parameters of hard coal offered for sale on foreign markets are presented in Table 1.

Table 1: Quality parameters of coal offered for sale by ten major world exporters according to 'Coal Week International'.

| Country | Calorific value Qmin – Qmax GJ/Mg | Ash content Amin – Amax % | Sulphur content Smin – smax % |
|----------------|--|--|--|
| Australia | 25–27 | 0.6–0.8 | 14–14 |
| China | 24.2–25 | 0.8–1.0 | 8–15 |
| Indonesia | 20.9–27 | 0.1–0.8 | 1–8 |
| Canada | 24.2–29.0 | 0.5–1.0 | 10–14 |
| Columbia | 25.4–27 | 0.7–0.8 | 8–9 |
| Russia | 25.4–27.2 | 0.4–1.0 | 13–16 |
| RSA | 24.2–25.8 | 1.0 | 16–16 |
| USA | 19.7–29 | 0.4–2.5 | 5–15 |

Source: Dubiński, 2005

The table shows that on the market there are coals with high quality parameters. Ash content in final products in 205 American processing plants is very low and accounts for between 5–15% (it should not exceed 15%). The data quoted above characterize the production of energy coal and its quality giving us a glimpse of the world energy sector. Table 2 below presents average quality parameters of energy coals sold to various national consumers. The parameters refer to the working state.

Table 2: Quality parameters of coals purchased by various national consumers.

| Coal consumers | Calorific value GJ/Mg | Ash content % | Sulphur content % |
|---------------------------------|----------------------------------|--------------------------|------------------------------|
| Power plants | 19–23 (śr.21.6) | 12–30 | 0.6–1.2 |
| Heat and power plants | 20–26 | 14–15 | 0.6–0.8 |
| Metallurgy and metal industries | 19–25 | 6–25 | 0.6–1.2 (0.6–0.8) |
| Chemical industry | 17–25 | 12–28 | 0.6–1.3 |
| Timber and paper industries | 19–26 | 10–22 | 0.5–1.0 (0.4–0.8) |
| Textile industry | 20–26 | 8–25 | 0.5–1.0 (0.5–0.8) |
| Sugar industry | 22–29 | 8–18 | 0.4–0.9 |
| Mining industries | 20–26 | 11–25 | 0.6–1.0 (0.5–0.7) |
| Cement industry | min. 22 | 12–18 | 0.8–1.0 |
| Lime industry | min. 24 | max 12 | max 0.8 |

Source: Dubiński, 2005

The table shows that hard coal mines deliver to the market energy coal with crucially diversified quality parameters. It proves considerable production capacity of coal industry, which tries to adapt to high quality demands of the market. Alas, it must be noted that Polish power engineering still burns coal of the worst quality (calorific value, ash content, sulphur content). It is currently a rarity in Europe. Almost the whole production of electrical energy is based on fine coal with a low calorific value of 21,6 GJ/Mg. After Poland had joined the European Union, the issue of mechanical processing, which influences the quality of market coal, became a major issue due to effective European coal quality requirements.

3. Methodology and Data

Coal assortments are described by usually present multiple dimensions in terms of calorific value, ash content, sulphur content and the complexity of variables interacting with each other. The aim of the study is to determine the determinants influenced volume sales using panel data techniques. Econometric models estimated on the basis of panel data are usually oriented to cross-section analysis, and their task is to isolate differences between objects that are inseparable from factors specific to individual objects. In econometric models, estimated on the basis of panel data, it is assumed that the evolution of an explanatory variable is influenced by, in addition to explanatory variables, immeasurable, constant over time and factors specific to a given object, called group effects and / or fixed factors specific to a given period factors, called time effects. Inclusion of group and time effects in panel models makes it necessary to use specific estimation methods. The article analyzes the impact of environmental protection regulation on the sale of carbon products, in order to obtain an answer, which quality parameter influences the choice of coal product by the power industry. The analysis of available data shows that sales are gradually decreasing. The decline concerns lower sales to commercial and industrial power plants. There is also a noticeable stable level of sales in commercial and non-commercial heat plants. The data provided by the Industrial Development Agency, Ltd. was used to build the model. Data with individual categories of assortments is shown in Figure 2.

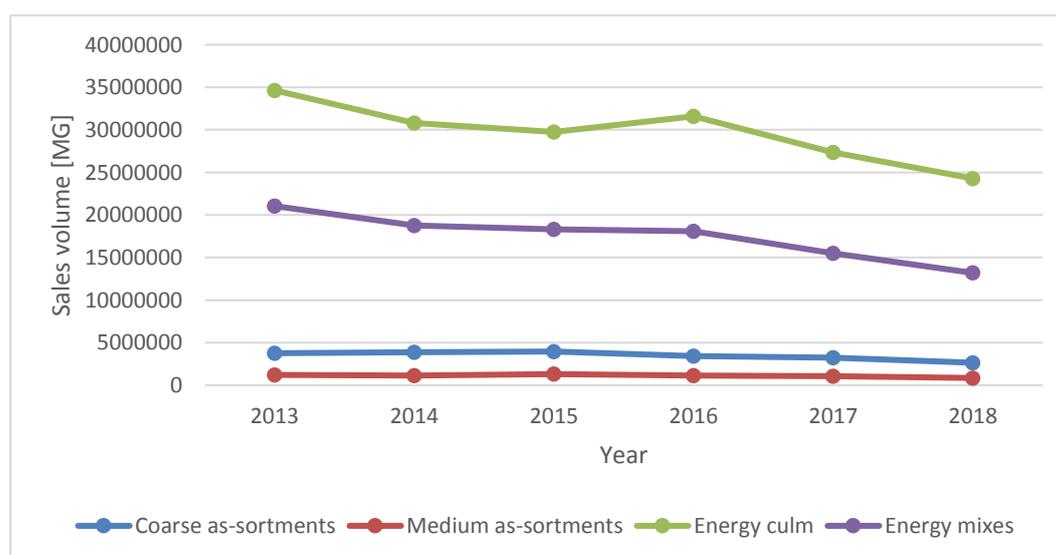


Figure 2: Coal assortments sold to consumers on the domestic market.
Source: individual study

In principle, it is possible to estimate time series for each case or cross-sectional regressions for each time unit by using the expressions (1) and (2) correspondingly (Gil-García et al., 2013):

$$y_{it} = x_{it}\beta + v_{it} \quad (1)$$

$$y_{it} = x_{it}\beta + u_{it} + \varepsilon_{it} \quad (2)$$

where:

y_{it} – explained variable,

x_{it} – explanatory variable (vector of variables),

β – vector with the N dimension of the structural parameters of the model

v_{it} – random error,

u_{it} – individual effect,

ε_{it} – pure random error,

where (1) is a model with fixed effects, while 2 is a model with random effects. The importance of panel models is emphasized by articles (Griliches et al., 2007). Wide range of panel models for econometric analysis is also presented by other articles (Baltag, 2003). They undoubtedly apply in the analysis of economic phenomena.

4. Results

Analyzes were carried out on panel data techniques and panel models were constructed with a generalized least squares method, a panel model with fixed effects and a panel model with variable effects. The statistics such as R^2 , standard error of residuals and sum of residual squares, statistics F. were used to verify the models. The sales level was used as the explanatory variable, the explanatory variables were: caloric content, ash content and sulfur content.

Table 3 contains the numbers characterizing the results of panel estimation using the least squares method. It was found that caloricity is the strongest stimulant of the sales volume. Sulfur content is also closely related to the level of sales.

Table 3: Fixed Effects Model

| Coefficients | Estimate | Std.Error | t-value | p-value |
|-------------------------|-----------------|------------------|----------------|----------------|
| Const | -1505.09 | 798.91 | -1.884 | 0.07 |
| LnCalorific value | 146.23 | 77.08 | 1.898 | 0.07 |
| Ash content | 1.81 | 1.10 | 1.655 | 0.01 |
| Sulphur content | 130.20 | 17.67 | 7.368 | 0.00 |
| Multiple R2 | 0.74 | | | |
| Adjusted R2 | 0.70 | | | |
| F-statistic (3,20) | 18.87 | | | 0.00 |
| Residual standars error | 2.265 | | | |

Source: own study

Table 4 presents the results of panel data techniques estimates with variable effects.

Table 4: Random Effects Model

| Coefficients | Estimate | Std.Error | t-value | p-value |
|-------------------------|-----------------|------------------|----------------|----------------|
| Const | -602.46 | 995.35 | -0.605 | 0.05 |
| LnCalorific value | 64.92 | 95.51 | 0.680 | 0.05 |
| Ash content | 0.43 | 2.16 | 0.198 | 0.08 |
| Sulphur content | 41.08 | 33.01 | 1.245 | 0.02 |
| Medium as. | 7.08 | 17.39 | 0.407 | 0.06 |
| Energy culm | 2.05 | 20.64 | 0.099 | 0.01 |
| Energy mixes | -5.35 | 2.03 | -2.647 | 0.01 |
| Multiple R ² | 0.87 | | | |
| Adjusted R ² | 0.82 | | | |
| F-statistic (6,17) | 18.89 | | | 0.00 |
| Residual standars error | 1.736 | | | |

Source: own study

Similarly to the model 1, the factor shaping the sales volume is caloric content and sulfur content. The smallest share has ash content. Pay attention the model fitting by coefficients: multiple R², Adjusted R², and F statistics. The model also compared products with respect to coarse assortments. You can see that the remaining products are characterized by inferior quality parameters, however, they have a significant impact on the level of sales. It can be concluded that the price is the decisive parameter in choosing products. Therefore, a model with variable effects was also taken into account including the price. The results are shown in Table 5.

Table 5: Random Effects Model

| Coefficients | Estimate | Std.Error | t-value | p-value |
|-------------------------|-----------------|------------------|----------------|----------------|
| Const | -17.30 | 14.91 | -1.160 | 0.02 |
| Price | 17.86 | 2.42 | 7.383 | 0.00 |
| Medium as. | 13.70 | 1.74 | 7.875 | 0.00 |
| Energy culm | 11.06 | 2.33 | 4.755 | 0.00 |
| Energy mixes | -6.83 | 0.51 | -13.286 | 0.00 |
| Multiple R ² | 0.96 | | | |
| Adjusted R ² | 0.95 | | | |
| F-statistic (4,19) | 123.6 | | | 0.00 |
| Residual standars error | 0.875 | | | |

Source: own study

From the developed model it is clear that the price level is the factor influencing the level of sales. The products purchased by the energy industry are energy clum and energy mixes, and the prices of these products are lower in comparison to coarse and medium assortments. This model has also the very high the model fitting (R²=95%).

5. Discussion and Conclusions

Panel data techniques are useful for solving problems related to the search for determinants shaping the sales volume in mining enterprises. The obtained results indicate an advantage of panel models with variable effects over panel models built with estimation

using the classic least squares method and panel models with fixed effects. Factors determining the sales volume include: caloric content, sulfur content and price. The increase in the quality of these parameters has a positive effect on the change in the level of sales volume.

The Polish mining industry is characterized by large coal resources and a well-developed, modern and efficient technological infrastructure in the field of coal mining, extraction and enriching. It allows for providing a proper amount and high quality of coal fuel to produce electrical and heat energy. An essential problem connected with energy processing of coal fuel is meeting increasingly strict ecological requirements for gases emission into the atmosphere.

To ensure this leading position for the next decades it is necessary to intensify research on advanced technologies of clean coal and rationalization of its use for the sake of future generations. What is also necessary is a reasonable promotion of good quality coal, which would benefit the whole fuel and energy sector as well as the national economy.

Acknowledgements

The work was elaborated in frames of the statutory research [06/030/BK_17/0021]

References

BALTAG, B.H., 2003. *Econometric Analysis of Panel Data*, John Wiley & Sons, LTD, England: 1-297.

DUBIŃSKI, J., TUREK, M. and ALEKSA, H. 2005. Węgiel kamienny dla energetyki zawodowej w aspekcie wymogów ekologicznych, *Prace Naukowe GiG Górnictwo i Środowisko*, 2/2005, 15–18 [Online]. Available at: <http://www.dawsonera.com/>. [Accessed: 10 February 2018].

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC.

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, Euratom, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006.

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

- Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.
- ECKE, J., STEINERT, T., BUKOWSKI, M. and ŚNIEGOCKI, A. 2017. Polski sektor energetyczny 2050, cztery scenariusze, Forum energii, 5–22.
- GIL-GARCÍA, R., PURON-CID, G. 2013. Using Panel Data Techniques for Social Science Research: an Illustrative Case and Some Guidelines, *Using Panel Data Techniques for Social Science Research*: 203–216.
- GRILICHES Z., M.D. INTRILIGATOR, 2007. *Handbook of econometrics*, V2, Elsevier North Holland, Spain: 1248–3018.
- KIJEWSKA, A., BLUSZCZ, A. 2016. Research of varying levels of greenhouse gas emissions in European countries using the k-means method. *Atmospheric Pollution Research*. 7: 935–944. <http://dx.doi.org/10.1016/j.apr.2016.05.010>.
- KORSKI, J., TOBÓR-OSADNIK, K., WYGANOWSKA M. 2016. Reasons of problems of the Polish hard coal mining in connection with restructuring changes in the period 1988–2014. *Resources Policy*. 48: 23–31.
- KORZENIOWSKI, M., KURCZABIŃSKI, L., ŁÓJ, R., 2012. Katowicki Holding Węglowy SA – 10 years of qualified coal fuels. Katowicki Holding Węglowy SA – X lat kwalifikowanych paliw węglowych. *Materiały XXVI Konferencji z cyklu: Zagadnienia surowców energetycznych i energii w gospodarce krajowej*. Zakopane, 14–17.10.2012 r., Kraków: Wyd. IGSMiE PAN: 45–54.
- KRZEMIEŃ A., FERNANDEZ P.R., SANCHEZ A.S., ALVAREZ I.D. 2016. Beyond the pan-european standard for reporting of exploration results, mineral resources and reserves. *Resource Policy* 49: 81–91. doi:10.1016/j.resourpol.2016.04.008.
- KRZEMIEŃ, A., WIĘCKOL–RYK, A., DUDA, A., KOTERAS, A., 2013. Risk assessment of a post – combustion and amine – based CO₂ capture ready process. *Journal of Sustainable Mining* 12 (4): 18–23. <http://doi.org/10.7424/jsm130404>.
- LUTYŃSKI, M., 2014. Impact of preparation and storage of activated carbon on the high pressure sorption of CO₂. *Bulletin of the Polish Academy of Sciences Technical Sciences*. 62 (1): 113–119.
- MALEC, M., KAMIŃSKI, J. and KASZYŃSKI, P. 2016. Regulacje środowiskowe w energetyce a zapotrzebowanie na węgiel kamienny, *Polityka Energetyczna – Energy Policy Journal*, Tom 19, Zeszyt 1, 21–34 [Online]. Available at: <http://www.dawson-era.com/>. [Accessed: 10 February 2018].
- STALA-SZLUGAJ, K., 2017. The development of the market of qualified coal fuels in Poland, *Gospodarka Surowcami Mineralnymi – Mineral Resources Management*, 33 (3): 95–108
- STROZIK, G., JENDRUŚ, R., MANOWSKA, A., POPCZYK, M., 2016. Mine Subsidence as a Post-Mining Effect in the Upper Silesia Coal Basin. *Pol. J. Environ. Stud.* 25(2): 777–785.
- ZUZELSKI, J., KURCZABIŃSKI, L., 2007. New quality of the coal markets. *Nowa jakość rynków węgla kamiennego*. *Polityka Energetyczna – Energy Policy Journal* 10 (2): 443–452.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The impact of pension systems on working life in Albania, Cyprus and Lithuania

Petroula Mavrikiou¹, Jolanta Pivorienė², Merita Xhumari³

¹*Department of Business Accounting and Finance, Frederick University, 7 Y. Frederickou Str. 1036, Nicosia, Cyprus, e-mail: p.mavrikiou@frederick.ac.cy*

²*Institute of Educational sciences and Social Work, Mykolas Romeris university, Ateities str. 20, Vilnius, Lithuania, e-mail: jolantapiv@mruni.eu*

³*Department of Political Sciences, Faculty of Social Sciences, University of Tirana, Bulv. Gjergj Fishta, Tirana, Albania, e-mail: xhumarimerita@gmail.com*

Abstract

In XXI century most of European countries underwent radical changes in economic and social systems. The goal of this paper is to discuss the impact of pension systems on extending working life in Albania, Cyprus and Lithuania. The paper is based on the comparative analysis which is done in the framework of EU COST Action IS1409 “Gender and health impacts of policies extending working life in Western countries”. Comparative analysis is based on theoretical, statistical and secondary data analysis.

In each country, the parametric reforms of increasing the retirement ages have forced old age people to extend their working life. In Albania the pension reform started in 1993 and has continued approximately every ten years, in 2002 and in 2015 tending to have a sustainable Pay As You Go system. In Cyprus major reforms in the Social Insurance Scheme, which covers all the employed and self-employed persons in the area controlled by the Republic of Cyprus, started in 1980 and then after the financial crisis of 2013. In Lithuania pension reform started in 1995, but only in 2004 three pillars system was implemented, new reform was introduced in 2018. However, introduced reforms don't guarantee well-being of elderly population and rise challenging discussions about what economic and social means should be in place in each country for extending the working life through active involvement and a productive life.

Keywords: Pension system, parametric reforms, systemic reforms, dependency rate, replacement rate, working life.

JEL Code: J26

1. Introduction

This analysis of most important policy developments during the last 10 years was finalized in the framework of the EU COST Action IS1409 “Gender and health impacts of policies extending working life in Western countries”, which created opportunities for exchange of experiences among researchers from the EU countries and neighbouring Western Balkan countries. This was the incentive to realize the comparative analysis on approaches and common problems that are facing policy-makers in the field of pensions. The analysis follows a comparative logic with its starting point the background of each country regarding to the economic, social, and demographic challenges to build adequate social security systems.

In Albania, the welfare state after 1990 was following the Bismarkian model, based on introduction of the social insurance system in health care, pensions, temporary incapacity to work, maternity, unemployment, employment injuries and professional diseases (Law no.7703, dated 11.05.1993). Based on the social right perspective, a large volume of legislation was produced and after 2000 it aims the harmonization with *Acqui Communautaire*. In this context, the supplementary professional schemes have been developed as the second pillar along with the voluntary private pension schemes.

In Cyprus the first social insurance scheme was introduced in January 1957 and it covered compulsorily the employed persons, with the exception of certain categories of agricultural workers. The self-employed persons and those workers excepted from compulsory insurance were given the right to be insured voluntarily. This first scheme had a major reform in 1980 which introduced an earnings-related social insurance, replacing the previous scheme of flat-rate contributions and benefits. Currently, there is only one Social Insurance Scheme (General SIS) which covers all employed and self-employed persons in the area controlled by the Republic of Cyprus.

Lithuania's first steps towards pension reform were taken in 1995, following a major economic crisis in the early 1990s. The first reform focused on making parametric changes to the first pillar and increasing the system's sustainability (Law on State Pensions, 1994). Another two pillars were added to the system in 2004, comprising funded schemes and supplementary pension provision. Contrary to most other CEE countries, Lithuania's second pillar is not mandatory. It is made up of individual defined contribution accounts, but employees are free to choose whether to join or not. Acceptance of second pillar pensions has been strong and participation has increased rapidly. The third pillar is fairly underdeveloped and consists of voluntary pension funds or life insurance products

(<http://www.pensionfundsonline.co.uk/content/country-profiles/lithuania/87>).

The goal of the paper is to discuss the impact of pension systems on extending working life in Albania, Cyprus and Lithuania.

2. Methodology and Data

Comparative analysis is based on theoretical, statistical and secondary data analysis. This paper includes discussion of the research, legal framework, policy documents, studies and statistical analysis on ageing and retirement.

3. Results

3.1. Albania

In the last years Albanian society has experienced societal changes in life course organizations. Among the factors with impact in such transformations have been demographic indicators of fertility, life expectancy and migration. The last Census (2011) showed the old-age dependency ratio almost doubled from 8.6 percent in 1989 to 16.7 percent in 2011, while in 2030 it was foreseen to be doubled to 32.9 percent (INSTAT, SDC, UNFPA, 2015:9). There is a gender gap to the old-age dependency ratio referring to higher life expectancy to 80.1 years for women compared to 77.0 years for men (INSTAT, 2017:19).

In the life course perspective, transition from employment to retirement is regulated mainly by two basic laws: on Social Insurance and Labour Code. The general system of social insurance is consisted of: compulsory social insurance, voluntary and supplementary social insurance. The state budget is financing the social pension and special state pensions for citizens with special merits in country. The compulsory social insurance covers all economically active population and since 1993 have been under continuous parametric reforms. In 1993 it consisted on unifying for a transitional period the retirement ages at 60 years old for males and at 55 years old for females and increasing the minimum insurance period for old age pensions at 20 years. In 2002 the retirement ages started again to be increased with 5 years for both males and females. The pension reform of 2015 aims the equalization of retirement ages at 65 years old and further increasing the insurance period in 40 years until 2044, as instruments for financial sustainability of the scheme.

The high rates of unemployment, migration and informal economy have been the main factors that imposed frequent parametric reforms on the pension system to influence its main indicators of: a) high dependency rate where 1 pensioner was supported by almost 1 contributor; and b) the replacement rate that didn't meet the ILO minimum standards of 40 percent of the average wage (ILO, 102/1952). This argument is a strong rationale that people to be interested to extend their working life to maintain their standard of living. "The pension scheme suffers from a very high deficit that makes it financially unaffordable... no longer able to guarantee the balance between the adequacies of benefits with the affordability of costs. Given the importance of pensions for social protection, it is necessary to intervene immediately to reform the system" (Ministry of Social Welfare and Youth, 2014:4).

Increasing the retirement ages has had a direct impact on extending the working life. In 1993 the average age of retirement was 53.2 years old, in 2017 the average age of retirement was increased with 10 years, reaching at 63.2 years old (Xhumari, 2011:36; SII, 2017:10). Although, the share of pensioners in the Albanian population was increased from 13.4 percent of the total population in 1993 at 19 percent of total population in 2016 (Xhumari, 2011:36; SII, 2017:10). Referring to the higher employment of women in two sectors, agriculture and non-market services (public administration), 79 thousand women pensioners receive a rural pension (8,556 ALL/month = Euro 64/month) compared to 45 thousand men. Most of the men receive an urban pension that is twice the rural pension (14,873 ALL = Euro111/month) (INSTAT, 2017:83). The low level of pension for women is related to low wages and low contributing period which for women is 29 years compared to 31.1 for men (SII, 2017:20). Women enjoy their pension for a longer period of 25 years compared to men of 20 years. "The sustainability of pension system is

under severe strains due to low employment, poor collection of contributions, and an unexpected increase in the number of pensioners, as a kind of poverty retirement” (Xhumari, 2011:10).

LSMS showed an increase of the poor population at 14.3 percent in 2014, compared to 12.4 percent in 2008 (INSTAT, LSMS 2014). Pension reform of 2015 introduced for the first time a means-tested social pension to the Albanian residents above 70. This measure is directed to benefit especially women, who have higher unemployment rate and higher life expectancy compared to men. Pension reform of 2015 aimed to improve the indicators of the system, incentivizing individuals to pay higher contributions and to increase their insurance period (Ministry of Social Welfare and Youth, 2014:34). Parametric changes of increasing the amount of pensions with 0.5 percent for each month contributing beyond the formal retirement age, as well as removing the limitation of the maximum amount of benefits are expected to encourage extension of working life. Other measures make the transition to retirement more flexible for the professors who are allowed to negotiate for staying longer in that position. In some other cases, experienced retired teachers, doctors and other professionals continue their work in the private sector, since it is flexible. Measures have been taken to formalize the pensioners work beyond the retirement age by allowing them to have a pension and continue working and paying social insurance contributions. Meanwhile, increasing the unemployment rates of young population that is double the unemployment rate of total population remain a big challenge for the Albanian society.

3.2. Cyprus

In Cyprus the current pension system comprises of: The General Social Insurance Scheme, a compulsory earnings-related scheme which covers every person gainfully employed in Cyprus, both in public and private sector, including self-employed; The Social Pension Scheme, an income-tested scheme, which covers residents of Cyprus with no or low pension income (i.e. housewives); The Occupational pension plan, which provides supplementary pensionable benefits to their members. Examples of the Occupational pension plan is the Government Employees Pension Scheme, the Semi-government Sector Employees Pension Scheme, The Voluntary Provident Fund and other similar collective arrangements.

The old-age pension is payable at the statutory pensionable age of 65 for both men and women for both the private and the public sector, provided that the person has been insured for at least 15 years and given some other requirements.

Until 2013 the rate of contribution was 17.9 percent on the monthly wage and was divided to 6.8 percent contributions paid by the employer, 6.8 percent paid by the employee and 4.3 percent paid by the State. For self-employed people the rate of contribution was 16.9 percent on the expected income; 12.6 percent was paid by the self-employed and 4.3 percent by the State. Following the 2013 financial crisis the social security contribution has increased to 20.2 percent on the monthly wage: 7.8 percent contributions paid by the employer, 7.8 percent paid by the employee and 4.6 percent paid by the State. For self-employed people the rate of contribution increased to 19.2 percent on the expected income (14.6 percent paid by the self-employed and 4.5 percent by the State). For the permanent employees of the public sector, the contribution is 3.95 percent for those who have been employed before 2011, and 7.8 percent for those who have been employed after 2011.

In 2007 Hoffmaister, Catalán and Guajardo (2007) in their work “Addressing the Macroeconomic Consequences of Aging in Cyprus: The Case for Pension Reform” concluded that, policy-wise deep pension reforms were required to address the macroeconomic effects of aging. Following the huge financial crisis in March 2013 many reforms took place in the tax system of Cyprus, such as increase in Income Tax, Special Contribution for Defence, Immovable Property Tax, increase in Value-Added Tax, Special Credit Institution, and Special contribution for the private and public sector. Therefore, the social security system could not be an exception.

According to the statistical data regarding the schemes administered by the social insurance services (Social Insurance Services, 2018) in 2014 there were 158, 743 pensioners benefited from the pension schemes. This number corresponds to 18.74 percentage of the total population of Cyprus and includes also the people who have received Social Pension, a scheme introduced in May 1995. In 2016 the average percentage of persons benefited from the pension schemes increased to 19.33 percentage. The average amount of pension in 2014 was 633.77 Euro per person (Social Insurance Services, 2018).

The minimum monthly amount pension for a pensioner with no dependents for 2016 was 418.51 Euro and the minimum monthly amount pension for a pensioner with three dependants 592.89 Euro (Social Insurance Services, 2018). The annual expenditures on pensions for the year 2016 were 1.261.200 thousand Euro spent to 148.977 pensioners making an average amount of pension 652.21 Euro per person. The mean monthly wage for 2016 was 1.879 Euro which yields to 34.65 percent of the average pension to the average (Social Insurance Services, 2018; Statistical Service of Cyprus, 2016).

During 2014–2015, the mean labour force participation rate for persons aged 55–64 rose from 56percent to 57.1 percent, (Statistical Service of Cyprus, 2016) both rates above the 50 percent, an objective set by the European Council in the Lisbon agreements in 2000. Notice that the participation rate refers to the number of people who are either employed or are actively looking for work. The respective employment rates for these two years in Cyprus were 46.9 percent and 48.2 percent respectively (Statistical Service of Cyprus, 2016). Given that during an economic recession the participation rate decreases, there is a slight hope that things are starting to improve after three years of recession in Cyprus. Nevertheless, the general feeling and the public opinion is not favouring the late retirement and the current working generation does not want to extend its working live.

Unemployment rates may also be an obstacle to increasing working life and maintain quality life. During the period 2012-2015 unemployment rate among the working labour force in the age group 55–64 rose from 1.19 percent to 2.04 percent, for men from 1.58 percent to 2.66 percent, and for women from 0.75 percent to 1.38 percent (Statistical Service of Cyprus 2016, author’s calculations). Even though these numbers look small relative to 32.8 percent unemployment rate for the age group of 15–24 in 2015, still for seniors in the age group 55–64 is generally accepted that they find it difficult to obtain a new full-time job.

3.3. Lithuania

Lithuania suffers from a declining and ageing population. In addition to low fertility rates, negative net migration has a serious impact. In 2004, Lithuania saw the highest rate of emigration among the EU member states that joined the same year. It is estimated that the dependency rate will rise up to 44.9percent in 2050, which is seven percentage points lower than the EU-25 average, public pension expenditure will increase from 6.7 percent (in 2016) to 8.6percent of GDP in 2050. These values are roughly four percentage points

lower than the corresponding values for the EU-25 average (<http://www.pensionfundsonline.co.uk/content/country-profiles/lithuania/87>).

The old-age retirement population amounted to 23percent as of the end of 2016. Each year, the number of people who have attained the old-age retirement age decreases slightly due to the raising of the old-age retirement age, which will reach the 65-year mark for both men and women in 2026. As of 2017, the old-age retirement age is 62 years for women and 63 years and 6 months for men. According to the data of the State Social Insurance Fund Board (hereinafter – the SSIFB) as of December 2016, about 90percent of people in retirement age receive a state social insurance old-age pension, while the rest have chosen to receive a disability pension (The Social Report 2016–2017, 2017). As for comparison, in 2014, beneficiaries of old-age pensions accounted for 55percent of all beneficiaries of state social insurance pensions. The old-age pensions made up 75percent of all expenditure of state social insurance pensions (The Social Report 2014–2015, 2015).

In 2016 the Government approved the new amount of the basic state social insurance pension and the insured income. As a result, the amount of the basic state social insurance pension increased from Euro 112 to Euro 120, while the insured income of the current year – from Euro 445 to Euro 476 as of 1st January 2017. This increase has affected about 802 thousand recipients of state social insurance pensions. Due to the higher amounts of the basic pension and the insured income, the average old-age pension awarded to people having the obligatory insurance record increased on average by about Euro 20 and amounted to about Euro 287.07 as of January 2017. During 2016, the average annual state social insurance old-age pension of persons having the mandatory social insurance record was Euro 266.18. The ratio between the average annual old-age pension of persons with the mandatory social insurance record and the average annual gross salary of persons insured with all types of social insurance is 40.2 per cent (The Social Report 2016–2017, 2017).

A new version of the Law on Social Insurance Pensions (2016) has reformed the pension scheme and came into force since 2018. Key provisions of the new legal regulation – new pension structure, introduction of pension points and indexing. The new edition of the law provides that the pension will consist of the general and the individual pension parts. The general part of the pension will replace the basic part of the pension and a bonus for the length of the record, while the individual pension will replace the additional part of the pension and reflect person's contributions paid to the social insurance scheme. The new edition of the law also provides for gradual increasing of the obligatory insurance record for which the old-age pension is paid from the current 30 years to 35 years. At present, the average insurance record for which the old-age pension is paid is already 37 years.

According to the Bank of Lithuania, there are 21 second pillar pension funds. According to the data as of early 2017, about 1.25 million Lithuanian residents accumulate their funds at pension accumulation companies (The review..., 2016). Contributions to pension funds have increased and since 2016 consists of a 2 percent contribution of state social pension insurance, a 2 percent additional contribution by the participant and a 2 percent pension benefit from the state budget. In 2014-2015, the contribution consisted of a 1 percent contribution of state social pension insurance, a 2 percent additional contribution by the participant and a 1 percent pension benefit from the state budget (The Social Report 2016–2017, 2017).

4. Discussion and Conclusions

The issue of increasing the effectiveness of the society investments on extending working life is of a special importance in the context of **economic, social, and** demographic changes to ageing and decrease of employment. In this context, the pension parametric reforms aimed increasing the retirement ages at 65 years old for both men and women in the three case studies: Albania, Cyprus and Lithuania. Reforms also increased the insurance period from average 20 to 35 years, forcing the group age above 55 to extend the working lives.

Table 1: The parametric reforms of pension systems in Albania, Cyprus and Lithuania

| Year | 1993 | 2016 |
|--|-----------------------------|--|
| Formal age of retirement | | |
| Albania | Varied from 45–65 years old | 55–65 years old, still in the process of increasing |
| Cyprus | Varied from 55–65 years old | 63–65 years old |
| Lithuania | 55 for women, 60 for men | 62 for women, 63 for men, will be increased till 65 years in 2026 |
| Maximum insurance period for a full old age pension | | |
| Albania | 15–20 years | 35 years |
| Cyprus | *no official data | at least 15 years for retiring at 65 at least 33 years for retiring at 63 |
| Lithuania | 20 years women/25 years men | 35 years |
| Replacement rate (average pension/ average wage) | | |
| Albania | 56.4 percent | 41.7 percent |
| Cyprus | *no official data | 34.7 percent |
| Lithuania | 34.0 percent | 40.2 percent |

Source: Statistical data from social insurance agencies of each country

The level of social insurance contribution for pensions has been increased to about 20 percent on the monthly wage, divided by the employer, the employee and the State which is supporting the system. It is a high cost paid by the labour forces, compared to the benefits they received. The average amount of pensions in Albania and Lithuania in 2016 was at the minimum standards, with a replacement rate of 40 percent of the average wage. So, since the maximum insurance period almost doubled and the amount of contributions increased in relative and absolute terms, on the contrary, the replacement rate in both Albania and Lithuania remained at the level of minimum standards of ILO Convention no.102 of 1952. Such standards are overtaken from most of the EU member states and in the EU Strategy 2020 was defined 60 percent of the average incomes as the minimum standard of living. Another incentive was that pensioners were allowed to receive their pension and to continue working and receive their incomes and continuing to pay their contributions. Such flexibility on the eligibility criteria for pensions will have an impact on extending the working life.

Table 2: The reformed pension systems in Albania, Cyprus and Lithuania

| Country | Zero Pillar | First Pillar | Second Pillar | Third Pillar |
|------------------|---|--|---|---|
| Albania | Social Pensions – from 2015 Income-tested for Albanian residents above 70 years. | Since 1993 a Pay-As-You-Go mandatory social insurance system for all economically active population in Albania, and a voluntary scheme for the Albanian emigrants and all those who want to increase the benefits and insurance periods. | Started in 1996 as pay-as-you go public mandatory supplementary pension schemes for senior civil servant, military servant and recently extended to professors. Professional supplementary schemes are offered from bank and insurance companies. | Fully Funded Defined Contribution Pension schemes started after 2005 on a voluntary basis. |
| Cyprus | Social Pension Scheme, an income-tested scheme, which covers residents in Cyprus. | The General Social Insurance Scheme, a compulsory earnings-related scheme which covers every person gainfully employed in Cyprus, both in public and private sector, including self-employed. | Occupational pension plans, which provide supplementary pensionable benefits to their members: – The Government Employees Pension Scheme – Semi-government Sector Employees Pension Schemes. | The Voluntary Provident Funds |
| Lithuania | Social insurance pensions for work incapacity; widows, widowers and orphans; persons who nursed disabled person at home for more than 15 years. | Implemented since 1995, obligatory, depends on the number of years worked, amount of social contributions paid, period of their payment, the amount of insured income for the current year. Since 2018 pension will consist of the general and the individual parts. | Implemented since 2004, is not mandatory, made up of individual defined contribution accounts. | Implemented since 2004, is underdeveloped, consists of voluntary pension funds or life insurance products, voluntary. |

Source: Social insurance legislation of each country

It is obvious that Albania, Cyprus and Lithuania were following the same reforms **on the first pillar of pension system and introduced the social state pensions to guarantee the minimum of living as a social right for elderly population.** Along with parametric reforms, the three countries introduced supplementary professional pension schemes, with the aim to encourage various professionals, like professors in Albania to extend their working life. In Lithuania State pensions and pension related benefits are: state pensions for victims, officials and soldiers, scientists, judges, professor emeritus, also there are personal pensions, first-degree and second-degree state pensions, annuities

for athletes, state signatory annuities (Law on State Pensions, 1994). In Cyprus the corresponding pensions and pension related benefits are: widows/death, invalidity, orphans', disablement, and missing persons'.

The impact of pension reforms in extending the working life for older labour forces is related with the need for promoting employment services of elderly as well as of young people. The labour market indicators in three countries showed difficulties for group age 55–65 to find a job in the labour market, although their unemployment rates are lower compared to the youngest. Skills need assessment of the labour market addressed to such categories and a better orientation of the curricula of the vocational and higher education to the market needs have to be associated with a better career orientation during the life course. Research data shows that not adjusted working places, not flexible working time, few opportunities for alternative employment, low possibilities for training and retraining are mentioned as the most restraining factors for elderly staying in labour market (Pocius, 2016).

However, to extend the working life and the employability of the elderly should be considered broadly as a responsibility of the government to establish the proper rules in the market and of the employers to offer flexibility for the older employees. Such interventions are necessary to face a competitive EU labour market toward a smart growth objective of the EU strategy 2020

Acknowledgements

An acknowledgement is addressed to the EU COST Action IS1409 "Gender and health impacts of policies extending working life in Western countries" that enabled the realization of the paper and provided funding for the participation in the conference.

References

- ALBANIAN INSTITUTE OF STATISTICS-INSTAT. 2014, LSMS. Available at: <http://www.instat.gov.al/al/themes/niveli-i-jetes%C3%ABs.aspx>. (Accessed: September 12, 2017).
- ALBANIAN SOCIAL INSURANCE INSTITUTE-SII. 2017. Report. Available at: <http://www.iss.gov.al/al/wp-content/uploads/2014/02/iss-per-tu-pare-shqipang.pdf>. (Accessed: September 19, 2017).
- DELOITTE 2016. Available at: https://www2.deloitte.com/content/dam/Deloitte/cy/Documents/tax/CY_Tax_WorkingAndLivinginCyprusEN_Noexp.pdf [Accessed 2010, February 20]
- HOFFMAISTER, A.W., CATALAN, M., GUAJARDO, J., LEVCHENKO A. 2007. International Monetary Fund, Cyprus, Selected issues.
- ILO, Convention no.102/1952 on Minimum Standards of Social Security, ratified by the Albanian Government in 2005.
- INSTAT, SDC, and UNFPA. 2015. Population Ageing: Situation of Elderly People in Albania. Available at: http://www.instat.gov.al/media/316728/population_ageing_situation_of_elderly_people_in_albania.pdf. (Accessed: September 19 2017).

- LAW No 80/2015 on Higher Education and Scientific Research in Higher Education Institutions in Republic of Albania, Art.65/1.
- LAW No XII-2512 on Amendment of Republic of Lithuania Law No I-549 On Social Insurance Pensions. 2016 TAR, 2016-07-15, Nr. 20649
- LAW No.7703, DATED 11.05.1993 on Social Insurance in the Republic of Albania, amended until 2017.
- LAW No.7870, DATED 13.10.1994 On Health Care Insurance in the Republic of Albania, replaced by Law no.10383, dated 24.02.2011, On Compulsory Health Care Insurance Fund in the Republic of Albania.
- LAW ON REFORM OF THE PENSION SYSTEM. 2002. Valstybes Zinios (Official Gazette), No. 123-5511.
- LAW on Social Insurance Pensions No I-549. 1994. Republic of Lithuania. Official Gazette, 1994, No. 59-1153.
- LAW on State Pensions No I-730. 1994. Republic of Lithuania. Official Gazette, 1994, No 101–2018
- MINISTRY OF SOCIAL WELFARE AND YOUTH. 2014. Pension Policy Paper.
- PENSION FUNDS ONLINE. LITHUANIA. Online. Available at: <http://www.pensionfundsonline.co.uk/content/country-profiles/lithuania/87>. [Accessed 2018, January 29].
- POCIUS A. 2016. Changes in the situation of different demographic groups in Lithuanian labor market and the influence of methodological differences on relative unemployment indicators. *Lithuanian Journal of Statistics*: vol. 55, No 1, pp. 6–18
- SOCIAL INSURANCE SERVICES OF CYPRUS 2018. Available at: <http://www.mlsi.gov.cy/mlsi/sid/sidv2.nsf/All/5FCEB55E3EFFB8FEC22580DC0022F3FD?OpenDocument> [Accessed 2018, February 23].
- SOCIAL INSURANCE SERVICES OF CYPRUS 2018. Available at: http://www.mlsi.gov.cy/mlsi/sid/sidv2.nsf/page21_en/page21_en?OpenDocument [Accessed 2018, February 23].
- STATISTICAL SERVICE OF CYPRUS 2016. Available at: http://www.mof.gov.cy/mof/cystat/statistics.nsf/labour_32main_en/labour_32main_en?OpenForm&sub=2&sel=2 [Accessed 2018, February 23].
- THE REVIEW OF LITHUANIA'S SECOND AND THIRD PILLAR PENSION FUNDS AND OF THE MARKET OF COLLECTIVE INVESTMENT UNDERTAKINGS. 2016. Bank of Lithuania
- THE SOCIAL REPORT 2014–2015. 2015. Vilnius: Ministry of Social Security and Labour.
- THE SOCIAL REPORT 2016–2017. 2017. Vilnius: Ministry of Social Security and Labour.
- XHUMARI.M. 2011. Pension Trajectories in Western Balkans Three case studies: Albania, Macedonia and Kosovo 1990–2010. Pegi, Tirana.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Credit Contract and Lending Contract in the Context of the New Czech Civil Code – Selected Issues

Karel Marek¹ and Martin Janků²

¹*Department of Civil and Labour law, Vysoka skola financni a spravni, a.s. Praha,
e-mail: k.marek@centrum.cz*

²*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel
University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic;
e-mail: jankum@mendelu.cz*

Abstract

Credit contract and lending contract represent to two related contract types regulated by the 2012 Czech Civil Code. Nevertheless, the lending contract differs from the credit contract in several aspects. Whereas the subject-matter of the credit contract can be only provision of money, the subject-matter of the lending contract may include – beside lending of money – various other fungible goods. Credits are always interest-bearing, lending can be both interest-bearing or interest-free. The credit contract is a consensual contract which is formed already by its closing, whereas the lending contract is a real contract and is formed only by provision or delivery of the goods provided to the lender (debtor).

The aim of the paper is to analyse selected issues from the existing legislation, especially the position of the contracting parties within the contractual types given. In the framework of the examination, we provide a comparison of the conceptual features of these closely related contract types from the point of view of the grantor. Also examined will be the space of contractual freedom provided by the legal rules and/or whether there are limits to this freedom, e.g. performance provided to consumers.

Key role in the defined juxtaposition plays the circumstance that among the essentials of the credit contract (as opposed to the lending contract) plays the determination of the amount of the lending, both in quantity and currency. The amount to that the credit provider is obliged to grant funds may be agreed in the contract as a fixed amount or as a defined credit limit, credit framework etc. There is no principal difference between the specification of the credit as a credit limit or as a fixed amount – the beneficiary is in both cases entitled to decide on the amount to that the credit will be taken.

Keywords: Civil Code, credit contract, lending contract, credit provider, borrower

JEL Code: K14

1. Introduction

Under Financial credit we understand a temporary provision of funds. In this sense is the credit also defined by the section 1 para. 2 (b) of the Banking Act, No. 21/1992 Gazette: “credit shall mean funds in any form provided temporarily”. Financial credit is also defined by the section 1 (h) of the Foreign Exchange Act, No. 219/1995 Gazette: “financial credit shall mean provision of funds in Czech or foreign currency to that the obligation of its recovery in monetary form is attached. Business credit, also called as supply or commodity credit – that will be out of the scope of the present study – means most often a delay of payment of the price. Business credit is also the sale of goods or services to consumers paid in instalments (instalment sales).

The rules on the credit contract are contained in sections 2395 to 2400 of the New Czech Civil Code, Act. No 89/2012 Gazette (Thereinafter “CivC”). In addition, contracts concluded on consumer credits are moreover covered by the rules of the Act No. 257/2016 Gazette, on consumer credits.

The lending contract differs from the credit contract in several aspects. Whereas the subject-matter of the credit contract can be only lending of financial funds, the subject-matter of the lending contract can include lending not only funds, but also any other fungible goods or assets. Credits are always interest-bearing relationships, lending can be both interest-free or interest-bearing. The credit contract is a contract made by consensus is established already by the contract signature, while lending contract is a real contract and is established only by transferring of the assets provided to the lender.

The aim of the present paper to analyse selected issues from the existing legislation, especially the position of the contracting parties within both contractual types given as closely inter-related according to the CivC. Nevertheless, lending contracts differ from credit contracts in several respects that we want to stress and comment. Further on, we will assess whether there is sufficient contractual autonomy, or whether there are limits to this freedom, e.g. as regards the performance of consumers. At the same time we will aim at the comparison of these similar, but not identical contracts from the perspective of their providers.

The key role in the framework of the above juxtaposition plays the circumstance that to the essentials of the credit contract (unlike that of the lending contract) plays the determination of the amount of the lending, both in quantity and currency. The amount to which the credit provider commits to provide the funds may be agreed as a fixed amount or as a credit limit, the amount of the credit limit, lending framework, etc. There is, however, no fundamental difference between agreement on the credit amount as a limit, or as a fixed amount. In both cases, the beneficiary is entitled to decide on the amount to that the credit will be taken.

2. Methodology

In the context of the paper we will first discuss the current CivC rules on the credit contract which corresponds to the former rules of Czech Commercial Code, (thereinafter “ComC” stays close to the legal arrangement of the latter in the Slovak Republic) (Kubíček, Mamojka, Patakyová, 2007). After that we will focus on the CivC provisions ruling the lending contract.

When we want to compare both contractual types we need first of all to determine the aspects in which are these treaties similar or substitutable. Then we can proceed to

the examination of the differences we may find in both contract types that restrict or even exclude their interchangeability.

The agreement on and payment of interest is for the lending contract not an essential requirement – for credit contracts, the opposite applies. The lending contract, as the so called real contract requires – in order to be perfect – not only an agreement of the parties, but it is necessary to hand over the subject – matter of the contract e.g. the agreed sum of money. On comparison to that a credit contract is contract of the so called consensual character which means that it is the consensus on the granting of funds by itself that makes the contract perfect, not their real provision. The factual provision of funds as pre-condition of the perfection of contract is typical for real contracts only.

A very important legal fact is that the subject-matter of the CivC lending contract may be not only provision of money, but also of other goods specified per type. Even if money is, and probably will continue to be most – often the subject – matter of lending contract, it is surely not the only one. This is in contrast to the credit contract, where the money is always in its centre. (Marek, Medková, 2012)

And, finally, the comparison will focus on the scope of application of both contract types. While the use of the credit contract prevails in the area of business (including a specific subtype – consumer contract ruled by separate statutory rules of The Consumer Credit Act, No. 257/2016 gazette and therefore not subject of the present paper), lending contract, mainly for its informality, finds a wide application in the non-business, civic sphere.

The present research paper is based on the use of the analytical, comparative and inductive methods.

3. Results

3.1. Credit Contract

3.1.1. Notion and types of credits

According to the systematic of the former ComC, the credit contract has been classified among the so-called absolute commercial obligations. The absolute commercial obligations were characterized by the fact that their character of a commercial (business) relationship, was given regardless of the nature of its parties (whether they were or weren't entrepreneurs and/or acting within their entrepreneurial capacity). This regulation was till 2012 common for both Czech and Slovak contract law (Husár, Suchoža, e. al. 2011).

From the perspective of the bank (financial institution) as one of the parties to the contract it is possible to classify the credits as obtained and provided. Among the types of obtained credits belong:

- On-demand deposits, which are deposited on the depositor's current account at the financial institution, and managed on daily basis;
- Saving deposits – as opposed to on-demand deposits, higher interest rates are provided. Deposits are provided on the longer term basis, however, they can be withdrawn at any time;
- term deposits – deposits with fixed term of withdrawal agreed or withdrawal upon notice;
- As a means for obtain funds are used certificates of deposit issued by banks when the “purchasing deposits”; they use to have shorter payment deadline;

- Bank bonds – are used for provision of longer-term resources; they represent security, “sold” by the bank; they use to have longer payment deadline;
- Purchases of deposits and conclusion of credit contracts with other banks are also major source of funding; funds can be obtained by banks from the Central Bank as well.

Within the second category – provided credit – we can distinguish following types:

- short term (e.g. bank overdraft, bill credits, escrow loans, special-purpose loans),
- medium-term and long-term credits (for example, emission, credit bond, mortgage lending) and purchase of receivables (factoring, forfaiting).

The substance of factoring is, as a rule, the purchase of short-term receivables (including passing-over of invoices, expense reports, etc.). Forfaiting means in principle purchase of mid-term and long-term receivables. Bank overdraft is allowed when setting up the account overdraft. In the absence of funds available on the account, the switch to debit (negative values) means provision of credit by the bank. Discount credit through bill of exchange means credit where the bank purchases bills of exchange before their maturity. At the time of buying out the bill, interest (discount) for the time remaining to maturity will be deducted. (Plíva, Liška, Elek, Marek, 2014)

By a bank bond the bank undertakes to pay for their client, if applicable, its obligation towards a third party. So called special-purpose credits may be provided to cover operational demands (for stocks, receivables before due date, etc.), special-purpose investment credits, for example, for the purchase of machinery and technology equipment), bridge-loan credits, if applicable, in the case of temporary shortage of funds, and others. Mortgage credits are granted for a pledge through real estate.

3.1.2. Principles of credit provision

Defining of purpose for a credit is not an essential requirement of the credit contract and is left to contracting parties, whether the purpose of the contract will be agreed or not. Reserved for an agreement by parties is also to which extent the purpose of the credit shall be specifically defined. It may be specified both in general (e.g. for business needs of the beneficiary) or concrete terms (e.g., for the purchase of a specified real property).

If the contract links the use credit only to a specific purpose, the credit provider may limit the granting of money only to the fulfilment of the obligations incurred by the beneficiary in connection with the contract purpose. As a rule, this occurs by providing the credit directly to the relevant creditor of the beneficiary (e.g. on the basis of invoicing). On the basis of other criteria we can distinguish between credits according to the degree to that they are secured, according to the purpose, etc. In banking, the transactions where the bank is the credit provider are called as active and those where the bank is creditor, are called as passive. In this terminology and from this point of view there are also transactions held for “neutral” (e.g., execution of payments, consultancy etc.) (Marek, 2008)

The credit is payable within the time limit laid down in the contract, this goes in line with the principle of time certainty. The credit provider grants credits, as a rule, only for fixed terms, and the beneficiary is obliged to repay the credit funds by the date due. This applies to both the total credit amount and single payments (specified instalments). Under the conditions laid down in the credit contract a bonus can be agreed upon in pre-mature repayment, and, of course, penalty for the delay with credit repayment.

The credit provider usually carefully keeps in sight that credits are secured, implementing the principle of credit securing. The point is to ensure the recovery of the credit and reduce cases of loss of resources. Typical instruments that apply are a pledge by use of material values or a guarantee provided by another person. Especially in the banking

sector, it should be the rule to reduce the risk to a minimum. Frequently the use of security instruments is cumulated.

Also banking (financial) guarantees issued by another bank or an agreement on deductions from salary or other income can serve in order to secure the credit recovery.

If there are bankers on the creditor side, they provide the credit principally only very rarely “*in bianco*” (unsecured), and only to clients with high credit rating. In practice, banks generally grant credits only provided that the securing instruments are available. Their importance is fully reflected in the situation where the beneficiary fails to fulfil repayment obligations arising from the credit contract.

The amount of the security is established in dependence on the type of the security instrument, either by a qualified certified expert (especially for real estate serving as subject-matter of the pledge), or by an employee of the bank, usually according to internal regulations of the bank (e.g., assessment of guarantees according to the issuer) or the value of the securing instrument equals to the carrying amount of the subject-matter of the security (e.g., stocks serving as the subject-matter of a contract on securing transfer of ownership).

Apart from the value of the security, it is necessary to distinguish the safeguarding value which means the price of the guarantee less the ratio which takes into account the degree of the possible price reduction in case of realization of the security instrument by the bank, provided that the beneficiary will not comply with the terms of the credit recovery. This ratio is usually set by the internal regulations of the bank and depends on the type of the security instrument, its quality, the credibility of the client, etc.

3.1.3. Rules for credit contract in the CivC

As mentioned above and stressed by the Explanatory Memorandum to the CivC as well, CivC provisions ruling credit contract were taken from a ComC only with minor modifications. The regulation in the CivC is abbreviated in comparison with the predecessor. It is ruled only by 6 sections, as opposed to ComC, which included 11 sections. This shortening was possible due to more effective arrangement of the CivC General Provisions, which are better linked with the special provisions.

A significant change entails the provision defining the Contracting Parties as the credit provider (“*úvěrující*” in Czech) and the beneficiary (“*úvěrovaný*”). This renaming corresponds better with the synallagmatic character of the credit contract. Which of the Contracting Parties bears the role of creditor changes during the various stages of the contractual relationship and the new nomenclature of the contracting parties explicitly helps to keep the overview. Last but not least this change brings better clarity of CivC for non-expert lay person who is the end user of this Code.

CivC has not taken over the former provisions of section 99 ComC, which gave to the creditor who had the providing of credits as subject of business, the possibility to demand consideration for arrangement of the commitment to provide funds to the beneficiary at his request. This change can be considered as a positive one, since the obligation to provide funds to the beneficiary on his request has identical consequences for the lender, whether lending would or wouldn't be his subject of business. It brings always for the credit provider the burden to keep ring fenced the funds in the amount in that that can be withdrawn in the future regardless on his decision. (Marek, Medková, 2012) Thus, the CivC, unlike previously ComC, does not prevent any credit provider from agreeing on a consideration for his obligation to grant funds to the beneficiary on his request.

The issue of the amount and the currency in which the credit is to be granted remained unchanged. Further on, CivC makes no explicit mention of the necessity to keep

credits in line with foreign exchange regulations. This notwithstanding the fact that the Foreign Exchange Act remain in force as rules of public law public related with the granting of credits – mainly as to the currency in which it is to be granted and, therefore, it will have to be kept in mind by the Parties when concluding credit agreements.

The obligation of the credit provider to grant funds to the beneficiary on his request has undergone in the CivC changes as to the time limit of the obligation. The new rules retains the obligation of the credit provider in force for the entire duration of the contract itself. In this respect a re-formulation of ComC rules with similar content occurred. And finally, the last essential of the credit contract – the obligation of the beneficiary to repay the funds provided and pay interest on them – remained unchanged. (Švestka, Dvořák, Fiala, 2014)

In the credit arrangement the parties may, in accordance with section 1806 CivC, agree that interest will be paid from interest already payable but still unpaid. However, this obligation lasts on the beneficiary only when explicitly provided for by the articles of the credit contract.

This brings us to the form of the credit contract. The CivC does not prescribe any form, so that the contract can be made in writing, orally, or by implication. In the banking practice, credit contracts are generally concluded only in written form. These contracts are in the banking sector often concluded in an adhesive way. Contracts on Consumer credits have, under the Consumer Credit Act, No. 257/2016 Gazette, prescribed written form as obligatory

CivC has not included to the regulation of credit contract special provisions for securing of this type of obligation ruled previously by the ComC (Štenglová, Plíva, Tomsa, 2009). Thus, for the entire regulation of securities we have to employ the general rules on securing of obligations in CivC with no exemptions applicable to credit contracts. CivC distinguish between instruments for securing of debt (pledge, security, bank guarantee, transfer of title to secure obligation and payroll deduction agreement) and those for affirmation of debt (acknowledgement of debt and contractual fine). Both acknowledgement of debt and contractual fine namely bring no economic guarantee for the creditor, even if they provide other advantages to him. In terms of the influence of the General rules on securing on the credit contract, it should be noted that the obligation of the beneficiary to replenish the material deposit continues to exist, this in case it should lose its price so that the deposit becomes insufficient. The beneficiary has to do so without undue delay; if he doesn't, the not sufficiently secured part of the credit will become due for payment. The CivC does not allow to the beneficiary to withdraw from the credit contract due to not completing the deposit to the price originally agreed.

In order to accelerate the contract negotiation, the parties may in the credit contract make reference to the general business terms and conditions. In this respect, the CivC distinguishes between contracts concluded in mutual intercourse of two entrepreneurs within their business and other cases. The latter requires that such conditions shall be attached to the offer or shall be well known to the parties at the conclusion of the contract, unless the acceptant declares he is aware of their content. (Patakyová, 2008)

Worth mentioning is also the rule of section 1753 CivC stipulating that the rules of general business terms and conditions, which could not be reasonably expected by the other party, are ineffective, should they not be accepted explicitly by the latter. Whether a specific rule of the general conditions could be expected or not to shall be assessed not according to its content, but also according to the way of its expression. (Marek, 2007)

As regards the rules on honouring of the obligation no significant or conceptual changes have occurred. The honouring of obligations is – in comparison to the former

ComC – ruled in more details and more provisions. More detailed rules are provided also with respect to the question of compensation of performance in case of debtor burdened by more debts towards the one and the same creditor. The former may by his expression of will change the statutory procedure for set-off of the performance, i.e. to begin with the interest on late payment, proceed with the ordinary interest and end up with the principal sum of the credit. If the debtor specifies that he will satisfy first the principal sum, both costs and interest will accrue.

The CivC rule also in more details on situations where a third person provides performance on behalf of the debtor and the former shall qualify for the assignment of the claim of the creditor. According to the section 1936, the person who provides performance on behalf of a debtor enters automatically into the rights of the creditor. The debtor has the obligation to settle the performance provided for him by a third party. The claim of the creditor including accessories, securing of the debt and other rights connected to the claim shall thereby pass to the third person. The obligation towards a third person shall arise for the creditor who shall provide to this person making the performance on behalf of the debtor the necessary documents and all that is needed to the presentation of claims. (Švestka, Dvořák, Fiala, 2014)

Only one reason for withdrawal from the credit contract has remained in special provisions of the CivC, ruling the credit contract. This derogation from the General Provisions on the obligations provides for the right to withdraw from the contract for the lender, should the beneficiary use the funds received to other purpose than agreed and in the case should the use of the funds for the agreed purpose become impossible. According to CivC, the non-replenishment of the deposit whose value has fallen by the beneficiary gives no reason to withdraw from the credit contract. This circumstance will only make payable that part of the credit, which is not secured by the deposit.

In practical terms, the legislature integrated into general provisions on withdrawal the rule that if the debt is secured, the withdrawal does not affect the securing (section 2005 (2) CivC).

3.2. Lending contract

3.2.1. Rules in the CivC

Lending contract is regulated by sections 2390 to 2394 CivC (before the adoption of the new CivC, the credit contract was regulated in Sections 657 to 658 of the 1964 CivC (Act No. 40/1964 Gazette). The new rules changed the previous terminology as regards the names of the Parties, replacing the term “loan” by “lending” (“zápůjčka” in Czech), which was used by the General Civil Code of 1811. This corresponds also to the new designation of the Contracting Parties – “borrower” a “lender” instead the former general names “creditor” and “debtor”, which should have remained in the new CivC only for general indication of the commitments of the parties. (Hurdík, Fiala, Lavický, Ronovská, 2004)

The CivC does not provide for obligatory written form of the lending contract law. Only for lending contracts, provided as consumer credit, the 2016 Consumer Credit Act specifies the written form as obligatory.

3.2.2. Subject-matter of lending

As subject-matter of lending only fungible goods can serve, including the monetary funds. In banking stand for subject-matter of the lending exclusively the funds. Attention of the present paper will be thus paid only to the lending of funds. Lending of fund is, in

fact, credit in the sense of section 1(2)(b) of the Banking Act, No. 21/1992 Gaz.: “...credit shall mean funds in any form provided temporarily”.(Štenglová, Plíva, Tomsa, 2009)

In order to be effective, contracts on lending of funds request not only agreement on the amount of lending, but also on the currency in that the funds will be provided. However, due to the fact that the conclusion of a contract for lending of funds occurs when only when the funds are transferred to the lender, in practice the currency of lending will be never questioned. The lending of money can occur not only in Czech currency but also in any other foreign currency.

Lending, whether in cash or in-kind is statute-based free of charge. In order to be considered with pecuniary interest the latter must be agreed in the contract. Thus, the lending of funds shall be charged with interest only if the Parties agree on its amount. This is the difference from the credit contract that is always bearing interest. With respect to the interest from lending of funds we may refer to the treatise on interest form credits.

3.2.3. Handing over of the subject-matter of lending

Without the funds being handed over to the lender there will be no contract on lending of funds. The handing over of the subject-matter of the lending is not to be construed only as physical transfer (passing over) of the lending subject-matter to the lender but as any act as a result of which the subject-matter of the lending becomes to the sphere of disposing by the lender. Thus, the handing over of the subject-matter of the lending may have even the form of a bank transfer of the cash to the account of the lender.

The borrower needs not to hand over the subject-matter of the lending directly to the lender, he may do it also indirectly, by advising his debtor to grant the amount owed as the lending to the lender. This occurs e.g. by inter-bank transfer of funds from the account of the borrower’s debtor to that of the lender. The lending contract is therefore concluded not only if the subject-matter of the lending shall be received from the borrower (or a person authorised by him), but even when the lender receives the subject – matter of the lending from a third person who acts on the instructions (or by a power of attorney) of the borrower.

The borrower hands over the subject-matter of lending to the lender for his use which means that the lender may use the subject-matter of the lending for a purpose that he determines for himself, i.e. to personal preferences. For the funds borrowed the lender may buy goods or services, the funds borrowed may be provided to a third person as a loan or it may be used to repayment of his debt or of that of a third person; he may also invest the funds or simply keep for himself (e.g. as an emergency aid reserve). The right of the lender to use the subject-matter of the lending in any way and for any purpose whatever is given by the fact that by the takeover of the funds lender becomes owner of the lending and shall poses all the entitlements constituting the right of ownership.

3.2.4. Obligation of the lender to return the goods, repayment and premature repayment

The lender shall be obliged to return to the borrower the goods of the same type. If returning the funds borrowed the lender is obliged to return funds as well. As to the currency of the funds to be returned the CivC provides in section 2391 para. 1 a different rule that that applicable to credits. Whereas for credit contracts applies that the beneficiary shall return to the credit provider the funds in the currency in which they were provided, the CivC rules on lending contract provide that the lending funds shall be paid in the currency of the place of performance. For the event that the funds should be returned in other currency that those it was provided, the section 2391(1) CivC rules that the lender shall

repay the lending so that the value equals to what he has received. (Švestka, Dvořák, Fiala, 2014)

As a rule, the term of lending repayment is agreed by the Parties in the lending contract. For the event. It is not the case, i.e. the contract provides for lending on indefinite period of time, the CivC rules that the lending becomes payable upon its termination either by the borrower or by the lender. The statutory period of notice shall be six weeks, however, the Parties may agree on a different notice period. The Parties may also agree that the lender will repay the lending gradually, in instalments. Regarding the instalments as well as the interest see also the treatise on the credit contract above.

Unlike the credit contract (section 2399 para. 2) for the lending contract the CivC does not provide for a possibility of early repayment of the lending. Therefore an early repayment of the lending, shall be possible only if explicitly agreed in the lending contract. (Patakyová, 2008)

3.2.5. Withdrawal from the lending contract

In addition to the general statutory reasons for withdrawal from the contract (section 1978 e.a. as well as 2001 e.a.) the CivC rules in section 2394 for a special reason for the withdrawal from the lending contract. According to this rule if the repayment of the lending was agreed in instalments, the borrower may withdraw from the contract and demand the repayment of the debt with interest should the lender be in default with repayment of more than two instalments or with one instalment for more than three months. The withdrawal from the contract does not apply to securities (section 2005(2) CivC).

In practice, unfortunately, frequently situations occur where both the beneficiary form the credit contract and the lender from lending contract have not fulfilled their obligations to recover the credit/lending and to pay the interest. Concern of the borrower and lender is, in addition to the statutory rules, to have appropriate contractual solutions available. (Štenglová, Plíva, Tomsa, 2009) The content of such arrangements is the specification of the current amount owed and determination of subsequent procedural steps for the credit provider and/or borrower.

The position of a creditor in these contractual relationship can be reinforced by certain solutions which are ranked among the statutory provisions on securities, however, they do strengthen their position (e.g. taking out the insurance).

4. Discussion and Conclusions

The credit contract relates only to the provision (granting) of monetary funds. One of its essential obligation is interest agreed. It represents the consensual contract. First, the contract is formed and only then the monetary funds will be granted. Only an entitled person can grant credits, save in the case of a one-time granting.

In general, the credit contracts may not necessarily be concluded in written form. However, in the case of consumer credits, the written form is required. Credit contract may use also certain specific types of credits, as overdraft credits, discount credit through bill of exchange, and/or bank bonds. For these credits, special arrangements for the withdrawal from the contract and therefore for the credit maturity apply.

Lending contracts allows the provision of goods by type of the good. This contract is a real one which means it can be concluded contracts shall be concluded at the same time with providing of the goods. It must be added, that the lending contract can be concluded for provision of monetary funds as well and also with specification of the interest, even if

not as essential provision of the contract itself. The nature of the contract as a real on remains, however, unchanged. If monetary funds are the subject-matter, they may be provided only by an entitled person, save in the case of a one-time provision. For provision of funds as consumer contract, the written form shall be obligatory. Reasons and procedure for the withdrawal from the contract should be ruled explicitly by the contract.

As a concluding recommendation it may be pointed out that the monetary funds may be granted even by a lending contract, given the specifics of the statutory provisions (which, of course, may be modified by the contract), for granting of money it is preferable to use the type of credit contract and by the lending contract implement the provision of goods as fungible items.

When assessing the shift of the statutory constraints by the new CivC we may stress that for the proper functioning of the market with free funds, it is correct that the Code has not fixed the maximum permitted amount of interest as it was in the case of the (today no longer in force) ComC. The non-provision of the maximum permitted amount of interest allows for the possibility of the implementation of risk business plans and entrepreneurial ideas, as well as it allows for funds to be received by persons who – if there would be maximum permitted amount of interest – were not capable to obtain them. The abuse of the absence of a ceiling for the amount of interest, in addition, is monitored by the new CivC rules regulating usury and compliance with moral standards.

A positive change represents also the CivC rules for securing, where, in the general rules, there affirmation of debt and securing of obligations are separated from each other. Another positive feature is the implementation of the rule that the withdrawal from the contract shall not affect the securing of the obligation.

As regards the lending contract, we may conclude by the summarisation that, notwithstanding the new designation of the parties as the borrower and the lender, the very nature of the contractual relationship remains unchanged. By the lending contract the borrower leaves to the lender goods specified by the type of the good. The latter is entitled to use the goods and after agreed time shall return them to the borrower. The subject-matter of the lending – next to monetary funds – may be any material thing, for which it is possible to specify the quantity, amount, volume or weight. For lending, it is not necessary to agree on remuneration, it may be provided also for free. This is fundamentally different from the credit. We may add, however, that as a rule also the lending is tied up with remuneration. The latter may be either an interest or increase of the quantity of the goods returned in the case of non-cash lending.

Another specific feature of the lending is, that the contract may not necessarily be in written although the business practice keeps the written form as a rule. In the non-written, i.e. oral form of contract complications may arise when it is necessary to prove the amount of lending and/or the interest agreed. Non-written form is thus suitable only rather for minor lending – e.g. non-monetary, between two individuals, non-entrepreneurs. Such lending may namely be provided by anybody, not only as object of business activities.

Acknowledgements

This paper was supported by Grant Agency of Vysoka skola financni a spravni, a.s. [internal grant.No. 7429/2017/02].

References

- BÁNYAIOVÁ, A.; POHL, T. in ŠVESTKA, J.; DVOŘÁK, J.; FIALA, J. 2014. Občanský zákoník, Komentář, Wolters Kluwer, vol. V, pp. 1486–1508.
- HURDÍK, J.; FIALA, J.; LAVICKÝ, P.; RONOVSÁ, K. 2006. Východiska a tendence vývoje českého občanského práva po vstupu České republiky do Evropské unie. Proceedings from Workshop Evropský kontext vývoje českého práva po roce 2004. 1st ed. Brno: MU.
- HUSÁR, J., SUCHOŽA, J. et al. 2011. Česko-slovenské kontexty obchodního práva. Praha: Wolters Kluwer.
- KUBÍČEK, P.; MAMOJKA, M.; PATAKYOVÁ, M. , 2007. Obchodné právo, Bratislava: Vydavateľské oddelenie Právnickej fakulty UK.
- MAREK, K. 2008. Smluvní obchodní právo, Kontrakty, 4th edition. Brno: MU,, 477 p.
- MAREK, K.; MEDKOVÁ, V. 2012. Smlouva o úvěru, Komorní listy, papers of Czech Chamber of Executors, No.3/2012, s. 10–19.
- PATAKYOVÁ, M. Et al. 2008. Obchodný zákonník – komentár. C. H. Beck, 2nd edition, 1143 p.
- PLÍVA, S., ELEK, Š., LIŠKA, P., MAREK, K. 2014, Bankovní obchody, Wolters Kluwer, 216 p.
- ŠTENGLOVÁ, I., PLÍVA, S., TOMSA, M. Et al. 2009. Obchodní zákoník. Komentář. 12th edition, Praha: C. H. Beck.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Rhetorical skills

Jitka Matějková¹, Dana Zapletalová² and Bohumil Vítek³

¹*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: jitka.matejkova@mendelu.cz*

²*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: dana.zapletalova.uphv@mendelu.cz*

³*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: vitek@node.mendelu.cz*

Abstract

Rhetoric is the art of effective or persuasive speaking or writing, especially the use of figures of speech and other compositional techniques. The rhetorical situation has four critical components: the speaker, the content, the audience, and the purpose of the speech. The intention of the speech presented by a speaker using the right appeals is to influence the attitudes, beliefs, values, or actions of the audience. Nevertheless, this is a very complex process, depending on a number of conditions, i.e. proficiency in relevant issues, attitude towards the received information, interest, concentration, or fatigue of listeners, etc.

Rhetorical skills must be cultured purposefully. In spite of the massive growth of modern electronic media that changes social existence, the spoken word still plays a significant role. There are a number of professions – executive managers among others – considerably dependent on rhetorical skills.

Keywords: Rhetoric, speaker, law, legal science, interpretation, presentation, management, art.

JEL Code: M530

1. Introduction

If a professional, the author of an idea, or a theory, or a design, has to show the results of their work and effort, they must master how to correctly and, if possible, flawlessly present it. As successful presentation we consider the adoption of a solution by the professional and non-professional public or by superiors in business environment. The goal of each professional is to refer results of their efforts to the target audience, by appropriately

chosen speech, to show their ideas and skills, the ways by which they have completed, or suggestions how to achieve the goals set. This concerns large amount of listeners and evaluators, whether they are already mentioned superiors, or prospective employers, investors, or for example, members of state final exams commissions at universities, where stressed students present and defend final papers.

In the university environment, we have to mention the activities of lecturers. They want to attract their students to topics discussed at lectures and to inspire students to study and analyze relevant matters by transferring of expertise and knowledge, which definitely results in higher education of students.

Jobseekers, who apply for a job offer, show great effort to appoint in interviews and to persuade evaluators than they are better in comparison with other seekers. In all the examples, but not just those, the applicants who present themselves and their abilities should select the appropriate words, in accordance with their position and the goal they want to achieve. They have to choose a way of speaking. The so-called "*body language*", in other words gestures, attitudes, eye contact and many other elements play a significant role, referred to as the way or the art of presentation or the rhetorical art.

However, not for everyone is easy to speak or even speak publicly. Of course, there are people who have innate talents for this art, as well as other artistic trends, but there are also people who, for various reasons, have a big problem with performing in public. It can be people who lack this talent, or are blockingly shy, with bad experience, or with different limitations. But is rhetoric just a talent to manage rhetorical art? Or, on the other hand, can it really happen that a great speaker, rhetoric, matures from a shy, and in this respect hand-made man?

A lot of people have to present their rhetorical skills only a few times in their life, as of the abovementioned presentation of their graduation papers or during their job seeking interviews. They do not have any reason to deepen further their rhetorical skills. On the other hand, many of us are trying to extend our rhetorical skills, even though, or just because of it, we speak to the audience regularly. Moreover, there are also speakers, that are fully satisfied with their speech and rhetorical skills, and do not miss the chance to present at least a short speech, even though they have a rather negative response from their listeners. Even for those speakers, this Greek-derived designation – rhetors – is being used, somewhat in a derogatory sense. Mostly politicians, for example. They can often affect really huge amount of people. However, we do not want to say that every politician is a rhetor in the wrong sense of the meaning. Nevertheless, it is very important to direct to high-level of rhetorical art.

Legal and political practitioners in Athens were originally called rhetors, and rhetoric was a prerequisite for political activity. The rhetorical skills were of most interest in the ancient times by teachers of speech, who, of course, mostly dealt with philosophy.

What is the purpose of legal rhetoric and how does it relate to other science disciplines, especially those which are to promote the results of their work and their expertise in clear, unambiguous and comprehensible speech? Is teaching and studying of rhetoric up to date?

Undoubtedly we can say that legal rhetoric is part of a legal science, because of a long historical development. The result of which has been separate legal science from philosophy as such. (Madar, 2002)

In the following text, we will focus on clarifying the issues and formulating the topics for discussion regarding the subject.

2. Methodology

The main used method is the compilation method which is considered as a creative synthesis of scientific ideas with our personnel view opinions followed upon previous organized research. Another method experted in the article are the observation method, i.e. the systematic observation of certain facts, and the comparison method, which means the identification of the indistinguishable or dissimilar aspects of two or more phenomena, objects, etc., but also the comparison of opinions, that are important for the creation or verification of individual opinion. The method of comparison is based on the analogy method, i.e. the method of searching for analogy.

Furthermore, the method of analysis is disposed, when a certain phenomenon or situation is decomposed into smaller parts and they are then subject of further investigation. Also the method of abstraction is utilized, i.e. the thought separation of insignificant properties of the phenomenon from the essential ones, which should allow discovering the general properties and relations, the nature of the phenomenon.

In conclusion, the induction method is used, i.e. a general conclusion based on the knowledge of the details.

3. Source and significance of Rhetoric

“These are not the things that excite people, but public words about these actions” said Epictetos.

Rhetoric originated in antiquity as a doctrine of persuasion by linguistic expression. The rhetor, or a speaker, used to be a teacher of rhetorical art at the same time. Commonly, this term is used to describe the vocabulary of rhetoric, or the doctrine of speaking. Rhetoric means exactly a real speech, a theory of reference stylization and argumentation, and a trustworthy way of public expression. However, it is possible to identify also the pejorative meaning of these term, expressing exaggerated efforts to formally perfect expression, often as disbursement of content, that is to say in terms of speech.

It can be argued that rhetoric is an art. This art is managed by its own rules that the right speaker must learn. As we mentioned above, a talent (this applies also to different kind of arts) is an advantage, but definitely it is not enough. To address the audience, in order to gain them for their opinions or the subject to discussion, the speaker must master the art of being perspicuous, words and all of his speech must be thoughtful, and unaffected as well. Otherwise, the speaker’s presentation would be perceived precisely in pejorative meaning and would miss a targeted effect. Regarding language expression in the context of a talent for speaking and engaging in convincing, it should be mentioned that even an individual who does not have such a talent can study, observe and, in particular, exercise and carefully prepare to achieve success in their own verbal expression. The art of rhetoric and persuasion, which is also a prerequisite for managing dialogue at the required level, can be learned to a certain level. And if, as with other skills again, talent and diligence are combined with, there is a high probability that such an individual can achieve great admiration and success in many areas where verbal expression and persuasion play a significant role or are part of the profession.

The general education that we receive in schools includes studying historical matters and also fundamentals of social sciences, in which we learn about the wealth of our culture and facts about ancient times. We all know that there were rhetoricians in ancient Greece, who besides other philosophical or scientific directions devoted themselves to

speech as a method and form of enlargement of their knowledge, but also to teach other languages. By the use of the rhetoric, they passed their knowledge and ideas further to their pupils. Let us pay tribute to Socrates, Plato's teacher, who unlike his pupil, did not write any papers, yet influenced philosophy and contributed to the development of science and education throughout the period up to the present. Socrates is considered to be one of the founders of science and university education. His life story is overall remembered even through the fatal punishment he was given for his views and the influence of his followers. Socrates is known to have taught the rhetoric skills. He was convinced that philosophical cognition, according to the current terminology of all knowledge, has to be instructed orally, based on dialogue. This dialogue can be conducted provided that the speaker can use words, arguments, and can direct their listeners to the proper place. *"Rhetoric of the past was one of the most important components of European culture, science and school education. In the Middle Ages, it was (along with grammar and dialectics) the primary focus of teaching in the system of scientific knowledge (and influence) of man and society. At that time it was a lot of rules on how to effectively organize a public speech to achieve listeners."* (Šanderová, 2005)

Nevertheless, it can not be overlooked the association with the present professions of lawyers, managers, politicians, but also writers and dramatists. Theirs work and art use many words which are acquired by those who cite them in their speeches or perform them directly. Like actors. And only a good actor who uses rhetoric correctly can apply to *"planks that mean the world"*.

Above all, it seems to be crucial to mention the rhetoric, Jan Amos Comenius, who expressed his view in the Labyrinth of the World and the Paradise of the Heart. The main hero, a pilgrim, has come to the session of rhetors and his feelings are as follows: *"We went into the hall where, oh, many of them stood with the brushes, and they talked about how the words either written or from the mouth to the air would be released, green, red, black, white, and how anyone would dye could be. I asked myself: What would it be? I was told: In order to the listener to get blurred. And I: Is the use of these ways used to describe the truth or lie? What will happen? He said: There is so much falsity and vanity here, as well as truths and benefits. I said: I am going from there."* (Škop, 2009)

Over time, in the beginning of the modern age, the interest in rhetoric and its recognition has dropped. In the 19th century, the rhetoric used to be rather pejorative term for speaking. The *"rhetorical"* as the adjective has even become, in contrast to the original meaning of the science, synonymous with thoughtless voids and expressive rigidity. Remember Šald's statement about Vrchlický: *"Yet his verse is more alive than the leather, rhetorical verse of Svatopluk Čech."* It does not seem to be a certificate for Sv. Czech, nor for rhetors, which, in the latter half of the last century, were considered to be multilingual, bombastic, spirited, and very few rhetoric. (Vozár, 2017)

Despite the fact that, unlike in the 19th century, we have incomparably enlarged communicative resources, the rhetoric and the rhetorical science study are once again returning to the center of interest. Naturally, we aim at the original concept of rhetoric, which is respectful. Apart from trainers who offer services in psychological counseling centers, where it is possible to seek help and find support in the development of rhetorical skills, rhetoric has been studied also at universities as a required subject.

4. The Charm of Rhetoric

The title of this chapter is respectfully borrowed from the title of an inspiring lecture of the actor and pedagogue Jan Přeučil, held on March 23, 2010, at the Faculty of Law of Masaryk University in Brno. Jan Přeučil has been teaching the art of rhetoric for a long period of time, and he regularly holds lectures not just for lawyers, but as he says, he is “... *trying to work with people who have different managerial duties, for whom the talking and the contact with people is professionally important, to show how they should talk about, how they should pass on their knowledge, and how they should present themselves at all. Because, unfortunately, people today have the ability to arrange a variety of personal contacts via e-mail and via any social network, but the real contact, an eye-to-eye contact, is irreplaceable. And there the word has an incredible magical power ...*” (Přeučil, 2010) Jan Přeučil has also published one of his book publications under the same title. As he has mentioned, every sentence, every word can be said in a variety of ways, depending on the content. Form and content are combined in one, Přeučil said. (Přeučil, 2010) In the current “time of Internet”, when social networking is very important for people not to lose the ability to speak together, to use words correctly, and it is the rhetoric, that is to say, to force us to use words accurately and precisely to present them.

Jadwiga Šanderová, in her recommendation for authors and speakers in social sciences, states that each oral presentation in a professional forum has, like the expert text, three basic parts: an introduction, a core and a summary of the key statements. (Šanderová, 2005) The speaker opens their speech with addressing listeners and introduces them the topic of the presentation. In this context, sometimes the speaker does, the in Latin so-called “*entry captatio benevolentiae*”, like an effort to gain favor, which in particular consists in some joking start with a funny picture, or a humorous story. As a rule, however, it is not sound if the speaker forces themselves to do so in any case. The “*All with Peace*” rule applies to each of the speakers’ performances and for each part of it, but it is difficult for the length of the whole performance. Often, in the preparation of a speech, or a professional performance, but also of short social outcomes, we are afraid of saying not enough for the whole time of the performance. If someone who has to speak in front of any group of people (although they were three members of the examining board) knows the fear of a possible outage of text, could be a nightmare. It can happen even to the most experienced speakers, but to be prepared properly is the first rule how to manage the relevant performance well and honestly.

In the introduction, the speaker should give the main idea of his presentation, to define the problem to be addressed and to familiarize the audience with the interpretation process. Particular attention should be paid to the preparation of performances, in particular the background to which the speaker leans. The essential substance of the speech presents a self-explanatory problem that should be as clear as possible. The problem is rather simplified than presented in all complexity. And of course, it is better to leave the details to discussions and question time. It seems to be inevitable to speak as simple as possible, to avoid complicated circumstances. It is always necessary to define the basic concepts precisely, and by the end of presentations just repeat the main idea, to summarize the main arguments or to indicate which questions remain open. The speaker should also thank the audience for their attention. The point is to say everything essential while respecting the time limit.

Martina Urbanová states (Urbanová, 2009), that the speaker needs to know, what they want to talk about, the target audience, what is the reason of speech, when, where

and how long the speech should be. Accuracy, sufficient differentiation, interest, engagement, assuacy and convincement are of course necessary ingredients.

The speaker should speak briefly, use pure linguistic language, and be immediate, tactile and polite. However, those who almost do not know what a trick is at a disadvantage can also be at a disadvantage. They tend to underestimate the preparation of the presentation.

The main reason for fear of speaking in public is the simple fact that we are not used to speak publicly. The basic recommendation, no matter how trivial, to breathe before speaking, several times, taking a deep breath! Tremma could be mostly caused by poor breathing. A more serious reason for the trembling may be a lack of self-confidence. Various lecture exercises and previous successful performances contribute to the reinforcement of rhetorical self-confidence.

As indicated above, complicated sentences, difficult words and screwed expressions should be avoided. It is important to speak at a reasonable pace, preferably rather slower than quickly, loud and to pronounce clearly. Jan Přeučil says (Přeučil, 2016) that “*the way of speech is a picture of the spirit*” and adds to this old Romans’ message that “*monotony is the grave of everything*”, adopts in front of his own rhetorical performance a variety of relaxation techniques commonly used by artists such as actors and singers, but it can be highly recommended for managers, lawyers, politicians and others. Relaxation techniques, “*conversation*” with the help of selected words and syllables, as well as resonance exercises, greatly save the vocal cords. The vocal cords are an important and valuable “*tool of production*” for people whose profession is verbal.

As experts mention, another important recommendation for a speaker is to follow the reactions of the listeners, it means to follow the appearance of their faces, the silence or the rest of the audience, etc., and to be able to correct their interpretation appropriately. We could recommend also getting ahead of messengers or other participants in the dialogue with respect, certainly not with fear and humiliation.

5. Legal Rhetoric

According to Viktor Knapp (Knapp, 1995), in the science of law, both in theory and in legal practice, rhetoric has its original meaning. In this regard, it is a doctrine of persuasion, respectively as persuasion itself. Rhetoric and argumentation are also related to the logic. Legal and, in particular, judicial rhetoric forms a separate branch of legal science with legal linguistics.

It is also feasible to accomplish considerations in the sense that “*law is rhetoric*”. The law, if legal discourse, relies primarily on the ability to convince, or almost, the ability to impose on the “*adversary*” their view on the way of regulating a certain social relationship. Is there something more than a masterly performed rhetorical work? (Škop, 2009)

As we mentioned above, law and rhetoric are linked tightly both historically and philosophically. However, not every legal profession requires a lawyer to act publicly. As stated above, the words, their interconnection and, in particular, the form and content of legal texts, whether legal norms or expert legal texts are of utmost importance for understanding the law, its interpretation and subsequent application.

Media as well as literature and films describe to the public the importance of a speech of lawyers to the courts, how it is necessary to negotiate reconciliation, or to represent the participants in legal relationships. Often, these are important works recognized by the law community as well. For example, a famous film based on the written story ¹² “Angry

Man" (1957), or the film "The Judge" (2014). The connection of fine literature and the legal profession in one personality is likewise unusual. *"The role of poets and writers is indispensable for national life ... Names such as Pavol Országh Hviezdoslav, Štefan Marko Daxner, Janko Jesenský associate the public with their writer activities. All of them were the vocation of an advocate ... The knowledge of the law and the functioning of the state apparatus enabled the Slovak advocates to help even where the word of the Slovak poet was not sufficient to defend the specific injustices committed by the Hungarian judiciary"*. Vozár also describes that many Slovak advocates have skillfully used to promote national interests and to promote Czechoslovak legal science. It was at a time when, after the establishment of Republic of Czechoslovakia, justice in Slovakia was still undermined by Hungarian influence. Also such manifestations and realizations require the acquisition of the art of rhetoric in common with specific legal rhetoric.

Moreover, Martin Škop presents a chapter dealing with the relation between law and literature, or the phenomenon of the word, by P. B. Shelley's quotation: *"Poets are the unacknowledged legislators of the world"*. (Škop, 2012) It is possible to agree with Martin Škop that *"... law and rhetoric is closely related, even it can be considered a kind of rhetoric. It is related to the ability to give confidence to a particular arbitrarily chosen rational argument. Anything that can be used only strengthens or weakens the power of the argument. It is no reason, logic, justice, or natural law."* It is indisputable that lawyers, as well as managers and politicians, are professions, in which it is as the imperative to skillfully deal with words and arguments in the process of persuasion which is the goal. Legal rhetoric serves, in addition to legal practitioners, where managers are involved, and executives. Their decisions and suggestions are to convince them that they are within the limits of the applicable law.

6. Conclusions and discussions

In conclusion, it is important to summarize that "the speaker is not the one who only speaks to the public, but the one who is able to prepare his own speech while presenting it to the audience compellingly and persuasively. So the speaker must know not only what he wants to talk about, but also how to present it, as the ancient rhetoric has emphasized. So the speaker is also an artist. The old saying says that as a poet you can be born, while you should grow into a speaker role."

Rhetorical skills must be cultivated purposefully. Despite the enormous growth in modern media, especially electronic media, which affect almost all areas of social life, the spoken word still plays an important role. There are a number of professions, as lawyers, managers and politicians, who are strongly dependent on speaking.

Speech is a practical use of language in communication. The goal of the message is directed from speaker to listener and should pass on information, with the idea that the listener understands, and can further process it. This is, however, a very complex process, depending on a number of circumstances that we have tried to define. Apart from the already mentioned inherent talent of the speaker, his preparation, coping with tricks, continuous improvement, deepening of knowledge, it is also important the standard of the audience, their basic knowledge and orientation in the communicated issues, the attitude towards the received information, the attention or the fatigue of the listeners, a lack of interest or discontent. However, this is merely an example.

To summarize, it may be worth remembering the words of St. Jacob from the List of James, directed to *"twelve tribes in the diaspora"*, i. e. Christian communities: *"Who does not*

harm someone by a word is a perfect person and can keep control his whole body. Atongue is just a small human organ, but it is very dangerous. A man rather shakes with a wild animal than to control his tongue so perfectly, and speaks angry, impatient, jealous, futile, and futile! Let every person hear fast, but slowly talk.” (Bible)

References

- Bible. Písmo svaté Starého a Nového zákona, List Jakubův. 1991. Praha: Svoboda.
- KNAPP, V. 1995. Teorie práva, 1.vydání. Praha: C.H.Beck.
- KOMENSKÝ, J., A. Labyrinth světa a ráj srdce. [Online] Available at: <http://www.labyrinth.cz> [Accessed: 22. 2. 2018].
- MADAR, Z. et al. 2002. Slovník českého práva. 3. rozšířené a přepracované vydání. Praha: Linde. pp. 1121.
- POLÍVKOVÁ, A. 2017. Rétorika v dějinách jazykové komunikace. In Naše řeč. [Online] Available at: <http://nase-rec.ujc.cas.cz/archiv.php?art=6407> [Accessed: 22. 2. 2018].
- PŘEUČIL, J. 2007. Kouzlo rétoriky. Praha: ALPRESS.
- PŘEUČIL, J. 2010. Kouzlo rétoriky. Přednáška ze dne 23. 10. 2010 na PrF MU v Brně.
- PŘEUČIL, J. 2016. Rétorika není mrtvý obor. Rozhovor pro První Boleslavskou [Accessed: 22. 2. 2018]. Available at: <https://www.youtube.com/watch?v=rkEdRch-MyXQ>.
- ŠANDEROVÁ, J. 2005. Jak číst a psát odborný text ve společenských vědách. Praha: SLON.
- ŠKOP, M. 2009. Teorie práva. Blog o teorii práva, filozofii práva a věcech souvisejících. [Online]. Available at: <http://teorieprava.blogspot.com/2009/10pravo-jako-re-torika.html> [Accessed 12. 02. 2018].
- ŠKOP, M. 2012. Právo a vášeň. Jazyk, příběh, interpretace. Brno: Masarykova univerzita. 30–145.
- URBANOVÁ, M. et al. 2009. Rétorika pro právníky. Plzeň: Aleš Čeněk.
- VOZÁR, J. 2017. Významní slovenskí právníci – Vladimír Fajnor. Bratislava: VEDA. 9-10
- VOZÁR, J. 2017. Přednáška ze dne 16. 11. 2017 na XXII. ročníku Jesennej školy práva. Pišťany, SR.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Effectiveness of Privacy Policies and What it Can Mean for the GDPR

Jens Nebel¹

*¹Department of Economics, Faculty of Business and Economics, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: xnebel@mendelu.cz*

Abstract

This paper examines the effectiveness of privacy policies displayed on websites, based on an analysis of the ratio between the number of how often they have been accessed in relation to the total number of visitors of the respective websites. It will try to show that few people ever access such data protection-related information. The paper is then going to draw conclusions as to what this can mean for the application of the EU General Data Protection Regulation, which imposes a duty to, and severely punishes failure to, provide a vast array of privacy-related information to the visitors of websites.

Keywords: data, protection, law, privacy, policy, effectiveness

JEL Code: K24

1. Introduction and Objective

The most recent and probably most important piece of data protection legislation is the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27.10.2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (the “General Data Protection Regulation” or the “GDPR”), which at the same time repealed the previous Directive 95/46/EC of the European Parliament and of the Council of 24.10.1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data (the “Data Protection Directive”). The General Data Protection Regulation shall become effective and replace the Data Protection Directive on 25.05.2018.

The GDPR stresses the importance of transparency of data processing to the concerned individuals. This is highlighted by the fact that it is prominently named in Article 5(1)(a) GDPR as part of the first principle that must be complied with in the course of any data processing. While transparency as a principle is of a rather general nature, the GDPR elaborates on the transparency principle in the context of various duties imposed on those persons controlling the processing of personal data (defined as “controllers” in the GDPR).

In particular, controllers are required to provide for transparent information to individuals. For example, the controller must provide the individual whose data is going to be processed (defined as the “data subject” in the terminology of the GDPR) an array of information, including the purposes of the processing for which the personal data are intended as well as the legal basis for the processing (Article 13(1)(c) GDPR), the recipients or categories of recipients of the personal data (Article 13(1)(e) GDPR), the period for which the personal data will be stored (Article 13(2)(a) GDPR), or, where the controller intends to further process the personal data for a purpose other than that for which the personal data were collected, information on that other purpose (Article 13(3) GDPR).

Where the controller cannot rely on one of the other alternatives of lawfulness of the processing, the controller will need to ask for the data subject’s consent. Within the context of a consent declaration, the controller must again provide extensive information, while any failure to do so will render the consent declaration non-binding (Article 7(2) GDPR).

The GDPR requires any information and communication relating to the processing of personal data to be concise, easily accessible and easy to understand (Article 12(1) GDPR). Given that the controller is responsible for, and must be able to demonstrate compliance with, the transparency principle (Article 5(2) GDPR), any mistake, inconsistency or choice of improper wording will render the controller subject to severe legal consequences.

Most notably, an infringement of the transparency principle, a violation of the information duties, or processing on a consent declaration which turns out to be invalid due to lack of information will be punishable with administrative fines up to 20 million Euros, or in the case of an undertaking, up to 4 % of the total worldwide annual turnover of the preceding financial year, whichever is higher.

Whenever legal duties are combined with high fines in cases of infringements, the exact interpretation of the regulations becomes paramount. In particular, given the severe consequences, it will become crucial to determine when an information has been communicated in a way that it can be easily understood by the recipient. When it comes to determining the exact amount of a fine, it becomes equally important to assess the gravity of the infringement based on if, and if yes, how severe, the individual’s interests are actually harmed.

To this end, this paper examines how interested individuals are in obtaining privacy information, and – should they be of rather low importance – what this can mean for the interpretation of the above questions.

2. Survey of Literature

A number of publications already deal with how individuals actually notice and comprehend legal texts in general, and privacy information in particular.

In one experiment, it was found that where, in the process of registering on a website, the privacy policy is not displayed to users by default, users will usually refrain from clicking on the non-obligatory link to actually access the document (Steinfeld, 2016). Even where users access the document, they usually spend less time on reading it compared to users to whom the text of the policy is mandatorily displayed.

This finding was somehow contradicted by the users’ self-assessment in another study, which found that 54% of the users claim they would read the privacy policy upon their first website visit (Earp and Baumer, 2003).

Others have focused on comparing various forms of privacy policies, i.e. regular, paragraph-style policies versus more visual variants, which put an emphasis on clearly lining out the privacy goals and vulnerabilities (Vail et al., 2008). The authors found that users have a hard time comprehending classical, paragraph-style policies, while at the same time users found those policies to be more trustworthy than the more visual and plain variant.

When testing the degree of user's comprehension of privacy policies, a study shows that the comprehension rate is of a quite low degree, regardless of whether the users were asked to answer a question that has been dealt with in the policy they were given to read prior to the experiment, or whether users had to locate a particular answer to a given question in the privacy policy in front of them (Vu et al., 2007).

Other research has found that it does not really matter whether the language in privacy policies is rather vague or explicit when it comes to the degree of comprehension (Strahilevitz and Kugler, 2016).

The issue is not limited to privacy policies, as it has been established that many consumers neither read the terms of a contract (e. g. the Facebook end user license agreement) they are entering into (Ayres, 2014).

But even where users do obtain and understand the relevant privacy information, it has been shown in various studies that people still disregard any concerns and readily provide personal data, even when told that such data was expressly not necessary for meeting the respective purpose of the website (Spiekermann et al., 2001; Behrendt et al., 2005; Norberg et al., 2007).

3. Methodology

Based on the ambiguous previous data and the author's own perception, a hypothesis can be formed that users rarely read privacy policies. If this was to be supported, the finding could be used for a legal interpretation of relevant provisions of the GDPR.

In order to determine whether users read privacy policies, objective access data was gathered from website operators. It can safely be inferred that a user who does not access the subpage where the privacy policy is made available accordingly cannot read the privacy policy.

Most website operators use website analytics software, such as Google Analytics, Adobe Analytics, Matomo (formally known as Piwik), etc. Such analytics software usually measures certain indicators in order to determine how a particular website is actually being used. Among the parameters are "page views" and "unique users".

A "page view" is defined as an instance of a page being loaded (or reloaded) in a browser. Page views is a metric defined by Google as the total number of pages viewed in a given period of time.

A "unique user" is defined as an IP address plus a further identifier, such as a cookie or registration ID. The metric is usually measured in a given period of time. While the term implies that one unique user actually equates to one and the same physical person using the website, the metric has certain shortcomings, given that the parameter is only suitable to recognize the same machine accessing a website. It may fail to take into account that a user may use more than one device and/or internet providers to access the website (e. g. a desktop computer and a smartphone), and thus may display a too high number of unique users. It might also fail to recognize a returning user where the user actively suppresses

the transmission of the additional identifier (e. g. by deleting the cookies from their computer between visits). It can be supposed that the actual number of physical users is lower than the measurement would suggest, although it can never be higher than the number of page views.

By comparing the number of unique users on the website's home page and the number of unique users accessing the data protection information page, it can be measured how many users actually access the provided information. To this end, despite its aforementioned shortcomings, the unique users metric was taken as a basis. It needs to be noted, however, that not all users access the website via the home page, but may directly view certain subpages (e. g. by following direct hyperlinks to subpages, by following search engines results, or by accessing dedicated landing pages). This implies that the actual number of website visitors will in fact be higher, while at the same time, the unique user metric will display more than the actual number of unique users. It is also worth noting that not every visitor who accesses a certain website can be deemed to have thoroughly read the displayed information. However, these inaccuracies shall be ignored, because they would lead to an even more unfavourable ratio between total number of visitors and the ones accessing the data protection information.

To gather the website analysis data, dedicated companies and organisations were invited to provide such data, encompassing a certain reference period between 1 month and 1 year, which must have been older than 2 years. To obtain a relevant picture, among the invitees were the following companies:

- the 30 largest German publicly listed stock corporations (so-called "DAX 30")
- the 30 largest German websites (AGOF, 2017)
- the 10 largest German non-public corporations
- the 10 most prominent global companies
- the 5 most relevant German media outlets
- 10 smaller German companies
- the 3 largest German footballs clubs
- German federal government and European Commission.

Those companies were asked to provide, for a reference period, the number of unique users and page views on their home page, and the number of unique users and page views on their privacy policy sub-page.

4. Data and Results

From those 100 invitees, 21 provided the requested data, representing, according to the unique user metric, an indicator of the behavior of a total of roughly 3.2 million different website users. 4 of those replies had to be discarded because they contained numbers either much too high, or they were invalid (e.g. total number of unique users on privacy policy sub-page was higher than total number of unique users on home page).

First, as could be expected, a correlation could be shown between the number of unique users on the home page and the number of unique users on the privacy policy sub-page:

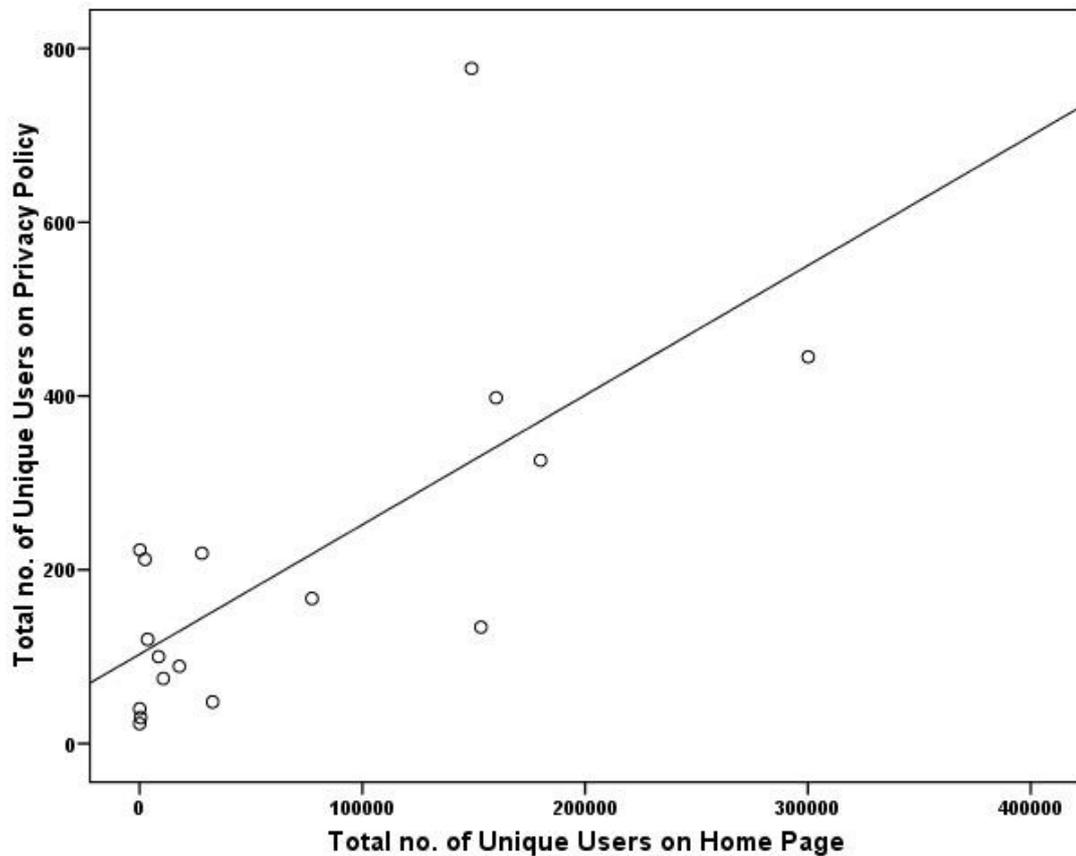


Figure 1: Total no. of Unique Users on Home Page vs. Privacy Policy

There is a strong positive correlation (Pearson correlation coefficient of .684) between the two variables, meaning that the higher the number of visitors to the home page, the higher the number of visitors to the privacy policy sub-page:

Table 1: Correlation between Unique Users on Home Page and Privacy Policy Page

| | | Total no. Unique Users on Home Page | Total no. Unique Users on Privacy Policy Page |
|--|---------------------------------|-------------------------------------|---|
| Total no. of Unique Users on Home Page | Pearson correlation coefficient | 1 | .684 |
| | significance (2-tailed) | | 0.002 |
| | N | 17 | 17 |
| Total no. of Unique Users on Privacy Policy Page | Pearson correlation coefficient | .684 | 1 |
| | significance (2-tailed) | 0.002 | |
| | N | 17 | 17 |

What is striking is that the ratio between the total number of visitors on the home page and the number of visitors of the privacy policy sub-page is very low. The results show that based on a unique user metric, an average of ca. 66,000 users visited the home page in the reference period, while only ca. 200 of them visited the privacy policy sub-page, amounting to a ratio of only .3%.

A similarly low number can be shown based on the median, where the percentage of users accessing the privacy policy sub-page is only slightly higher than the average at about .75%:

Table 2: Total no. Unique Users on Home Page, Privacy Policy Page, and Imprint Page

| | | Total no. Unique Users on Home Page | Total no. Unique User on Privacy Policy Page | Total no. Unique User on Imprint Page |
|--------------------|---------|-------------------------------------|--|---------------------------------------|
| N | Valid | 17 | 17 | 17 |
| | Invalid | 4 | 4 | 4 |
| Average | | 66,132.16 | 201.53 | 2,080.47 |
| Median | | 17,854.00 | 134.00 | 322.00 |
| Standard Deviation | | 89,364.93 | 194.90 | 3,359.27 |
| Minimum | | 220 | 23 | 20 |
| Maximum | | 300,089 | 777 | 10,134 |

There is also a significant difference between the Percentage of users accessing the privacy policy and the ones accessing the so-called imprint (a sub-page on which basic information about the identity of the provider is disclosed, such as company address, name, company registry no. etc.). The imprint apparently draws a somewhat greater interest, with a ratio of 3.1% based on average and 1.8% based on the median value. The number of users accessing the imprint was thus up to 6 times higher than the number of users accessing the privacy policy.

5. Discussion and Conclusions

The above results could lead the observer to believe that failure to provide the necessary information may be considered a minor fault.

5.1. Systematic Classification of Information Duties in the GDPR

However, when looking at Art. 83 of the GDPR, one can find that there are two categories of fines, one with a fine framework of up to the higher of 10 million euros or 2% of the annual world-wide turnover, and one with a fine framework of 20 million euros or 4% of the annual worldwide turnover. Interestingly, a violation of the information duties belong to the second category which threatens the higher fine. The lawmaker obviously held that an infringement of the information duties must be considered a major one, compared to infringements of the first category, which contains, among others, infringements against the regulations concerning a child's consent (Art. 8 GDPR), against the obligations of a data processor (Art. 28 GDPR), and even the notification of the individual in cases of a personal data breach (Art. 34 GDPR). In other words, the fine framework for failing to provide a general information on how data is being processed is surprisingly higher than for failing to inform a person if that individual's personal data has been accidentally disclosed to third parties and this is likely to result in a high risk to the rights and freedoms of natural persons (Art. 34 (1) GDPR), e.g. if credit card information has been disseminated into the dark web.

Notwithstanding the maximum ceiling of a fine, according to Art. 83 (2)(a) GDPR, administrative fines shall be imposed depending on the circumstances of the individual case, with regard being given to the nature and gravity of the infringement, as well as the level of damage suffered by individuals. In addition, according to Art. 82(2)(k) GDPR, any mitigating factors shall be taken into account.

5.2. Effectiveness of Privacy Policies

Here it is where the above findings must be taken into account. It would be hard to argue that the failure to provide information caused any damage, when the data shows that in fact virtually no one would have acknowledged the information, let alone base a purchase decision on such information. Failure to provide information that virtually nobody ever accesses can hardly be found to be an infringement of great gravity.

It seems that with the implementation of the GDPR, the lawmakers vastly overestimated the relevance of privacy information, which is surprising, given that the consumer's indifference to privacy information has been established for many years.

To this end, it must also be taken into account that even if the information on how data is being processed is provided to users, and where users originally have no intention of disclosing personal information altogether (whether based on a general reluctance or the actual information provided in the privacy policy), it has been demonstrated that such intention is not a reliable indicator of the users' actual behavior. This finding also invalidates any notion of privacy information being key for enabling self-determined consumers.

What is also worth noting is that there cannot be found a general indifference to the provision of certain information, as can be seen with regard to the access numbers on the imprint sub-page. Apparently, obtaining such basic information about the identity of the provider is much more frequent than about data processing, albeit, also on a comparably low level.

5.3. Conclusion

It must be concluded that where controllers fail to provide the information according to Art. 13 GDPR, save for special circumstances of the individual case, the imposition of a severe fine would generally not be warranted.

If this applies to cases of complete failure to provide the information, it must apply all the more to cases where the information has been provided, but merely failed to adhere to the required level of concise, transparent, intelligible and easily accessible form, and clear and plain language (Art. 12 (1) GDPR). This will be the practically more relevant issue, because, whether it is due to legal requirement or to best practice, most websites do provide some sort of privacy information.

As was shown above, the vast majority of users will never be impacted by an insufficiently transparent formulation of privacy information, as they do not access this information in the first place. This should call administrative authorities for a more lenient approach when it comes to assessing whether website controllers have complied with information duties.

References

- AGOF (Arbeitsgemeinschaft Online Forschung e.V./Working Group for Online Media Research). 2017. Digital Facts August 2017. [Online]. Available at: <https://www.agof.de/>. [Accessed: 2017, October 2].
- AYRES, Ian. 2014. The no-reading problem in consumer contract law. (2014). Yale Law School: Faculty Scholarship Series: Paper 4872. [Online]. Available at: <https://http://digitalcommons.law.yale.edu/>. [Accessed: 2018, February 18].
- BEHRENDT, B., GUENTHER, O. and SPIEKERMANN, S. 2005. Privacy in E-Commerce: Stated Preferences vs. Actual Behavior. *Communications of the ACM* Vol. 48 No. 4: 101–106. [Online]. Available at: <http://www.researchgate.net/>. [Accessed: 2018, February 25].
- EARP, J. B. and BAUMER, D. 2003. Innovative web use to learn about customer behavior and online privacy. In: *Communications of the ACM* Vol. 46 No. 4: 81–83. [Online]. Available at: <http://www.researchgate.net/>. [Accessed: 2018, February 18].
- GOOGLE. Google Analytics Help: Glossary – Pageview. [Online]. Available at: <https://support.google.com/>. [Accessed: 2017, October 2].
- NORBERG, P. A., HORNE, D. R. and HORNE, D. A. 2007. The Privacy Paradox: Personal Information Disclosure Intentions versus Behaviours. *The Journal of Consumer Affairs* Vol. 41 No. 1: 100–126.
- SPIEKERMANN, S., GROSSKLAGS, J. and BERENDT, B. 2001. E-privacy in 2nd Generation E-Commerce: Privacy Preferences versus actual Behavior. *Proceedings of the 3rd ACM Conference on Electronic Commerce: Tampa, Florida*: 38–47.
- STEINFELD, N. 2016. “I agree on the terms and conditions”: (How) do users read privacy policies online? An eye-tracking experiment. *Computers in Human Behaviour* 55: 992–1000.
- STRALIHEVITZ, L. J. and KUGLER, M. B. 2016. Is privacy policy language irrelevant to consumers? Coase-Sandor Institute for Law and Economics: Working Paper no. 776. [Online]. Available at: <http://srn.com/>. [Accessed: 2018, February 18].
- VAIL, M. W., EARP, J. B. and ANTÓN, A. I. 2008. An empirical study of consumer perceptions and comprehension of web site policies. *IEEE Transactions on Engineering Management* Vol. 55 No. 3: 442–454.
- VU, K.-P. L. et al. 2007. How users read and comprehend privacy policies. In: *Human Interface and the Management of Information. Interacting in Information Environments: Symposium on Human Interface: Proceedings, Part II. HCI International 2007, Beijing, China, July 22–27*. [Online]. Available at: <http://www.researchgate.net/>. [Accessed: 2018, February 18].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Research on profit shifting techniques

Danuše Nerudová¹, Veronika Solilová² and Marian Dobranschi³

*¹Department of Accounting and Taxation, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: danuse.nerudova@mendelu.cz*

*²Department of Accounting and Taxation, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: veronika.solilova@mendelu.cz*

*³Department of Accounting and Taxation, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: marian.dobranschi@mendelu.cz*

Abstract

This paper is concerned with reviewing the literature regarding the profit shifting techniques used by the Multinational Companies to avoid taxation. We review both theoretical and empirical studies in order to establish the main techniques of profit shifting and what is their reflection in the financial statements of the companies. Also, the paper aims to find what are the main factors that enhance profit shifting. The objective of this review is to provide a better appraisal of profit shifting techniques in a systematic manner, by showing what are the latest findings related to tax avoidance practices.

Keywords: Profit shifting techniques, tax avoidance, base erosion, transfer pricing.

JEL Code: H25, H26, H32.

1. Introduction

In the context of globalization and increased mobility of capital across the world, the avoidance of corporate income tax (hereinafter as CIT) becomes a difficult issue to tackle. Since each country has a different set of tax rules regarding CIT, the Multinational Companies (hereinafter as MNC's) can exploit these differences in order to lower their tax burden. One of the most common tax avoidance strategy used by the MNC's is the shifting of profits through various methods from high-tax jurisdiction to low or no-tax country. The objective of this paper is to review the literature that assesses the profit shifting techniques. We aim to provide a comprehensive evaluation on the latest findings related to tax avoidance practices of the MNC's. In the last three decades, there is a rich body of literature that has been concerned with investigation and evaluation of profit shifting techniques across the world. However, the literature tends to assess each profit shifting sepa-

rately, where the economists focus on a particular tax avoidance practice, leaving the perception of a scattered approach towards the issue. The contribution of this paper arises from a systematic approach to review the latest findings with respect to profit shifting techniques, in order to build an encompassing overview on MNCs' tax avoidance methods. The structure of the paper is as follows. In the first section we describe the concept of profit shifting, its' triggering factors and potential countermeasures. In the second section we identify different techniques of profit shifting following the current literature. In the third section of this paper we build groups of studies which study profit shifting of MNC's pertaining to a specific country (i.e., the US-based MNC's) and MNC's based in the EU. In this section we compare the results obtained in order to show subsequent discrepancies between studies. The fourth section of this paper ends with concluding remarks.

2. The concept of profit shifting

Dyreng (2015) defines profit shifting as the strategic actions taken by MNC's to report less profit in high-tax countries and more income in low or no-tax jurisdictions. The author argues that a narrow conceptualization of profit shifting concept is needed. Thus, profit shifting represents those strategic actions to report profit in a jurisdiction different from where the economic value is created. Dyreng (2015) considers that the main factors or drivers of profit shifting are the loop-holes in tax laws from different countries accompanied by the great difficulty to establish the true value of intellectual property. According to Dyreng (2015) another driver of profit shifting is represented by tax differentials between world countries. MNC's are prone to shift profits as long as there are different corporate income tax rate in different jurisdictions. Moreover, there are cases where profits are shifted or entire companies relocate because of political or social instability.

Markle (2015) describes profit shifting as the intentional movement of profits by the MNC's from high to low tax jurisdictions. One important argument brought by Markle (2015) is the fact that profit shifting itself produces a range of costs that a MNC should take into account. In some cases shifting profits can involuntarily break some tax rules or local laws. In this situation the MNC could face penalties and fines. Moreover, when a company uses shell companies or special purpose entities (hereinafter as SPE's) or hybrid entities to shift profits into tax havens, there are legal costs associated with the creation and the maintenance of such entities. Markle (2015) considers that a bad reputation or an image loss is another costs that a MNC should take into account if found that is trying to shift profits in order to avoid taxation. The author considers that the most common drivers of profit shifting are tax rate differentials and the increasing mobility of intangible assets – intellectual property.

OECD (2013a) underlines that tax base erosion poses a risk towards tax revenue, tax sovereignty and tax fairness across the OECD countries and non-OECD countries alike. Profit shifting plays an important role in base erosion. The main factors that enhance profit shifting according to OECD (2013a) are: international mismatches in entities such as hybrid arrangements and arbitrage; the abuse of tax treaties related to profits derived from transactions of digital economy; preferential tax regimes related to debt-financing and other intra-company transactions; transfer pricing and artificial splitting of ownership of assets between legal entities; the low effectiveness of anti-avoidance measures such as GAARS; different treatment of Controlled Foreign Companies; thin capitalization rules and the existence of tax preferential regimes. Base Erosion and Profit Shifting (here-

inafter as BEPS) is seen by the OECD (2013a) as a result of active and aggressive tax planning and tax strategies aimed to avoid taxation in high-tax rate countries and shift profits towards low or no-tax countries. This practice is not only affecting tax revenues collected by the state (i.e., the integrity of corporate income tax revenues) but also undermines competition between companies. Profit shifting gives a competitive advantage to MNC's in comparison to domestic companies. Profit shifting, according to OECD (2013) distorts investment decisions, where the resource allocation does not follow added value creation but aims to shift investment towards locations with low pre-tax return and high after-tax return. Finally, profit shifting could harm the overall voluntary tax compliance by all taxpayers, if there is a broad perception that MNC's can legally avoid taxation.

OECD (2013b) considers that a concerted action plan should be adopted through mutual cooperation between the governments in order to decrease base erosion and limit profit shifting. In the context where there are three parties that are harmed by profit shifting, namely governments, individuals and businesses, OECD (2013b) proposed a 15-step action plan to counter base erosion and profit shifting.

3. Categories of profit shifting techniques

Gravelle (2015) considers as a common method to shift the profit and avoid taxation by the MNC's, the practice to intra-company loans granted to subsidiaries placed in high-tax countries in comparison with the subsidiaries placed in low-tax nations. Earning stripping is another method to shift profits by the MNC's addressed by Gravelle (2015). Earning stripping aims to use the interest payments as the tool of decreasing the tax base and thus lower the tax base for corporate income tax. On the other hand, the borrower is a company placed in no or low tax jurisdiction which would avoid paying taxes on interest income. One of the main countermeasures to overcome this profit shifting method is to limit earning stripping by imposing thin capitalization rules. Another common method to shift profits, according to Gravelle (2015) is transfer pricing. The countermeasure to limit profit shifting is the arms-length principle. This principle is easily applicable in case of goods and services that have comparables on the market. However, Gravelle (2015) notes that the ability of arms-length principle is greatly reduced in case of intellectual property. Most of the patents are unique and do not have comparables on the market in order to establish the true price according to arms-length principle. Therefore, the MNC's can abuse of intra-company trade to shift profits, by over-invoicing the royalty payments to subsidiaries placed in high tax countries.

The third technique to evade CIT is the check-the-box practice used mainly by the US MNC's. In order to register for income tax purposes in the US, a business can choose to be declared as a corporation, a partnership or a disregarded entity. The US companies can choose if their foreign affiliates can be treated as foreign disregarded entities of another corporation. If the MNC chooses to declare its foreign affiliates as foreign corporation (i.e., branches) then all the income obtained by these CFC's are subject to subpart F income rules and are liable to corporate income tax. On the other hand if the CFC's are declared as foreign disregarded entities then the income obtained by these entities does not fall under US tax law (Dowd, Landefeld and Moore (2017)). Another method to avoid CIT used by the MNC's, assessed by Gravelle (2015) is cross crediting. The MNC's can use the excess of foreign taxes paid in one jurisdiction to offset the US tax due on other income obtained by the subsidiaries of the same MNC in other countries.

Contractor (2016) notes that there are seven main tax-avoidance techniques used by the MNC's, in order to erode tax base and shift profits from high-tax to low or no-tax jurisdictions. The first method to shift profit shifting is represented by exemptions or deferrals of profits obtained in company's foreign affiliates. This example is applicable mostly to US MNC's, where the US not only taxes the profits obtained by parent company based on US soil but also the income obtained abroad by the MNC's affiliates. However, the US tax law allows the US MNC's foreign income to be deferred indefinitely. The reason behind this practice is due to the fact that MNC's do not remit the profits back to US. Usually these untaxed profits are hold in tax havens or reinvested in other businesses abroad.

The second most common technique to shift profits used by the MNC's is transfer pricing. Often the MNC's engage in artificially increase of price between two subsidiaries in order to increase costs for the affiliate placed in high-tax rate country and increase revenues for the affiliate placed in low or no-tax jurisdiction. Contractor (2016) argues that the intra-company trade is amounting up to 42–55% of world trade, meaning that there is a lot of space for unfair transfer pricing practice. This technique to shift profits and avoid taxation is more prone in particular cases where the arms-length principle is difficult to enforce (i.e., the intermediate products with unique characteristics with embedded technology – intellectual property).

Royalty payments represent the third method to shift profits by the MNC's from high to low tax countries. Contractor (2016) notes that royalty payment could help MNC's to shift profits because the current business are technology intensive and most value is contained into intangible assets or proprietary technologies. Another cause of profit shifting through royalty payments is the current tax rules which allow companies to transfer patents and brands from parent company to a holding company or subsidiary placed in low or no tax country. The third cause of profit shifting through royalty payments cited by Contractor (2016) is the fact that most of tax rules across the world countries allow royalty payment deductions even if the patent or the invention is held by the subsidiary of the same MNC.

The fourth technique to shift profits assessed by Contractor (2016) is the intra-corporate loans. This practice is used mainly because the borrower can deduct its interest expenses and thus lower the tax base in order to pay less CIT. The current tax rules allow interest payments deductions, without differentiating who is the real creditor (e.g., the source of loans is a subsidiary controlled by the same MNC or an external financial entity). Profit shifting through intra-corporate loans appears when the borrower company and the lender are subsidiaries owned by the same MNC, except they are based in different countries. Usually the borrower is placed in high-tax rate country and the lender is based in a low or no-tax country.

The fifth technique of profit shifting is the parent overheads and costs concentration to parent company which is placed in high-tax country. Even if the full overheads and costs are not born entirely by the parent company these expenses are not spread to other subsidiaries.

The sixth method to shift profits is the use of tax havens by the creation of shell-companies (Contractor (2016)). The shell-companies based in tax haven countries can be used by the MNC's as parking places for un-repatriated profits into US. This practice is mostly used by the US-based MNC's in order to avoid CIT and maintain an indefinite deferral of foreign profits taxation. Another use of tax haven countries is the so-called "round-tripping" scheme used especially by the Chinese MNC's to channel FDI in China. Firstly the outbound Chinese FDI is placed in small tax havens countries such as Caribbean Islands

or Honk-Kong. Then, these out-bond FDI return to China under the pretext of foreign investment which benefits from special tax breaks and other benefits from Chinese government.

The seventh technique to evade taxation and shift profits is the inversion. Contractor (2016) gives the example of pharmaceutical company Pfizer which is based in the US to merge with an Ireland based company Allergan in 2016. An inversion represents a head-quarter shifting to a lower tax country by acquiring or merging with another company.

De Simone, Klassen and Seidman (2016) investigate other techniques to shift profits. The authors analyse the so-called shift-to-loss strategy to avoid taxation. This unconventional strategy assumes that MNC's not only direct profits to subsidiaries based in low-tax countries, but profits could be shifted to unprofitable, loss-reporting subsidiaries in high-tax jurisdictions. This means that even if profitable subsidiaries based in low-tax countries will pay less tax, in comparison with them, the unprofitable subsidiaries based in high-tax countries have an advantage since reporting loss means that the marginal tax rate is zero. In this case the MNC's adopt a shift-to-loss strategy by moving profits to unprofitable subsidiaries, reporting less losses and decreasing the tax burden of profitable subsidiaries. De Simone, Klassen and Seidman (2016) found that this non-conventional profit shifting technique is done using intra-company trade, where transfer prices are adjusted between the profitable and unprofitable subsidiary in order to shift income towards zero-tax paying entity.

With respect to discrepancies between studies that assess the profit shifting techniques there are opposite classification of profit shifting techniques. Clausing (2009) divides the profit shifting techniques into two distinct categories: financial tools as response to taxation of corporate income tax such as transfer prices assigned to international trade, the financial structure of the subsidiaries and change of location of royalties and intangibles; the real response of the MNC's to changes in CIT rates associated to complete movement of assets, employment and economic activities in low tax countries. Heckemeyer and Overech (2017) consider that the strategic use of debt (i.e., intra-company loans) represents tax-efficient financial technique and the non-financial technique are represented by transfer pricing and licensing.

4. Profit shifting techniques – literature review

In this section we provide a systematic review of the empirical literature concerned with profit shifting techniques. OECD (2015) underlines that the overall BEPS magnitude is significant, which translates into annual losses of 4–10% of CIT revenues or 100 to 240 billion USD. According to Devereaux and Maffini (2007) and Heckemeyer and Overech (2017) the empirical literature regarding profit shifting is driven mainly by data availability than developing new methods of examining profit shifting. Consequently, we group the empirical literature according to the country (i.e., United States of America) or group of countries (i.e., the EU) on which the empirical analysis is based. The state of current literature regarding profit shifting analysis presents a polarization, where the empirical studies use mainly the US data or the EU company-level data and to a lesser extent other countries (i.e., China, India).

Before we refer to empirical studies that tackle profit shifting techniques in a particular country, we present the studies that performed meta-analyses taking into account the most influential publications on this issue. One of the main contributions in reviewing

the empirical literature with respect to profit shifting techniques is the study of Dharmapala (2014). The author points that the dominant approach to empirically analyse the profit shifting practices is the “Hines-Rice” method. Hines and Rice (1994) were the first economists that proposed a methodology to investigate and assess profit shifting. The methodology used by Hines and Rice (1994) to investigate if profit shifting does occur, is by assuming that pre-tax income of an affiliate represents the sum of “true” and “shifted” income. This “true” income is a result of employing labour and capital. Thus the most important independent variables used by the authors are: fixed tangible assets and employment compensations. Hines and Rice (1994) assume that the size of shifted income is determined by the tax incentives in different jurisdictions. The basic tax incentive taken into account by the authors is the tax difference faced by the parent company based in one country and the tax rates faced by the foreign subsidiary.

Devereaux and Maffini (2007) also provide a detailed analysis of empirical literature that assesses the issues of profit shifting. The authors propose a more complex analysis of profit shifting by investigating the impact of taxation on several aspects regarding the MNC’s locational decisions. Devereaux and Maffini (2007) found that effective average tax rate plays a more significant role than marginal tax rates in case of discrete location choices of the MNC’s. The differences in statutory tax rates have a significant impact on the location of income (i.e., declared profit). Tax differentials, according to Devereaux and Maffini (2007) have affected financial policy, the repatriation of profits and the intra-company transfer prices.

A considerable contribution to the literature regarding the assessment of profit shifting techniques is done by first group of empirical studies which use the US company-level data.

Clausing (2006) analyses the impact of tax incentives on intra-company trade. The author uses the data provided by Bureau of Economic Analysis (hereinafter as BEA) for the period of 1982–2000. The data is concerned with US-based multinationals and the US international trade. The author demonstrates that tax incentives do affect international intra-company trade balance due to potential tax savings.

Clausing (2009) uses the data provided by BEA for US MNC’s in order to analyse the sensitivity of profit shifting due tax differences between countries. When a host country where a subsidiary owned by an US-based MNC decreases the tax rate by 1% then the subsidiary will declare 0.5% more profit as response to lower tax burden. Clausing (2009) found that in 2004 the financial techniques to shift profits used by US MNC’s have lowered the US CIT revenues by 35% or 180 billion USD. The real movement of assets and employment in order to avoid high CIT rates have decreased the US CIT revenues by 18% or 80 billion USD.

Schwarz (2009) uses BEA database to research the profit shifting techniques by the US-based MNC’s. The author finds that the US owned subsidiaries have a lower equity ratio in high-tax rate countries compared with affiliates in low-tax countries. Thus the strategic use of debt to shift profits from high to low tax countries plays an important role. Also the author finds that retained earnings in lower in high-tax countries due to the tax deferral rules. Schwarz (2009) concludes that the US controlled subsidiaries report a higher pre-tax profitability in low-tax countries than the affiliates based in high-tax countries.

Keightley and Stupak (2015) use the US BEA database to examine the main routes of profit shifting by the US MNC’s. The BEA database provides a detailed set of data regarding the financial operations of the US MNC’s including reported profits and their location and also country-level data of FDI. The authors conclude that 65% of the reported profits by

the US owned MNC's in tax havens countries and tax preferred countries such as: the Netherlands, Ireland, Luxembourg and Bermuda. The authors observe that 47% of outbound FDI by the US MNC's are directed in tax preferred countries or tax havens. Another strategy of US MNC's to channel investment in low or no-tax countries by using holding companies. The authors stress that FDI channelled through holding companies has increased in the last 3 decades from 9.4% to 46.2%.

Gravelle (2015) assesses the role of tax havens in profit shifting by the US MNC's. The author lists a number of 50 countries that bear the characteristics of tax haven: low or no-taxes; lack of transparency and lack of effective exchange of information. The author uses the data regarding the Controlled Foreign Companies of the US MNC's provided by Internal Revenue Service and US Statistics of Income. Gravelle (2015) finds that the profits declared by the US CFC's in tax havens and tax preferred countries such as Ireland and the Netherlands have increased significantly from 2004 to 2010, signalling profit shifting practices in order to avoid taxation.

Flaen (2017) analyses transfer pricing techniques of the US MNC's. The author studies the profit shifting behaviour of US MNC's by estimating the impact of CIT rate differences and dividend repatriation tax rate on transfer prices. Flaen (2017) uses the micro-level data for the US MNC's from Linked/Longitudinal Firm Trade Transaction Database. The author finds evidence of profit shifting through transfer prices, where a gap is present between arms-length principle and related party export prices. The export prices towards low-tax countries tend to be under-priced and the import prices through prices tend to be over-prices. The results obtained by Flaen (2017) show that the US MNC's under-reported 6 billion USD of exports and over-reported 7 billion USD imports.

The second group of empirical studies that contribute significantly to the literature regarding profit shifting methods is represented by the researches that use the EU company-level data.

Dischinger (2007) underlines three major categories of profit shifting: intra-company trade with overpriced intermediate goods; the use of overhead costs such as R&D and headquarter services which are strategically allocated to subsidiaries located in low tax countries and inter-company financial transactions. The author uses the European micro database AMADEUS to analyse CIT avoidance and found evidence of profit shifting through the subsidiaries based in the EU countries. Dischinger (2007) found a decrease of pre-tax profits by 7% if the tax difference of a subsidiary to its immediate shareholder increases by 10%.

Huizinga and Laeven (2008) analyse the profit shifting by the EU-based MNC's using the micro-level data compiled by Bureau van Dijk (AMADEUS). Following the traditional approach of investigating the responsiveness of reported profits to tax differentials, the author introduce a new approach, the tax differences between affiliates of the same MNC based in different countries. The average semi-elasticity of reported profits by the European subsidiaries is found to be 1.43. Thus, the authors find a substantial response of the reported profits that validate profit shifting among the European countries. Huizinga and Laeven (2008) conclude that the intra-European profit shifting depends on the international structure and international tax regime that the MNC's face in each country where its subsidiaries are based.

Weichenrieder (2008) analyses the profit shifting behaviour using the inbound and outbound German FDI data. The method adopted by the author is to analyse the correlation between the home-country tax rates where the MNC's is based with the after-tax profitability reported by German affiliates. The author does find evidence of profit shifting, where the profitable affiliates increase their reported net profit by 0.5% as a response to

10% increase of parent's home-country tax rate. Buettner and Wamser (2013) use the micro-level database of all German multinationals from the German Central Bank to analyse the size of profit shifting done by German MNC's using the strategic intra-company loans. The author uses the internal loans between subsidiaries owned by the German MNC's and tax differentials between multinational groups. The results obtained show that internal loans tend to react significantly to tax differentials between subsidiaries placed in low-tax countries.

Saunders-Scott (2015) analyses the relationship between profit shifting methods, namely transfer pricing and intra-company loans. The author uses the Bureau van Dijk ORBIS database to collect the data regarding the financial information of European multinationals. To investigate the relationship of transfer pricing over intra-company loans, the author uses the pre-tax income reported and taxes and the responsiveness of debt to equity ratio to government changes of interest deductions rules. Saunders-Scott (2015) finds that earning stripping rule implementation does decrease profit shifting through transfer pricing. However, the MNC's tend to treat intra-company trade and intra-company loans as substitutes.

Beer and Loeprick (2015) use the ORBIS database to analyse the main drivers of transfer pricing and potential counter measures. The authors use as profit shifting enhancing factors the intangible assets endowment of subsidiaries and the supply-chain complexity of the MNC's. Beer and Loeprick (2015) found that if the subsidiaries have a greater ratio of intangible to total assets, tend to report less profits if the tax rate increases compared with subsidiaries with no intangibles. In the same manner as the supply-chain of the subsidiaries becomes more complex, their reported profits tend to decrease as the tax rate increases. The authors conclude that the implementation and enforcement of strict transfer pricing regulation does show a steep decrease of profit shifting though this practice.

Fuest et al. (2015) analyse the profit shifting technique using the strategic placement of intellectual property rights. The authors present the case of "Double Irish Dutch Sandwich", used to minimize tax base and avoid taxation, by exploiting the low tax rates of Ireland and the Netherlands and benefit from withholding tax-free regime in the EU countries. The authors recommend the implementation of a new or to extend the existing withholding taxes on interest and royalty payments, which could limit tax planning and profit shifting.

Jansky and Kokes (2015) analyse the financial and ownership data of companies operating in the Czech Republic aiming to find evidence of profit shifting. The authors also use data regarding 4124 multinational companies that operate in Czech Republic. Jansky and Kokes (2015) found that the MNC's with links to tax haven countries have a positive impact on the debt to equity ratio of the subsidiaries. Moreover, Jansky and Kokes (2016) research the ability of MNC's to shift profits from Czech Republic to three European tax havens, namely the Netherlands, Switzerland and Luxembourg. The authors found that companies linked to the above stated countries show a higher debt to equity ratio, which indicates profit shifting through strategic use of debt.

Heckemeyer and Overech (2017) analyse which factors have a greater impact on the profit shifting behaviour of the MNC's. The starting point of this research is the negative correlation between the reported profits of parent and subsidiaries and the level of local tax rate. Heckemeyer and Overech (2017) perform a meta-analyse using 25 primary empirical studies which amount up to 238 estimates representing tax-rate elasticity of reported parent and subsidiary profits. The authors predict that if the host country decreases the corporate tax rate by 1 percent then the tax semi-elasticity of pre-tax profits

will increase by 0.8% in absolute terms. The paper of Heckemayer and Overech (2017) reaches opposite conclusions regarding the most used techniques to shift profits by the MNC's compared with previous studies. While, Grubert (2003) considers that profit shifting is done equally through intra-company loans and intra-company trade, Dharmapala and Riedel (2013) find that the strategic use of debt is the main method used to shift profits from high to low tax countries. On contrary, Heckemayer and Overech (2017) conclude that non-financial methods to shift profit dominate the strategic use of debt. The same conclusion was reached in an earlier study by Huizinga, Laeven and Nicodeme (2008) where transfer prices and royalty payments dominate the intra-company loans in terms of main choice to shift profits and avoid taxation.

5. Conclusions

The aim of this paper is to review the literature that assesses the issue of profit shifting techniques. The concept of profit shifting represents the strategic actions and the intentional movement of profits from high-tax to low or no-tax countries. According to the literature, there are three main groups that are negatively affected by profit shifting practices, namely the government tax revenues, domestic companies and the overall voluntary tax compliance of the individuals. The factors that enhance profit shifting and tax avoidance by the MNC's are the tax differences between countries and loopholes in tax rules across different jurisdictions which are exploited by the MNC's in order to lower their tax burden. The reviewed literature underlines two main categories of profit shifting categories, namely the financial techniques and the real techniques to shift profits. The first category refers mainly to intra-company loans, intra-company trade, royalty payments, inversions, cross-crediting, tax deferrals, round-tripping of income and the use of holding companies and special purpose entities to strategic placement of FDI in low or no-tax countries. The real techniques of profit shifting used by the MNC's refer to complete movement of production plants, capital and employment from a high-tax to a low-tax jurisdiction. Among the financial techniques of profit shifting, the US-based MNC's engage in particular practices such as indefinite deferrals of CIT, check-the-box and round-tripping of profits due to the fact that the US government adopts the worldwide taxation of profits compared with territorial tax rules applied in other countries.

With respect to the empirical literature that investigates the behaviour and the existence of profit shifting across world countries, we found that there is a dominant approach – so-called the “Hines-Rise” method. The majority of reviewed papers tend to analyse indirectly the existence of profit shifting behaviour. The indirect method examines the semi-elasticity of reported profits to tax differences between countries where the subsidiaries are placed. The empirical literature that evaluates profit shifting techniques can be divided in two main groups according to the data used. The first group of paper uses extensively the US-based company level data and the second group of studies uses the EU-based company-level data. The US-based studies tend to perform a more in-depth analysis of profit shifting techniques due to detailed data availability regarding the financial information of MNC's in comparison with the EU-based studies where the mainstream method is the “Hines-Rice” approach. The reflection of tax planning and tax avoidance into the financial statements of the MNC's and their subsidiaries varies according to the profit shifting technique used. When the intra-company loans are used to shift profits, then the subsidiaries placed in high-tax rate will have a higher ratio of debt to equity; when the

intra-company trade is used (i.e., transfer pricing) to avoid taxation then overpriced exports and under-priced imports will appear; when inversion is used then the headquarters of the MNC's will move from a high-tax to low-tax country. In conclusion, all existent practices of tax avoidance aim to lower the MNC's worldwide tax burden by exploiting tax rules differences between different countries. We consider necessary the development of new methods to analyse the profit shifting techniques in order to reveal the magnitude of profit shifting behaviour and propose appropriate countermeasures.

Acknowledgements

This paper was funded by the Czech Science Foundation (GACR) grant [no.18-14082S] entitled: "Fair corporate taxation: Measurement of the impact of the corporate profit shifting on the budget of the Czech Republic".

References

- BEER, S. and LOEPRICK, J., 2015. Profit shifting: drivers of transfer (mis) pricing and the potential of countermeasures. *International Tax and Public Finance*, 22(3), pp.426–451.
- BUETTNER, T. and WAMSER, G., 2013. Internal debt and multinational profit shifting: Empirical evidence from firm-level panel data. *National Tax Journal*, 66(1), p.63.
- CLAUSING, K.A., 2006. International tax avoidance US international trade. *National Tax Journal*, pp.269–287.
- CLAUSING, K.A., 2009. Multinational firm tax avoidance and tax policy. *National Tax Journal*, pp.703–725.
- CONTRACTOR, F.J., 2016. Tax avoidance by multinational companies: Methods, policies, and ethics.
- DE SIMONE, L., KLASSEN, K.J. and SEIDMAN, J.K., 2016. Unprofitable affiliates and income shifting behavior. *The Accounting Review*, 92(3), pp.113–136.
- DEVEREUX, M. and MAFFINI, G., 2007. The Impact of Taxation on the Location of Capital, Firms and Profit: a Survey of Empirical Evidence.
- DHARMAPALA, D. and RIEDEL, N., 2013. Earnings shocks and tax-motivated income-shifting: Evidence from European multinationals. *Journal of Public Economics*, 97, pp.95–107.
- DHARMAPALA, D., 2014. What do we know about base erosion and profit shifting? A review of the empirical literature. *Fiscal Studies*, 35(4), pp.421–448.
- DISCHINGER, M., 2007. Profit shifting by multinationals: Indirect evidence from european micro data.
- DOWD, T., LANDEFELD, P. and MOORE, A., 2017. Profit shifting of US multinationals. *Journal of Public Economics*, 148, pp.1–13.
- DYRENG, S., 2015. Making Sense of Profit Shifting: Scott Dyreng. Tax Foundation Forum Series.

- FLAAEN, A., 2017. The Role of Transfer Prices in Profit-Shifting by U.S. Multinational Firms: Evidence from the 2004 Homeland Investment Act, Finance and Economics Discussion Series 2017-055. Washington: Board of Governors of the Federal Reserve System.
- FUEST, C., SPENGLER, C., FINKE, K., HECKEMEYER, J. and NUSSER, H., 2013. Profit shifting and 'aggressive' tax planning by multinational firms: Issues and options for reform.
- GRAVELLE, J., 2015, Tax havens: International tax avoidance and evasion, Congressional Research Service Report for Congress (Congressional Research Service, Washington, DC).
- GRAVELLE, J.G., 2009. Tax havens: International tax avoidance and evasion. *National Tax Journal*, pp.727–753.
- GRUBERT, H., 2003. Intangible income, intercompany transactions, income shifting, and the choice of location. *National Tax Journal*, pp.221–242.
- HECKEMEYER, J.H. and OVERESCH, M., 2017. Multinationals' profit response to tax differentials: Effect size and shifting channels. *Canadian Journal of Economics/Revue canadienne d'économie*, 50(4), pp.965–994.
- HINES Jr, J.R. and RICE, E.M., 1994. Fiscal paradise: Foreign tax havens and American business. *The Quarterly Journal of Economics*, 109(1), pp.149–182.
- HUIZINGA, H. and LAEVEN, L., 2008. International profit shifting within multinationals: A multi-country perspective. *Journal of Public Economics*, 92(5–6), pp.1164–1182.
- HUIZINGA, H., LAEVEN, L. and NICODEME, G., 2008. Capital structure and international debt shifting. *Journal of Financial Economics*, 88(1), pp.80–118.
- JANSKÝ, P. and KOKEŠ, O., 2015. Corporate tax base erosion and profit shifting out of the Czech Republic. *Post-Communist Economies*, 27(4), pp.537–546.
- JANSKÝ, P. and KOKEŠ, O., 2016. Profit-shifting from Czech multinational companies to European tax havens. *Applied Economics Letters*, 23(16), pp.1130–1133.
- KEIGHTLEY, M.P. and STUPAK, J.M., 2015. Corporate Tax Base Erosion and Profit Shifting (BEPS): An Examination of the Data. CRS Report, 44013.
- MARKLE, K., 2015. Making Sense of Profit Shifting: Kevin Markle. Tax Foundation Forum Series.
- OECD, 2013a. Addressing Base Erosion and Profit Shifting, Paris: OECD.
- OECD, 2013b. Action Plan on Base Erosion and Profit Shifting, Paris: OECD.
- OECD, 2015. OECD/G20 Base erosion and Profit Shifting Project 2015 Final Reports, Paris: OECD.
- SAUNDERS-SCOTT, M.J., 2015. Substitution across methods of profit shifting. *National Tax Journal*, 68(4), p.1099.
- SCHWARZ, P., 2009. Tax-avoidance strategies of American multinationals: an empirical analysis. *Managerial and Decision Economics*, 30(8), pp.539–549.
- WEICHENRIEDER, A.J., 2009. Profit shifting in the EU: Evidence from Germany. *International tax and public finance*, 16(3), pp.281–297.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

An Assessment of the Effectiveness of the Debt Rule in Poland’s Territorial Government Entities

Katarzyna Owsiak¹

*¹Department of Local Finance, Faculty of Finance and Law, Cracow University of
Economics, Rakowicka 27, 31-510 Cracow, Poland, e-mail: owsiakk@uek.krakow.pl*

Abstract

The objective of the paper is to present problems associated with the implementation of the model of limiting indebtedness based on the individual debt ratio, which is calculated individually for every territorial government entity in Poland after 2013. It is the result of the introduction into the Public Finance Act of 2009 of fiscal rules protecting territorial government entities from losing their financial liquidity and preventing them from taking on excessive debt (the balanced budget rule and the individual debt ratio). The article also discusses some other factors which can affect local debt levels.

Keywords: individual debt ratio, non-standard financial instruments, local debt management

JEL Code: H63, H72, H74

1. Introduction

1.1. Background

In 2004–2008, and in 2009–2015 the Excessive Deficit Procedure was launched against Poland, which led to implementing a number of public finance reforms. The reforms were recommended by the European Commission as well as scientists and practitioners, and related to changes in the structure of expenditure and revenue as well as public finance management. They led to adopting the Act on Public Finance in 2009, which aimed to increase the stability, safety, effectiveness and rationality of public finance. In practice, the Act covered the following issues: the organizational and legal framework for the public finance sector; the activity-based budget (ABB); increased significance of planning through creation of tools for extended financial planning; introduction of stricter prudential standards and corrective measures related to public debt to GDP ratios; separation – within the central budget – of European funds, and introduction of management control

in public finance entities. The next stage of the process included structural reforms, contributing to fiscal consolidation (pension reforms), and the strengthening of the national fiscal framework through the implementation of new fiscal rules.

From the perspective of the local self-government sector, the major changes related to implementing two fiscal rules. The first one relates to balancing the operating budget of territorial government entities (as of 2011); pursuant to Article 242 (the Public Finance Act of 2009), a body having the status of a territorial government entity cannot approve a budget in which planned current expenditure exceeds planned current revenue increased by a budget surplus of previous years and free funds. The other one is the individual debt ratio (as of 2014). Another significant step was creating a financial planning instrument for several years or longer periods within the framework of a mandatory long-term financial projection as of 2011. The objective of this projection was to increase the transparency and predictability of self-government finances, to facilitate the absorption of EU funds as well as to enhance the debt management process.

Despite much controversy over the construction of fiscal rules and the role of a long-term financial projection as a debt management tool, the implemented solutions remain in force. Also, it should be noted that the 2009–2013 period recorded a rapid increase in the indebtedness of territorial government entities.

In the context of increased indebtedness, the following question arises: was it the effect of an attempt to avoid new restrictions (the individual debt ratio), or did the new ratio prove to be a more effective practical solution increasing the financial security of territorial government entities? This paper discusses the above mentioned issues, and it also refers to some other factors which can affect local debt levels.

1.2. Literature Review

Theoretically, the character of public debt can be referred to its categories – good debt, financial debt, or financially rewarding debt (for financing investment projects which might generate future revenue, Poniatowicz, 2011). Good debt can be opposed to bad debt – administrative debt, non-rewarding debt aimed to achieve current budget balance. The first type of debt is productive by its nature as it affects development, while the second one is destructive (Jurewicz, 2017). Assessments of the indebtedness of territorial government entities, as part of public debt, frequently focus on the impact of debt on the ability to stimulate local development. However, attention should also be given to the financing of various tasks performed by self-government entities.

Territorial government entities are entitled by law to enter into financial commitments. However, it can pose a very serious threat of excessive deficit in relation to an entity's repayment capacity, leading to the loss of liquidity. Literatures offer a number of definitions of excessive debt (e.g. Shiller, 2015; Salsman 2017). Poland does not use a legal definition of the excessive debt of public finance entities. With regard to such entities it can be assumed that excessive debt represents such a financial condition which prevents them from the timely meeting of financial obligations, leading to obligations which are immediately due, thus hindering the performance of public/local tasks (Krawczyk, 2016). In a broader context, the effects of excessive debt include the loss of creditworthiness and reliability and, consequently, the loss of financial liquidity and the threat of insolvency (Jastrzębska, 2016).

To counteract the phenomenon of excessive debt, the legislator has introduced an individual debt ratio based on a mathematical formula, calculated for a given entity in compliance with Article 243 of the Public Finance Act, which provides that a territorial

self-government entity cannot pass a budget the performance of which leads to the situation in which in a budget year and each year following a budget year the value of repaid debt obligations along with servicing costs (loan repayments, annual interest expenses, redemption of securities along with due interest and discount security, and potential repayments resulting from extended sureties and guarantees) to total budget revenue exceeds the arithmetic mean, calculated for the last three years, of the relation between current revenue, increased by the proceeds from the disposal of assets and decreased by current expenditure, and total budget revenue (the Public Finance Act of 2009). The determination of the individual debt ratio does not consider the amounts/debt related to the implementation of programmes, projects or tasks co-financed by EU funds and EFTA state aid schemes during periods not exceeding 90 days after the completion of a programme, project or task and the collection of refunded costs. It should be noted that the amount of debt of a territorial self-government entity, including the relations referred to in Article 243, as well as debt financing methods, constitute the elements of long-term financial projections, with the amount of debt being projected for the period of actual and planned financial obligations (the Public Finance Act of 2009).

The legislative body aims to reduce self-government debt, and it is the determination of the allowed debt limit that poses the greatest challenge in the debt management process. The individual debt ratio is mainly criticized for its impact on the possibility of taking out new loans the amounts of which are conditioned by an operating surplus generated in the period of the last three years. Moreover, specific ratio levels favour those entities which generate higher income from the disposal of assets (Kornberger-Sokołowska, 2015). In the case of excessive debt the construction of the ratio can be regarded as “stiff”. It results from the absence of the legislative mechanism which could provide the possibility of higher repayments than those imposed by the calculated formula. Also, literatures stress the deficiencies of the legal regulations related to debt reductions (Krawczyk, 2016) including the following: no possibility to reduce debt despite the availability of an entity’s own funds or to restructure debt through returnable revenue); the ratio is not affected by one-time considerable changes in revenue; differences in defining assets-related revenue (the Public Finance Act vs a long-term financial projection).

The adoption of the new solution is likely to encourage self-government entities to effectively manage their debt. Apart from debates over the term “effectiveness”, it should be assumed that optimal debt management policies do not aim to eliminate debt altogether but to integrate it effectively with financial management (Peter-Bombik, Kożuch, 2013). Paradoxically, the new debt limits have increased off-budget debt, which is not subject to the monitoring and control of supervisory bodies (hidden debt), encouraging entities to take out new expensive and high-risk loans (Jastrzębska, 2017). Self-government entities use instruments characterized by diversified legal structures, which are frequently based on several legal contracts (non-standard financial instruments and non-standard methods for financing budgetary activities, para-financial instruments having the characteristics of the system of financing from an entity’s own resources) in order to reduce budgetary debt. Such instruments include the following: equity financing (self-government entities set up community partnerships); sale and lease back; instalment payments; subrogation (National Council of Regional Clearing Houses, 2016). Some other instruments can be used to hide debt: assignment of receivables, factoring, forfaiting, trade credit, and public law partnership (Langer, 2014). In the context of legal solutions, such instruments are not subject to debt limits stipulated by the budget resolutions of territorial self-government entities, and, in addition to that, the concluding of agreements is not preceded by an opinion given by a Regional Clearing House with regard to the ability to

meet relevant financial obligations. Moreover, agreements are not subject to any limitations related to the purpose for which they are concluded (Budner-Iwanicka, 2017). The functioning of these instruments allows for postponing the maturity date, which results in the possibility to hide debt. The use of non-standard instruments is regarded as a way of manipulating the individual debt ratio. A significant role in this process is played by taking out loans from shadow banks. Moreover, public finance reporting (including the self-government sector) does not allow for an overall assessment of the financial effects of manipulating the individual debt ratio (Jastrzębska, 2017). It results from the fact that non-standard instruments are recognized as task-related expenditure – not debt-related expenses. Therefore, the resulting liabilities can only be verified by balance sheet reporting – not by budgetary reports. Being aware of these threats, the Ministry of Finance decided to enhance the monitoring of self-government debt and to counteract the manipulation of debt limit ratios. According to draft amendments to the Public Finance Act, the calculation of the ratio is to be based on new principles. It will exclude proceeds from the disposal of assets and include liabilities resulting from non-standard financial instruments. The proposal of the Ministry of Finance will allow for debt restructuring based on the repayment of existing debt through new debt with lower servicing costs. Also, prepayment will be possible from an entity's own resources, e.g. a budget surplus of the previous years. Currently, if a self-government entity does not have an appropriate surplus from the last three years, it cannot pay off its debt.

In the context of considerations concerning the indebtedness of self-government entities, attention should be given to two issues:

1. self-government entities can use standard financial instruments including credit lines, loans or the issue of securities in the cases stipulated by legal acts. It refers to an entity's financial budget needs and the concluding of pre financing agreements on the acquisition of EU funds.

2. debt projections constitute an element of long-term financial projections, prepared for the period in which actual loans are taken out or planned. Without considering some detailed interpretations of provisions related to long-terms financial projections, it should just be stressed that the term "planned" indicated a budget year. Therefore, financial projections are regarded as general debt steering instruments corresponding to relevant legal acts, which are not used for the purpose of rational decisions in response to an entity's current financial conditions (Filipiak, 2016).

2. Methodology and Data

The analysis of the effectiveness of the individual debt ratio comprises several stages. The first stage is an analysis of data provided by the Ministry of Finance for the purpose of determining the share of self-government debt in Poland's public debt in 2009-2016. Reports prepared by the National Council of Regional Clearing Houses and self-government entity's reports on the implementation of budgets in particular years, presented by the Ministry of Finance, allow for the estimation of the size and structure of self-government debt by types of Polish self-government entities. The last stage of the analysis assesses compliance with the debt rule introduced in 2014. The conducted analysis is also qualitative in character – the ongoing changes are conditioned by the institutional and legal environment, e.g. new sources of income provided by the "Family 500+" social scheme 500+".

3. Results

An increase in Poland's public debt coincides with the period of economic slowdown caused by the 21st century financial global crisis. In an attempt to identify the reason for a sharp increase in self-government debt, we should stress the fact that self-government debt accounts for merely 6% (2009) and 7.2% (2016) of the total public debt, and that it is dominated by the debt of territorial government entities and their associations (Table 1).

Table 1: The share of self-government debt in Poland's public debt in 2009-2016 (PLN billions)*

| debt/year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|
| State public debt | 669.9 | 747.9 | 815.3 | 840.5 | 882.3 | 826.8 | 877.3 | 965.2 |
| including: | | | | | | | | |
| Self-government debt** | 39.3 | 53.4 | 64.2 | 67.4 | 68.4 | 71.6 | 72.1 | 69.6 |
| including: | | | | | | | | |
| Debt of self-government entities and their associations | 36.3 | 50.6 | 61.2 | 64.0 | 65.2 | 68.2 | 68.3 | 65.8 |

Source: author's research based on Ministry of Finance data

* Data after consolidation

** The self-government sector comprises territorial self-government entities and their associations, self-government public health care centres, self-government cultural institutions and other self-government legal persons belonging to the public finance sector.

As of 1999, Poland's administrative structure has been based on a three-tier system comprising *gminas* (rural communes, boroughs, and urban-rural communes), *powiats* (townships; country districts), and voivodeships. These entities enjoy constitutional rights to associate (e.g. *gmina* associations). At the end of 2016 Poland had 2,478 *gminas* (1,555 rural communes, 302 boroughs, and 621 urban-rural communes), 380 *powiats* (66 townships, 314 country districts), and 16 voivodeships. An analysis of the structure of self-government debt by type of entity (Table 2) indicates that the greatest share of debt is represented by *gminas* and cities with county rights. In 2009, *gmina* debt accounted for 36.3%, and in 2016 – 34.8% of the total debt. With regard to cities with county rights, their debt represented 46.5% (2009) and 47.2% (2016) of the debt of territorial self-government entities.

Table 2: Indebtedness of Poland's self-government entities in 2009-2016 (PLN billions)

| debt/year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------------------|------|------|------|------|------|------|------|------|
| Gminas | 14.6 | 21.9 | 26.0 | 25.9 | 25.8 | 26.4 | 25.4 | 23.9 |
| Cities with county rights | 18.7 | 23.4 | 28.1 | 29.8 | 30.9 | 32.4 | 33.2 | 32.4 |
| Powiats | 3.9 | 5.4 | 6.1 | 6.0 | 5.9 | 5.9 | 5.8 | 5.6 |
| Voivodeships | 3.0 | 4.3 | 5.6 | 6.1 | 6.6 | 7.3 | 7.1 | 6.8 |

Source: author's research based on Ministry of Finance data

In the structure of debt of the particular types of self-government entities, up to 90% of liabilities in the cities with county rights are represented by credit and loans, while in the remaining entities the respective level is well above 90%. Self-government entities rely on securities on a much smaller scale.

In light of the above, the following reasons for an increase in self-government debt should be regarded as well justified: increased investment including EU-supported projects; decreased revenue resulting from economic slowdown in Poland (decreased contribution of direct taxation); new tasks assigned to self-government entities (Owsiak, 2014). Moreover, substantial liabilities were recorded in those gminas or cities with county rights which implemented active investment policies – not in the ones that found it difficult to finance the performance of public tasks due to low revenue levels (Misiąg, 2015).

Moreover, the analysis of data indicates that the expected “escape” from new limitations (the individual debt ratio) was recorded in 2010–2013, that is the time of implementing the Public Finance Act, strengthening the security of self-government finance (the implementation of the individual debt ratio was postponed until 2014).

In an attempt to determine whether the individual debt ratio contributed to reducing self-government debt, attention should be given to the fact that two rules had to be complied with in 2010–2013: a cap on debt servicing (principal plus interest to revenue could not exceed 15%), and the debt ceiling (liabilities to debt could not exceed 60% of revenue).

The data presented in Tables 2 and 3 confirm the stability of and slight reductions in the size of territorial self-government entities’ debt as of 2014. Also, a decrease is recorded in the number of entities which do not comply with the individual debt ratio.

Table 3: The number of territorial self-government entities in Poland not complying with the individual debt ratio in 2014–2019

| entity/year | 2014a | 2015b | 2016c | 2017c | 2018c | 2019c |
|------------------------------|-------|-------|-------|-------|-------|-------|
| Total | 64 | 78 | 48 | 31 | 21 | 18 |
| Gminas | 47 | 57 | 33 | 21 | 15 | 13 |
| Cities with county rights | 1 | 1 | 1 | 0 | 0 | 0 |
| Powiats | 16 | 20 | 14 | 10 | 6 | 5 |
| Voivodeships | 0 | 0 | 0 | 0 | 0 | 0 |

Source: author’s research based on Ministry of Finance data

a – data related to the implementation of entities’ budget in 2011-2013

b – data related to the implementation of entities’ budget in 2012-2014

c – data related to the implementation of entities’ budget in 2013-2015

In 2014, 64 territorial self-government entities failed to comply with the individual debt ratio, accounting for 2.3% of the total number of entities. In 2015, the number of such entities rose to 78 (2.8%), and in 2016 – to 48 entities (1.7%). According to projections, the number of entities which do not comply with the ratio is expected to fall as of 2017.

Table 4: The levels of the individual debt repayment ratio which are enforced in the process of creating budgets for territorial self-government entities in 2014–2017

| Year | 2014 | 2015 | 2016 | 2017 |
|--------------------|------|------|------|------|
| Number of entities | 2809 | 2809 | 2808 | 2808 |
| Below 0.0% | 9 | 11 | 8 | 8 |
| 0.0%–3.0% | 128 | 69 | 65 | 63 |
| 3.0%–6.0% | 779 | 640 | 525 | 544 |
| 6.0%–9.0% | 990 | 1027 | 1031 | 1011 |
| 9.0%–12% | 549 | 641 | 703 | 698 |
| 12%–15% | 219 | 272 | 303 | 304 |
| Above 15% | 135 | 149 | 173 | 180 |

Source: author's research based on data from the National Council of Regional Clearing Houses

The above Table indicates a decrease in the number of entities which could plan debt repayments at the level not exceeding 6%, and an increase in the number of entities planning debt repayments at the level not exceeding (12%–15%) and exceeding 15%.

The construction of the ratio based on the arithmetic mean of a 3-year period in accordance with regulations considers the following data: 1) for the year preceding the budget year – the planned data presented in the report on budget implementation for 3 quarters, 2) the calculation of relations for the previous two years is based on the achieved values presented in annual reports.

Considering the above, and in accordance with the recommendations not to deteriorate their combined maximum repayment limit, territorial self-government entities should seek to achieve relations (components of the arithmetic mean) recommended for the year preceding the year of projections at least at the target level (set by the National Council of Regional Clearing Houses, 2017).

4. Discussion and Conclusions

An increase in self-government debt was recorded until 2013. An analysis of debt levels after 2014 indicates that the implemented financial security instrument (the individual debt repayment ratio) was effective, leading to lower debt levels and decreasing the number of non-complying entities. However, it also led to increased amounts of so called hidden debts. Therefore, it can be concluded that a decrease in indebtedness in 2015 was only formal in character, as it was accompanied by an increase in the debt of communal partnerships. The reverse trend occurred in 2016, when such partnerships reduced their activities on the credit market (Ranking samorządów, 2017).

It should be noted that compliance with the recommendations of Article 243 (the Public Finance Act of 2009) does not imply a satisfactory assessment of the financial standing of territorial self-government entities. An increased size of debt can intensify negative phenomena (including due and payable liabilities or budget deficit financing from illegal sources), indicating financial liquidity problems (Wróblewska, 2015).

The current structure of the individual debt repayment ratio is characterized by a number of deficiencies which should be promptly eliminated. If the size of hidden debt rises, it may pose a real threat to the process of monitoring debt levels. According to the estimates of Regional Clearing Houses, the indebtedness of shadow banks amounted to PLN 237.5m in 2015, and to 164.2m in 2016, affecting 41 and 38 self-government entities, respectively. Simultaneously, loan-related liabilities were recorded in 241 entities (2015), and in 2016 in 290 entities, totalling PLN 876m in 2015, and PLN 1.4bn in 2016. In the

same years sales and lease back contracts in financial liabilities related to credit and loans were recorded in 16 and 21 entities, respectively, totaling PLN 53.5m and PLN 86.3m (the National Council of Regional Clearing Houses, 2016, 2017).

A threat to financial liquidity and the passing of budgets can be posed by the “Family 500+” scheme which implies the tax-free monthly transfers of PLN **500 for each second and subsequent child without meeting additional conditions. Low income families can also rely on aid schemes for the first or only child. Central budget subsidies for this purpose affected the total revenue of gminas and cities with county rights contributing to the scheme in 2016**, having a direct effect on lowering individual debt ratios, which is also expected in the coming years (the National Council of Regional Clearing Houses, 2017).

Acknowledgements

Publication was financed from the funds granted to the Faculty of Finance and Law at Cracow University of Economics, within the framework of the subsidy for the maintenance of research potential.

References

- BUDNER-IWANICKA L. 2017. Niestandardowe instrumenty finansowania potrzeb budżetowych jednostek samorządu terytorialnego w odniesieniu do ograniczeń samodzielności finansowej w zakresie zadłużania się tych jednostek. *Finanse Komunalne* (11): 35–42.
- Ministry of Finance data
- FILIPIAK B.Z. 2016. Instrumenty i narzędzia zarządzania długiem – ocena spójności z wieloletnią prognozą finansową. *Finanse Komunalne* (11): 29–40.
- JASTRZĘBSKA M. 2016. Nadmierne zadłużanie się jednostek samorządu terytorialnego – przyczyny, skutki, przeciwdziałanie. *Finanse Komunalne* (6): 15–29.
- JASTRZĘBSKA M. 2017. Dług ukryty jednostek samorządu terytorialnego – przyczyny, skutki, przeciwdziałanie. *Annales Universitatis Mariae Curie-Skłodowska, sectio H – Oeconomia* (4): 126–132.
- JUREWICZ D. 2017. Zadłużanie a zrównoważony rozwój jednostek samorządu terytorialnego. *Finanse Komunalne* (9): 5–18.
- KRAJOWA RADA REGIONALNYCH IZB OBRACHUNKOWYCH. 2016. Niestandardowe instrumenty finansowania potrzeb budżetowych jednostek samorządu terytorialnego. Regionalna Izba Obrachunkowa w Łodzi.
- KRAJOWA RADA REGIONALNYCH IZB OBRACHUNKOWYCH. 2016. Sprawozdanie z działalności regionalnych izb obrachunkowych i wykonania budżetu jednostek samorządu terytorialnego w 2015 roku. Krajowa Rada Regionalnych Izb Obrachunkowych, Warszawa.
- KRAJOWA RADA REGIONALNYCH IZB OBRACHUNKOWYCH. 2017. Sprawozdanie z działalności regionalnych izb obrachunkowych i wykonania budżetu jednostek

- samorządu terytorialnego w 2016 roku. Krajowa Rada Regionalnych Izb Obrachunkowych, Warszawa.
- KRAWCZYK R.P. 2016. Problem skuteczności rozwiązań prawnych zapobiegających nadmiernemu zadłużaniu się samorządu terytorialnego. *Finanse Komunalne* (12): 5–19.
- KORNBERGER-SOKOŁOWSKA E. 2015. Wskaźnik zadłużenia a uwarunkowania funkcjonowania jednostek samorządu terytorialnego w warunkach zmiennej koniunktury gospodarczej. *Finanse Komunalne* (1-2): 37–42.
- LANGER M. 2014. Ukryte formy zadłużenia jednostek samorządu terytorialnego – próba oceny zjawiska. *Prawo Budżetowe Państwa i Samorządu* 4(2): 75–86.
- MISIAĞ W. 2015. *Finanse samorządowe po 25 latach –stan i rekomendacje*. Bank Gospodarstwa Krajowego. [Online]. Available at: https://www.bgk.pl/files/public/Pliki/news/Ekspertyzy_BGK/Finanse_samorzadowe_po_25_latach_-_stan_i_rekomendacje/finanse_samorzadowe_7.pdf. [Accessed: 10 February 2018].
- OWSIAK K. 2014. Increase in debt of local government units as a threat to national fiscal stability. The case of Poland. *Proceedings of the 16th International Scientific Conference Finance and Risk*. Publishing House EKONÓM. Bratislava. Slovak Republic (1): 152–161.
- PONIATOWICZ M. 2011. Dobry dług versus zły dług, czyli o specyfice zadłużenia sektora samorządowego [in:] *Ekonomiczne i prawne uwarunkowania i bariery redukcji deficytu i długu publicznego*. red. nauk. J. Szołno-Koguc, A. Pomorska. Lex a Wolters Kluwer business. Warszawa.
- RANKING SAMORZĄDÓW 2014–2016. Zdolność kredytowa samorządów. 2017. Wspólnota. [Online]. Available at: http://www.wspolnota.org.pl/fileadmin/user_upload/Andrzej/11_2017/Nr_23_Ranking_-_Zdolnosc_kredytowa_2014-2016.pdf. [Accessed: 12 February 2018].
- SALSMAN R. M. 2017. *The Political Economy of Public Debt. Three Centuries of Theory and Evidence*. Edward Elgar Pub.
- SHILLER R.J. 2012. *Finance and the Good Society*. Princeton University Press.
- The Act of 27 August 2009 on public finance, *Journal of Laws* 2009, No. 157 point 1240 with later amendments.
- WRÓBLEWSKA G. 2015. Zarządzanie długiem jednostki samorządu terytorialnego – problemy praktyczne. *Finanse Komunalne* (1-2): 99–109.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Shift of Enterprise Software to Cloud Computing in Polish manufacturing companies

Anna Pamula¹

*¹Department of Computer Science, Faculty of Management, University of Lodz,
Narutowicza 68, 90-136, Lodz, Poland, e-mail: anna.pamula@uni.lodz.pl*

Abstract

Using cloud computing with web technology affects the scalability, reliability and availability of information and data systems which may influence not only the costs but also the way in which an organization does business. Cloud solutions are undergoing great development and managers are more willing to adopt them into business processes. The use and transfer of IT systems to the cloud, including ERP, is observed to have an upward trend, although it can be a source of many problems. The aim of the paper is, apart from theoretical considerations, an indication of how Polish companies start implementation of cloud-based solutions and which business areas and software applications they mostly focus on. The paper presents the result of a survey conducted in Poland in 2017/2018. The main objective of the study was to find out the degree of cloud computing environment proliferation among Polish manufacturing companies. For the purpose of the study, a survey method was applied, and a questionnaire was developed. In general, survey results show that companies are interested in Cloud Computing solutions, the majority of them is also drawn to test Sales and Distribution as well as CRM, and after they gather some experience, they continue with another software. Most of the companies investigated, that have made a shift of the software supporting production processes to a Cloud Computing model also use this implementation model for a software supporting more business-related processes.

Keywords: manufacturing, cloud computing

JEL Code: M15, O33

1. Introduction

Digital economy offers exciting, new opportunities for businesses, but it also brings unprecedented IT challenges. Fast Cloud Computing disruption influences the way in which organizations deliver and implement the software. While vendors are focused on providing services, consumers have to concentrate on business processes that allow to apply the

best practices for cloud implementations (Nieuwenhuis et al., 2017). Cloud Computing (CC) investments are growing, however, manufacturers must ensure their investments bring benefit for the business. The concept of cloud computing began to function in science and business at the end of the twentieth century. As an innovation technological paradigm, that offers greater flexibility, scalability, reliability, delivery at a relatively acceptable cost, it has been defined and widely described in the literature (Armbrust et al., 2009, McKinsey&Co, 2009, Mell and Grance, 2011,). CC eliminates the need for IT managers and customers to buy, deploy and maintain an IT infrastructure and applications. Some authors argue that the projects which only use IT resources made available in a cloud model cannot be called innovative, as they are similar to outsourcing idea; most do agree that CC offers new business opportunities. CC is described as a natural evolution of traditional IT, which many companies, institutions and end-users have been waiting for. It is an idea that greatly facilitates implementation of innovations aimed at changing business processes, shortening the time of introducing new products and services to the market, and supporting new channels of interaction with clients or building their loyalty (Bughin et al., 2010). The opportunity to access the latest solutions, without the need to purchase physical hardware or software, and many settlement options make it extremely important not only for big companies but also SMEs.

2. Literature review

The rapid development of cloud computing technology means that more and more organizations are opting for this model of using IT. This applies to both simple services such as e-mails and more complex like ERP systems. The omnipresence of mobile applications and the Internet of Everything together with the M2M concept are main drivers of the new enterprise system implementation. The delivery of cloud service architecture implies a transition from goods to service dominant logic (Panetto et al., 2016, Nieuwenhuis et al., 2017).

The enterprise software can be defined as a set of applications supporting company business processes, decision-making processes and communication. Organizations use computer applications to support main and auxiliary processes like financial reporting, production or sales. The core processes are determined individually by each organization, hence the need to create process maps, especially before making the decision on implementation of IT systems. To manage and optimize company resources, Enterprise Resource Planning (ERP) is implemented, thus becoming the basic data flow system in the organization. There are many other systems often implemented in manufacturing organizations. Product Life Cycle Management systems (PLM) aimed to reduce the cost of getting a product to market, Customer Relationship Management systems (CRM) to improve contact with customers and Supplier Relations Management Systems (SRM) for wider participation in the supply chain and performance of activities in business processes that go beyond the organization.

For many years, ERP have been seen as the main system of the organization designed to collect data and register all economic transitions. The years of system evolution starting from the MRP concept were devoted to improve business performance covering all organizations processes. Over the past several decades, many organizations have invested in systems aimed to get support in information and data flow, business processes integration and management of all the company resources (materials, devices, human and financial resources).

The new Enterprise Information Systems (EIS) are focused on integrating everything: data, services, sensors, devices and people. They will provide support to organizations operating in the Future Internet and will have to present the following qualities: (al., 2016):

- ubiquitous – previous generations were implemented in the organization's computer networks and the Internet, taking into account the needs of specific applications. Development of services for mobile devices and communication devices will ensure presence and access to the system in every place;
- architecture controlled by distributed models controlling and modifying functionality and business models for cooperating organizations, which will affect changes in the product life cycle;
- open – technological and legal access to software and resources, or knowledge sharing. In a broader context, this means transparency of the organization's structures in the form of a possibility to co-create environments and tools that support the creation of new products and services;
- dynamically reconfigured – allowing different ways of implementing tasks and processes with the use of the same or improved set of resources by creating interfaces to process models and actions;
- available for multiple functional users who have the authority to perform specific actions; the user in this case may also be program agents or a system supervising cooperation processes;
- equipped with semantic awareness at a sensor level – allowing to collect and process data at the level of distributed devices, and at higher levels to manage cooperation processes;
- application of advanced models of inference;
- equipped with elements of gamification that affects the involvement and identification of employees and partners with the organization's goals.

ERP systems usually have a rather complicated structure, as they refer to almost all organizational processes and resources. The company can choose commercial, tailored or open source systems. There are many differences, and before deciding which is the best, the company should consider the pros and cons of both (Lee et al., 2011). The system can be implemented in a traditional model (on-premise), fully in the cloud or as a hybrid model, where a part of the system is available via on-premise applications, and a part via the cloud model.

The transfer of IT solutions from the on-premise model to the cloud model seems unavoidable even in the case of manufacturing companies that consider safety and the possibility of supervision over production processes to be the main advantages of solutions adopted so far. The Cloud Computing model offers unique capabilities for companies, which can quickly move into a competitive position and take advantage of service-based IT solutions at low cost (El-Gazzar et al., 2016). The purposes of using the ERP system are the same, regardless of the type of hosting used; the choice of model must be carefully considered by the organization prior to implementation, taking into account a number of aspects, as each model brings a number of benefits, but also barriers (Abd Elmonem et al., 2016). Company size is one of the most important factors as many of the concerns associated with cloud ERPs are not seen as important for SMEs (Johansson et al., 2015).

It can be observed that more software is moved to cloud technology as big ERP market players offer their systems in cloud-based environment. There has been a significant

increase in software purchases based on the cloud model. According to a Panorama Consulting Solutions Research Report from 2016, a visible trend of ERP systems migration to the cloud can be observed from 2014, when 56% of investigated companies decided for on-premise ERP implementation, (comparing to 85% in 2013). More interest in ERP systems in the cloud is associated with the increasingly wider and more attractive offer available on the market. This is also confirmed by another report released yearly by IDC, which focused on analyzing the current trends and future plans for cloud adoption among manufacturing enterprises in Europe. The research result showed 56% of respondents running more than one type of cloud deployment and 40% of cloud users focused on a "Cloud First" approach. In this approach, the concept of cloud computing is not only a way to increase flexibility and maintain the costs of IT solutions necessary for the business. It also gives the opportunity to extend the business beyond typical areas of organization, and at the same time it facilitates the design and provision of completely new solutions or services for clients. It is thus one of the most important factors of digital transformation in the implementation of new business models. Digitalization has transformed industries, such as music and travel and is now changing manufactures. New technologies like the Internet of Things, dynamic enterprise management, global supply chain visibility, and machine learning are already changing the way manufacturers produce goods and interact with customers as well.

3. Cloud computing deployment in Polish manufacturing enterprises

3.1. Methodology and Data

The Polish manufacturing industry is undergoing a digital revolution with the IoT paradigm. New activities are welcome by the government as they are in line with the Polish Strategy for Responsible Development. The main aim of this study was to understand the shift of enterprise software supporting core business processes to Cloud Computing solutions.

Two research questions were considered:

Q1. Do manufacturing companies transfer applications related to core business process to a cloud computing model?

Q2. What proprietary type of software did they use before moving to the cloud?

For research purposes, a questionnaire was developed. In order to ensure high quality of data, research was conducted by a professional Market Research and Analysis Centre (ASM) using the CATI method, based on a database and with the application of a sample frame with the so-called legal unit (which is an approximate equivalent to an enterprise with all its branches) with its registered office and/or production plant based on territory of the Republic of Poland. The paper presents the result of a study based on data obtained in December 2017 and January 2018. The result of investigated 400 manufacturing companies located in Poland is presented in the paper. The random samples method was applied to choose respondents. The managers in charge of IT solutions (or company owner in case of small enterprises) were interviewed via telephone. The results were gathered into a database and analyzed using a computer software. Characteristics of the investigated companies covered:

| | |
|------------------|---------|
| Big companies | 30.75%, |
| Medium companies | 36.50%, |

| | |
|-----------------|---------|
| Small companies | 20.25%. |
| Micro companies | 12.50%. |

The companies represented a variety of sectors including manufacturing of finished products and parts; spatial market structure of the surveyed organizations covered: international (almost 59%), domestic (30%), local levels – the poviát in which the firm operates (6.1%) and regional market – the province in which the enterprise operates (3%).

3.2. Results

Digitalization may impact many areas within the organization, incorporating many solutions and applications that include supporting core processes. From the research point of view, it was important to prepare a study which would allow for identification of the software supporting business processes shifted to the cloud by manufactures, as they are known for slow and careful introduction of new technologies.

To find the answer to the first research question, the following list of main software types which support business processes has been indicated: Production (MRP), Sales and Distribution, Logistics (Warehouse and transportation), CRM, SCM, PLM, Finance and Controlling, Human Resource Management (HRM), IT Service Management (ITSM) and Office Business Applications. The list was based on ERP modules and the most often implemented software according to the report of the Central Statistical Office in Poland. Respondents were asked to assign the following status to each type: applied, tested, planned, not considered or unknown. The multiple choice option was adopted as companies may integrate different software to support business process and release IT services to the live environments according to the accepted schedule.

Table 1 shows the general results of areas where the investigated manufacturing companies prefer to support business processes with a cloud-based model software. The business software implementation process can be divided into smaller fragments, not all the modules or functions must be entered at the same time for users; the last column of table 2 represents the percentage of investigated companies with mixed status of cloud computing model adoption. Figure 1 presents aggregated values that regard a computing cloud for planned, tested or applied answers (registered as a single or mixed option) versus those not considered. Results show that around 47% of investigated companies did not consider the application shift for supporting core production processes, 60% do not even consider to move to a Product Management Life Cycle software. The investigated companies were more willing to shift to the cloud the application related to sales and customer service – around 60% plan, test or use a Sales and Distribution or CRM software in the Cloud Computing model. The adoption (planned, applied and tested) of cloud office software and email cloud services (more than 60%) is confirmed by results of research conducted in Poland in previous years (Czerwonka, 2016).

Table 1: Percentage of enterprise software shift to cloud status

| Reported status→ | Applied | Tested | Planned | Not considered | Do not know | Planned Tested Applied |
|---|---------|--------|---------|----------------|-------------|------------------------|
| Software supporting business processes↓ | | | | | | |
| Production (MRP) | 25% | 7% | 15% | 47% | 3% | 3% |
| Sales & Distribution | 32% | 8% | 18% | 35% | 5% | 2% |
| Logistics | 28% | 5% | 15% | 46% | 4% | 2% |
| CRM | 32% | 6% | 22% | 35% | 4% | 1% |
| SCM | 24% | 5% | 19% | 45% | 6% | 2% |
| PLM | 17% | 4% | 12% | 60% | 7% | 2% |
| Finance & Controlling | 25% | 5% | 13% | 50% | 5% | 2% |
| HRM | 18% | 3% | 13% | 60% | 6% | 1% |
| ITSM | 36% | 5% | 16% | 38% | 5% | 2% |
| Office, email | 39% | 5% | 15% | 38% | 2% | 2% |

Source: Based on research results

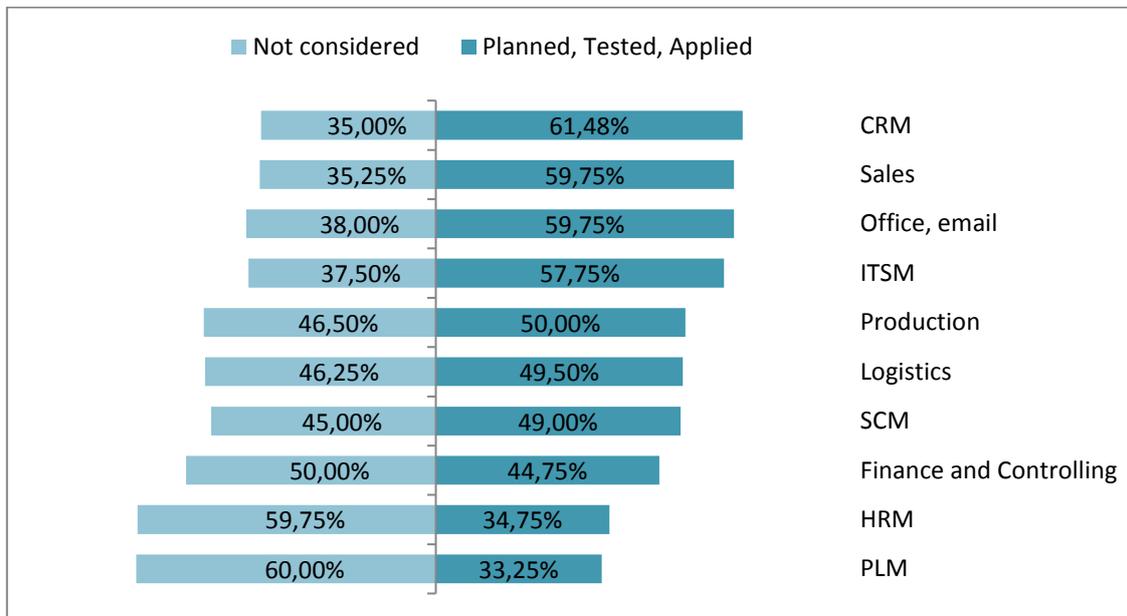


Figure 1: Shifted and not considered to move to cloud model enterprise software

Source: Based on research results

Cloud migration or enablement of existing legacy systems is a fundamental shift in delivering IT services and a challenge for the organization. The current knowledge in this area is limited and lacks a detailed view of how the organization can undertake complex changes to attain advantages of cloud services from old systems (Gholami et al., 2017). Cloud solutions combine not only new deployment models but new business models as well. The second research question was designed to verify software models applied so far by the investigated companies. Respondents were asked about the software development model adopted in the organization to support business areas, before moving to the cloud. The following options were pointed out: commercial, open-source, designed and tailored for the company or none.

Table 2 presents the results for all investigated companies. They show that the majority has supported their business processes using commercial or tailored software so far. The multiple choice option was applied in the survey as companies may integrate different software to support the business process. The fourth column represents companies that supported the business area with a mix of open-source, commercial and tailored solutions. Quite a big percentage of companies did not implement information systems at all. Around 20% of investigated companies did not use any computer software to support Material Management, CRM, HRM or Production processes so far, a little less – 16% did not apply a software for Sales and Distribution while 13% did not implement a Finance and Accounting software.

Table 2: Software development model supporting business areas

| Software→ | Designed and | | Open- | Commercial | |
|------------------------|--------------|----------|--------|----------------------|------|
| Business area↓ | Commercial | Tailored | Source | Open-Source Tailored | None |
| Finance and Accounting | 62% | 16% | 3% | 7% | 13% |
| Production | 51% | 21% | 2% | 8% | 20% |
| Sales & Distribution | 61% | 16% | 2% | 5% | 16% |
| Material Management | 59% | 15% | 1% | 5% | 21% |
| CRM | 54% | 19% | 2% | 4% | 21% |
| HRM | 56% | 15% | 1% | 6% | 22% |

Source: Based on research results

4. Discussion and Conclusions

The 4.0 industrial revolution is at an early stage, and the impact of digitalization will be widespread, dynamic, and lasting. Many companies all over the world face a fundamental change due to Cloud Computing. They attempt to understand how the new ecosystem works and adopt the new technology to transform the business and create a value for customers and other stakeholders. Software licensing is a major part of IT service delivery in the cloud computing model and offers more dynamic and flexible solutions. The research showed that manufacturing companies prefer the commercial license model. It also indicated towards a very limited number of open-source applications implemented in manufacturing companies. The decision of applying a software license model in cloud computing is more complicated and depends on a number of factors; companies will have to find the best ROI possible on the chosen deployment. This problem requires addition research, as it was not considered while the survey. Additionally, when cloud services depend on commercial software, licenses for that software usually become another resource to be managed by the cloud (McRoberts, 2013), forcing companies to wider cloud solution proliferation.

The results are confirmed by other studies and business reports, which show that supporting sales and customers is most important for the business and those are the first areas to be moved to the cloud. CRM is an application most often transferred to a new IT paradigm. On the other hand, the study also confirms that manufacturing companies are cautious in implementing new solutions for core business areas like Product Life Cycle Management. The research also confirms that organizations that start to support one area usually deploy more. In case of investigated companies, the performed analysis showed

that 75% of them moved more than one application supporting the business processes into the cloud. A surprising result is the percentage of companies with no IT support for certain business areas. The presented research is limited to certain areas, it does not consider the barriers and motivators associated with the choice of application and business process shifted to the cloud. As listed in table, 1 only general software categories were investigated.

Future research considering different scenarios, deployment models and business process support on a lower level is required, although some models (Nieuwenhuis et al., 2017 can be obtained from the literature).

References

- ABD ELMONEM, M.A., NAS, R.E.S., GEITH M.H. 2016. Benefits and challenges of cloud ERP systems a systematic literature Review, *Future Computing and Informatics Journal* 1 (2016) 1-9, <http://dx.doi.org/10.1016/j.fcij.2017.03.003>.
- ARMBRUST, M., FOX, A., GRIFFITH, R., JOSEPH A.D., KATZ R. 2009. Above the Clouds: A Berkeley View of Cloud Computing. Technical Report No. UCB/EECS-2009-28, University of California, Berkeley. Available at: <https://www2.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf> [Accessed: 10 December 2017].
- BUGHIN, J., CHUI, M., and MANYIKA, J. 2010. Clouds, big data, and smart assets: Ten tech-enabled business trends to watch. *McKinsey Quarterly*. [Online]. Available at: <https://www.mckinsey.com/industries/high-tech/our-insights/clouds-big-data-and-smart-assets-ten-tech-enabled-business-trends-to-watch>. [Accessed: 10 February 2018].
- CZERWONKA, P. 2016. Zastosowanie chmury obliczeniowej w polskich organizacjach, Wydawnictwo Biblioteka, Łódź.
- EL-GAZZAR, R., HUSTAD, E., OLSEN, D.H. 2016. Understanding cloud computing adoption issues: A Delphi study approach. *The Journal of Systems and Software* 118. doi: 10.1016/j.jss.2016.04.061.
- GHOLAMI, M.F., DANESHGAR, F., BEYDOUN, G., & RABHI, F. 2017. Challenges in migrating legacy software systems to the cloud – an empirical study. *Information Systems* 67. doi:10.1016/j.is.2017.03.008.
- JOHANSSON, B., ALAJBEGOVIC, A., ALEXOPOULOU, V., & DESALERMOS, A. 2015. Cloud ERP Adoption Opportunities and Concerns: The Role of Organizational Size. In *System Sciences (HICSS)*, 2015 48th Hawaii International Conference. IEEE--Institute of Electrical and Electronics Engineers Inc. doi: 10.1109/HICSS.2015.504.
- LEE, S.-H., TRIMI, S., CHOI, D., SUNG RHA, J. 2011. A comparative study of proprietary ERP and open source ERP modules on the value chain. *International Journal of Information and Decision Sciences*, 3 (1), pp. 26-38. Cited 10 times. doi: 10.1504/IJIDS.2011.038839.
- NIEUWENHUIS, L. J. M., Ehrenhard, M. L. and Prause, L. 2017. The shift to Cloud Computing: The impact of disruptive technology on the enterprise software business ecosystem. *Technological forecasting and social change*. doi: 10.1016/j.techfore.2017.09.037.

- MELL, P., GRANCE, T. 2011. The NIST Definition of Cloud Computing. Available at: <https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf>. [Accessed 15. January 18].
- MCKINSEY&CO. 2009. Clearing the air o Cloud Computing. Technical Report. Available at: http://www.isaca.org/Groups/Professional-English/cloud-computing/GroupDocuments/McKinsey_Cloud%20matters.pdf. [Accessed 15. January 18].
- McROBERTS, M. 2013. Software Licensing in the Cloud Age. Solving the Impact of Cloud Computing on Software Licensing Models. The International Journal of Soft Computing and Software Engineering [JSCSE], Vol. 3, No. 3, Special Issue: The Proceeding of International Conference on Soft Computing and Software Engineering 2013 [SCSE'13]. Available at: <https://arxiv.org/ftp/arxiv/papers/1401/1401.5346.pdf> [Accessed: 10. February 2018].
- PANETTO, H., ZDRAVKOVIC, M., JARDIM-GONCALVES, R., ROMERO D., CECIL, J., MEZGAR, I. 2015. New perspectives for the future interoperable enterprise systems. Computers in Industry vol. 79. doi: 10.1016/j.compind.2015.08.001.
- Panorama Consulting Solutions Research Report. 2016. Report on ERP Systems and Enterprise Software. Available at: <http://go.panorama-consulting.com/rs/panorama-consulting/images/2016-ERP-Report.pdf>. [Accessed 12 December 17].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Financial Condition of Polish Self-Government units

Marzena Piszczek¹

¹Department of Self-Government Finance, Cracow University of Economics, Rakowicka 27 str., 31-510 Cracow, Poland, e-mail: marzena.piszczek@gmail.com

Abstract

The assessment of the financial condition of local government units (LGUs) is affected by many factors. Despite the fact that all local government units specified by type are obliged to follow the same legal regulations, the financial situation of each of these units is quite different. Therefore, the analysis of the financial condition should include many different activities and aspects of the function of the LGUs.

The objective of the article is to present the factors affecting the assessment of the financial condition of Polish LGUs, the characteristics of the trends of the core economic categories and economic indicators used in the evaluation in years 2012–2015. The Author proposes a set of several indicators that allow to capture comprehensively the financial situation of the audited entities as well as to better fulfil the principle of transparency in the public finance sector.

Keywords: financial condition, local government units, transparency

JEL Code: H71, H72, H76

1. Introduction

Each local government unit, being a participant in the public services market, an employer or a borrower, is assessed from various points of view. Also, as part of its competence and responsibility, it creates many reports and documents, by means of which it communicates with the environment. The subject of the paper is to answer the question regarding the assessment of the financial condition of local government units as the basic criterion by which a comprehensive image of a given LGU can be captured, as well as an answer to the question on the extent to which it can fulfil the statutory rule of public finance transparency to which LGUs are obliged. This issue is all the more important because, although the same legal regulations apply to all local government units, for example, the contribution system, rules for establishing the budget or allocating financial resources, organization of tasks, then still, the financial situation of each of these units though often seeming similar, may be quite different. There are many different reasons leading up to this, such as: contribution source efficiency, different operating conditions, degree of urbanization,

the adopted LGU organizational model, efficiency of LGU potential management, etc. (cf. Kosek-Wojnar, 2007; Filipiak, 2005; Gonet 2004). Therefore, the analysis of the financial condition should include many different activities and aspects of the functioning of local government units. According to M. Jastrzębska (2009), among others, the structure of budget revenues, maintaining budget and current balance, capital expenditure, debt incurred, and above all, the level of meeting inequality resulting from art. 243 of the Public Finance Act (PFA) should be examined (Journal of Laws of 2013, item 885)⁴⁸.

The objective of the article is to discuss factors influencing the assessment of the financial condition of local government units as well as the characteristics of the basic economic indicators used in its assessment.

The applied research method is critical analysis of literature and normative acts in the field of the public finance sector. The study uses a set of methods typical for social sciences, such as empirical cognitive methods, in particular observation, comparison and measurement, which was carried out for the time series 2012–2015. The study was based on reports on the implementation of the budget by local governments published on the official website of the Ministry of Finance of the Republic of Poland.

2. Financial Condition of Local Government Units

The literature of the subject includes many different terms related to the assessment of the financial situation of local government units. These include: financial credibility, financial condition, ability to meet obligations as well as creditworthiness. In fact, the point is to determine whether a given entity will be able to meet its obligations to the bank or other institutions. This means that it is important to view an LGU in a much broader light, not only from the point of view of what their subject of activity is, but also in what surroundings they operate, how it changes, how it affects the external and internal conditions of their functioning, and what is the political or general economic situation, and whether and to what extent it affects the financial situation, causing its specific distortions, which may affect the assessment of the financial condition of this unit. All of them have an impact on determining the risk of insolvency, specifying the transaction risk, determining the possibility of generating a financial surplus (free funds) for the repayment of obligations or for the implementation of new tasks or programs. Financial condition is defined in different ways. Many authors emphasize, however, that the essence of the assessment of financial condition is the answer to the question of the ability of the local government to provide services at an appropriate level, fulfilling its current and future obligations (cf. Berne, 1996; Berne and Schramm, 1986; Rivenbarck, Roenigk and Allison 2009; Wang, Dennis and Tu, 2007). There are also different criteria for the assessment of the financial

⁴⁸ Art. 243 of the Public Finance Act has been in force since 2014 and refers to the possibility of LGU contracting. According to the article, LGUs cannot adopt a budget, the implementation of which will cause that in the budgetary year and each year following the budget year the relation of the total amount in a given budget year of: repayment of loan and loan instalments with interest due on loans and borrowings, redemption of securities together with interest due and discount, potential repayment of amounts resulting from sureties and guarantees granted to the planned total budget revenues will exceed the arithmetic average of the current account income calculated for the last three years, increased by income from the sale of assets and decreased by current expenses, to the total budget revenue, calculated according to the formula:

$$\left[\frac{R + O}{D} \right]_n \leq \frac{1}{3} * \left[\frac{Db_{n-1} + Sm_{n-1} - Wb_{n-1}}{D_{n-1}} + \frac{Db_{n-2} + Sm_{n-2} - Wb_{n-2}}{D_{n-2}} + \frac{Db_{n-3} + Sm_{n-3} - Wb_{n-3}}{D_{n-3}} \right]$$

condition of local government units, a different approach to its analysis, interpretation as well as the method of communication with the external environment. One can use GASB Statement No. 34 (1999) or use the model developed by ICMA (2003), with the proviso that each country has its own guidelines for keeping accounting books and preparing reports. There have also been many studies performed in this area using different approaches and criteria. What is definitely worth emphasizing is that the study of the financial condition, i.e. the final selection of indicators as well as the way of communicating it, remains at the disposal of specific local government units, unless the law provides otherwise (cf. Rivenbark and Roenigk, 2011; Piszczek 2016).

There are no direct guidelines in the Polish system, such as in the American system, to use the developed models. This does not mean, however, that there is no need to properly use comprehensive information about the financial situation, or, more broadly, the economic efficiency of a given LGU. This need occurs if only of the fact, that Polish law, although it uses the concept of openness or transparency, in particular the latter, i.e. the principle of transparency, does not define the principle at all. This gap could be filled in practice by adopting a specific model of communicating the various actions performed by local managers and actions taken by them, including the area of finances, which in a simple, unified manner would give a sufficiently comprehensive picture of the LGU's financial situation in a short time. This requires the adoption of a set of indicators, which this article proposes. In order to answer the question about the financial situation of a given LGU, an analysis should be made of various trends, including: the participation and stability of individual sources of income, the generation of LGU revenues, changes in the implementation of obligatory tasks, changes in the quality and quantity of provided public services, changes in the scope of implemented investment tasks, including co-financed from foreign funds and determination of their impact on the level of budget expenditures, the amount of maturing liabilities and the current financial situation, in addition to demographic data (cf. Wiśniewski, 2013; Bitner, Chichocki and Sierak, 2013; Kavanagh, 2007).

All the above-mentioned areas and parameters are subject to independent assessment not only by the bank and other financial institutions, but also by the business, which recognizes the partner in the local government for their development goals. The assessment methods used by banks or rating agencies differ from each other depending on a set of indicators, their score, etc., which, in effect leads to the criteria for the classification of local governments as borrowers, potential investors and risk assessment.

3. Methodology and Data

Below is a list of indicators which, according to the author, allow to assess the financial situation of Polish LGUs. All local government units, in total 2,874, in Poland, i.e. municipalities (2,478), poviats (380) and self-governing voivodships (16) were selected for analysis. The data was obtained by the author from the official reports on the implementation of budgets by local government units, published on the website of the Ministry of Finance of the Republic of Poland for the years 2012–2015 (www.mf.gov.pl).

The following values and indicators were used to assess the financial situation of local government units:

- level of operating surplus. Operating surplus is calculated as the difference between current income and current expenses; it determines the amount of

budget funds that in a given budget year can be used to finance investments without charging future budgets with debt servicing costs⁴⁹;

- operating surplus ratio in relation to total revenues; is the basic measure of the possibility of financing investment projects. It also accounts for the financial condition of local government unit and its potential economic and social development;
- debt ratio in relation to total income – this is one of the basic indicators used in the rating process. The level of this indicator is important from the point of view of perceiving LGUs as a reliable partner by investors, financial institutions or rating agencies;
- indicator of total debt servicing costs in relation to total revenues. When calculating the ratio, not only all the charges that result from servicing debt are taken into account, but also payments due to sureties and guarantees granted. In general, the value of the indicator should be below 12%. When this indicator is higher, we are talking about approaching the financial security threshold;
- difference between total incomes and current expenses (the so-called gross margin). It defines the amount of budget funds that in a given year may be allocated towards financing investments and debt service, and determines the revenue potential of LGUs. In the literature, one can also sometimes find another term for this category; the level of free gross funds. This amount less the amount for servicing existing debt is the amount of net free cash;
- the ratio of total income surplus share over current expenditure (gross surplus) in total income – indicates readiness to invest and repayment options;
- relation of investment expenditures to total LGU revenues – is a measure of the LGU's investment impetus. However, this indicator does not say anything about the LGU's financial policy nor how the investments are financed;
- investment expenditure ratio in relation to total budget expenditure; closely related to the level of economic development. The value of the indicator points out the investment momentum of local government units as well as the desire to improve the services and living conditions of the inhabitants. The level of this indicator is limited by such categories as: the value of debt, total debt service costs or the amount of operating surplus. Both indicators, i.e. capital expenditures to total revenues as well as capital expenditure to total expenditure should be considered jointly. The high value of both shows a rational approach to investment activity;
- investment expenditure as a percentage of net free funds – this indicator informs what part of net free funds finances development tasks;
- current expenditure to total income – this indicator is related to the effectiveness of the provision of services and tasks imposed on local government units. The high value of this indicator may mean low efficiency of LGU functioning, which results in a low value of free funds for investments. However, it can also mean high quality of services provided by an LGU;

⁴⁹ The operating surplus in the Polish public finance system was introduced by law relatively late, as only in 2014. Earlier, there was no obligation to count and comply with this rule. Today, pursuant to art. 242 of the Public Finance Act, an LGU authority cannot adopt a budget in which the planned current expenditure is higher than the current income, increased by the budget surplus from previous years and free funds (here, the act defines free funds as a cash surplus in the current account of the budget resulting from settlements of issued securities, credits and loans from previous years). This rule applies to both the planning and implementation of the budget.

- the ratio of incurred property expenses in relation to total revenues is evidence of acquiring funds mainly for external financing of investments. Currently, a significant part of property income is made up of EU funds and income from the sale of property. This ratio should be correlated in a multi-year property management and sales program.

The research disregards the demographic aspect and focuses on financial aspects. Some of the indicators fully coincide, from a substantive point of view, with those proposed by GASB, although their names vary. An example is the ratio of current expenditure to total budget income in percent, which corresponds to the typical operations ratio or other debt service ratios, which in the study correspond to the ratio of debt service costs to total income in percent and the ratio of debt servicing costs to free gross funds in percent. The study used mainly budget reports as, according to the Polish law, the implementing authority of the LGUs receive a discharge on the basis of the assessment of budget implementation.

4. Analysis of Selected Indicators and Economic Categories for LGU in General

The basic economic categories for all local government units are presented below in Table 1, i.e. their total income, total expenditure, current income, current expenses, operating surplus, property income, property expenditure, capital expenditure, free gross and net resources, total liabilities, service costs liabilities and the basic relations between them were calculated, such as the relation of operating surplus to total income, the relation of operating surplus to investment expenditures, the level of covering investment expenditures by property income, and many others.

Certain trends including their dynamics can be observed while analysing the particular categories in the period under review 2012–2015. First of all, it should be stated that the basic categories of total LGU income and expenditure as well as current income and expenses show similar average annual growth / fall rates (AAG/F) of dynamics. For example, the AAG of total revenues in the audited period is 103.93%, and for current revenues 104.03%. In the case of total expenditure, it is 102.87%, and for current expenditure 102.93%. Undoubtedly, this has an impact on the most important category of operating surplus from the point of view of planning development and financial management, understood as the difference between current incomes and current expenditures. This category in the analysed period is characterized by the highest growth rate (116.18% AAG). However, between 2014 and 2013, we observe a significant decrease of 10 percentage points year-on-year, followed by a slight increase of just under 2 percentage points. This decline was accompanied by an increase in the growth of property income (111.6%). In the audited period, two other trends can also be noticed: a drop in debt servicing costs from PLN 3.52 billion in 2012 to PLN 2.06 billion in 2015 (83.65% AAG/F) and an increase in total liabilities (101.83% AAG/F). It is also worth paying attention to the category of free gross and net funds, whose AAG exceeds total revenues and total expenditure AAG. In the audited period, there was also a decrease in investment expenditure. The greatest dynamics of decline takes place between 2015 and 2014.

Of course, determining the financial condition of individual local government units requires an individual approach and may diametrically differ from the picture presented in Table 1, which is averaged for all local government units.

Table 1: Basic economic categories (bil. PLN) and key economic indicators for LGU in total for the years 2012–2015 along with their dynamics.

| Billion PLN | 2012 | 2013 | 2014 | 2015 | | | | AAG/F |
|--|--------|--------|--------|--------|--------|--------|--------|--------|
| Total LGU | 1 | 2 | 3 | 4 | 2/1 | 3/2 | 4/3 | |
| total income | 177.30 | 181.82 | 192.61 | 199.04 | 102.55 | 105.93 | 103.34 | 103.93 |
| total expenses | 180.46 | 182.20 | 195.00 | 196.42 | 100.96 | 107.02 | 100.73 | 102.87 |
| current income | 156.40 | 161.71 | 170.19 | 176.09 | 103.40 | 105.24 | 103.47 | 104.03 |
| current expenses | 144.78 | 147.49 | 154.22 | 157.87 | 101.87 | 104.56 | 102.36 | 102.93 |
| current expenses/ total income (%) | 81.66 | 81.12 | 80.07 | 79.31 | 99.34 | 98.71 | 99.05 | 99.03 |
| operating surplus | 11.62 | 14.22 | 15.97 | 18.22 | 122.39 | 112.26 | 114.13 | 116.18 |
| operating surplus/ current income (%) | 7.43 | 8.79 | 9.38 | 10.35 | 118.37 | 106.68 | 110.30 | 111.68 |
| operating surplus/ total income (%) | 6.55 | 7.82 | 8.29 | 9.15 | 119.35 | 105.98 | 110.44 | 111.79 |
| operating surplus/ investment expenditure (%) | 33.78 | 43.76 | 40.37 | 48.98 | 129.56 | 92.24 | 121.34 | 113.18 |
| free gross funds | 20.90 | 20.11 | 22.42 | 22.95 | 96.22 | 111.48 | 102.38 | 103.17 |
| free net funds | 17.38 | 17.25 | 19.97 | 20.89 | 99.28 | 115.74 | 104.62 | 106.33 |
| free gross funds/ total income (%) | 11.79 | 11.06 | 11.64 | 11.53 | 93.82 | 105.24 | 99.07 | 99.27 |
| total liabilities | 67.83 | 68.54 | 71.47 | 71.62 | 101.05 | 104.27 | 100.21 | 101.83 |
| liabilities/ total income (%) | 38.26 | 37.70 | 37.11 | 35.98 | 98.54 | 98.43 | 96.97 | 97.98 |
| debt service costs | 3.52 | 2.85 | 2.45 | 2.06 | 81.09 | 85.76 | 84.16 | 83.65 |
| debt service costs/total income (%) | 1.99 | 1.57 | 1.27 | 1.04 | 79.07 | 80.96 | 81.44 | 80.48 |
| debt service costs free gross funds (%) | 16.84 | 14.19 | 10.92 | 8.98 | 84.28 | 76.93 | 82.20 | 81.08 |
| property income | 20.96 | 20.08 | 22.41 | 22.95 | 95.80 | 111.60 | 102.43 | 103.07 |
| property expenses | 35.63 | 34.08 | 40.99 | 38.58 | 95.66 | 120.27 | 94.13 | 102.69 |
| investment expenses | 34.40 | 32.50 | 39.55 | 37.20 | 94.47 | 121.71 | 94.06 | 102.65 |
| investment expenditure/total expenditure (%) | 19.06 | 17.84 | 20.28 | 18.94 | 93.57 | 113.73 | 93.38 | 99.79 |
| investment expenditure/total income (%) | 19.40 | 17.87 | 20.54 | 18.69 | 92.12 | 114.90 | 91.02 | 98.76 |
| investment expenditure/capital expenditure (%) | 96.55 | 95.35 | 96.49 | 96.42 | 98.76 | 101.20 | 99.93 | 99.96 |
| incomes/investment expenditure (%) | 60.93 | 61.79 | 56.65 | 61.69 | 101.41 | 91.69 | 108.90 | 100.42 |
| investment expenditure/net free cash (%) | 197.93 | 188.34 | 198.06 | 178.08 | 95.16 | 105.16 | 89.91 | 96.54 |
| investment expenditure/free gross funds (%) | 164.59 | 161.61 | 176.44 | 162.09 | 98.19 | 109.18 | 91.87 | 99.49 |

Source: own study based on MF data on the implementation of LGU budgets

* AAG/F average annual growth / fall rate

5. Discussion and Conclusions

Many factors influence the financial condition of LGUs. These are both the dynamics of income and expenditure growth, including current income and current expenditure, which affect the level of operating surplus. In the audited period, the operating surplus is the category characterized by the highest AAG.

The level of free gross and net funds also affects the financial condition of local government units. The latter was mainly influenced by the systematically decreasing costs of LGU debt servicing, thanks to which AAGs free net funds exceeded the AAG in other basic categories such as total income and expenses as well as current income and expenses.

In the audited period, despite the on-average-similar investment expenditure ratio (ca. 19%) we recorded a significant decrease in investment expenditure between 2015 and 2014 (from 122.71% to 94.06%) which may be an expression of caution in the investment policy of Polish LGUs. Undoubtedly, this may also be connected with the change of the rules of applying local governments for EU funds in the new financial perspective.

The analysis of LGU data in general confirms that Polish LGUs are in good financial condition which gives them the chance of their development, better conditions for providing ongoing services or, above all, the possibility of appearing on the capital market and using external financing to accelerate growth dynamics.

The suggested methodology for assessing the financial condition of local government units is also aimed at contributing to the discussion on the possibilities of broader use of various indicators by local government managers, which will allow better communication with the environment and a more complete application of the transparency principle. In addition, the proposed evaluation, which differs from what is usually proposed in budget reporting, will allow to capture the wider context of the management of local government units.

In addition, it is worth noting that the data presented in the article are based on annual performance. Similar comparisons can be made by local government units on a quarterly or even monthly basis, moreover, using specific benchmarks, referring to the situation of a particular LGU to the average value in a given group, the highest or lowest value. This way, you can position your local self-government in respect to the examined set (LGU in general or LGU in the region).

The discussion about the need to analyse data from reports more widely is most needed – so that it can become a standard. As experience and practice suggest, sometimes implementing improvements that seem obvious and desirable to us is impossible for many years. As an example, the introduction in Poland of the act from 2014 on the need to calculate the operating surplus, as well as the statutory prohibition of budget approval by the LGU authority if the current expenditure is greater than the current income. This does not mean, however, that financial institutions which had provided loans to local governments for 24 years⁵⁰ in Poland did not count the operational surplus! Or, that they did not require a long-term financial forecast, which the Polish law did not require from local governments also. The multi-year financial forecast has been introduced by law, with many shortcomings, only since 2011. Similarly, it was not until 2008, with effect from 2009, that the obligation was introduced to draw up the state budget according to the task method of budgeting. It is quite possible that these improvements might have been even later implemented if it were not for EU guidance. LGUs are not legally required to create a task budget system.

That is why certain good habits and practices are worth discussing and propagating today, so that LGUs can become familiar with them, understand their concept and purpose and choose for themselves what best serves what GASB introduces as a novelty and is

⁵⁰ The self-government in Poland was reborn in 1990.

called MD&A (Management's Discussion and Analysis). It is really about developing and providing an instrument that would be helpful for many local government units in the service and financial management process, as well as for better communication with the local community. Meanwhile, the conditions of LGUs do not only give rise to the existence of barriers limiting the use of at least selected elements of the LGU financial assessment methodology in Poland, but also, they do not serve their implementation or development. Polish self-governments tend to focus on compliance with budgetary discipline which is a manifestation of the legal and administrative approach to managing local government units rather than seeking managerial solutions. The latter should be widely propagated as the desired direction of change.

References

- BERNE, R., 1996. Measuring and Reporting Financial Condition (in:) Handbook of Public Administration, ed. J. L. PERRY, San Francisco: Jossey-Bass, 2nd ed.
- BERNE, R. and SCHRAMM, R., 1986. The Financial Analysis of Governments, NJ: Englewood Cliffs: Prentice Hall.
- BITNER, M., CICHOCKI, K. and SIERAK, J., 2013. Standardy zarządzania długiem na szczeblu lokalnym i regionalnym oraz ich wpływ na finansowanie infrastruktury, Warszawa: PAN IBS.
- DYLEWSKI, M., FILIPIAK, B. and GORZAŁCZYŃSKA-KOCZKODAJ, M., 2004. Analiza finansowa w jednostkach samorządu terytorialnego, Warszawa: Municipium SA.
- EVALUATING FINANCIAL CONDITION: A HANDBOOK FOR LOCAL GOVERNMENT, 2003, Washigton, DC.: ICMA.
- FILIPIAK, B. 2005. Badanie wiarygodności finansowej jednostki samorządu terytorialnego w świetle obowiązujących limitów zadłużenia (in:) L. Patrzalek (ed.), Finanse samorządu terytorialnego. Wybrane zagadnienia, Poznań-Wrocław, Wydawnictwo Wyższej Szkoły Bankowej.
- GOVERNMENTAL ACCOUNTING STANDARDS BOARD STATEMENT NO. 34, 1999. Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Government, Norwalk CT: GASB.
- GONET, W. 2004. Metodyka oceny zdolności kredytowej samorządów, Studia i Prace Kolegium Zarządzania i Finansów SGH, Zeszyt Naukowy nr 48, Warszawa.
- JASTRZĘBSKA, M., 2009. Zarządzanie długiem jednostek samorządu terytorialnego, Warszawa: Oficyna Wydawnicza Wolters Kluwer.
- KAVANAGH, S., 2007. Increasing Trust and Financial Sustainability through Transparency, www.gfoa.org.
- KOPAŃSKA A., 2003. Zewnętrzne źródła finansowania inwestycji jednostek samorządu terytorialnego, Warszawa: Difin.
- KOSEK-WOJNAR M. (ed.), 2007. Dług lokalny w teorii i w praktyce, Kraków: Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.
- PISZCZEK, M., 2016. Determinanty finansowania rozwoju przez samorząd terytorialny w latach 2014–2020. (in:) M. Ćwiklicki, M. Jabłoński and S. Mazur (ed.), Współczesne

koncepcje zarządzania publicznego. Wyzwania modernizacyjne sektora publicznego, Kraków: Fundacja Gospodarki i Administracji Publicznej.

PUBLIC FINANCE ACT, Journal of Laws of 2013, item 885.

WIŚNIEWSKI, M., 2013. Ocena zdolności kredytowej gminy, Warszawa: Difin SA.

RIVENBARCK, W.C., ROENIGK, D.J. and ALLISON, G.S., 2009. Communicating Financial Condition to Elected Officials in Local Government, Popular Government

RIVENBARCK, W.C. AND ROENIGK, D.J., 2011. Implementation of Financial Condition Analysis in Local Government, Public Administration Quarterly, Vol. 35 (2).

WANG, X., DENNIS, L. and TU, J.S., 2007. Measuring Financial Condition: A Study of US States, Public Budgeting and Finance

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

State aid to promote risk capital investments and its impact on the economic growth of the EU Member States

Piotr Podsiadło¹

¹Department of Local Government Finance, Faculty of Finance and Law, Cracow University of Economics, Rakowicka 27, 31-510 Cracow, Poland, e-mail: podsiadp@uek.krakow.pl

Abstract

The subject of the article is to present the conditions of admissibility of State aid in the European Union, taking into account the rules applicable to the horizontal State aid. The qualitative analysis of State aid granted by the Member States is carried out under the provisions of the Treaty on the Functioning of the European Union and the rules of State aid admissibility on the basis of the implementing regulations, adopted by the European Commission in 2006 and 2014 on State aid provided under the framework for State aid to promote risk finance investments. Statistical data for quantitative analysis were gathered on the basis of reports published by the European Commission on State aid granted by Member States. This should lead to verify the hypothesis of the influence of State aid on the economic growth in the EU Member States, which have provided State aid to promote risk capital investments in small and medium-sized enterprises in the years 2002–2016. This analysis is carried out based on the linear regression model. The response variable (dependent variable Y) is the size of the GDP, and explanatory variable (independent variable X) is the expenditure on State aid to promote risk finance investments.

Keywords: competition policy, European Union, risk capital investments, SMEs, State aid

JEL Code: E62, K20, K33

1. Introduction

The foundation of European Union policy in the area of State aid is the notation in Article 107 par. 1 of the Treaty on the functioning of the European Union (TFEU, 2012), according to which the State aid is inconsistent with the Internal market. Article 107 par. 1 TFEU states that: “Subject to other provisions foreseen in the Treaties, any aid provided by a Member State or by means of State resources in any form, which disturbs or threatens to disturb the competition by favouring of certain enterprises or the production of certain goods shall be inconsistent with the Internal market within the scope as it affects the trade

between Member States.” On the basis of Article 107 par. 3(c) TFEU, the European Commission may consider compatible with the internal market State aid designed to facilitate the development of certain economic activities, where such aid does not adversely affect trading conditions to an extent contrary to the common interest. The Commission takes the view that the development of the risk finance market and the improvement of access to risk finance for small and medium-sized enterprises (SMEs) is of great importance to the Union economy at large. Encouraging the development and expansion of new enterprises, especially innovative and high-growth firms, can have a great potential to create jobs. Therefore, an efficient risk finance market for SMEs is crucial for entrepreneurial companies to be able to access the necessary funding at each stage of their development.

The purpose of the article is the analysis of the State aid provided by Member States of the European Union to finance high risk capital from the perspective of the State aid impact on economic growth of these countries. Adopted measure of economic growth is the size of gross domestic product in real terms, which is a synthetic measure of the economic situation of the State. As a test period the years 2002–2016 were adopted, i.e. the period of implementation of the two most important development strategies of the European Union – the Lisbon strategy and the “Europe 2020” strategy (taking the year 2016 as the closing period of observation was due to the available annual data on State aid, which is published by Eurostat). The thesis was accepted that the amount of State aid provided by EU Member States should be positively correlated with the size of the economic growth of these countries. The positive correlation of GDP with the size of State aid to finance the high risk capital would mean that with increasing State aid provided in this form there is positive economic growth of the Member States and their competitiveness increases.

2. State aid to promote risk capital investments – institutional and legal regulations

In principal, risk capital relates to the financing of companies with perceived high-growth potential during their early growth stages. The demand for risk capital typically comes from companies with growth potential that do not have sufficient access to capital markets. Hence, there is a persistent capital market imperfection preventing supply from meeting demand at a price acceptable to both sides, which negatively affects European small and medium-sized enterprises (SMEs), in particular high-tech innovative and mostly young undertakings with high growth potential.

Despite their growth prospects, SMEs may face difficulties in gaining access to finance. At the heart of those difficulties lies a problem of *asymmetric information*: SMEs, especially when they are young, are often unable to demonstrate their credit-worthiness or the soundness of their business plans to investors. In such circumstances, the type of active screening that is undertaken by investors for providing finance to larger companies may not be worth the investment in the case of transactions involving those SMEs because the screening costs are too high relative to the value of the investment. Therefore, irrespective of the quality of their project and growth potential, those SMEs are likely not to be able to access the necessary finance as long as they lack a proven track record and sufficient collateral. As a result of this *asymmetric information*, business finance markets may fail to provide the necessary equity or debt finance to newly created and potentially high-growth SMEs resulting in a persistent capital market failure preventing supply from meeting demand at a price acceptable to both sides, which negatively affects SMEs'

growth prospects. Small mid-caps and innovative mid-caps may, in certain circumstances, face the same market failure.

The consequences of a undertaking not receiving finance may well go beyond that individual entity, due in particular to *growth externalities*. Many successful sectors witness productivity growth not because firms present in the market gain in productivity, but because the more efficient and technologically advanced firms grow at the expense of the less efficient ones (or ones with obsolete products). To the extent that this process is disturbed by potentially successful undertakings not being able to obtain finance, the wider consequences for productivity growth are likely to be negative. Allowing a wider base of undertakings to enter the market may then spur growth. Therefore, the existence of a financing gap affecting SMEs, small mid-caps and innovative mid-caps may justify public support measures including through the grant of State aid in certain specific circumstances. If properly targeted, State aid to support the provision of risk finance to those companies can be an effective means to alleviate the identified market failures and to leverage private capital.

During the end of the 1990ies the European Commission expressed a general policy in favour of promoting risk capital (Commission, 2001). In the Commission's view SMEs at early growth stages were better served by risk capital in the form of equity or quasi-equity finance than by loan finance alone, in particular given the costs of servicing debt. A commitment to risk capital was set out as a wider European objective at the Lisbon European Council of 23–24 March 2000, in the context of the Lisbon Strategy. In the Communication "State Aid and Risk Capital" of 2001 the Commission set out how it would apply Article 107 par. 1 TFEU (previous 87 par. 1 EC) to risk capital measures constituting State aid (Morais and Ferro, 2011).

In line with the Lisbon Strategy on 7 June 2005 the Commission released the communication "State Aid Action Plan: less and better targeted State aid (Bartosch, 2007). A road map for State aid reform 2005 to 2009" which aimed to create a simple, user-friendly and coherent set of rules for State aid which is likely to promote economic development without unduly distorting competition (Commission, 2005). The next step was the publication of the Community Guidelines on State aid to Promote Risk Capital Investments in Small and Medium-Sized Enterprises (Guidelines on Risk Capital Investments, 2006) that replace the Communication "State Aid and Risk Capital" of 2001. Moreover, in accordance with the State Aid Action Plan and the "Small Business Act" of 25 June 2008" (Commission, 2008a), the Commission Regulation 800/2008 of 6 August 2008 (Commission, 2008b) (General Block Exemption Regulation – GBER) consolidates into one text and harmonises the rules previously existing in five separate regulations and enlarges the categories of State aid covered by the exemption including also certain risk capital measures. It was very important, because risk capital measures had, so far, not been block exempted. In addition to the GBER risk capital measures can also be exempted in accordance with the Commission Regulations on the application of Articles 107 and 108 of the Treaty to *de minimis* aid (Commission, 2006; Commission, 2013a). Both the Guidelines on Risk Capital Investments 2006 and the GBER applied until 30 June 2014.

Access to finance for SMEs is an objective of common interest underpinning the Europe 2020 strategy (Commission, 2010a). In particular, the "Innovation Union" flagship initiative (Commission, 2010b) aims to improve framework conditions and access to finance for research and innovation so as to ensure that innovative ideas can be turned into products and services that create growth and jobs. In addition, the "Industrial policy for the globalisation era" flagship initiative (Commission, 2010c) is designed to enhance the

business environment and to support the development of a strong and sustainable industrial base able to compete globally. The Roadmap to a resource-efficient Europe (Commission, 2011a) calls for framework conditions to increase investor certainty and ensure better access to finance for companies making green investments that are seen as riskier or that have longer payback times. Moreover, the Small Business Act sets out a number of guiding principles for a comprehensive policy designed to support the development of SMEs. One of those principles is to facilitate access to finance for SMEs. That principle is also reflected in the Single Market Act (Commission, 2011b).

Within this policy context, the 2011 Action plan to improve access to finance for SMEs (Commission, 2011c) and the debate launched in 2013 by the Green Paper on Long-term finance for the European economy (Commission, 2013b), recognises that the Union's success depends largely on the growth of SMEs, which however often face significant difficulties in obtaining financing. In order to address this challenge, policy initiatives have been taken or proposed to make SMEs more visible for investors and finance markets more attractive and accessible for SMEs. For example, two initiatives relevant to investments funds were taken: the Regulation on venture capital funds in the Union (EC, 2013) adopted in 2013, which enables venture capital funds in the Union to market their funds and raise capital across the internal market, and the proposal for a regulation on European Long-term Investment Funds (Commission, 2013c), which aims at introducing framework conditions to facilitate the operation of private investment funds that have a long-term commitment from their investors. Beyond these specific regulations, the regulatory framework for the management and operation of investment funds active in risk finance, such as private equity funds, is provided by the Directive on Alternative Investment Fund Managers – AIFMD (Directive, 2011). In line with those policy initiatives, the Commission intends to use the Union budget to facilitate access to finance for SMEs with a view to addressing structural market failures that limit the growth of SMEs. To this end, proposals have been made with the view to enhancing the use of new financial instruments – which may take the form of debt instruments (loans, guarantees) or equity instruments (pure equity, quasi-equity investments or other risk-sharing instruments) – under the 2014–20 Multiannual Financial Framework (MFF). In particular, the Union funding programmes COSME (Regulation, 2013a) and Horizon 2020 (Regulation, 2013b) will endeavour to improve the use of public resources through risk-sharing funding mechanisms to the benefit of SMEs in their start-up, growth and transfer phases, as well as small mid-caps and innovative mid-caps, with a particular emphasis on actions designed to provide seamless support from innovation to market, including the commercial implementation of research and development (R&D) results.

In 2012, the Commission launched a public consultation to substantially review the State aid regime applicable to risk capital measures, including those covered by the GBER, so as to promote a more efficient and effective provision of various forms of risk finance to a larger category of eligible undertakings (Quigley, 2015). For block-exempted measures, no notification is necessary because they are presumed to address a market failure through appropriate and proportionate means, while having an incentive effect and limiting any distortions of competition to the minimum (Hofmann and Micheau, 2016). As a result, for the compatibility assessment of all risk finance aid to be awarded from 1 July 2014 until 31 December 2020, the Commission will apply the principles set out in the Guidelines on State aid to promote risk finance investments (Commission, 2014a) and the new GBER (Commission, 2014b).

It should be noted that State aid can only be justified if it is targeted at specific market failures affecting the delivery of the common objective (Podsiadlo, 2017). The European

Commission considers that there is no general market failure as regards access to finance for SMEs, but only a failure related to certain groups of SMEs, depending on the specific economic context of the Member State concerned (Cattrysse, 2014). This particularly but not exclusively applies to SMEs in their early stages which, despite their growth prospects, are unable to demonstrate their credit-worthiness or the soundness of their business plans to investors. The scope of such market failure, both in terms of the affected companies and their capital requirement, may vary depending on the sector in which they operate. Due to information asymmetries, the market finds it difficult to assess the risk/return profile of such SMEs and their ability to generate risk-adjusted returns. The difficulties those SMEs experience in sharing information about the quality of their project, their perceived riskiness and weak creditworthiness lead to high transaction and agency costs and may exacerbate investor risk-aversion. Small mid-caps and innovative mid-caps may be faced by similar difficulties and therefore be affected by the same market failure.

3. Methodology and Data

A feature of applied research method is the analysis of the intervention instruments used by the State from the point of view of concepts of State aid within the meaning of art. 107 par. 1 TFEU. The adoption of such a method provided an opportunity to: firstly, determining the semantic scope of admissibility and the rules of providing aid as interpreted by the Court and the Court of Justice of the European Union, and secondly – capturing the specific characteristics of State aid to promote risk capital investments. Another feature of the method used in the paper is the analysis of the relation between the Member States expenditure on State aid designed for risk capital investments and the size of the GDP in real terms of these countries. This analysis was carried out in accordance with the linear regression model. The response variable (dependent variable Y) is the size of the GDP in real terms and the explanatory variable (independent variable X) is the expenditure on State aid to promote risk capital investments.

Statistical analysis will be carried out based on two source tables. The first table shows the calculations for the linear regression model concerning respectively the slope parameter (directional factor β). t Stat is a test of linear relationship occurrence between expenditure on State aid for risk capital and the size of the GDP. This statistical test allows to verify the authenticity of the so-called null hypothesis that the parameter of the regression function I type β is equal to zero, with the alternative hypothesis that it is not equal to zero ($H_0: \beta = 0$; $H_A: \beta \neq 0$). The acceptance of the null hypothesis that the parameter $\beta = 0$ would mean that the increase in the value of expenditure on State aid by € 1 million will not cause any changes in the size of the GDP which means the lack of any relationship between expenditure on State aid and the size of the GDP. In other words, the acceptance of the null hypothesis means the lack of the influence of the State aid to promote risk capital provided by the Member States of the European Union on the size of their GDP. From the perspective taken in this paper it will be essential to reject the null hypothesis in favor of the alternative hypothesis which states that between the studied phenomena – expenditure on State aid and the size of the GDP – there is a significant statistical relationship. From the tables of critical values of t-Student it is seen that $\pm t_{\frac{\alpha}{2}} = \pm 2.1604$ for $\alpha = 0.05$ and $n - 2 = 13$ degrees of freedom. The null hypothesis can be rejected in favor of the alternative hypothesis only when $t_b < t_{\frac{\alpha}{2}}$ or $t_b > t_{\frac{\alpha}{2}}$, that is when $-t_b < -2.1604$ or $+t_b > +2.1604$.

The second table contains regression statistics. Among the regression statistics are: the correlation coefficient, determination coefficient, standard error and the parameters of F test, that is the value of F-test and the probability of making type I error, when the hypothesis is verified concerning the lack of impact of expenditure on State aid on the size of the GDP (irrelevance of State aid expenditure in the regression model). F-test, similarly as described above t-test, is used for testing the significance of linear regression coefficient β evaluation. The checking of this test is a statistic F having F-Snedecor distribution of k_1 and k_2 freedom degrees. When rejecting the null hypothesis $F > F_\alpha$ of no relation between expenditure on State aid and the size of the GDP sector debt and accepting the alternative hypothesis of the existence of a statistically significant relationship between the variables. From the table of critical values of the F-Snedecor for $k_1 = 1$ (1 independent variable) and $k_2 = n - 2 = 13$ degrees of freedom and $\alpha = 0.05$ we read $F_{0,05} = 4.67$. Thus, the alternative hypothesis can be adopted only when $F > 4.67$.

4. Results

Does State aid to promote risk capital investments provided by Member States to enterprises have an adverse effect on the condition of their economic growth, leading to an increase in the size of the GDP of these countries? Or does such aid not have any impact on the GDP? Answers to these questions will be provided by the regression analysis.

Table 1 presents the calculations for verifying the hypothesis, according to which the EU Member States expenditure on State aid to promote risk capital investments does not affect the level of GDP in these countries.

Table 1: State aid to promote risk capital investments and GDP – Analysis of Variance: the ine “variable X”

| EU Member States | Regression coefficient b | Standard error Sb | t Stat tb | p -value | Lower 95% | Upper 95% |
|-----------------------|----------------------------|---------------------|-----------------|-----------------|-----------------|-----------------|
| Austria | -88.7199 | 153.0078 | -0.57984 | 0.571936 | -419.273 | 241.8332 |
| Belgium | -377.223 | 229.0759 | -1.64672 | 0.23563 | -872.111 | 117.6654 |
| Bulgaria | 5893.16 | 6862.333 | 0.858769 | 0.406024 | -8932.01 | 20718.33 |
| Croatia | - | - | - | - | - | - |
| Cyprus | -237.42 | 97.46659 | -2.4359 | 0.029997 | -447.983 | -26.8557 |
| Czech Republic | -352.941 | 80.75599 | -4.3704 | 0.000758 | -527.404 | -178.479 |
| Denmark | 492.3321 | 925.2257 | 0.532121 | 0.603618 | -1506.5 | 2491.161 |
| Estonia | -494.482 | 859.4015 | -0.57538 | 0.574859 | -2351.11 | 1362.142 |
| Finland | -691.034 | 406.331 | -1.70067 | 0.112787 | -1568.86 | 186.7903 |
| France | -345.395 | 114.1352 | -3.0262 | 0.009736 | -591.969 | -98.8215 |
| Germany | -104.08 | 211.149 | -0.49292 | 0.630289 | -560.24 | 352.0797 |
| Greece | 458.8204 | 72.94341 | 6.290087 | 2.79E-05 | 301.2357 | 616.405 |
| Hungary | -56.8217 | 131.9383 | -0.43067 | 0.673763 | -341.857 | 228.2136 |
| Ireland | 338.0587 | 102.1863 | 3.308258 | 0.005657 | 117.2986 | 558.8188 |
| Italy | -132.309 | 25.53975 | -5.1805 | 0.000177 | -187.485 | -77.134 |
| Latvia | 19.8328 | 20.64855 | 0.960494 | 0.354332 | -24.7757 | 64.44128 |
| Lithuania | 650.4568 | 351.9804 | 1.847992 | 0.087476 | -109.951 | 1410.864 |
| Luxembourg | 663.8296 | 889.1236 | 0.746611 | 0.468587 | -1257.01 | 2584.664 |
| Malta | -440.434 | 161.3269 | -2.7300 | 0.017179 | -788.959 | -91.9085 |
| Netherlands | -969.482 | 325.6774 | -2.9768 | 0.010706 | -1673.06 | -265.898 |
| Poland | -168.384 | 418.3795 | -0.40247 | 0.69388 | -1072.24 | 735.4698 |
| Portugal | -283.757 | 47.56984 | -5.9650 | 4.71E-05 | -386.526 | -180.989 |
| Romania | -866.263 | 560.0621 | -1.54673 | 0.14592 | -2076.2 | 343.6776 |

| | | | | | | |
|-----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Slovakia | -268.024 | 775.5995 | -0.34557 | 0.735194 | -1943.6 | 1407.557 |
| Slovenia | -339.483 | 127.9347 | -2.6535 | 0.019876 | -615.87 | -63.0974 |
| Spain | -667.772 | 122.225 | -5.4634 | 0.000109 | -931.824 | -403.721 |
| Sweden | -4583.82 | 794.7194 | -5.7678 | 6.51E-05 | -6300.71 | -2866.94 |
| United Kingdom | 524.4998 | 79.09411 | 6.631338 | 1.63E-05 | 353.6273 | 695.3722 |
| EU 28 | -897.97 | 174.0454 | -5.1594 | 0.000184 | -1273.97 | -521.968 |

Source: the author's own calculations.

On the basis of the calculations in table 1, it can be concluded that in the case of three Member States (Greece, Ireland and United Kingdom), the regression coefficient takes a positive value. Consequently, the increase in expenditure on State aid to promote risk capital by €1 million is accompanied by an increase in GDP by average: €458.82 million, €338.06 million and €524.50 million. Margin of error is: €72.94 million, €102.19 million and €79.09 million. Bearing in mind however the confidence interval for the regression coefficient, it can be with a probability of 95% said that the increase of granted risk finance aid by €1 million will cause an increase of GDP of: Greece from €301.24 million to €616.41 million, Ireland from €117.30 million to €558.82 million and United Kingdom from €353.63 million to €695.37 million. It should also be noted that the probability of type I error (p-value), involving the rejection of a true null hypothesis that, in the case of these seven countries providing State aid to promote risk capital do not significantly affect the size of the GDP of the countries, is below the accepted level of significance, i.e. 0.05. The consequence is that the result of the study in relation to these countries, may be considered important, and thus the null hypothesis can be rejected in favour of the alternative hypothesis.

For Cyprus, Czech Republic, France, Italy, Malta, Netherlands, Portugal, Slovenia, Spain and Sweden, the regression coefficients take negative values, which means that the expenditure on State aid to promote risk capital have a negative impact on GDP of these countries. This relation occurs also at the level of the European Union (EU-28). The increase in expenditure on public aid by €1 million is accompanied by a fall in GDP – respectively – with an average of €237.42 million, €352.94 million, €345.40 million, €132.31 million, €440.43 million, €969.49 million, €283.76 million, €339.48 million, €667.77 million and €4583.82 million. Estimation errors are respectively €97.47 million, €80.76 million, €114.14 million, €25.54 million, €161.33 million, €325.68 million, €47.57 million, €127.93 million, €122.23 million and €794.72 million. At the level of the EU-28 decrease in the value of GDP *per capita* is: – €897.97 million. On the other hand taking into account the confidence interval for the regression coefficient it can be with a probability of 95% said that the increase in expenditure for State aid of €1 million will cause fall in GDP by the value of the interval (€26.86 million; €447.98 million) for Cyprus, (€178.48 million; €527.40 million) for Czech Republic, (€98.82 million; €591.97 million) for France, (€77.13 million; €187.49 million) for Italy, (€91.91 million; €788.96 million) for Malta, (€265.90 million; €1673.06 million) for Netherlands, (€180.99 million; €386.53 million) for Portugal, (€63.10 million; €615.87 million) for Slovenia, (€403.72 million; €931.82 million) for Spain, (€2866.94 million; €6300.71 million) for Sweden and (€521.97 million; €1273.97 million) for EU-28. For these countries the probability of making a type I error, connecting with the rejection of a real null hypothesis concerning lack of relation between the size of the State aid and the value of GDP, is very small and does not exceed the accepted level of significance of 0.05. Identical request as to the proposed hypothesis can be obtained by analyzing the value of F test (5.93, 19.10, 9.16, 26.84, 7.45, 8.86, 35.58, 7.04, 29.85, 33.27, and 26.62 for EU-28 level), and F significance (lower than 0.05). F test

parameters and regression statistics for the studied relationship between the size of the State aid to promote risk capital and the value of GDP in the European Union countries are shown in table 2.

Table 2: State aid to promote risk capital investments and GDP – Regression Statistics and F-test

| EU Member States | Regression statistics | | | Test F | |
|-----------------------|-----------------------|---------------------------|-----------------|-----------------|-----------------|
| | Correlation indicator | Determination coefficient | Standard error | F | Significance F |
| Austria | 0.158778 | 0.025211 | 40339.57 | 0.336214 | 0.571936 |
| Belgium | 0.415439 | 0.17259 | 45667.65 | 2.711674 | 0.123563 |
| Bulgaria | 0.231698 | 0.053684 | 10757.31 | 0.737485 | 0.406024 |
| Croatia | – | – | – | – | – |
| Cyprus | 0.559814 | 0.313391 | 2682.86 | 5.933641 | 0.029997 |
| Czech Republic | 0.771381 | 0.595028 | 23320.2 | 19.10099 | 0.000758 |
| Denmark | 0.146002 | 0.021317 | 27841.72 | 0.283153 | 0.603618 |
| Estonia | 0.157588 | 0.024834 | 4678.808 | 0.331061 | 0.574859 |
| Finland | 0.426606 | 0.181992 | 21764.3 | 2.892274 | 0.112787 |
| France | 0.642885 | 0.413301 | 174213.8 | 9.157869 | 0.009736 |
| Germany | 0.135452 | 0.018347 | 259726.2 | 0.242972 | 0.630289 |
| Greece | 0.867576 | 0.752688 | 15936.21 | 39.56519 | 2.79E-05 |
| Hungary | 0.118603 | 0.014067 | 17485.31 | 0.185476 | 0.673763 |
| Ireland | 0.676077 | 0.457079 | 19692.99 | 10.94457 | 0.005657 |
| Italy | 0.820778 | 0.673677 | 79216.04 | 26.83784 | 0.000177 |
| Latvia | 0.257416 | 0.066263 | 5747.019 | 0.922548 | 0.354332 |
| Lithuania | 0.456119 | 0.208045 | 7569.1 | 3.415073 | 0.087476 |
| Luxembourg | 0.202771 | 0.041116 | 8700.882 | 0.557428 | 0.468587 |
| Malta | 0.60366 | 0.364406 | 956.7287 | 7.453293 | 0.017179 |
| Netherlands | 0.636668 | 0.405346 | 58105.26 | 8.861434 | 0.010706 |
| Poland | 0.110935 | 0.012307 | 85769.42 | 0.16198 | 0.69388 |
| Portugal | 0.85581 | 0.732412 | 9036.138 | 35.58207 | 4.71E-05 |
| Romania | 0.39424 | 0.155425 | 39039.97 | 2.392364 | 0.14592 |
| Slovakia | 0.095407 | 0.009102 | 20809.21 | 0.119419 | 0.735194 |
| Slovenia | 0.592742 | 0.351344 | 4729.144 | 7.041427 | 0.019876 |
| Spain | 0.834633 | 0.696612 | 89716.67 | 29.84948 | 0.000109 |
| Sweden | 0.847956 | 0.719029 | 31733.07 | 33.26811 | 6.51E-05 |
| United Kingdom | 0.878538 | 0.771828 | 89957.55 | 43.97464 | 1.63E-05 |
| EU 28 | 0.819682 | 0.671878 | 852482 | 26.61943 | 0.000184 |

Source: the author's own calculations.

In the case of Greece and United Kingdom, one can speak of a strong correlation of risk finance aid granted to companies with the amount of their GDP in a positive sense: 0.87 and 0.88. These models have a good fit to the empirical data, as its calculated coefficient of determination is 0.752688 and 0.771828. Therefore, variations in GDP in these countries were explained in 75.27% and 77.18% with variations in expenditure on State aid to promote risk capital, while the remaining 24.73% and 22.82% result from the impact of other factors.

In the case of Ireland, the value of the correlation coefficient is 0.68. This country is characterized by weak positive relationship occurring between the amount of provided State aid and the level of its GDP. Moreover, there can be no satisfactory adjustment of the regression line to the empirical data. The determination coefficient equals: 0.457079.

For all countries of the European Union (EU-28) between the amount of State aid to promote risk capital and GDP in the real terms, there is a strong negative correlation ($r = -0.82$). The determination coefficient is 0.671878.

Italy, Portugal, Spain and Sweden are characterized by occurring between the amount of provided risk finance aid to undertakings and the level of GDP, very strong negative correlation – respectively 0.82, 0.86, 0.83 and 0.85. In the case of Portugal, for which the determination coefficient has the highest value, the variability of GDP in the real terms was explained in 73.24% by variability of expenditure on State aid to promote risk capital. The remaining 26.76% is the effect of random and non-random factors (other non-aid variables, imprecise fit of a straight line to the empirical data etc.). For Cyprus, France, Malta, Netherlands and Slovenia the determination coefficient assumes lower values and amounts to 0.313391, 0.413301, 0.364406, 0.405346 and 0.351344. This means that there can be no satisfactory adjustment of the regression line to the empirical data.

5. Discussion and Conclusions

In the market of the European Union, which is based on the mechanism of free competition, many changes occur as a result of the impact of micro-, meso- and macroeconomic factors. On the one hand, these changes go together with positive effects in the form of the development of the enterprises, both those already operating in the Internal market as well as those whose strategic goal is to enter the market and do business activity in the long term. Compliance with the principles of free competition, reduction of the entry barriers, elimination of customs barriers, consistent combating monopolistic practices, the inflow of direct foreign investments and the related production increase, creating the conditions for public procurement and the suppliers endeavour for uniform purchase prices and purchasing the products at prices adopted in the country where they are the lowest, they are the desired effects of competition in the Single European Market, enabling economic and social development of the European Union. On the other hand, not all market processes can be considered as the desired effect of competition. Then it is indicated, that the market economy, in which the primary regulator of the occurring processes is the competition, is burdened with certain deficiencies. The deficiencies of the market system are in such a situation justification for a replacement or supplement based on free competition of the market mechanism by other decision making processes, such as the State intervention.

The conducted analysis of regression indicated that expenditure on State aid to promote risk capital and measured by GDP the size of the economic growth are linearly dependent regarding 13 Member States, which in the years 2002-2016 provided State aid for this purpose. Risk finance measures often involve complex constructions creating incentives for one set of economic operators (investors) to provide risk finance to another set of operators (eligible undertakings). Depending on the design of the measure, and even if the intention of the public authorities may be only to provide benefits to the latter group, undertakings at either or both levels may benefit from State aid. Moreover, risk finance measures always involve one or more financial intermediaries which may have a status separate from that of the investors and the final beneficiaries in which investments are made. In such cases it is also necessary to consider whether the financial intermediary can be considered to benefit from State aid.

Acknowledgements

The publication was financed from means granted to the Faculty of Finance and Law of Cracow University of Economics, in framework of subsidy to keeping the research capacity.

References

- BARTOSCH, A. 2007. The more refined economic approach – still some room for fine-tuning. *European State Aid Law Quarterly* 6(4): 2-11.
- CATTRYSSE, B. 2014. The Newly Adopted Risk Finance State Aid Rules. *European State Aid Law Quarterly* 13(4): 689–697.
- COMMISSION 2001. Communication “State Aid and Risk Capital”, OJ 2001 C 235/03.
- COMMISSION 2005. Communication “State Aid Action Plan: less and better targeted State aid. A road map for State aid reform 2005 to 2009”, COM (2005) 107 final.
- COMMISSION 2006. Commission Regulation (EC) No 1998/2006 of 15 December 2006 on the application of Articles 87 and 88 of the Treaty to de minimis aid, OJ 2006 L 379/5.
- COMMISSION 2008a. “Think Small First” – A “Small Business Act” for Europe of 25 June 2008, COM (2008) 394 final.
- COMMISSION 2008b. Commission Regulation 800/2008 of 6 August 2008 declaring certain categories of aid compatible with the common market in application of Articles 87 and 88 of the Treaty (General block exemption Regulation), OJ 2008 L 214/3.
- COMMISSION 2010a. Communication from the Commission, Europe 2020, A strategy for smart, sustainable and inclusive growth, COM(2010) 2020 final, 3.3.2010.
- COMMISSION 2010b. Communication from the Commission “Europe 2020 Flagship Initiative Innovation Union” COM (2010) 546 final, 6.10.2010.
- COMMISSION 2010c. Communication from the Commission “An Integrated Industrial Policy for the Globalisation Era” COM (2010) 614, 28.10.2010.
- COMMISSION 2011a. Communication from the Commission, “Roadmap to a Resource Efficient Europe”, COM (2011) 571 final, 20.9.2011.
- COMMISSION 2011b. Communication from the Commission, Single Market Act, Twelve levers to boost growth and strengthen confidence, ‘Working together to create new growth’, COM (2011) 206 final, 13.1.2011.
- COMMISSION 2011c. Communication from the Commission, An action plan to improve access to finance for SMEs, COM(2011) 870 final, 7.12.2011.
- COMMISSION 2013a. Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to de minimis aid, OJ 2013 L 352/1.
- COMMISSION 2013b. Green Paper on Long-term finance for the European economy, COM(2013) 150 final, 25.3.2013.

- COMMISSION 2013c. Proposal for a Regulation of the European Parliament and of the Council on Long-term Investment Funds, COM(2013) 462 final, 2013/0214 (COD).
- COMMISSION 2014a. Guidelines on State aid to promote risk finance investments, OJ C 19/4, 22.1.2014.
- COMMISSION 2014b. Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty, OJ 187/1, 26.6.2014.
- DIRECTIVE 2011. Directive 2011/61/EU of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010, OJ L 174, 1.7.2011, p. 1.
- EC 2013. Regulation (EU) No 345/2013 of the European Parliament and the Council of 17 April 2013 on European venture capital funds. OJ L 115, 25.4.2013, p. 1.
- GUIDELINES ON RISK CAPITAL INVESTMENTS 2006. OJ 2006 C 194/2.
- HOFMANN, H.C.H. and MICHEAU, C. 2016. State Aid Law of the European Union. Oxford: Oxford University Press.
- MORAIS, L. and FERRO, M. 2011. Risk Capital as State Aid. Revision the Commission's Market Failure Approach. *European State Aid Law Quarterly* 10(3): 425–432.
- QUIGLEY, C. 2015. *European State Aid Law and Policy*. Oxford: Hart Publishing.
- PODSIADLO, P. 2017. State Aid for Environmental Protection in EU Member States – The Perspective of the Economic Growth and the State of Public Finance. *Argumenta Oeconomica Cracoviensia* 17: 75–95.
- REGULATION 2013a. Regulation (EU) No 1287/2013 of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (COSME) (2014–20) and repealing Decision No 1639/2006/EC, OJ L 347, 20.12.2013, p. 33.
- REGULATION 2013b. Regulation (EU) No 1291/2013 of the European Parliament and of the Council establishing Horizon 2020 — the Framework Programme for Research and Innovation (2014–20) and repealing Decision No 1982/2006, OJ L 347, 20.12.2013, p. 104.
- TFEU 2012. Treaty on the Functioning of the European Union, Consolidated version 2012, OJ C 326, 26.10.2012.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Selected problems of life quality on protected areas of the Swietokrzyskie voivodeship in Poland

Lukasz Poplawski¹

*¹Department of Finance Government, Faculty of Finance and Law, Cracow University of
Economics, Rakowicka27, 31-510 Cracow, Poland,
e-mail: lukasz.poplawski@uek.krakow.pl*

Abstract

The area covered by protected areas in Poland amounts to 33.1%; the region with the highest percentage of areas covered by them is in the Swietokrzyskie Voivodeship – 62%. These areas are usually landscape parks and protected landscape areas. The basic of development of protected areas should be based on the production of high quality food and food processing. This paper presents selected problems of life quality on protected areas of the Swietokrzyskie voivodeship in Poland (in the inhabitants' opinion). The work continue discusses theoretical issues of instruments and institutions with reference to Polish protected areas. Following the topic, the problems of life quality of inhabitants in ecodevelopment of protected areas has been analyzed. The last chapter presents opinions of inhabitants in the aspect of ecodevelopment, especially about selected problems of life on protected areas. The problem of life quality in the context of ecodevelopment has been raised in this paper. The work ends with a brief conclusion.

Key words: life quality, inhabitants, local development, protected areas, Poland

JEL code: H41

1. Introduction

At the end of 2003, spatial forms of nature and landscape preservation constituted 33.1% of the total country area (in Poland). Landscape parks together with national parks, nature reserves and protected landscape areas make up the system of protected areas as a set of mutually complementary forms of nature preservation. Because of their specificity, protected areas are subject to particular legal statutes, which define admissible human activity depending on the level of protection. The conditions of the development in the protected areas result from the potential of natural resources in this area as well as from objective conditions shaping their position in the region.

As a protected area, a landscape park is supposed to protect nature on its territory in accordance with the legislation in force, whereas the development of rural areas located in such parks is usually closely connected to agriculture. The two elements are frequently a source of conflict between farmers and park management. The directions of correct development of these rural areas are therefore an essential argument for looking into possibilities of development of protected areas. Findings of studies on the possibilities of developing these areas in line with nature conservation objectives and with an appropriate consideration for all the aspects of the development may solve or at least alleviate such conflicts. The interests of all parties involved in a given protected area should be carefully considered and taken into account, while also observing the legislation in force.

The need to conduct studies on the development of protected areas situated in rural areas was the impulse for addressing this problem in this research project. An additional argument for pursuing this problem was that fact that the literature on the subject, in the case of the protected areas in Swietokrzyskie voivodeship⁵¹, was either very scarce or addressed only selected aspects. In Poland, the only areas where studies on the development of rural areas in landscape parks were conducted are the “Green Lungs of Poland” territory and Wielkopolska voivodeship. There are also very few publications about the development of landscape parks in Mazowieckie and Malopolskie voivodeships (Poplawski 2014).

The necessity of carrying a research on development of protected areas was a reason to refer to this problem in this publication. The aim of this paper is to present selected problems of life quality on protected areas of the Swietokrzyskie voivodeship in Poland (in the inhabitants’ opinion).

2. The range and methods of research

The research consisting in pointing the directions of development of protected regions in Swietokrzyskie Voivodeship has been conducted since 1998 and has been continued up till the present day. The research was based on inhabitants’ opinions concerning particular courses of development, i.e. tourism, services, handicraft, industry and small business, folk culture and art, agriculture, food processing and nature conservation. The research embraces, among others, finding natural and landscape qualities which influence a multi-functional and eco-development of rural areas. The statistical data as well as materials obtained from communes constituted an element completing the research and assessment of the commune potential. The description of the research was presented, among others, in Poplawski’s papers (2014 and 2014a).

The basis of the publication are the results of questionnaires concerning a current potential of communes as well as its influence upon their development as well as meetings with inhabitants and authorities of communes. The questionnaires were filled in by all potential leaders who were interested in the issue as well as people enjoying the authority and having the influence on the decisions (the choice of the test was purposeful in the population), especially: commune chief, counsellors, village administrators, employers, entrepreneurs, the inhabitants interested in the future of the commune, farmers, female organizations leaders, social and political organizations leaders, trade union leaders, a priest, pharmacists, doctors and teachers, which means, according to what Parysek (2001), Siekierski (2004) as well as Zawisza and Pilarska (2003) claim, that such people

⁵¹ Voivodeship is one of the sixteen provinces in Poland (translator’s note).

determine the directions of development actions in a given village. Among the surveyed, farmers constituted 30–40%, and the remaining part the above mentioned people. The number of questionnaires addressed directly to inhabitants in communes was among 102–178 inhabitants who expressed their opinions in questionnaires after the EU integration. In the surveyed group the number of women and men was comparable. This type of questionnaire can be regarded as a quota sampling of the whole population of the area; even though it is not random, in the case of such an approach to the problem, this kind of a procedure is possible and correct, and frequently used in English-language literature (Poplawski 2014).

The carried out survey concerned: favoured courses of development of the research area, ecological awareness, possibility of maintaining agricultural and tourist activity, problems of everyday life hindering the development, some demographic aspects, development chances and obstacles. The study also used publications issued by statistical offices, conservation plans (finished or in preparation), and the documentation of the voivodeship Inspectorate of Environmental Protection in the city of Kielce (Poplawski 2009).

This publication was financed by the State Committee for Scientific Research in Poland as a research project (Lukasz Poplawski, the Manager of the project). The article is the author's original contribution in science with the use of the deliberate attempt of over 6,000 respondents in 45 communes without using other scientists' research. The paper expresses the respondents' opinions residing the area of the research and it was written for 3 consecutive years in the period after joining the EU. Owing to this paper, it will be possible to compare the opinions what the life was in the past and what the problems were in this and present, i.e. the previous period, which means what could be solved and unfortunately, what worsened (which phenomenon was negative).

3. Research results and discussion⁵²

According to the respondents, the following are mentioned among the most important desired actions of the authorities in the order: inhabitants' security and development of economic potential of the commune as well as health care and social services.

The respondents gave the following as the most desired actions of the authorities of the commune: material security – in 26 communes, including the one in Piekoszow the answer was a definite “no”; health care and social services – in 36 communes; raising awareness and shaping social attitudes – in 23 communes; development of the economic potential of the commune – in 39 communes; development and protection of the environment – in 34 communes; shaping the spatial structure – in 25 communes; inhabitants' security – in 34 communes, but in Krasocin “no.”

It should be emphasized that the respondents mostly expect to have the economic potential of their communes developed by their authorities as well as health care and social welfare. These problems have been especially difficult to be solved in the rural areas in Poland in spite of undertaking a lot of supporting instruments encouraging business activity and increasing accessibility to these social services.

According to the respondents, the following are the most urgent problems with respect to health and social services: common and easy access to open medicine – in 41

⁵² This article is part of L. Poplawski's unpublished dissertation in English (The conditions of eco-development of rural communities in the protected areas of the Swietokrzyskie Voivodeship. The publishing house Wyd. Naukowe PWN. Warsaw, 2009)

communes, a full range of services in open medicine – in 41 communes, counteracting alcoholism and drug addiction – in 41 communes, effective operation of social services – in 41 communes, organized group childcare – in 39 communes.

Considering the results presented above, it can be said that the array of problems in this area is very big and, unfortunately, results from the low accessibility to these services and the overuse of alcohol. At the moment, the organised group care of children is especially vital on account of the bigger number of children being born in the village than in cities. The most tedious problems out of the mentioned below in connection with the fact that agriculture is the main business activity there are two basic ones i.e. unemployment due to the lack of workplaces and perspectives of economic development resulting from the lack of systemic solutions for rural areas either financial support for limited developmental possibilities or tax reliefs for the communes and business entities although everybody in the European Union talks about environmental protection.

The interviewees answered that the following are the most burdensome social problems for the inhabitants of the commune out of the mentioned ones (Poplawski 2009): unemployment among adults – in 40 communes, and among the youth – in 41 communes, alcoholism, drug addiction – in 31 communes, problems of the elderly and lonely persons – in 25 communes, and “no” especially in Złota, lack of economic development prospects – in 38 communes, lack of inhabitants’ activity – in 33 communes, threat of crime – in 17 communes, and “no” especially in Slupia Konecka.

Continuing the description of these results it is not possible not to pay attention to the results below which confirm the ones previously presented i.e. that the commune should take actions in the scope of the sewage system and waste management as well as fight against unemployment by supporting a creation of workplaces, development of agriculture or agritourism or social welfare especially when there is a process of aging. The results below referring to attitudes and awareness among the respondents are a manifestation of cooperation of the local society in particular engaging the young in this activity.

According to the respondents, the following enterprises and actions are the most essential and should be the priority scope of activity of the commune out of the listed ones below: access to primary and secondary education – “yes” in 12 communes, but “no” in 8 communes, construction of the water supply network – in 14 communes, and “no” in 6 communes, construction of the sewage equipment – in 37 communes, organizing waste disposal (a landfill) – in 36 communes, air and landscape protection – in 29 communes, telephone lines – in 13 communes, and “no” in 9 communes, gasification – in 33 communes, and “no” in Brody, development of agricultural tourism and recreation in the commune – in 40 communes, road construction and repair – in 38 communes, creation of new workplaces and fight against unemployment – in 42 communes, health care – in 37 communes, local cultural and artistic activity – in 35 communes, social services – in 38 communes, an increase in effectiveness of agriculture (irrigation, land consolidation) – in 40 communes.

In 35 communes there are not national or ethnic problems, and only the respondents in Slupia Konecka indicated that such a problem exists.

With reference to attitudes and awareness, the interviewees pointed out: adjustment of fields of study to the needs of the labour market – in 39 communes, but “no” in Piekoszow, access to various forms of development for the youth – in 39 communes, participation of the youth in the life of the commune – in 38 communes, access to various forms of culture – in 38 communes, creation of inhabitants’ needs to participate in cultural

events – in 34 communes, stimulation to inhabitants' activity to participate in management of the commune – in 38 communes, increase in activity of branch groups in solving their problems – in 34 communes.

Table 1: The inhabitants' opinion which material aims and in the scope of the inhabitants' security are the most important and real to be solved in existing conditions in the commune.

| Commune | increase in the number of workplaces in the commune[%] | | | Possibility to gain new professional qualifications [%] | | | Increase in active and passive road security [%] | | |
|---------------------|--|-------|-------|---|-------|-------|--|-------|-------|
| | K | O | NK | K | O | NK | K | O | NK |
| Backowice | 5.34 | 36.64 | 58.02 | 10.69 | 38.17 | 51.14 | 8.33 | 40.15 | 51.52 |
| Baltow | 11.76 | 19.61 | 68.63 | 9.00 | 25.00 | 66.00 | 11.11 | 32.32 | 56.57 |
| Blizyn | 7.92 | 21.78 | 70.30 | 4.85 | 33.98 | 61.17 | 5.88 | 31.37 | 62.75 |
| Bodzechow | 8.26 | 22.31 | 69.43 | 12.29 | 26.23 | 61.48 | 8.78 | 33.33 | 57.89 |
| Bogoria | 10.69 | 26.72 | 62.59 | 6.87 | 36.64 | 56.49 | 3.87 | 46.51 | 49.62 |
| Brody | 11.28 | 13.53 | 75.19 | 8.21 | 23.13 | 68.66 | 11.85 | 33.33 | 54.82 |
| Daleszyce | 21.90 | 49.52 | 28.58 | 19.44 | 58.33 | 22.23 | 19.05 | 51.43 | 29.52 |
| Gnojno | 14.56 | 17.89 | 67.55 | 12.58 | 31.79 | 55.63 | 6.00 | 39.33 | 54.67 |
| Gorno | 6.93 | 46.53 | 46.54 | 0.99 | 53.46 | 45.55 | 8.91 | 48.51 | 42.58 |
| Imielno | 14.56 | 33.01 | 52.43 | 14.02 | 38.32 | 47.66 | 11.21 | 39.25 | 49.54 |
| Iwaniska | 13.33 | 27.76 | 58.91 | 15.24 | 32.38 | 52.38 | 9.61 | 37.50 | 52.89 |
| Kije | 3.74 | 25.23 | 71.03 | 5.55 | 29.63 | 64.82 | 1.85 | 37.04 | 61.11 |
| Kluczewsko | 21.51 | 30.10 | 48.39 | 16.67 | 38.89 | 44.44 | 19.56 | 42.39 | 38.05 |
| Krasocin | 19.27 | 22.93 | 57.80 | 20.56 | 32.71 | 46.73 | 14.95 | 44.86 | 40.19 |
| Lagow | 12.12 | 18.18 | 69.70 | 13.26 | 33.67 | 53.07 | 7.14 | 35.71 | 57.15 |
| Lopuszno | 12.00 | 25.00 | 63.00 | 13.00 | 34.00 | 53.00 | 6.32 | 35.79 | 57.89 |
| Maslow | 5.93 | 35.59 | 58.48 | 6.78 | 45.76 | 47.46 | 8.62 | 41.38 | 50.00 |
| Michalow | 7.55 | 28.30 | 64.15 | 14.81 | 31.48 | 53.71 | 5.55 | 45.37 | 49.08 |
| Mirzec | 8.92 | 32.14 | 58.94 | 9.82 | 44.64 | 45.54 | 5.41 | 48.64 | 45.95 |
| Mniow | 5.50 | 22.94 | 71.56 | 3.60 | 30.63 | 65.77 | 5.88 | 31.37 | 62.75 |
| Nowy Korczyn | 6.54 | 58.88 | 34.58 | 7.55 | 52.83 | 39.62 | 10.38 | 68.87 | 20.75 |
| Oksa | 17.86 | 22.14 | 60.00 | 12.59 | 31.85 | 55.56 | 13.43 | 30.59 | 55.98 |
| Opatowiec | 13.20 | 21.70 | 65.10 | 9.52 | 32.38 | 58.10 | 8.49 | 33.96 | 57.55 |
| Pacanow | 10.10 | 22.22 | 67.68 | 13.40 | 21.65 | 64.95 | 7.37 | 36.84 | 55.79 |
| Pawlow | 3.57 | 24.11 | 72.32 | 9.17 | 32.11 | 58.72 | 4.50 | 32.43 | 63.07 |
| Piekoszow | 17.31 | 62.50 | 20.19 | 14.42 | 74.04 | 11.54 | 18.27 | 52.88 | 28.85 |
| Pierzchnica | 7.00 | 17.00 | 76.00 | 7.00 | 23.00 | 70.00 | 8.08 | 31.31 | 60.61 |
| Radoszyce | 10.89 | 21.78 | 67.33 | 8.82 | 33.33 | 57.84 | 8.91 | 35.64 | 55.45 |
| Rakow | 9.71 | 11.65 | 78.64 | 5.88 | 22.55 | 71.57 | 11.00 | 32.00 | 57.00 |
| Ruda Maleniecka | 13.40 | 16.49 | 70.11 | 12.76 | 30.85 | 56.39 | 10.87 | 39.13 | 50.00 |
| Sitkowka Nowiny | 10.91 | 55.45 | 33.64 | 21.10 | 49.54 | 29.36 | 9.26 | 62.04 | 28.70 |
| Skarzysko Koscielne | 3.96 | 18.81 | 77.23 | 9.09 | 23.23 | 67.68 | 6.00 | 26.00 | 68.00 |
| Slupia Jedrzejowska | 11.61 | 54.46 | 33.93 | 11.50 | 63.72 | 24.78 | 10.62 | 64.60 | 24.78 |
| Slupia Konecka | 8.03 | 38.39 | 53.58 | 7.14 | 50.00 | 42.86 | 9.82 | 48.21 | 41.97 |
| Smykow | 11.82 | 12.72 | 75.46 | 14.95 | 17.76 | 67.29 | 6.54 | 37.38 | 56.08 |
| Sobkow | 17.17 | 31.31 | 51.52 | 16.00 | 39.00 | 45.00 | 13.40 | 42.27 | 44.33 |
| Solec Zdroj | 9.85 | 14.39 | 75.76 | 8.59 | 32.81 | 58.60 | 8.73 | 38.89 | 52.38 |
| Stopnica | 9.82 | 10.71 | 79.47 | 9.26 | 23.15 | 67.59 | 8.18 | 26.36 | 65.46 |
| Strawczyn | 8.49 | 14.15 | 77.36 | 8.82 | 32.35 | 58.83 | 7.92 | 30.69 | 61.39 |
| Szydlow | 11.40 | 21.05 | 67.55 | 6.14 | 35.09 | 58.77 | 8.04 | 40.18 | 51.78 |
| Tuczepy | 5.21 | 19.79 | 75.00 | 13.00 | 19.00 | 68.00 | 6.12 | 29.59 | 64.29 |
| Wislica | 14.42 | 13.46 | 72.12 | 10.10 | 28.28 | 61.62 | 11.88 | 28.71 | 59.41 |

| | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Wodzislaw | 14.68 | 35.78 | 49.54 | 16.36 | 38.18 | 45.46 | 12.84 | 49.54 | 37.62 |
| Zagnansk | 7.48 | 22.43 | 70.09 | 5.61 | 29.91 | 64.48 | 10.28 | 20.56 | 69.16 |
| Zlota | 10.81 | 25.22 | 63.97 | 3.60 | 52.25 | 44.15 | 13.39 | 67.86 | 18.75 |

Source: own case study, NK – unfavorable, K – favorable, O – neutral

Table 2: The inhabitants' opinion which material aims and in the scope of the inhabitants' security are the most important and real to be solved in existing conditions in the commune (continue).

| Commune | Assurance of a high level of firefighting services [%] | | | Assurance of high level of public safety [%] | | | Increase in profitability of agricultural production [%] | | |
|---------------------|--|-------|-------|--|-------|-------|--|-------|-------|
| | K | O | K | K | K | NK | K | O | NK |
| Backowice | 6.87 | 43.51 | 9.09 | 9.09 | 9.09 | 59.55 | 9.09 | 33.33 | 57.58 |
| Baltow | 19.00 | 30.00 | 21.36 | 21.36 | 21.36 | 56.13 | 21.36 | 23.30 | 55.34 |
| Blizyn | 8.82 | 32.35 | 25.24 | 25.24 | 25.24 | 62.38 | 25.24 | 33.01 | 41.75 |
| Bodzechow | 7.02 | 45.61 | 13.67 | 13.67 | 13.67 | 62.39 | 13.67 | 31.62 | 54.71 |
| Bogoria | 5.38 | 55.38 | 16.79 | 16.79 | 16.79 | 45.73 | 16.79 | 25.95 | 57.26 |
| Brody | 11.94 | 38.80 | 23.88 | 23.88 | 23.88 | 64.39 | 23.88 | 26.86 | 49.26 |
| Daleszyce | 18.09 | 60.00 | 31.48 | 31.48 | 31.48 | 24.07 | 31.48 | 56.48 | 12.04 |
| Gnojno | 10.67 | 38.00 | 12.58 | 12.58 | 12.58 | 59.33 | 12.58 | 20.52 | 66.90 |
| Gorno | 5.94 | 55.44 | 4.95 | 4.95 | 4.95 | 31.68 | 4.95 | 52.47 | 42.58 |
| Imielno | 15.89 | 31.78 | 12.84 | 12.84 | 12.84 | 55.66 | 12.84 | 37.61 | 49.55 |
| Iwaniska | 17.65 | 37.25 | 11.43 | 11.43 | 11.43 | 52.39 | 11.43 | 35.24 | 53.33 |
| Kije | 6.54 | 33.64 | 1.87 | 1.87 | 1.87 | 64.81 | 1.87 | 38.32 | 59.81 |
| Kluczewsko | 11.70 | 48.94 | 13.83 | 13.83 | 13.83 | 42.70 | 13.83 | 40.43 | 45.74 |
| Krasocin | 24.07 | 42.59 | 27.78 | 27.78 | 27.78 | 44.48 | 27.78 | 22.22 | 50.00 |
| Lagow | 13.54 | 38.54 | 11.22 | 11.22 | 11.22 | 56.57 | 11.22 | 34.69 | 54.09 |
| Lopuszno | 12.09 | 45.05 | 8.42 | 8.42 | 8.42 | 54.74 | 8.42 | 45.26 | 46.32 |
| Maslow | 13.79 | 40.51 | 9.24 | 9.24 | 9.24 | 51.27 | 9.24 | 47.90 | 42.86 |
| Michalow | 14.15 | 10.57 | 11.93 | 11.93 | 11.93 | 54.21 | 11.93 | 26.60 | 61.47 |
| Mirzec | 15.31 | 51.35 | 10.00 | 10.00 | 10.00 | 49.11 | 10.00 | 36.36 | 53.64 |
| Mniow | 6.80 | 35.92 | 8.26 | 8.26 | 8.26 | 64.36 | 8.26 | 30.27 | 61.47 |
| Nowy Korczyn | 11.43 | 62.86 | 7.61 | 7.61 | 7.61 | 23.59 | 7.61 | 62.85 | 29.54 |
| Oksa | 8.75 | 43.79 | 16.43 | 16.43 | 16.43 | 49.63 | 16.43 | 20.71 | 62.86 |
| Opatowiec | 6.60 | 46.22 | 6.60 | 6.60 | 6.60 | 57.70 | 6.60 | 20.75 | 72.65 |
| Pacanow | 14.14 | 32.32 | 9.09 | 9.09 | 9.09 | 61.62 | 9.09 | 23.23 | 67.68 |
| Pawlow | 4.54 | 36.36 | 5.45 | 5.45 | 5.45 | 67.27 | 5.45 | 30.91 | 63.64 |
| Piekoszow | 12.62 | 66.02 | 19.23 | 19.23 | 19.23 | 23.31 | 19.23 | 70.19 | 10.58 |
| Pierzchnica | 12.00 | 38.00 | 7.00 | 7.00 | 7.00 | 65.66 | 7.00 | 26.00 | 67.00 |
| Radoszyce | 13.86 | 32.67 | 11.76 | 11.76 | 11.76 | 66.67 | 11.76 | 39.22 | 49.02 |
| Rakow | 6.00 | 37.00 | 3.92 | 3.92 | 3.92 | 65.66 | 3.92 | 19.61 | 76.47 |
| Ruda Maleniecka | 18.48 | 36.96 | 15.31 | 15.31 | 15.31 | 52.23 | 15.31 | 28.57 | 56.12 |
| Sitkowka Nowiny | 10.09 | 61.47 | 27.27 | 27.27 | 27.27 | 30.91 | 27.27 | 55.45 | 17.28 |
| Skarzysko Koscielne | 7.07 | 38.38 | 10.89 | 10.89 | 10.89 | 65.35 | 10.89 | 41.58 | 47.53 |
| Slupia Jedrzejska | 13.39 | 62.50 | 8.85 | 8.85 | 8.85 | 23.01 | 8.85 | 61.06 | 30.09 |
| Slupia Konecka | 9.01 | 49.55 | 7.21 | 7.21 | 7.21 | 42.34 | 7.21 | 42.34 | 50.45 |
| Smykow | 8.33 | 37.96 | 11.82 | 11.82 | 11.82 | 70.38 | 11.82 | 21.82 | 66.36 |
| Sobkow | 8.00 | 49.00 | 12.87 | 12.87 | 12.87 | 51.00 | 12.87 | 39.60 | 47.53 |
| Solec Zdroj | 12.70 | 38.89 | 4.76 | 4.76 | 4.76 | 54.69 | 4.76 | 23.01 | 72.23 |
| Stopnica | 7.41 | 36.11 | 7.27 | 7.27 | 7.27 | 65.14 | 7.27 | 17.27 | 75.46 |
| Strawczyn | 11.58 | 42.10 | 8.49 | 8.49 | 8.49 | 64.65 | 8.49 | 15.09 | 76.42 |
| Szydlow | 12.28 | 35.96 | 7.89 | 7.89 | 7.89 | 61.60 | 7.89 | 24.56 | 67.55 |
| Tuczepy | 7.29 | 31.25 | 8.08 | 8.08 | 8.08 | 64.27 | 8.08 | 20.20 | 71.72 |

| | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Wislica | 12.87 | 39.60 | 11.54 | 11.54 | 11.54 | 58.00 | 11.54 | 17.31 | 71.15 |
| Wodzislaw | 15.60 | 47.71 | 16.51 | 16.51 | 16.51 | 44.04 | 16.51 | 31.19 | 52.30 |
| Zagnansk | 7.55 | 37.74 | 18.69 | 18.69 | 18.69 | 70.19 | 18.69 | 41.12 | 40.19 |
| Zlota | 9.91 | 70.27 | 4.46 | 4.46 | 4.46 | 16.08 | 4.46 | 8.03 | 87.51 |

Source: own case study, NK – unfavorable, K – favorable, O – neutral

4. Conclusions

On the basis of the conducted research in 45 communes with the majority of protected areas in the Swietokrzyskie Voivodeship in Poland one should state that:

- the respondents evaluate the level of living quality in a different way,
- the inhabitants indicated the problem of unemployment among the adults and the youth as one of the most important ones in all analysed communes,
- inhabitants' security and development of the economic potential of the commune as well as health care and welfare are enumerated in the order as the most desirable actions of the authorities,
- according to the respondents (in 41 communes), the most essential problems in the scope of health and welfare include: common and easy access to out-patient health care, a full range of services in out-patient health care, counteracting alcoholism and drug addiction, effective welfare,
- lack of perspectives of economic development – in 38 communes,
- creating new workplaces and fight against unemployment – in 42 communes,
- there are no national and ethnic problems, and only in Slupia Konecka the respondents indicated that such a problem exists,
- in the scope of attitudes and awareness the respondents indicated the following: adjustment of the educational directions to the needs of the labour market – in 39 communes, but “no” in Piekoszow, access to various forms of the youth development – in 39 communes, the participation of the youth in life of the commune – in 38 communes, access to various forms of culture – in 38 communes, activation of the inhabitants' participation in management of the commune – in 38 communes.

The presented original research with the deliberate attempt of over 6,000 respondents in 45 communes expresses the respondents' opinions residing this research area and they can be used to compare the opinions of what the life was like and what problems were in this period with the problems in terms of the quality of life in the future (what problems were solved and which negative phenomena, unfortunately, got worse).

References

- POPLAWSKI, L. 2009, Uwarunkowania ekorozwoju gmin wiejskich na obszarach chronionych wojewodztwa swietokrzyskiego. Wydawnictwo Naukowe PWN, Warszawa.
- Poplawski L. 2011, Wybrane problemy polaryzacji rozwoju obszarów wiejskich w teoriach rozwoju regionalnego. Roczniki Naukowe Stowarzyszenia Ekonomistow Rolnictwa i Agrobiznesu, vol. 13, no. 1.

POPLAWSKI, L., 2014, Courses of development of communes in Swietokrzyskie voivodeship in the opinion of its inhabitants, *Economic Science for Rural Development*, No. 35, Poplawski L., 2014, Multifunctional Development of Protected Areas in Poland in the Opinion of its Inhabitants in 2 Municipalities, *Review of Integrative Business & Economics Research (RIBER)*, vol. 3 (2014), Issue 2, ISSN: 2304–1013 (Online); 2304–1269 (CDROM).

Rocznik statystyczny – Ochrona srodowiska 2002 2003: Wyd. GUS, Warszawa.

Ustawa o ochronie przyrody z dnia 16 kwietnia 2004 r. (Dz. U.04.92.880 z dnia 30 kwietnia 2004 r).

SIEKIERSKI, J. 2004, Rola liderow wiejskich w absorpcji finansowych srodkow unijnych dla rozwoju rolnictwa o obszarow wiejskich, [w:] Palasz L. (red.) *Wplyw integracji europejskiej na przemiany strukturalne obszarow o wysokim bezrobociu*, Wyd. AR Szczecin, Szczecin.

ZAWISZA, S., PILARSKA, S., 2003, Liderzy wiejskich spolecznosci lokalnych, *Zagadnienia Doradztwa Rolniczego 1/2 2003 (34)*, Krajowe Centrum Doradztwa Rozwoju Rolnictwa i Obszarow Wiejskich.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Key Success Factors of Small and Medium-sized Enterprises

Lenka Procházková¹, Marek Zábaj²

*¹Department of Marketing and Trade, Faculty of Business and Economics, Mendel
University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: lenka.prochazkova@medelu.cz*

*²Department of Marketing and Trade, Faculty of Business and Economics, Mendel
University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: marek.zabaj@mendelu.cz*

Abstract

Small and medium-sized enterprises face growing competition. Not just by domestic entities, but also from foreign enterprises entering the local market. The way how to deal with increasing competitive primarily depends on internal characteristics (factors of the internal environment) of individual enterprises. The aim of this paper is to present factors of internal environment of SMEs which determine their success. These factors are categorized into five groups. These are: human resources, marketing, manufacturing, management organization and financial management. The results are based on the analysis of secondary data focused on the success factors of SMEs' and on primary survey conducted among Czech SMEs in manufacturing industry. The survey validated selected SMEs' key success factors and their specifics.

Keywords: Small and medium-sized enterprises, success, key factors of success, primary research, questionnaire survey, internal environment.

JEL Code: M00

1. Introduction

The objective of this article is to present partial results of research work, thus the identified key factors of an internal environment, which determine success of small and medium-sized enterprises. These key factors will serve to setting up a model of evaluation of SMEs. It will be a supportive tool for easy self-evaluation and a potential comparison with competing subjects. The most significant benefit of the model for SMEs will be ability to identify own weaknesses. The model will be based on non-financial indices, which will be created from the identified key success factors. For needs of identification of SME in the Czech Republic and their division, recommendation of the Commission 2003/361/ES was used, which represents the new definition of SMEs (European Commission, 2012).

In order to complete the objective, it is necessary to define a successful enterprise. Many theories have been created about the topic of a successful enterprise (e.g. Weinzimmer and Manmadhan, 2009; Vodáček and Vodáčková, 2004; Cowling, 2007; Fairlie and Robb, 2009; Masuo et al., 2001; Philip, 2010; Blažek et al., 2008). The term “success” can be defined from many perspectives (e.g. financial, market and social indicators). By summarization of obtained knowledge, it was possible to define a successful enterprise as an enterprise, which by acting at the market satisfies requirements of fulfilment of objectives and results of entrepreneurial activities of all interested people or groups of people. The primary data was gathered from self-evaluation survey in SMEs (just as it was in case of secondary data).

2. Literature Review

An old-fashioned view about an enterprise as a mechanic system leads a manager primarily to development of a technical part of success potential, so-called knowledge capital of an enterprise (production and information technologies, economic controlling systems, quality management systems, etc.). The second part of success potential is often not a priority for SMEs, i.e. people, social capital. This imbalance fundamentally decreases efficiency of investments into technical systems (Häuser, 2004). Häuser (2004) understands an enterprise as a bio system, in which it is necessary to dedicate balanced attention to the both components of success potential, thus to social capital (people, human resources) and knowledge capital (financial capital, material resources, know-how). The set of internal factors of success (as a result of extensive and thorough study of professional resources) is presented in Table 1, Table 2, Table 3, Table 4 and Table 5.

Table 1: Overview of the key success factors of SMEs – Human resources

| Group | Authors | Factors | Factors | Authors |
|-----------------|--|--------------|-----------------|---|
| Human resources | Man, Lau and Chan (2002), Ratnaningsih at al. (2010) | employees | skill | Kislingerová and Nový (2005), Nieuwenhuizen and Kroon (2003), Lin (1998), Stoner and Freeman (1989) |
| | | | experience | Al-Mahrouq (2010), Rose, Kumar and Yen (2006), Nieuwenhuizen and Kroon (2003), Kislingerová and Nový (2005) |
| | | | education | Charney and Libecap (2000), Al-Mahrouq (2010) |
| | | | fluctuation | Al-Mahrouq (2010) |
| | | | qualification | Lin (1998), Rose, Kumar and Yen (2006), Al-Mahrouq (2010) |
| | | | motivation | Lin (1998), Al-Mahrouq (2010), Kislingerová and Nový (2005) |
| | | entrepreneur | education | Sinha (1996), Indarti and Langenberg (2004) |
| | | | work experience | Indarti and Langenberg (2004), Kislingerová and Nový (2005) |

Human resources (see Table 1) are divided into two main factors, i.e. employees and an entrepreneur. In case of employees, the key factors of success are their skills, experience, qualification and further education. An important role is played by motivation of employees and size of their fluctuation. Factors related to entrepreneurship are more important primarily in small enterprises, where a personality of an entrepreneur, his/her

education and work experience are reflected more in activity of an enterprise. In small enterprises an entrepreneur influences directly a majority of activities.

Table 2: Overview of the key success factors of SME – Marketing

| Group | Authors | Factors | Authors | Factors | Authors |
|-----------|---|------------------|--|------------------------|---|
| Marketing | Indarti and Langenberg (2004), Man, Lau and Chan (2002) O'Farell, Hitchens and Moffat (1992), | strategy, vision | Man, Lau and Chan (2002), Wijewardena and Zoysa (2005), Kislingerová and Nový (2005), Indarti and Langenberg (2004), | pricing policy | Lin (1998), Al-Mahrouq (2010), Philip (2010) |
| | | | | flexibility | Man, Lau and Chan (2002), Philip (2010) |
| | | | | quality | O'Farell, Hitchens and Moffat (1992), Man, Lau and Chan (2002), Wijewardena and Zoysa (2005), Ratnaningsih et al. (2010), Philip (2010), Lin (1998) |
| | | | | customer services | Man, Lau and Chan (2002), Nieuwenhuizen and Kroon (2003) |
| | | | | complementary services | Man, Lau and Chan (2002), Philip (2010) |
| | | | | (stable) customer | Chittithaworn et al. (2011) Blažek et al. (2008) |

Another key factor of success is marketing (see Table 2). In the area of marketing, strategy and vision are identified as the key factors, which can be further defined as determinants of success, such as price policy of an enterprise, ability to flexibly react to requirements of the market, quality of products, a level of customer service and offered additional services. Price policy of an enterprise is an important factor of success. However, it is necessary to evaluate this factor in context of business strategy.

Table 3: Overview of the key success factors SMEs – Production

| Group | Factors | Authors | Factors | Authors |
|------------|--------------------------|--|--|--|
| Production | technology | | level of production technologies and equipment | Al-Mahrouq (2010), Indarti and Langenberg (2004), Lin (1998), Ratnaningsih et al. (2010) |
| | innovations | Nieuwenhuizen and Kroon (2003), Man, Lau and Chan (2002), Al-Mahrouq (2010), Lin (1998), Kristiansen, Furuholt and Wahid (2003), Philip (2010), Kislingerová and Nový (2005) | | |
| | research and development | Lin (1998), Al-Mahrouq (2010), Ratnaningsih et al. (2010) | | |
| | know-how | Lin (1998), Ratnaningsih et al. (2010), Philip (2010), Chittithaworn et al. (2011) | | |

Another group of factors determining success of an enterprise is production (Table 3). Here, the key factors are a level of production technologies and production equipment. Furthermore, innovations carried out in an enterprise, research and development, and last but not least, know-how of an enterprise. An enterprise can carry out innovation activity in the area of products (development of a new product or improvement of an existing one), furthermore in the area of processes (innovation of production technologies and equipment or production processes). Further, innovation can be marketing innovation

(e.g. in the area of marketing communication) and organizational innovation (changes in management of an enterprise). The key factor know-how is primarily a competitive advantage of a given enterprise.

Success of an enterprise is further determined by a method of its management, however, it is possible to be further specified (Table 4). Here, the success factor is organizational structure, especially a number of levels. It means that an average number of levels, which corresponds with size of an enterprise, needs of management and characteristic of production. Then, communication is important within a management style. It means communication inside an enterprise, horizontal as well as vertical. Thus, success of an enterprise is further influenced by relationships, which an enterprise created with its suppliers. Stable relationships are important because of continuity of supply of production process and because of satisfaction of requirements of customers. These success factors are completed by corporate culture, which has influence on behaviour of employees and on overall atmosphere in an enterprise.

Table 4: Overview of the key success factors of SMEs – Management of an organization

| Group | Authors | Factors | Authors | Factors | Authors |
|-------------------------------|---|---------------------------------------|---|------------------|---|
| Management of an organization | O'Farell, Hitchens and Moffat (1992), Chittithaworn et al. (2011) | organization structure | Man, Lau and Chan (2002) | number of levels | Man, Lau and Chan (2002), Al-Mahrouq (2010), O'Farell, Hitchens and Moffat (1992) |
| | | style and effectiveness of management | Man, Lau and Chan (2002), Wijewardena and Zoysa (2005), Al-Mahrouq (2010) | communication | Lin (1998), Al-Mahrouq (2010), Philip (2010) |
| | | stable suppliers | Blažek et al. (2008) | | |
| | | corporate culture | Man, Lau and Chan (2002), Ratnaningsih et al. (2010), Verhees and Meulenberg (2004) | | |

The last is the group of success factors in the area of financial management (see Table 5). Here, success is influenced especially by a way of financial management of an organization. At a closer look, it is especially used financial resources.

Table 5: Overview of the key success factors of SMEs – Financial management

| Group | Authors | Factors | Authors | | |
|----------------------|--|----------|--|--|--|
| Financial management | Nieuwenhuizen and Kroon (2003), Ratnaningsih et al. (2010) | resource | Man, Lau and Chan (2002), Indarti and Langenberg (2004), Wijewardena and Zoysa (2005), Chittithaworn et al. (2011) | | |

Thus, it is possible to include some of the success factors into more groups. Groups of factors are intersected and they complement each other. It was decided about the above mentioned division based on long-term study of professional resources.

3. Methodology and Data

In order to identify key success factors of SMEs, an analysis followed by a synthesis of secondary and primary data was carried out. The secondary data were acquired by study of professional domestic and foreign resources, monographs as well as professional articles and research published in professional journals. The main objective of the analysis of the secondary resources was to define key factors of an internal environment, which determine success of SMEs. Based on knowledge of the secondary analysis seven hypotheses were stated (see the chapter Results).

The next step was realization of a quantitative questionnaire survey. Acquired primary data served to verification of the stated hypotheses and to verification of the chosen factors of success and their specifics.

The primary survey was conducted using a structured questionnaire. The questionnaire was created by identification questions related to an organization, human resources, an area of technical processes and technologies, an area of marketing and by several additional questions. At the end of the questionnaire, respondents evaluated a level of achieved success during acting at the market. The question is important for the following analysis of data in pivot tables (similarly as in foreign research, e.g. Philip, 2010; Indarti and Langenberg, 2004). In the analysis of dependence, achieved success acts as a dependent variable, other chosen variables of the questionnaire survey are then independent variables.

Firstly, it was necessary to carry out pre-research. Data collection was performed by an electronic questionnaire which was sent to 6,236 SMEs of processing industry, the same way as it was during the pre-research. The final collection of data was carried out from April to September 2014. Before sending the electronic questionnaire, it was necessary to create a database of subjects to be approached. A targeted selection was carried out, and it was limited by availability of addresses of subjects. Requirements for respondents were following: Size perspective – small and medium-sized enterprises according to quantity of employees, quantity of employees 10–249; Sector perspective – enterprises from the section C Processing industry according to the classification CZ-NACE; Territorial perspective – enterprises with a residence in the Czech Republic; Ownership perspective – an owner, owners or majority owners come from the Czech Republic.

The specific chosen characteristics of respondents who completed the questionnaire is following: the group with 10 to 49 employees created 60.2% of respondents and the group with 50 to 249 employees created 39.8% of respondents. The selection of surveyed enterprises was not limited by their legal form. The most of the respondents, 71.2%, operate at the market as limited liability companies. According to representation, they were followed by public limited companies with the share of 14.4%. Legal persons were represented by 8.5% and cooperatives by 5.9%. The survey was carried out among enterprises of the processing industry. The highest representation of 33.1% was by enterprises of the engineering industry. It was followed by enterprises dealing with production of food products and beverages, i.e. 17.8% of respondents. 13.6% of respondents deal with production of electric appliances, followed by enterprises producing textile, clothing and footwear with the share of 11.0%. The smallest group of respondents, 2.5% deals with production of pharmaceutical products and preparations. 22.0% of respondents deal with different production within the processing industry.

From the quantity of 267 completed questionnaires, 118 of correctly completed questionnaires were obtained after clearing. After coding of answers, data were processed in the statistical software Statistica 12 from the company StatSoft CR, s. r. o.

In order to have an overview about obtained values of individual variables, sorting of the I. level was carried out. It was followed by the II. level of data sorting. By testing of all seven hypotheses, dependency of data in pivot tables was verified by usage of the Pearson's chi-square test of independence. The level of significance $\alpha = 0.05$ was set for the testing. For measuring the power of relations in pivot tables, the Pearson's contingency coefficient and Cramer's coefficient were used. Based on these contingency coefficients it is possible to say how intensive dependency is. The result of the analysis of primary data is the verification of selected success factors and their specifics.

4. Results

The quantitative survey served to verification of chosen success factors, stated in the overview (Table 1, Table 2, Table 3, Table 4, Table 5) in an environment of Czech SMEs of processing industry, especially to the analysis of specifics of chosen success factors. The selected results of the survey are following.

The number of employees who terminate employment is less than 2% of the total quantity during a year for 67.8% respondents. For 29.7% of respondents, the level of fluctuation of employees is 2 to 10% from the total quantity during a year. Only 2.5% of respondents report fluctuation of employees higher than 10% from the total quantity of employees during a year. The hypothesis about fluctuation of employees in an enterprise was stated.

H₀: The level of fluctuation of employees has no influence on success of SMEs at the domestic market.

H₁: The level of fluctuation of employees has influence on success of SMEs on the domestic market.

During the testing of relationship between the level of fluctuation of employees and success of SMEs (chi-square = 1.862414, degree of freedom = 2) the p-value was calculated as 0.39408, which means at the set level of importance, that we do not reject the null hypothesis. We assume, according to the results, that there does not exist any dependency between fluctuation of employees and success of SMEs at the domestic market.

In order to motivate and influence satisfaction of employees, enterprises can use employee benefits. Within the quantitative survey there is a positive finding, that only 3.4% of respondents does not provide any benefits to their employees. 20.3% of respondents provide employees with 1 to 3 benefits, 32.2% of respondents provide 4 to 6 benefits and 37.3% of respondents provide 7 to 10 benefits. Then, 6.8% of respondent provide 11 to 13 benefits to their employees. There is a positive finding, that the majority of respondent provide 4 and more different employee benefits, despite some of the benefits are not designed for all employees of an enterprise. In relation to providing employee benefits as a form of motivation, the hypothesis was set.

H₀: Providing of employee benefits has no influence on success of SMEs at the domestic market.

H₁: Providing of employee benefits has influence on success of SMEs at the domestic market.

During the testing of relationship between providing of employee benefits and success of SMEs (chi-square = 12.57844, degree of freedom = 4), the p-value 0.01353 was calculated, which means that at the set level of significance $\alpha = 0.05$ we reject the null hypothesis. According to the conducted research, there is dependency between providing

of employee benefits and success of SMEs at the domestic market. By the Pearson's contingency coefficient and Crammer's contingency coefficient the power of dependency was calculated. Based on the calculated values, where $P = 0.3103685$ and $C = 0.3264919$, it is possible to deduce that there is moderate dependency between providing of employee benefits and success of SMEs acting at the domestic market.

Employees can increase the qualifications themselves, or within the enterprise. Based on the questionnaire survey, it is obvious that 15.3% of enterprises do not educate their employees continuously. 2.5% of enterprises educate their employees only in accordance with statutory requirements and 10.2% of enterprises educate their employees only when it is necessary. Frequency of employees' education was also investigated in the questionnaire. 37.3% of enterprises educate their employees annually, 16.1% twice a year and 18.6% three or more times a year. Based on the knowledge that (continuous) education of employees has an impact on the success of SMEs, hypothesis was created.

H_0 : Continuous education of employees does not affect SME's success in the domestic market.

H_1 : Continuous education of employees affects SME's success in the domestic market.

Based on hypothesis testing of relationship between the education of employees and SME's success in the domestic market, p-value of 0.49040 was calculated (chi-square = 5.426337, $sv = 6$). Due to the significance level $\alpha = 0.05$, null hypothesis cannot be rejected. According to the findings of the survey we assume that there is no dependence between the education of employees and the success of SMEs in the domestic market.

Results of the survey among manufacturing enterprises demonstrated that 2.5% of them evaluate their technical level as excellent and 16.1% as a very good. The biggest part of enterprises (37.3%) considers their technical level as well and 33.9% of enterprises as sufficient. As inadequate assessed the technical level of production equipment 10.2% of enterprises. Based on the importance of the factor, next hypothesis was created.

H_0 : Technical level of production equipment does not affect SME's success in the domestic market.

H_1 : Technical level of production equipment affects SME's success in the domestic market.

Based on hypothesis testing of relationship between the technical level of production equipment and SME's success in the domestic market, p-value of 0.00016 was calculated (chi-square = 22.50147, $sv = 4$). It means that null hypothesis can be rejected and we assume that technical level of production equipment can impact SME's success in the domestic market. Based on calculated values of Pearson's and Cramer's coefficient of contingency ($P = 0.4001889$ a $C = 0.4366812$) it is noticeable that there exists moderate correlation between technical level of production equipment and SME's success in the domestic market. These results have been also confirmed by international researches.

According to obtained data, research and development is carried out by 61.9% of SMEs. The largest part of these enterprises is then focused on a product quality improving (50.8% of them). Others are focused on productivity improvement (21.2% of them) or product innovation (15.3% of them). Next hypothesis was created.

H_0 : Conducting of research and development does not affect SME's success in the domestic market.

H_1 : Conducting of research and development affects SME's success in the domestic market.

Based on hypothesis testing of relationship between the technical level of production equipment and SME's success in the domestic market, p-value of 0.00554 was calculated (chi-square = 7.694857, $sv = 1$). At the significance level $\alpha = 0.05$, null hypothesis can be

rejected. Based on the calculated values of Pearson's coefficient of contingency ($P = 0.2474238$) it is noticeable the weak correlation between the conduction of research and development and SME's success in the domestic market.

Results of our research show that the most often used method of communication is advertising on the internet (59.3% of enterprises). This is largely related to the low cost of this type of promotion. Other method of communication is direct marketing (41.5% of enterprises) followed by print advertising (34.6% of enterprises) and television advertising (3.4% of enterprises). The results correspond with the size of costs, necessary to make a specific promotion tool. Relationship between promotion and SMEs success has been hypothesised.

H₀: Using the tools of marketing communication does not affect SME's success in the domestic market.

H₁: Using the tools of marketing communication affects SME's success in the domestic market.

Based on hypothesis testing of relationship between the number of tools used in the promotion and SME's success in the domestic market, p-value of 0.64185 was calculated (chi-square = 1.677917, sv = 3). Due to the significance level $\alpha = 0.05$, null hypothesis cannot be rejected. According to the findings of the survey we assume that there is no dependence between number of tools used in the promotion and SME's success in the domestic market.

Considering product pricing, most of the subjects (62.7% of enterprises) using cost method. 16.1% of enterprises set prices based on the prices of competitors' products. 12.7% of enterprises set prices according to the marketing objectives (maximizing turnover, current income, current profit, or just survival) and 5.9% of enterprises set prices according to demand. The remaining enterprises (2.5%) use an individual approach and a combination of different approaches. Based on the importance of the factor, next hypothesis was created.

H₀: Methods used for product pricing does not affect SME's success in the domestic market.

H₁: Methods used for product pricing affect SME's success in the domestic market.

Based on hypothesis testing of relationship between the method of product pricing and SME's success in the domestic market, p-value of 0.09369 was calculated (chi-square = 7.942886, sv = 4). It means that we cannot reject the null hypothesis. According to the findings of the survey we assume that there is no dependence between pricing method of enterprise products and its success in the domestic market.

5. Discussion

Although the issue of SME's success is a relatively frequent topic, it was difficult to obtain the data needed to identify the key success factors. Because especially foreign authors deal with this theme, results of the paper are mainly based on foreign secondary data.

Based on the primary survey among SMEs, it was found that critical business activities (such as marketing activities and human resources management) are not adequately supported by employees in more than half of enterprises. Nevertheless, enterprises reported low rates of employees turnover, put the emphasis on continuous education of employees. These enterprises also very often use financial and non-financial motives when it was found that these motives affect success of these enterprises. This result is

consistent with the findings of foreign authors (e. g. Charney and Libecap, 2000; Al-Mahrouq, 2010).

It was found that production equipment is another important element of manufacturing enterprise. Especially technological and technical level influences SMEs' success. These findings are consistent with the results of international studies (Indarti and Langenberg, 2004; Al-Mahrouq, 2010; Ratnaningsih et al., 2010).

More than half of enterprises are (beyond mere production) also engaged in research and development especially in the area of quality improvement. Also in this case was found dependence between performing research and development in the enterprise and its success in the market. The same results were identified by foreign experts (Al-Mahrouqi, 2010; Ratnaningsih et al., 2010).

It should be noticed that primary data collection was limited by the lack of readiness of surveyed SMEs. Moreover it was completely anonymous survey. Another limitation is the possible influence of personality and the subjective perception of the person who filled out the questionnaire. However, data served to form judgments about Czech SMEs and knowledge of the specifics of selected success factors.

Moreover the success is not determined by the internal factors only, but external factors could be very important. This paper is focused on internal nonfinancial factors. The other attributes should be have used in next research.

6. Conclusion

The paper presents partial results of research focused on the success of SMEs. Key success factors of SMEs were identified based on the secondary research and the primary survey conducted among Czech SMEs of manufacturing industry. Success factors were thematically divided into five groups: human resources, marketing, production, management of an organization and financial management. Employees (their skills, experience, education, turnover, qualification and motivation) and entrepreneurs (their education and work experience) were identified as key factors within the group of human resources. Strategy and vision (pricing, flexibility, quality, customer service, additional services, and subscribers) are key success factors within the group of marketing. Within the group of production four key factors were identified. These are technology, innovation, research and development. Firm's management is other key group for success of SMEs; especially organizational structure of SMEs, style and efficiency of management, stable suppliers and corporate culture. Within the last group were as key factors identified method of financial management and resources used in business.

The next part of the article was focused on verification of expressed hypotheses. There were identified dependences within the testing. It was found that there exists dependence between providing employees' benefits and success of SME. There exists also dependence between technological and technical level of the production equipment and the success of the enterprise. As the last was identified that success of the SME affects, whether the enterprise conducts research and development.

Obtained data (primary and secondary) are important for further research activities focused on the success of SMEs. Key factors of SME's success will be also used for creation of a model evaluating SMEs, which will be used as a support tool for management of the SME. This model will meet the requirement of easy application and unpretentious knowledge, experiences and resources. The main benefit of the model will be an identification of SME's weaknesses.

References

- AL-MAHROUQ, M. 2010. Success Factors of small and medium-sized enterprises: The case of Jordan. In: *Journal of social science*, vol. 10, no. 1. pp. 1–16, ISSN 1549–3652.
- BLAŽEK, L. et al. 2008. Konkurenční schopnost podniků: (analýza faktorů hospodářské úspěšnosti). 1. vyd. Brno: Masarykova univerzita, 211 s., ISBN 978-80-210-4734-1.
- COWLING, M. 2007. Early stage survival and growth. In: *The Life Cycle of Entrepreneurial Ventures*, vol. 3, no. 6, pp. 479–506, ISBN 978-0-387-32313-8.
- EUROPEAN COMMISSION, 2012. What is an SME? In: European Commission: Entrepreneurship and SMEs [online]. European Commission [cit. 2013-10-07]. Available at: http://ec.europa.eu/growth/smes/index_en.htm
- FAIRLIE, R. W. and ROBB, A. M. 2009. Gender differences in business performance: Evidence from the characteristics of business owners survey. In: *Small Business Economics*, vol. 33, no. 4, pp. 375–395, DOI: 10.1007/s11187-009-9207-5.
- HORNE, M., LLOYD, P., PAY, J. and ROE, P. 1992. Understanding the competitive process: a guide to effective intervention in the small firms sector. In: *European Journal of Operational Research*, vol. 56, no. 1, pp. 54–66, ISSN 0377-2217.
- CHARNEY, A. and LIBECAP, G. D. 2000. The Impact of Entrepreneurship Education: An Evaluation of the Berger Entrepreneurship Program at the University of Arizona, 1985-1999. Final Report. Kansas City: The Kauffman Center for Entrepreneurial Leadership. 131 p.
- CHITTITHAWORN, C., ISLAM, A., KEAWCHANA, T. and YUSUF, D. H. M. 2011. Factors Affecting Business Success of Small and Medium Enterprises (SMEs) in Thailand. In: *Asian Social Science*, vol. 7, no. 5, ISSN 1911-2025, DOI 10.5539/ass.v7n5pl80.
- INDARTI, N. and LANGENBERG, M. 2004. Factors affecting business success among SMEs: empirical evidences from Indonesia. Small and Medium Enterprises Development Center (SMEDC), Gadjah Mada University, Yogyakarta, Indonesia.
- KISLINGEROVÁ, E., NOVÝ, I. et al. 2005. Chování podniku v globalizujícím se prostředí. 1. vyd. Praha: C. H. BECK, 422 s., ISBN 80-7179-847-9.
- KRISTIANSEN, S., FURUHOLT, B. and WAHID, F. 2003. Internet cafe entrepreneurs: pioneers in information dissemination in Indonesia. In: *The International Journal of Entrepreneurship and Innovation*, vol. 4, iss. 4, pp. 251–263, ISSN 1465-7503.
- LIN, C. Y.-Y. 1998. Success Factors of Small- and Medium- Sized Enterprises in Taiwan: An Analysis of Cases. In: *Journal of Small Business Management*, vol. 36, no. 4, pp. 43–56, ISSN 1540-627X.
- MAN, T. W. Y., LAU, T. and CHAN, K. F. 2002. The competitiveness of small and medium enterprises: a conceptualization with focus on entrepreneurial competencies. In: *Journal of Business Venturing*, vol. 17, no. 2, pp. 123–142, ISSN 0883-9026.
- MASUO, D. et al. 2001. Factors Associated with Business and Family Success: A Comparison of Single Manager and Dual Manager Family Business Households. In: *Journal of Family and Economic Issues*, vol. 22, iss. 1, pp. 55–73, ISSN 1573-3475, DOI 10.1023/A:1009492604067.

- NIEUWENHUIZEN, C., KROON, J. 2003. The relationship between financing criteria and the Access factors of entrepreneurs in small and medium enterprises. In: *Development Southern Africa*, vol. 20, no. 1, pp. 129–142, ISSN 0376-835X.
- O'FARRELL, P., HITCHENS, D. and MOFFAT L. 1992. The Competitiveness of Business Service Firms: A Matched Comparison between Scotland and the South East of England. In: *Regional Studies*, vol. 26, no. 6, pp. 519–533, ISSN 1360-0591.
- PHILIP, M. 2010. Factors affecting business success of Small & Medium Enterprises (SMEs). In: *Asia Pacific Journal of Research in Business Management*, vol. 1, iss. 2, p. 118–136, ISSN 2229-4104.
- RATNANINGSIH, A. et al. 2010. Analysis of internal and external factors for competitive advantage of Indonesian contractors. In: *Journal of Economics and Engineering*, iss. 4, p. 51, ISSN 2078-0346.
- ROSE, R. CH., KUMAR, N. and YEN, L. L. 2006. Entrepreneurs Success Factors and Escalation of Small and Medium-Sized Enterprises in Malaysia. In: *Journal of Social Sciences*, vol. 2, no. 3, pp. 74–80, ISSN 1549-3652.
- SINHA, T. N., 1996. Human Factors in Entrepreneurship Effectiveness. In: *The Journal of Entrepreneurship*, vol. 5, iss. 1., pp. 23–39, ISSN 09713557.
- STONER, J. A. and FREEMAN, E. R. 1989. *Management*. New Jersey: Prentice Hall, 196 p., ISBN 0135484219.
- VERHEES, Frans J. H. M. and Matthew T. G. MEULENBERG, 2004. Market Orientation, Innovativeness, Product Innovation, and Performance in Small Firms. In: *Journal of Small Business Management*. vol. 42, no. 2, pp. 134-154. ISSN 1540-627X.
- VODÁČEK L. and VODÁČKOVÁ, O. 2004. *Malé a střední podniky: konkurence a aliance v Evropské unii*. 1. Vyd. Praha: Management Press, 192 s., ISBN 80-7261-099-6.
- WEINZIMMER, L. G. and MANMADHAN, A. 2009. Small business success metrics: The gap between theory and practice. In: *International Journal Of Business Research*, vol. 9, no. 7, p. 166–173, ISSN 1555-1296.
- WIJewardena, H. and ZOYSA, A. 2005. Factor Analytic Study of the Determinants of Success in Manufacturing SMEs. In: 35th EISB Conference-Sustaining the Entrepreneurial Spirit Over Time, Barcelona, Spain, 12–14 September.
- YUSOF, S. M. and ASPINWALL, E. 1999. Critical Success Factors for Total Quality Management Implementation in Small and Medium Enterprises. In: *Total Quality Management*, vol. 10, no. 4–5, ISSN 0954-4127.
- ZACHARAKIS, A. L., MEYER, D. G. and DECASTRO, J. 1999. Differing Perceptions of New Venture Failure: A Matched Exploratory Study of Venture Capital and Entrepreneurs. In: *Journal of Small Business Management*, vol. 37, no. 3, p. 1–14, ISSN 1540-627X.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Extension of working lives: gender perspective of retirement timing in the Czech Republic and Sweden. Preliminary results.

Martina Rašticová¹, Pavel Žiaran², Jakub Šácha³, Clary Krekula⁴

¹*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: martina.rasticova@mendelu.cz*

²*Department of Law and Social Sciences, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: pavel.ziaran@mendelu.cz*

³*Department of Statistics and Operation Analysis, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic,
e-mail: Jakub.sacha@mendelu.cz*

⁴*Department of Social and Psychological Studies, Karlstads Universitet, Sweden,
e-mail: clary.krekula@kau.se*

Abstract

Extension of working life in relation to the demographic development belongs to the most important issues the European nations face today. The objective of this paper, which is based upon work from ISCH COST Action IS1409 *Gender and health impacts of policies extending working life in western countries*, supported by COST (European Cooperation in Science and Technology), is to analyse individual psychological factors of late workers influencing their preference to leave the labour market. The research sample is based on the data of the Survey of Health, Ageing and Retirement in Europe (wave 6), using the variables of data package Employment-Pension (containing data on self-reported aspect of work perception as job satisfaction, recognition for work, health limits, etc.) for the group of economically active persons. The research focuses on 2 countries: Sweden (N=942) and Czech Republic (N=880) as these countries are symbolically located in geographically distant and culturally different areas of the EU, however, being similar in terms of the population size. The combination of non-parametric statistical tests and logit models is used for each nation, using the variables for the gender differences. The results show that Sweden exhibits only moderate gender differences as regards the subjective work perceptions in relation to the extension of working life. Late workers in the Czech Republic exhibit a relatively wide spectrum of factors influencing the extension of working life. The results

bring suggestions on the existence of cross-cultural differences as well as information for the EU policy-makers within the framework of labour market and working life extension.

Keywords: working life extension, gender and cross-national differences, ageing, retirement, labour and retirement policies

JEL Code: J26, J28

1. Introduction

People today can look forward to more years of retirement than ever before (Adams and Rau, 2011). Many retirees choose to keep certain levels of work engagement after retirement and such workforce participation has been found to be beneficial to retirees' physical health and psychological well-being (Kim and Feldman, 2000; Zhan et al., 2009).

As an increasing proportion of married and working women are reaching retirement age, it is important to understand couples' transitions to retirement. Several studies have revealed that retirement is a joint decision of husbands and wives, suggesting that couples coordinate their retirement dates (e.g., Hurd, 1990; Gustman and Steinmeier, 2000; Zweimüller et al. 1996; Blöndal and Scarpetta, 1999; Hospido and Zamarro, 2014).

Decision-making in the work/retirement transition will be influenced by the degree of control which individuals have over key events affecting their lives. Researchers contrast those with total choice and control to those with virtually no choice at all (Arthur, 2003; Barnes et al., 2004).

Family circumstances may be relevant for some, notably those with responsibilities for caring for a spouse or parent (Mooney and Statham, 2002; Phillips et al., 2002).

Women in their 50s are viewed by Mooney and Statham (2002) as a 'pivot' generation, switching between care and work roles.

Women's labour market participation is further jeopardized by their husbands' long hours: when husbands work more than 60 hours per week, the probability of giving up work is significantly increased for mothers in professional roles—although the probability of a man leaving work is not significantly affected by his wife's working hours (Cha, 2010). A further consequence of women leaving the workforce is that more men acquire the domestic partner they need in order to perform as an ideal worker, dedicating themselves to work without domestic interference (Merilainen et al., 2004; Stier and Lewin-Epstein, 2000; Stone, 2007).

Cultural and societal norms portray men as more active, assertive, independent, and achievement-orientated, whereas women are more communal, friendly, unselfish, interdependent, expressive, and relationship-oriented (Eagly and Mladinic, 1989). These pre-defined gender roles, which stem from masculine and feminine stereotypes, support the traditional gendered division of labour where there is 'women's work' – in the form of unpaid labour – inside the household and paid 'men's work' outside. Further, because strong cultural norms influence gender roles, men and women then internalize these roles and integrate them into their identities (Kidder, 2002; Wood and Eagly, 2012). Also, regional disparities influence the approach to the employment in seniors age (Špírková et al., 2015).

Gender differences may be observed in relation to changes in the life span: for example, when women have the main responsibilities in raising a family; priorities may change when taking a career break, working part-time or experiencing conflict between family and work roles (Greenhaus and Beutell, 1985; Rašticová, Kolářová, 2015). For example,

men place more importance on achievement (e.g. Kanfer and Ackerman, 2000; Warr, 2008), power (Page and Baron, 1995), the opportunity to use initiative, a responsible job, and good chances of promotion, while women value more pleasant people to work with, good hours, and meeting people (Warr, 2008).

Financial factors are likely to be a key factor in the above finding. Price and Ginn (2003) concluded from their analysis of the General Household Survey (GHS) data that most married women (in Britain) are dependent on either their husband or the state for pension provision, whereas most men, once married, participate in additional pension schemes as part of their 'breadwinning' role. They conclude that most working age women risk individual poverty in retirement through being unable to pay additional contributions into a personal or occupational pension scheme.

2. Methodology and Data

In line with literature on factors influencing the extension of working life, and on gender and cross-cultural differences, the research question is formulated as follows:

Which subjective factors of late workers (as defined in the work-package EU Share, w6) generate gender differences with respect to the population of late workers in Czech Republic, Sweden in terms of a decision to leave early the labour market (defined by the variable Look for early retirement).

The research is based on data from the SHARE database (Survey of Health, Ageing and Retirement in Europe). SHARE is a multidisciplinary international database containing microdata about health, socio-economic situation, social and family network of respondents over 50 years old. SHARE now covers 26 European Union countries, Switzerland and Israel. The Czech Republic has been involved in the investigation periodically since the second wave of the investigation since 2006. In this research the data are used from the most recent wave, number 6 (Börsch-Supan, 2017).

The data are used from the *Employment-Pension* package, containing data on self-reported aspects of the perception of labour conditions such as job satisfaction, recognition for work, adequacy of salary, etc., defined by the five-point Likert scale. As a dependent variable is used the *Looking for early retirement* binary variable, with *yes* or *no* options. This variable is highly convenient as the responses are equally distributed.

The group of economically active persons is used. The research focuses on 2 countries: Sweden (N=942) and Czech Republic (N=880) as these countries are symbolically located in geographically distant and culturally different areas of the EU being, however similar in terms of the population size. A combination of non-parametric statistical tests and logit models is used for each nation, using dummy variables for the gender differences. The analysis is complemented by three-dimensional graphical analysis, which makes it possible to reveal more complex relations between the variables. The data for both countries are shown in the following table (Tab. 1).

Table 1: Description of the variable *Looking for early retirement*

| | Look for early retire- ment | Freq. | % | Gender | Freq. | % |
|----------------|--|-------|------|---------------|-------|------|
| | | | | | | |
| Czech Republic | No | 452 | 51.4 | Males | 398 | 45.2 |
| | Yes | 428 | 48.6 | Females | 482 | 54.8 |
| | Total | 880 | 100 | | 880 | 100 |
| Sweden | No | 633 | 61.1 | Male | 469 | 45.3 |
| | Yes | 403 | 38.9 | Female | 567 | 54.7 |
| | Total | 1036 | 100 | Total | 1036 | 100 |

Source: authors' calculations, based on EU Share, wave 6, Börsch-Supan (2017)

As dependent variables is used the set of variables of the Employment-Pension data package (wave 6), describing various aspects of relation to work. Variables are self-reported, using the Likert scale (1 – strongly agree, 4 – strongly disagree). The data are collected by the trained interviewer, using exact scenario for questioning. Dependent variables are shown in the following table (Tab. 2).

Table 2: Description of dependent variables

| | Czech Republic | | Sweden | |
|---|-----------------------|-----------|---------------|-----------|
| | Mean | SD | Mean | SD |
| 1 Satisfied with (main) job | 1.8 | 0.57 | 1.55 | 0.65 |
| 2 (Main) job physically demanding | 2.53 | 0.93 | 2.85 | 1.06 |
| 3 Time pressure due to a heavy workload in (main) job | 2.42 | 0.76 | 2.6 | 0.90 |
| 4 Little freedom to decide how I do my work in (main) job | 2.75 | 0.83 | 3.18 | 0.83 |
| 5 Opportunity to develop new skills in (main) job | 2.12 | 0.71 | 1.96 | 0.77 |
| 6 Receive support in difficult situations in (main) job | 2.13 | 0.64 | 1.98 | 0.76 |
| 7 Receive recognition for work in (main) job | 2.29 | 0.68 | 1.95 | 0.72 |
| 8 Salary or earnings are adequate in (main) job | 2.5 | 0.73 | 2.32 | 0.88 |
| 9 Poor prospects for (main) job advancement | 1.93 | 0.76 | 1.95 | 0.86 |
| 10 Poor (main) job security | 2.7 | 0.74 | 3.35 | 0.82 |
| 11 Afraid health limits ability to work before regular retirement in (main) job | 3.93 | 1.77 | 4.23 | 1.58 |

Source: authors' calculations, based on EU Share, wave 6, Börsch-Supan (2017)

Owing to the characteristics of the dependent variable (binary), the logit model is used enabling to reveal the significance of the given variables. Dummy variables are used for males and females, so that we could identify the gender specific differences.

The combination of non-parametric statistical tests and logit models is used for each nation, using the dummy variables for the gender differences. A separate model for each country is provided.

3. Results

Following the descriptive analyses, a logit model is developed first for the Czech Republic and later for Sweden. All factors were tested separately for men and women. The table below (tab. 3) brings the differences and similarities between men and women in terms of the variable: *Looking for early retirement*.

While these variables influence seeking early retirement for both men and women: *job satisfaction* (the more satisfied a senior is the less early retirement is sought), *fear of health limits* (the more afraid of health limits a senior is the more retirement is sought), *physically demanding job* (the more physically demanding a senior's job is the more retirement is sought), these variables are significant only for male seniors: *salary adequate* (the more the men perceive their salary as adequate the less they are ready for early retirement) and time pressure and stress (the more the men feel time pressure and stress in their jobs the less they are ready for early retirement). Regarding female seniors, these factors are relevant: *support received* (the more support women receive in their jobs, the less they seek early retirement), *new skills development* (the more development of new skills provided in their jobs, the less retirement is sought by women), *little freedom to decide* (if women perceive little freedom to decide, they seek early retirement).

3.1. Analysis of the Czech Republic

Table 3: Binary logit model, dependent variable *Looking for early retirement*, country Czech Republic, all economically active, dummy variables separately for males and females, independent variables are sorted according to the regression coefficients, all listed variables are statistically significant ($p < 0.05$), insignificant variables are excluded. Parameters of the model: Nagelkerke R² = 0.23

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|-------|------|-------|-----|------|--------|
| Constant | -1.08 | 0.79 | 1.87 | 1.0 | 0.17 | 0.34 |
| Aspects with similar importance for both | | | | | | |
| Job satisfaction MAL | 0.79 | 0.26 | 9.44 | 1.0 | 0.00 | 2.20 |
| Job satisfaction FEM | 0.65 | 0.22 | 8.46 | 1.0 | 0.00 | 1.91 |
| Afraid of health limits FEM | -0.17 | 0.07 | 6.37 | 1.0 | 0.01 | 0.85 |
| Afraid of health limits MAL | -0.21 | 0.07 | 8.94 | 1.0 | 0.00 | 0.81 |
| Physically demanding job FEM | -0.33 | 0.13 | 6.18 | 1.0 | 0.01 | 0.72 |
| Physically demanding MAL | -0.39 | 0.14 | 7.41 | 1.0 | 0.01 | 0.68 |
| Differences for males | | | | | | |
| Salary adequate MAL | 0.68 | 0.20 | 12.28 | 1.0 | 0.00 | 1.98 |
| Time pressure stress MAL | 0.37 | 0.16 | 5.18 | 1.0 | 0.02 | 1.45 |
| Differences for females | | | | | | |
| Support received FEM | 0.44 | 0.21 | 4.50 | 1.0 | 0.03 | 1.56 |
| New skills development FEM | 0.41 | 0.18 | 5.01 | 1.0 | 0.03 | 1.51 |
| Little freedom to decide FEM | -0.30 | 0.15 | 4.22 | 1.0 | 0.04 | 0.74 |

Source: authors' calculations, based on EU Share, wave 6, Börsch-Supan (2017)

3.2. Analysis of Sweden

The table below (tab. 4) brings the differences and similarities between men and women in terms of the variable: *Looking for early retirement* in Sweden.

While these variables influence the seeking of early retirement for both Swedish men and Swedish women: *job satisfaction* (the more satisfied a senior is the less early retirement is sought), *fear of health limits* (the more afraid of health limits a senior is the more retirement is sought), these variables are significant only for male seniors: *new skills development* (the more development of new skills provided in their jobs, the less retirement is sought by women), *support receive* (the more support Swedish men receive in their jobs, the early retirement is sought). For Swedish female seniors, based on the SHARE data, there was not found any specific factors influencing their decision regarding early retirement.

Table 4: Logit model, dependent variable *Looking for early retirement*, country Sweden, all economically active, dummy variables separately for males and females, independent variables are sorted according to the regression coefficients, all listed variables are statistically significant ($p < 0.05$), insignificant variables are excluded. Parameters of the model: Nagelkerke R² = 0.19

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|-------|------|-------|----|------|--------|
| Constant | -0.85 | 0.69 | 1.52 | 1 | 0.22 | 0.43 |
| Aspects with similar importance for both | | | | | | |
| Job satisfaction FEM | 0.70 | 0.17 | 16.37 | 1 | 0.00 | 2.01 |
| Job satisfaction MAL | 0.59 | 0.20 | 8.56 | 1 | 0.00 | 1.80 |
| Afraid of health limits FEM | -0.18 | 0.06 | 9.28 | 1 | 0.00 | 0.84 |
| Afraid of health limits MAL | -0.20 | 0.08 | 6.49 | 1 | 0.01 | 0.82 |
| Differences for males | | | | | | |
| New skills development MAL | 0.30 | 0.14 | 4.37 | 1 | 0.04 | 1.34 |
| Support receive MAL | -0.33 | 0.17 | 3.99 | 1 | 0.05 | 0.72 |
| Differences for females | | | | | | |
| no aspects with statistical significance | | | | | | |

Source: authors' calculations, based on EU Share, wave 6, Börsch-Supan (2017)

4. Discussion

This brief analysis brings intriguing results regarding the differences between men and women in two different countries, Czech and Sweden, in terms of their expectation, readiness for and seeking of retirement. Unfortunately, the page limit of this conference paper does not allow us to provide and present a more detailed analysis of the issues in question regarding the retirement timing in these two countries. Still such problems are worth a deep and thorough research.

However, the results are promising in many aspects as they reveal differences between countries as well as between the genders of seniors.

The limits of this paper are particularly caused by the missing values in the SHARE database for the Czech Republic and for Sweden and by the limitations of quantitative approach, which does not allow us to interpret the results and understand them in a broader context. That is one of the reasons (the other reason being the heterogeneity of seniors) why we strongly recommend the application of a qualitative or mixed-method

approach when focusing on the issues of early retirement and retirement timing in general. In addition, the specific cultural background and the policies regarding extended working lives as applied to each country has to be taken into consideration.

5. Conclusion

The present paper brings preliminary results focusing on the extension of working lives, especially on the gender aspect of retirement timing in the Czech Republic and Sweden. The quantitative analysis was based on the SHARE data from the Czech Republic and Sweden of the wave 6.

The results suggest that there might be universal factors influencing the retirement timing for men, women from different countries: *job satisfaction* and *fear of health limitations* that influences the seeking of early retirement. However, according to the results, gender and country matter if we focus on other factors such as *support received* and *new skills development*. Even though, based on these results these issues can be hardly be explained and interpreted in sufficiently, we believe that presenting these results will motivate researchers in focusing on gender and country specifics when dealing with retirement timing. The research also helps formulate hypotheses and future directions of the research on antecedents and moderators of retirement timing.

Acknowledgement

This article is based upon work from ISCH COST Action IS1409 *Gender and health impacts of policies extending working life in western countries*, supported by COST (European Cooperation in Science and Technology).

References

- ADAMS, G. A. and RAU, B. L. 2011. Putting off tomorrow to do what you want today: Planning for retirement. *American Psychologist* 66: 180–192.
- ARTHUR, S. 2003. *Money, Choice and Control*. Bristol/York: Policy Press/Joseph Rowntree Foundation.
- BARNES, H., PARRY, J. and TAYLOR, R. 2004. *Working After State Pension Age: Qualitative Research*. Department for Work and Pensions (DWP) Research Report No. 208, London: DWP.
- BLONDAL, S. and SCARPETTA, S. 1999. *The Retirement Decision in OECD Countries*. OECD Economics Department Working Papers No. 202.
- BORSCH-SUPAN, A. 2017. *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6*. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w6.600.
- EAGLY, A. H. and MLADINIC, A. 1989. Gender stereotypes and attitudes toward women and men. *Personality and Social Psychology Bulletin* 15(4): 543–558.
- GREENHAUS, J. H. and BEUTELL, N. J. 1985. Sources of Conflict Between Work and Family Roles. *Academy of Management Review* 10: 76–88.

- GUSTMAN, A. and STEINMEIER, T. 2000. Retirement in dual-career families: a structural model. *J Labor Econ* 18(3): 503–545.
- HOSPIDO, L. and ZAMARRO, G. 2014. Retirement patterns of couples in Europe. *IZA J Eur Labor Stud* 3:12.
- HURD, M. J. 1990. The Joint Retirement Decision of Husbands and Wives. In: Wise DA (ed) *Issues in the Economics on Aging*. University of Chicago Press, Chicago: 231–258.
- CHA, Y. 2010. Reinforcing Separate Spheres: The Effect of Spousal Overwork on Men's and Women's Employment in Dual-Earner Households', *American Sociological Review* 75(2): 303–329.
- KANFER, R. and ACKERMAN, P. L. 2000. Individual Differences in Work Motivation: Further Explorations of trait framework. *Applied Psychology: An International Review*, 49: 470–482.
- KIDDER, D. L. 2002. The influence of gender on the performance of organizational citizenship behaviors. *Journal of Management* 28: 629–648.
- KIM, S. and FELDMAN, D. C. 2000. Working in retirement: The antecedents of bridge employment and its consequences for quality of life in retirement. *Academy of Management Journal* 43: 1195–1210.
- MERILAINEN, S., TIENARI, J., THOMAS, R., et al. 2004. Management Consultant Talk: A Cross-Cultural Comparison of Normalizing Discourse and Resistance', *Organization* 11(4): 539–64.
- MOONEY, A., STATHAM, J. and SIMON, A. 2002. *The Pivot Generation: Informal and Work after 50*, Bristol/York: The Policy Press/Joseph Rowntree Foundation.
- PAGE, R. C. and BARON, H. 1995. Identifying What Motivates Managers. Paper presented at the 10th Annual Conference of the Society for Industrial and Organizational Psychology, Orlando, FL.
- PRICE, D. and GINN, J. 2003. Sharing the Crust? Gender, Partnership Status and Inequalities in Pension Accumulation'. In Arber, S., Davidson, K. and Ginn, J. (eds) *Maidenhead: Open University Press. Gender and Ageing*: 127–147.
- PHILLIPSON, C. 2002. *Transitions from Work to Retirement: Developing a New Social Contract*. Bristol/York: The Policy Press/Joseph Rowntree Foundation.
- RAŠTICOVÁ, M., KOLÁŘOVÁ, I. (2015) Myths about Ageing Population – Findings of A Research. In Soliman, K.S. (Ed.) *Proceedings of the 25th International Business Information Management Association Conference: Innovation Vision 2020: From Regional Development Sustainability to Global Economic Growth*, May 7–8, 2015, Amsterdam, Netherlands. ISBN: 978-0-9860419-4-5, 3896–3902 pp.
- ŠPIRKOVÁ, D., ZUBKOVÁ, M., STEHLÍKOVÁ, B. (2015). Regional disparities in the context of economic growth. *Znalosti pro trzni praxi 2015: Ženy – podnikatelky v minulosti a současnosti*: 934–941.
- STATISTICA 12. 2017. Conceptual Overviews – Surface Plots. [Online]. Available at: <http://documentation.statsoft.com/STATISTICAHelp.aspx?path=Graphs/Graph/UnderstandingGraphs/Concepts/ConceptualOverviewsSurfacePlots>. [Accessed 2017, December 17].

- STIER, H. and LEWIN-EPSTEIN, N. 2000. Women's Part-Time Employment and Gender Inequality in the Family'. *Journal of Family Issues* 21(3): 390–410.
- STONE, P. 2007. *Opting Out? Why Women Really Quit Careers and Head Home*. Berkeley, CA: University of California Press.
- WARR, P. 2008. Work values: Some demographics and cultural correlates. *Journal of Occupational and Organizational Psychology* 81: 751–775.
- WOOD, W. and EAGLY, A. H. 2012. Biosocial construction of sex differences and similarities in behavior. *Advances in Experimental Social Psychology* 46: 55–103.
- ZHAN, Y., WANG, M., LIU, S. and SHULTZ, K. S. 2009. Bridge employment and retirees' health: A longitudinal investigation. *Journal of Occupational Health Psychology* 14: 374–389.
- ZWEIMULLER, J., WINTER-EBMER, R. and FALKINGER, J. 1996. Retirement of spouses and social security reform. *Eur Econ Rev* 40(2): 449–472.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Do students of management and economics consider choosing jobs in social economy organizations?

Janusz Reichel¹ and Błażej Socha²

¹Department of City and Regional Management, Faculty of Management, University of Łódź, ul. Narutowicza 68, 90-136 Łódź, Poland, e-mail: janusz.reichel@uni.lodz.pl

²Department of Finance and Strategic Management, Faculty of Management, University of Łódź, ul. Narutowicza 68, 90-136 Łódź, Poland, e-mail: blazej.socha@uni.lodz.pl

Abstract

People used to think that graduates in management and economics are usually looking for jobs only in the enterprise sector. The authors assumed that there is a group of such students who plan to start a career in the public or social sector too. The authors' interest is the preferences regarding the choices of future jobs specially in the sector of social enterprises and non-governmental organizations. The article presents the shape of the labour market in that respect in Poland, and also examines whether future graduates in management and economics seeks for opportunities for the development of their professional career in the social sector and whether they have any knowledge about it. For this purpose, a research was carried out. Students from the Faculty of Management and the Faculty of Economics and Sociology at the University of Lodz, Poland were surveyed. Authors examined students' preferences revealing during an assessment of a future employer and their entrepreneurial traits with emphasis on a level of knowledge and awareness about the social sector. The research revealed that only very small fraction of students plan to work in social sector and their knowledge about the sector is relatively very weak.

Keywords: labour market, social economy, occupational choice

JEL Code: J24, J21, J49

1. Introduction

The labour market is constantly changing. In the past significant shifts in employment were observed eg. lessen the amount of employment in agriculture, migration of workers from industrial to service sector (see for example: Bielik and Rajčániová, 2008 or Batóg and Batóg, 2001). Nowadays we face the beginning of another revolution in employment: AI and robots will replace people from many occupations leaving them alternative to stay outside the labour market or gain new abilities that allow to find different jobs. According

to analysts from the McKinsey Institute, as many as 7.5 million jobs in Poland today can be potentially replaced by robots and algorithms, which is about 45% of all jobs on a labour market (Ratajczak, 2017). There are potentially many options to utilize that already exist and there will probably be developed also new non-existing yet jobs of the future. This will create challenges both to public policies of future societies as well as for individuals and their occupational choices. Three main trends generating jobs in the near future: higher health and education spending thanks to rising incomes and higher spending, healthcare and related jobs because of aging of populations and jobs related to developing and deploying new technologies (Manyika *et al.*, 2017 and MGI, 2017, p. 6–7). It means that one of existing possibility is to turn people's attention to the non-profit and social economy sectors: non-governmental organizations and social enterprises, especially those that deal with health problems and elderly people. In the paper authors decide to examine wheat-ear students of management and economics consider their future jobs in these sectors.

2. Labour market in Poland and employment in a social economy sector

This chapter will shortly present the labour market in Poland and then the role of the social sector as a source of jobs. The organizations of the social sector in Poland will be described and the employment in this sector will be presented.

2.1. Labour market in Poland

Poland is one of the fastest developing EU countries, with gross value added in national economy in 2017 increased by 4.3%. According to Table 1, recent years have witnessed a gradual rise in the number of employed persons in the enterprise sector and, simultaneously, increase in nominal wages and salaries, which has had a beneficial effect on the unemployment rate indicator.

Table 1: Employment in national economy in Poland (end of period).

| | 2010 | 2012 | 2014 | 2016 | 2017 |
|--|-------|-------|-------|-------|-------|
| Employment in national economy (thousand people) | 14107 | 14172 | 14563 | 15293 | 15720 |
| Paid employment in the enterprise sector (thousand people) (1) | 5373 | 5549 | 5529 | 5760 | 6017 |
| Unemployment rate (%) | 12.40 | 13.40 | 11.40 | 8.20 | 6.60 |

(1) Data concern economic entities employing more than 9 persons.

Source: GUS, 2018c.

One of the characteristics of the labour market in Poland is the structural mismatch which is the result of the relatively low labour mobility and spatial concentration of unemployment. Although the scale of this phenomenon was much smaller than in previous years (GUS, 2017b, p. 93).

2.2. Employment in social economy sector

2.2.1. Social economy organizations

Social economy can be understood as “a tool of economic mobilization and social neglected communities/areas” and the formula of “increasing the participation of their members/residents in the exchange of economic and public life” (Każmierczak and Rymśza, 2007, p. 11). Social economy is a part of economy. What distinguishes it from the traditional understanding of business is the fact that besides economic goals, attention is also paid to social objectives, including the re-entering of the labour market or the entry into the labour market of people with risk of social exclusion. As the statistics show, the market for social economy is “2 million social economy enterprises in Europe, representing 10% of all businesses in the EU. More than 11 million people – about 6% of the EU’s employees – work for social economy enterprises” (EC, 2018). Organizations in the framework of social entrepreneurship can have a different legal form and lead diverse economic activities. In this regard, there may also be differences between the economies of particular countries. Despite this differences the European Research Network (EMES) proposed its own, more universal, definition of social enterprise (for details see for example: ekonomiaspoleczna.pl, 2013; see also: Communication from the Commission to the European Parliament ..., 2011).

Social enterprises and other entities in the social economy like typical companies face the problems and calls that are characteristic of a competitive market. What is added value is the creation of jobs for people who would normally not have a chance to become active. On the one hand, social enterprises are firmly rooted in the non-governmental sector, basing themselves on the core of their work in carrying out the social mission and addressing the specific problems faced by modern societies. What is more, e.g. in Poland, non-governmental organizations conducting business activity are qualified also as social economy entities. On the other hand, in order to multiply profits, social enterprises have to use actions typical for profit-oriented organizations such as strategy, promotion, customer acquisition and retention, innovation, etc. The specificity of social economy entities also includes reinvesting profits. Here the priority is again social activity and investment in the development of workers and communities, which distinguishes these organizations from traditional business.

Organizations of social economy in Poland include: associations and foundations conducting economic activity or charity activities, economic self-government organizations, cooperatives (including cooperatives of invalids), social cooperatives, mutual insurance companies and other reciprocal organizations, and other forms in which social entrepreneurship can be realized, including traditional forms of doing business, e.g. some limited liability companies.

2.2.2. Employment in non-profit organizations and social enterprise

Information on employment in non-profit sector organizations describes: active associations and similar social organizations, foundations, faith-based charities, economic and professional self-government as well as employers' organizations.

Based on the data from Table 2, a steady increase in the number of employees in the presented period can be observed. For approximately 85% of those employed in these organizations, this is the main place of work (this figure is maintained at this level more or less for the analyzed period of time). The high percentage of women (73.9% women in

2016) is noteworthy. In the same year, people with certified disability accounted for 6.4% of employees in described organizations.

Table 2: Employment in non-profit organizations based on employment contracts [thousand people].

| | 2010 | 2012 | 2014 | 2016 |
|------------|-------|-------|-------|-------|
| Employment | 132.5 | 147.0 | 150.4 | 162.4 |
| Women | 93.8 | 105.7 | 109.2 | 120.1 |

Source: GUS, 2018a and GUS, 2017a.

The number of people employed in the sector is associated also with other people that work for these organizations on basis of so called civil law contracts – there were over 400 thousand of persons in 2016 (GUSa and GUS, 2017a). As this is usually part time job it would not be included in the below calculations.

The number of people employed in 2015 in cooperatives (employing up to 10 people) amounted to 210,691 (authors were not able to find comparable data on employment in the cooperative sector for 2016). Estimated employment in all cooperatives is about 300,000 people (and this estimation will be used to farther calculations). As the Central Statistical Office research shows, employment in this sector has been falling in recent years (GUS, 2018b). When one take into account only social cooperatives 4.2 thousand people were employed under a contract of employment in 2016 (including 58% women and 26% people with disabilities) (GUS, 2018d, p. 4).

Based only on the above data, one can assume that employment (employment contracts) in the social sector in Poland is around 462.4 thousand people in 2016 but only 166.6 thousand when including only social cooperatives (these above calculations are confirmed for example by the CIRIEC study: Monzón and Chaves, 2017, p. 61–62). This is respectively about 3% and 1.09%. But still these numbers shows all contracted even those for whom this is not the main place of work. When referring only to employed in enterprise sector the above numbers are respectively: around 8% and 2.89%.

The 3% of labour market mentioned above shows that this is still not very meaningful sector in terms of number of people employed. But its role will certainly increase. If Poland will continue to develop in the way typical for western economies this sector is about to grow even till 9% as examples of Belgium, France, Luxemburg and Netherlands show (Monzón and Chaves, 2017, p. 62).

3. Methodology and Data

For the purpose of the research a research survey was designed and conducted among students of the 3rd year of bachelor studies and the second year of complementary master studies of business majors at the University of Łódź, Poland. The survey questionnaire was made available in December 2017 in the form of an electronic questionnaire. The survey was completed by 130 respondents and the ratio of filled questionnaires to all that enter a survey page was 38%. In order to achieve the research goal, a standard statistical analysis of results was performed and K-means cluster analysis to assign cases to a fixed number of groups whose characteristics are based on a set of specified variables.

4. Results

The majority of surveyed students associated their professional plans with the business sector (82.9%). As presented in Table 3, 33.8% of respondents would like to work in corporations. The same number would like to be employed in the sector of SMEs. That means that more than 67.8% of students plan to be an employee. Only a relatively small group of people plan to start their own business (13.8%) or take over a family business (1.5%). Only 7.7% of respondents are interested in work in public administration and 0.8% in the higher education sector. Among 6.2% of respondents who responded “other”, there are people who do not have specific plans for the future. Only 2.3% of respondents plan to work in non-governmental organizations. The research also shows that the fact of combining studies and professional work does not significantly affect student career plans.

Table 3: Career plans after finishing studies

| | Frequency | Percent | Cumulative Percent |
|---|-----------|---------|--------------------|
| Self-employed (my own business idea) | 18 | 13.8 | 13.8 |
| Own business (family business takeover) | 2 | 1.5 | 15.4 |
| Corporation employee | 44 | 33.8 | 49.2 |
| SME employee | 44 | 33.8 | 83.1 |
| Public administration employee | 10 | 7.7 | 90.8 |
| Academic teacher | 1 | 0.8 | 91.5 |
| NGO employee | 3 | 2.3 | 93.8 |
| Other | 8 | 6.2 | 100.0 |
| Total | 130 | 100.0 | |

Source: own elaboration.

The surveyed students were asked about their preferable factors that determine the choice of employer (Table 4).

Table 4: Factors determining the choice of employer (where 1 denotes: totally not important; 7 denotes: very important).

| No. | Factor | Mean |
|-----|--|------|
| 1 | Distance from the place of residence | 4.55 |
| 2 | Easy and fast access to the workplace | 5.12 |
| 3 | Salary | 6.19 |
| 4 | Social package (fitness card, additional health insurance etc.) | 4.50 |
| 5 | Company car | 3.27 |
| 6 | Company mobile | 3.20 |
| 7 | The atmosphere at work | 6.29 |
| 8 | A clear division of responsibilities | 6.28 |
| 9 | Democratic management style | 4.92 |
| 10 | Organizational values consistent with personal values | 5.37 |
| 11 | Social projects run by the employer (sponsoring, volunteering etc.) | 3.59 |
| 12 | Activities for environmental protection | 3.62 |
| 13 | The image of the employer | 5.12 |
| 14 | Opinions of other employees | 5.41 |
| 15 | Opinions of the stakeholders (local community, non-governmental organization etc.) | 4.99 |
| 16 | Honesty and ethical standards compliance by the employer | 6.22 |

Source: own elaboration.

The factors determining the choice of employer the most frequently chosen by students are as follows: the atmosphere at work, a clear division of responsibilities, honesty and ethical standards compliance by the employer and salary.

In the next question students were asked to declare their entrepreneurship competences (table 5).

Table 5: Entrepreneurship competences (where 1 denotes: I do not have skills in that the area; 7 denotes: I do have excellent skills in the area).

| No. | Factor | Mean |
|-----|--|------|
| 1 | The ability to take risk | 4.50 |
| 2 | The ability to analyse the market / environment | 4.65 |
| 3 | Creativity | 5.35 |
| 4 | The ability to self-improvement | 5.54 |
| 5 | Negotiation skills | 4.63 |
| 6 | Leadership skills | 4.72 |
| 7 | The ability to build a professional network of contacts | 4.32 |
| 8 | Effective management | 4.82 |
| 9 | Cooperation with others | 5.55 |
| 10 | The ability to advise | 5.14 |
| 11 | The ability to identify others' needs | 5.01 |
| 12 | Empathy | 5.55 |
| 13 | The ease of establishing contacts | 5.03 |
| 14 | Communication skills | 5.35 |
| 15 | Striving for perfection and continuous improvement of the effects of their actions | 5.62 |

Source: own elaboration.

The winning competences are as follows: striving for perfection and continuous improvement of the effects of their actions, empathy, cooperation with others and the ability to self-improvement, creativity and communication skills. Students generally seem to have a relatively good self-assessment of their competencies and skills.

One the most important question tried to explore whether students possess at least a fragmentary knowledge about the organizations in the social sector (Table 6).

Table 6: Knowledge and awareness about the social sector (where 1 denotes respondent's opinion the least compliant with the reality; 7 denotes full compliance with reality)

| No. | Verified element of knowledge on the basis of the following sentences | Mean |
|-----|--|------|
| 1 | In non-governmental organizations people usually work voluntarily | 3.59 |
| 2 | Social entrepreneurship is an organization that does not make a profit | 4.06 |
| 3 | Social enterprises are not competitive with typical business | 3.95 |
| 4 | Social enterprises are a form of social aid | 3.77 |
| 5 | In social enterprises usually people at risk of social exclusion work | 3.64 |
| 6 | Social enterprises do not employ a manager | 5.28 |
| 7 | Social entrepreneurship combines economic and social goals | 4.95 |

Source: own elaboration.

The average knowledge of responding students on social economy and non-profit sector seems to be relatively bad – almost all means oscillate around the centre of the scale (just right in the middle between compliance and non-compliance of answers with the reality). Only two sentences were recognized by the respondents more accurately: more students know that social enterprises also employ managers and know that social entrepreneurship means combining economic and social goals.

In the next step of the research authors assigned students to 2 clusters whose characteristics were based on two questions on: 1) factors determining the choice of employer

and 2) entrepreneurship competences (revealing clusters separately for these two questions). Next, we checked whether these clusters differ significantly in terms of knowledge and awareness about the social sector. Results are shown in the figure 1 and 2.

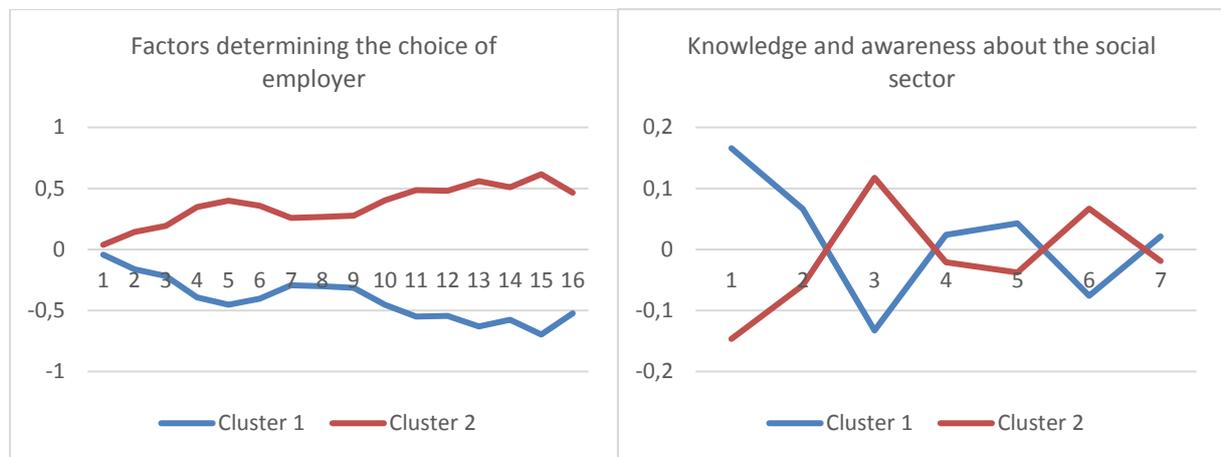


Figure 1: Two clusters based on factors determining the choice of employer (legend for the left chart is in Table 4 and for the right chart in Table 6). All factors contribute to separation between clusters (p -value < 0.05). Means for the whole group = 0.

Source: own elaboration.

The left chart in Figure 1 presents the surveyed students divided into two clusters based on factors determining the employer's choice. The first cluster, constituting 47% of respondents, assessed the validity of all employer features below the average. In turn, the cluster 2, representing 53%, validity of all features assessed above the average. The largest differences in the surveyed groups were observed in the scope of the validity of the opinion of stakeholders about the company as well honesty and ethical standards compliance by the employer. In general both clusters seem to have different (completely opposite) ranking of factors that determine the choice of the employer. Cluster 2 is more aware of the fact that social enterprises may be competitive with a typical business and that a manager is employed in social enterprises (the right chart in Figure 1). Cluster 1, usually presenting lower answer about choice of employer, more accurately assessed 5 out of 7 features of social enterprises.

Analysing the assessment of entrepreneurial competences (see Figure 2), one can observe a larger group (cluster 2 – 74% of respondents), which evaluates its entrepreneurial abilities above average and less numerous (26% of respondents) assessing their competences below average. Empathy differs the least in both groups.

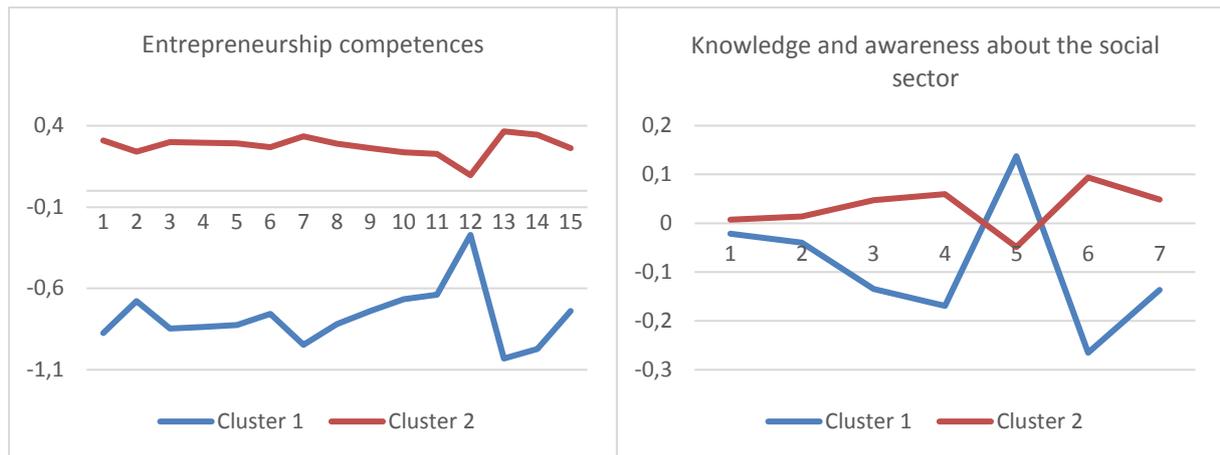


Figure 2: Clusters based on entrepreneurship competences (legend for the left chart is in Table 5 and for the right chart in Table 6). All factors contribute to separation between clusters (p -value < 0.05). Means for the whole group = 0.

Source: own elaboration.

A group of students assessing their competences above average is characterized by a greater knowledge of the features characterizing social enterprises (6 out of 7 features). The division on cluster in the above figure does not correspond to the division done in the figure 1.

Respondents were also asked about potential factors that could enable them to establish their own social enterprise. The distribution of answers is presented in the Table 7.

Table 7: Factors that could enable establishment of own social enterprise

| | Percentage |
|---|------------|
| I would want to help other people | 48.4 |
| I would be able to work with people I like | 46.4 |
| An innovative idea | 43.7 |
| The ability to do things that are important and needed in society | 41.3 |
| I would want to take on new challenges | 40.1 |
| The possibility of receiving support for activities from public funds | 31.7 |
| I would want to check myself in the role of manager of the organization | 28.6 |
| Independence in making decisions | 27.8 |
| Less risk than in a typical business | 21.4 |
| Someone's help in establishing the organization | 15.9 |

Source: own elaboration.

The factors which may encourage business oriented students to set up a social enterprise are mainly: willingness to help other people and society in general. An innovative idea, ability to work with liked people and facing with new challenge could also make students more inclined to establish own social business. Respondents are less interested in risk avoidance and professional help in establishing their own social enterprises.

5. Discussion and Conclusions

The presented research revealed that only 2.3% of students of management and economy faculties in University of Łódź plan to work in non-governmental organizations. This exactly corresponds with the percentage of employment in the social sector in Poland according to the CIRIEC report (Monzón and Chaves, 2017, p. 62) and data presented in the paper. As examples of western European countries show the probable meaning of the social sector (in terms of the labour market share) will continue to grow also in Poland. Even if the interest in the social sector fits to the current needs of the economy in Poland it does not mean that this is a sustainable situation. The probable increase of the social sector share in the labor market in the near and distant future requires the existence of awareness and knowledge about this sector and the opportunities it creates. Unfortunately, the current knowledge of the surveyed students seems insufficient (or at least very low).

When aggregated the factors determining the choice of employer, the students were asked about, present the below picture (Figure 3):

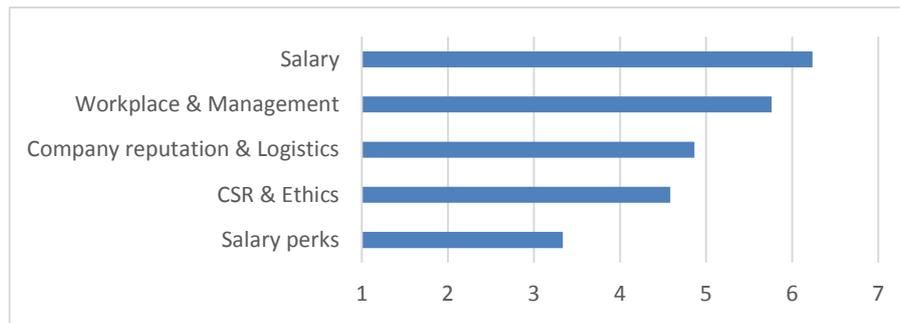


Figure 3: Attractiveness of aggregated attributes of potential employer for respondents (where 1 denotes: totally not important; 7 denotes: very important).

Source: own elaboration.

These results are confirmed also by the already existing rare studies on the subject – they show that students when choosing a future employer take into account, first of all, work related factors: the prospects of their own development, training and courses, the amount of proposed earnings and promotion opportunities. Other elements and the involvement of the company in social activities (CSR) are almost at the end of the ranking (see for example: Karbowski *et al.*, 2007, p.13). More wider the European Values Study research discovered that considering job-related aspects, 14 Central and Eastern European countries (and Poland among them) “give preference to high salaries and wages, job security, pleasant colleagues and an interesting job” (Borgulya and Hahn, 2008, p. 235–236). The same can be said about the Global Leadership & Organizational Behavior Effectiveness Studies (the GLOBE) results, worldwide conducted research aimed at gaining information about the impact of socio-cultural factors on business behaviour (see for example: Bakacsi *et al.*, 2002 and Komor, 2013).

Tomlinson (2012, p. 409–410) points out that the correspondence between higher education and the labour market is dependent largely on three main dimensions: knowledge and skills that it transfers to graduates, “the legitimatisation of credentials that serve as signifiers to employers and enable them to ‘screen’ prospective future employees and [...] the enrichment of personal and cultural attributes” (‘personality’). Referring to the first dimension one can conclude that current management education does not cover enough knowledge about the possibilities of entrepreneurial career development in the social economy sector. The second dimension seems to be neutral to the objectives of current analysis. But the third one can be again crucial. Students present a relatively good self-assessment of their competencies and skills. But the previous research (eg. Matejun, 2016) shows high subjectivism in self-assessment of entrepreneurial competences of students. The key question here is whether the process of “enrichment of personality” during the higher education of managers encompasses such competencies, skills, abilities and personal character traits that in result turn students attention to the possibilities of achieving their professional ambitions as part of a career developed in various sectors of the economy, including social economy sector. Presented research shows that these students that better assessed their own competencies have also better knowledge about a social sector in general what may in the future lead to a decision to start a professional career in this sector, However, this requires further confirmation in the research.

Acknowledgements

The paper was created in relation to activities of the project “OPEN MIND – gamified platform and open online course in Social Entrepreneurship for female learners and students from diverse fields of study” [nr: 2016-1-BG01-KA203-023754], supported by the European Commission funds under the Erasmus+ program. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein. The research, publication and conference participation is financed by the Polish Ministry of Science and Higher Education from financial resources for science in the years 2017–2018 granted for the implementation of an international co-financed project [nr. 3774/Erasmus+/2017/2].

References

- BAKACSI G., SÁNDOR T., ANDRÁS K., VIKTOR I., 2002, Eastern European cluster: tradition and transition, *Journal of World Business*, Volume 37, Issue 1, Spring 2002, Pages 69–80, [https://doi.org/10.1016/S1090-9516\(01\)00075-X](https://doi.org/10.1016/S1090-9516(01)00075-X).
- BATÓG B., BATÓG J., Analiza zbieżności struktur zatrudnienia w wybranych krajach wysokorozwiniętych, *Zeszyty Naukowe Uniwersytetu Szczecińskiego Nr 320, Prace Katedry Ekonometrii i Statystyki nr 11*, 2001, p. 155–163.
- BIELIK P., RAJČÁNIOVÁ M., Shift-share analysis of employment growth – the case of the V4 countries, *Agric. Econ. – Czech*, 54, 2008 (8): 347–351.
- BORGULYA A., HAHN J., 2008, Work related values and attitudes in Central and Eastern Europe, *Journal for East European Management Studies*, ISSN 0949-6181, Hampp, Mering, Vol. 13, Iss. 3, pp. 216–238.
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 2011, Social Business Initiative Creating a favourable climate for social enterprises, key stakeholders in the social economy and innovation (COM/2011/0682 final).
- EC (European Commission), 2018, Social economy in the EU, European Commission webpage, [Online]. Available at: https://ec.europa.eu/growth/sectors/social-economy_en [Accessed: 17 January 2018].
- ekonomiaspoleczna.pl, 2013, Co to jest ekonomia społeczna?, [Online]. Available at: www.ekonomiaspoleczna.pl/x/433225 [Accessed: 26 November 2010].
- GUS, 2017a, Działalność stowarzyszeń i podobnych organizacji społecznych, fundacji, społecznych podmiotów wyznaniowych oraz samorządu gospodarczego i zawodowego w 2016 r. – wyniki wstępne. Notatka informacyjna, Warszawa, 27.12.2017 r.
- GUS, 2017b, Human capital in Poland in the years 2012-2016, Gdańsk, [Online]. Available at: http://stat.gov.pl/download/gfx/portalinformacyjny/en/defaultaktualnosci/3316/5/5/1/human_capital_in_poland_2012_2016.pdf [Accessed: 26 February 2018].
- GUS, 2018a, Bank danych lokalnych, [Online]. Available at: <https://bdl.stat.gov.pl> [Accessed: 23 February 2018].

- GUS, 2018b, Informacja o podstawowych danych ekonomiczno – finansowych dotyczących sektora spółdzielczego w roku 2015 i ich zmian w latach 2011–2015, [Online]. Available at: <https://www.krs.org.pl/index.php/projekty/wspopraca-z-gus>, [Accessed: 26 February 2018].
- GUS, 2018c, Informacja o sytuacji społeczno-gospodarczej kraju w 2017 r., [Online]. Available at: http://stat.gov.pl/download/gfx/portalinformacyjny/pl/defaultaktualnosci/5498/1/68/1/informacja_o_sytuacji_spoleczno-gospodarczej_kraju_w_2017_r.pdf [Accessed: 23 February 2018].
- GUS, 2018d, Spółdzielnie socjalne w 2016 r., [Online]. Available at: http://stat.gov.pl/download/gfx/portalinformacyjny/pl/defaultaktualnosci/5490/15/1/1/spoldzielnie_socjalne_2016.pdf [Accessed: 28 February 2018].
- KARBOWSKI A., BIELIŃSKA A., ŻYGŁOWICZ M., SELWA M., CHLEBEK M., MAKUCH Ł., 2007, Raport z badania, „CSR oczami studentów”, [Online]. Available at: http://www.proto.pl/PR/Pdf/csr_oczami_studentow.pdf [Accessed: 20 December 2017].
- KAŹMIERCZAK T., RYMSZA M. (ed.), Kapitał społeczny. Ekonomia społeczna. ISP, Warszawa.
- KOMOR M., 2013, Charakterystyka Country Cluster według wymiarów kultury GL OBE, Organizacja i Kierowanie, nr 2, 99–119.
- MANYIKA J., LUND S., CHUI M., BUGHIN J., WOETZEL J., BATRA P., KO R. and SANGHVI S., 2017, What the future of work will mean for jobs, skills, and wages, [Online]. Available at: <https://www.mckinsey.com/global-themes/future-of-organizations-and-work/what-the-future-of-work-will-mean-for-jobs-skills-and-wages> [accessed: 28 February 2018].
- MATEJUN M., 2016, Rozwój kompetencji przedsiębiorczych studentów w środowisku akademickim – zakres i uwarunkowania, Marketing i Zarządzanie nr 2 (43), p. 131–146. DOI: 10.18276/miz.2016.43-11.
- MGI (McKinsey Global Institute), 2017, Jobs lost, jobs gained: workforce transitions in a time of automation, December 2017, McKinsey & Company 2017, [Online]. Available at: https://www.mckinsey.com/~media/mckinsey/global%20themes/future%20of%20organizations/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi%20jobs%20lost-jobs%20gained_report_december%202017.ashx [Accessed: 28 February 2018].
- MONZÓN J.L. and CHAVES R. (ed.). 2017. Recent evolutions of the Social Economy in the European Union, CIRIEC-International.
- Ratajczak M. (oprac.), 2017, Połowę pracujących Polaków mogą zastąpić roboty. Górnicy, kierowcy, rolnicy zagrożeni?, [Online]. Available at: <https://www.money.pl/gospodarka/wiadomosci/arttykul/roboty-maszyny-automatyzacja-miejsca-pracy,249,0,2382585.html>, [Accessed: 28 February 2018].
- TOMLINSON M., 2012, Graduate Employability: A Review of Conceptual and Empirical Themes, Higher Education Policy, 25, (407–431).

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

German Consumer Expectations in the field of Digital Kitchen

Tina Rönnberg¹

*¹Department of Economics, Faculty of Business and Economics, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: mail@tinaroennberg.de*

Abstract

“Digitalisation” affects society and business models equally. Given this technical evolution is still new, scientific research on the implications for consumer behaviour and expectations is also just at the beginning. By now there is only consumer behaviour related data in the field of Smart Brown Goods but no scientific data in the specific field of Smart White Goods. Therefore the research question of this article is: “What do German consumer expect from connected kitchen home appliances?”. Based on an online survey with over 300 participants the author investigated German consumer expectations towards Smart White Goods. Results indicate that consumer were open for digital features in the kitchen, but have not yet internalised the possibilities of connected appliances within a smart network. The expectations were focussed on single device usage, but have not been in context with other appliances. Furthermore the consumer’s overall interest in smart kitchen home appliances was limited, as its intention to buy a connected kitchen home appliance was on an overall low level. The results of this research can help to understand what the drivers of consumers’ adoption and use of smart kitchen home appliances are.

Keywords: Consumer Behaviour, Consumer Expectations, Digitalisation, Internet of Things, White Goods, Smart appliances

JEL Code: M310

1. Introduction & Methodology

Given the current pace of digitalisation in all areas, consumer households as well as industries are investigating possibilities, chances and risks linked to this development.

In the Brown Goods industry, smart appliances like TVs, digital media players, tablet PCs etc., were introduced to the market since approximately the year 2010. In the White Goods sector, also known for “Slow Moving Consumer Goods”, the first connected kitchen home appliances were introduced to the market in the year 2015, five years later. “Digitalisation” will have an enduring effect on how businesses will operate long-term, so kitchen home appliance manufacturers are (also) in the urge of finding an appropriate

approach in order to deliver “digital value” to the consumer. Because of that, it is important to understand the drivers of consumer adoption and use of smart kitchen home appliances, which is the main objective of this article. What is the consumer’s attitude towards “Digital Kitchen”, what are the expectations? And is an interest in “Digital kitchen” potentially linked to socio demographic factors like gender or age or place of residence? These questions will be addressed in the following paragraphs.

Official data about consumer acceptance, respectively consumer interest in this specific field of smart kitchen home appliances is not available. White Goods manufacturers do not make sales figures public and market research organisations like “Growth for Knowledge” (GfK) or Statista do not differentiate between “Fast moving Consumer Goods” and “Slow Moving Consumer Goods”, when publishing information about smart appliances. By example “Smart home: the truth behind the hype” (GfK, 2017), or Statista, “Prognose zur Anzahl der vernetzten Geräte im Internet der Dinge (IoT) weltweit in den Jahren 2016 bis 2020” (Statista, 2018).

Scientific data bases like Google Scholar, Research Gate, IDEAS (RePEc), Academia, Microsoft Academia, EconStore, EconPapers etc. do not show any matches when searching for “Consumer expectations & Connected kitchen”, “Consumer expectations & Digitalization”. “Consumer behaviour & Digital kitchen”, “Consumer expectations & Digital Kitchen” or “Consumer expectations & connected kitchen home appliances” or similar search requests. Results are often linked to “Data Security” issues, “Platform Marketing” or “Online shopping”, but none of them specifically investigate consumer behaviour and connected kitchen appliances. In addition to that no other sources (e.g. libraries) offer any scientific publications on this.

Therefore the author decided to research the topic by investigating consumers’ profiles with the help of an online survey. Despite obstacles like the problem of managing the time frame and the fact that this tool is not appropriate if detailed responses are needed, the advantages of an internet survey proved to be useful (Sue & Ritter, 2012). Filling in an online questionnaire is perceived to be a convenient and modern way of giving opinions and answering questions (Boyce, 2005), the choice of method also appeared to be an appropriate tool for this internet related topic (McLafferty, 2010). To complete the survey was supposedly not to take longer than 10 minutes for the respondent. The data gained in the period from July to December 2017 was then examined and statistically analysed, mainly with the help of e.g. Pearson Correlations in order to measure the strength of a relationship between two variables like “Does interest in Smart Home differ with years of age”? and Mann Whitney Test for analysing dependent variables (men/women) on an ordinal scale with a question like this “How much are you interested in Smart Home?”

In total, 312 participants answered the questionnaire with a sample structure as follows. The sampling distribution is a result of the chosen method. The researcher did not have an influence on the data. It could be possible that gender, education or place of residence influence research results. But this was not tested as this was not relevant for the research question.

Table 1: Sample Structure online questionnaire

| Women 137 participants/mean age 39 years in total per age group | Age 18-30 39 | Age 31-45 53 | Age 46-60 33 | Age 61 and older 12 |
|--|--------------------|--------------------|--------------------|---------------------------|
| Education Level | | | | |
| Primary School | 0 | 0 | 0 | 0 |
| Secondary School (5-8 years) | 2 | 2 | 2 | 2 |
| Secondary School (8-10 years) | 15 | 9 | 10 | 5 |
| Secondary School A-Levels | 13 | 13 | 7 | 2 |
| University | 9 | 27 | 14 | 3 |
| Postgraduate studies without exam | 0 | 1 | 0 | 0 |
| Postgraduate studies with exam | 0 | 1 | 0 | 0 |
| Place of residence | | | | |
| Metropolis (more than 1 Mio) | 9 | 10 | 5 | 5 |
| Major City (more than 100k) | 7 | 6 | 3 | 4 |
| City (more than 10k) | 10 | 13 | 7 | 0 |
| Small City (more than 5k) | 6 | 8 | 4 | 1 |
| Rural area (less than 5k) | 7 | 16 | 14 | 2 |
| Men 175 participants/ mean age 41 years in total per age group | | | | |
| | Age 18-30 44 | Age 31-45 64 | Age 46-60 45 | Age 61 and older 21 |
| Education Level | | | | |
| Primary School | 1 | 1 | 0 | 0 |
| Secondary School (5-8 years) | 5 | 4 | 2 | 6 |
| Secondary School (8-10 years) | 29 | 25 | 18 | 9 |
| Secondary School A-Levels | 5 | 22 | 20 | 5 |
| University | 2 | 6 | 1 | 1 |
| Postgraduate studies without exam | 0 | 0 | 0 | 0 |
| Postgraduate studies with exam | 2 | 6 | 4 | 0 |
| Place of residence | | | | |
| Metropolis (more than 1 Mio) | 4 | 14 | 12 | 3 |
| Major City (more than 100k) | 10 | 22 | 14 | 2 |
| City (more than 10k) | 13 | 16 | 7 | 2 |
| Small City (more than 5k) | 10 | 6 | 5 | 4 |
| Rural area (less than 5k) | 7 | 6 | 7 | 10 |

Source: own research

2. Results

After the questions which helped to evaluate the statistical/segmentation characteristics of the respondents, participants were lead to the main topic of the questionnaire: “Smart Home”. The survey was designed to start with very basic questions building up to more detailed questions, thereby to carefully explore the consumers’ level of knowledge respectively experience with connected kitchen home appliances. By stating their opinion the participants also revealed their expectations towards connected kitchen home appliances.

2.1. Smart Home

Answering the first question of the survey’s second part, 90.77% claimed that they have already heard of “Smart Home” or “Connected Home”.

However, when investigating the knowledge level one can conclude that there is a great difference in “having heard” about “Smart Home” compared to “feeling informed” about the topic. In fact the majority stated that they feel “partly yes/partly no” informed about the topic which could potentially indicate a general uncertainty in this field.

Table 2: Feeling informed about “Smart Home”:

| Level of feeling informed about “Smart Home” | Respondents | |
|--|-------------|-------|
| | % | Count |
| very good | 3.07% | 10 |
| good | 26.07% | 85 |
| partly yes/partly no | 42.64% | 139 |
| bad | 24.54% | 80 |
| very bad | 3.68% | 12 |

Source: own research

This uncertainty however did not prove to imply a negative bias towards “Smart Home”, because 44,92% of the respondents stated that they are “very much interested” or “interested” in this field. Only 28.61% stated a strong lack of interest.

Table 3: Interest in “Smart Home”:

| Level of interest in “Smart Home” | Respondents | |
|-----------------------------------|-------------|-------|
| | % | Count |
| very much interested | 11.69% | 38 |
| interested | 33.23% | 108 |
| partly yes/partly no | 26.46% | 86 |
| not very interested | 24.92% | 81 |
| hardly interested | 3.69% | 12 |

Source: own research

After investigating basic knowledge and general interest, the participants were asked to state their interest (“1” being highest level, stating “very interested” and “5” being lowest level stating “not interested”) in a selection of popular “Smart Home” functionalities. The topic “Smart home kitchen appliances” has been on purpose one of the options on the list.

The fact that “Smart Home Kitchen Appliances” ranked on fifth position got underlined by the analysis of clustered groups of the listed “Smart Home” functionalities.

- “House” : heat settings, automatic blinds, automatic lights
- “Appliance Control” : smart home kitchen appliances, Smart TV control (via App) and Smart Car control (via App)
- “Caretaking” : smart baby phone, smart watering of plants and smart feeding of pets

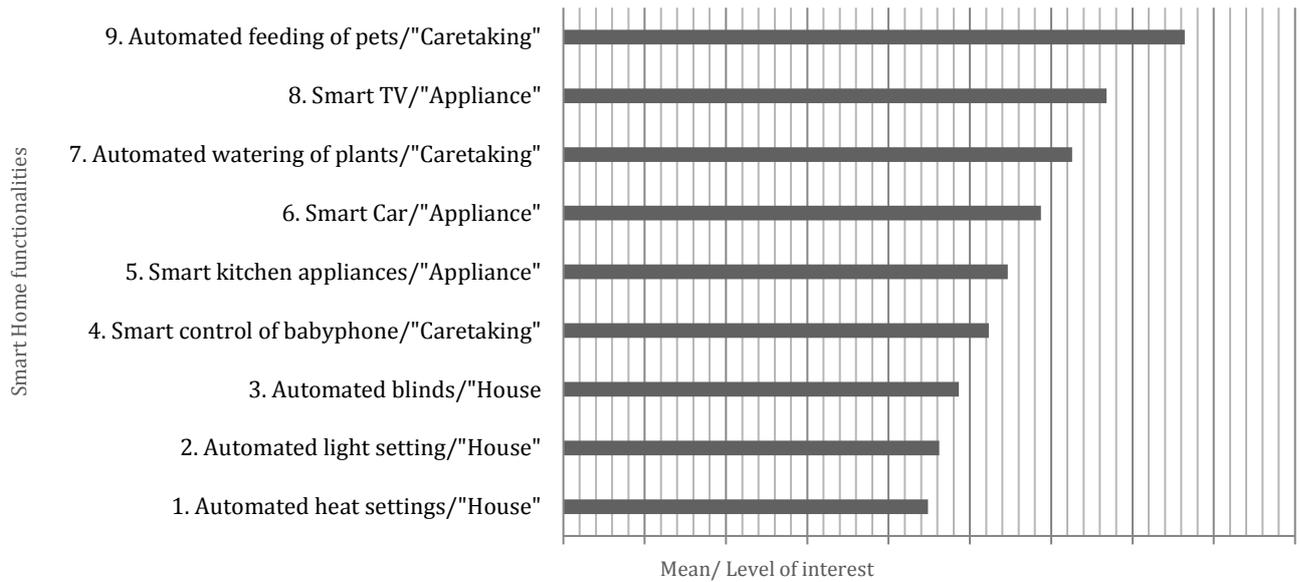


Figure 1: Most appealing “Smart Home” functionalities
Source: own research

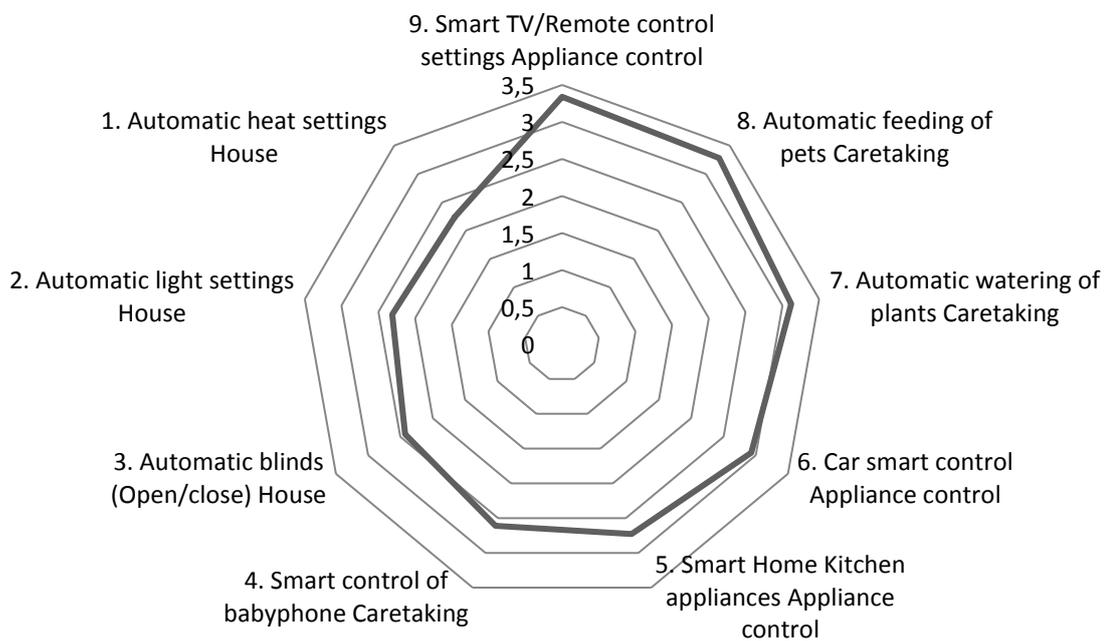


Figure 2: Heat Map for most appealing “Smart Home” functionalities
Source: own research

As figure 2 shows, German consumer stated the highest interest in “Smart Home” functionalities which are linked to “House/Home”. “Appliance control” functionalities (and there within “Smart Home Kitchen Appliances”) only came second.

2.2. Connected kitchen appliances

After considering “Smart Home functionalities” in general the author then focussed on connected kitchen home appliances, starting with the question which connected kitchen appliances might be of highest relevance for the consumer (“1” being highest level, stating “very interested” and “5” being lowest level stating “not interested”). The descending order of interest in connected kitchen home appliances indicated very clearly that cooling products seem to attract a lot of interest as well as washing machines – which are kitchen home appliances that are actually not very typical in German kitchens.

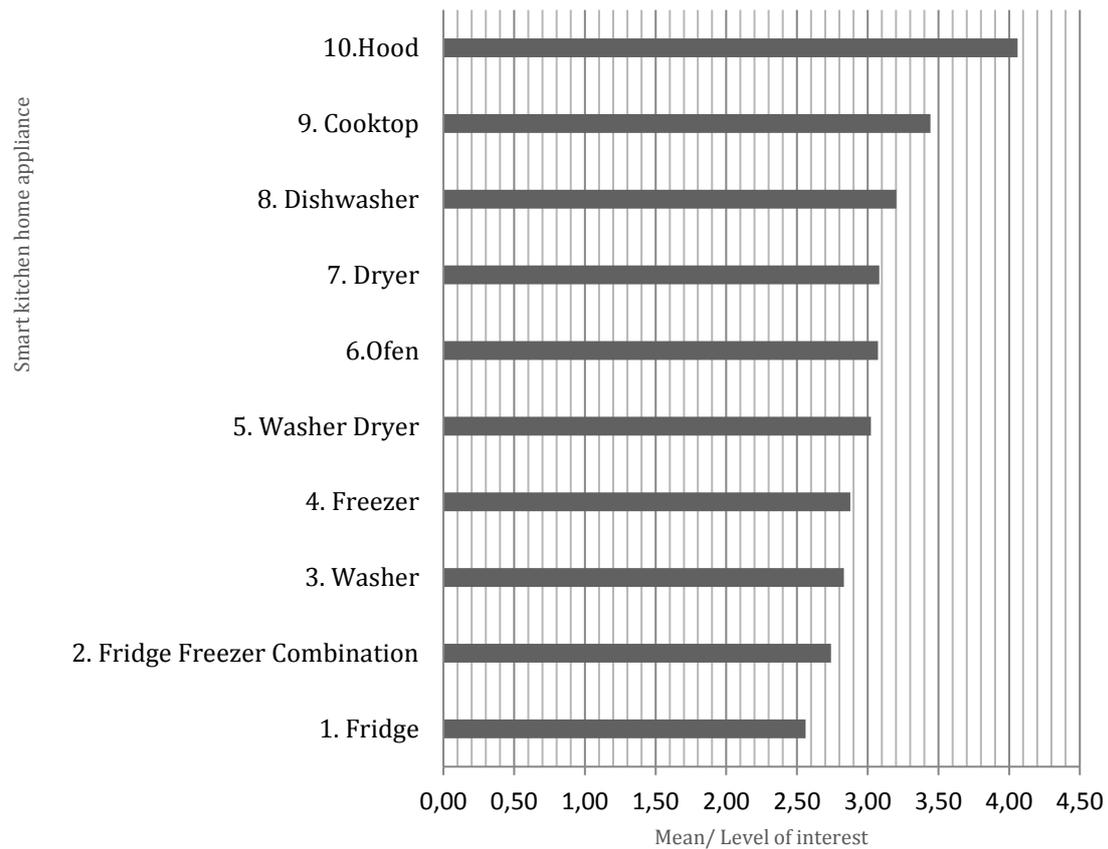


Figure 3: General interest in connected kitchen home appliances

Source: own research

After the respondents were able to state their interest in specific connected kitchen home appliances, the respondents were again offered popular (smart) use cases. This time strictly linked to kitchen appliances.

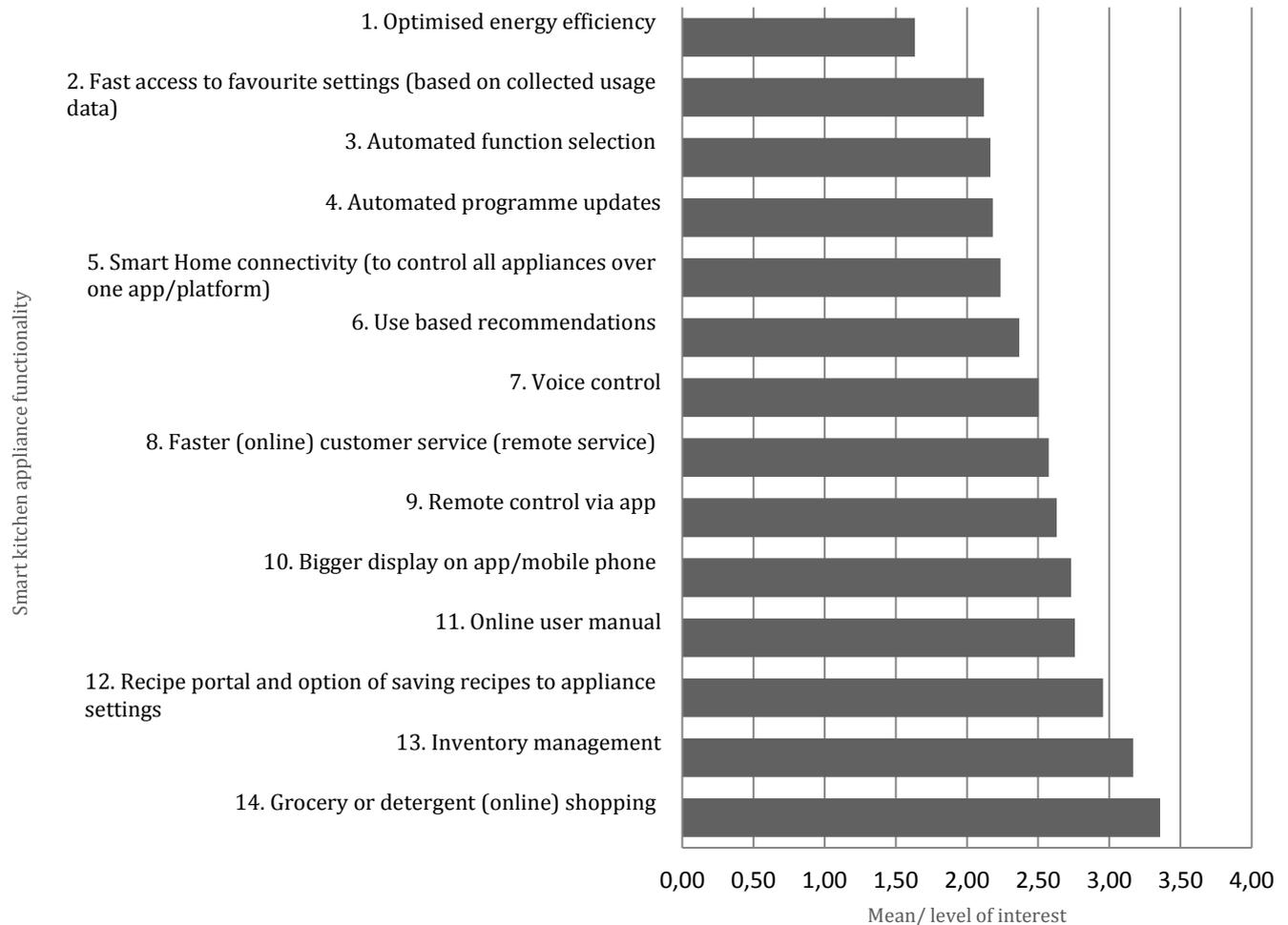
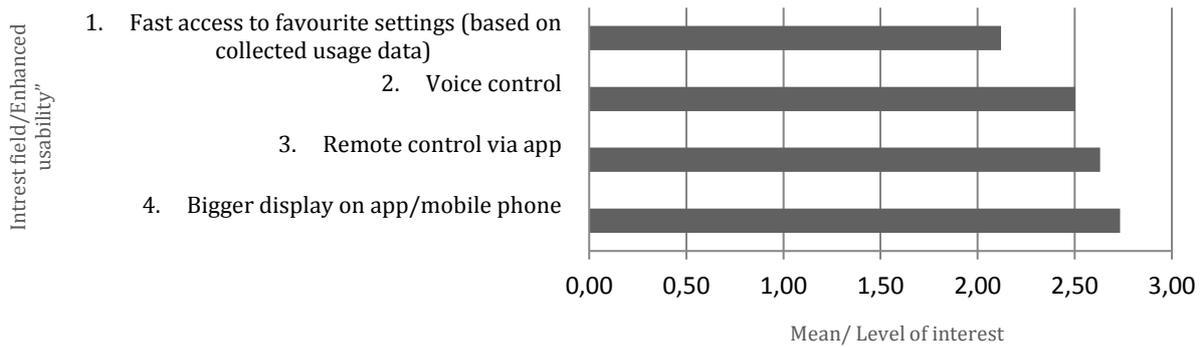


Figure 4: Interest in connected functionalities for smart kitchen home appliances
Source: own research

Analysing the group of clustered topics helped to get a clearer picture of what German consumer consider to be the most interesting use cases (“1” being highest level, stating “very interested” and “5” being lowest level stating “not interested”).

The given examples of connected functionalities for smart kitchen appliances were grouped into the following specific fields of use cases

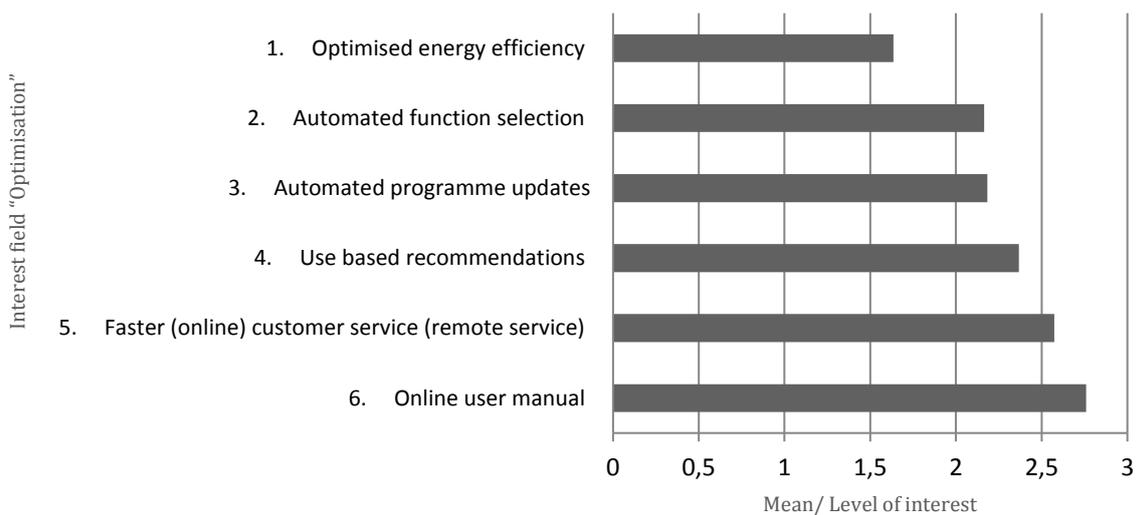
- “Enhanced usability”: fast access to favourite settings, voice control, remote control via app, bigger display on app/mobile phone
- “Optimisation”: optimised energy efficiency, automated function setting, automated programme updates, use based recommendations, faster online (customer) service (remote service), online user manual.
- “New functionalities”: smart home functionalities, recipe portal and option of saving favourites to the appliance, inventory management, grocery/ detergent shopping



(“1” being highest level, stating “very interested” and “5” being lowest level stating “not interested”)

Figure 5: Interest in the field of use cases that offer “Enhanced Usability”
Source: own research

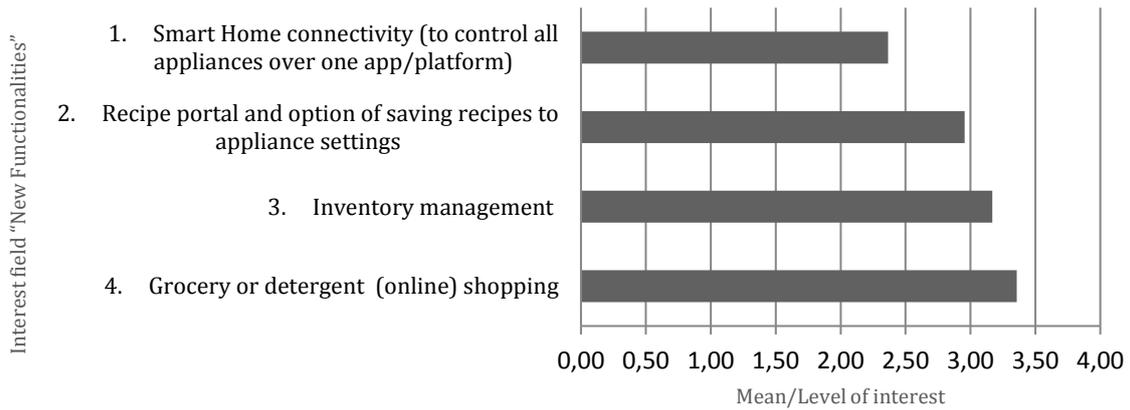
When analysing the group “Enhanced usability”, “fast access to favourite settings (based on collected usage data)” stood out. “Voice control” (e.g. via Alexa, Siri, Google Assistant) seems to be as less attractive as “remote control via App”.



(“1” being highest level, stating “very interested” and “5” being lowest level stating “not interested”)

Figure 6: Interest in the field of use cases that offer “Optimisation”
Source: own research

When analysing the group “Optimisation”, “optimised energy efficiency” was highlighted by the consumer. “Online user manual” did only attract the least interest.



(“1” being highest level, stating “very interested” and “5” being lowest level stating “not interested”)

Figure 7: Interest in the field of use cases that offer “New Functionalities”

Source: own research

When analysing the group “New Functionalities”, “Smart Home connectivity (to control all appliance with one app)” attracted the consumer. Replenishment topics like “Grocery or detergent (online) shopping” did not seem to be of greater interest.

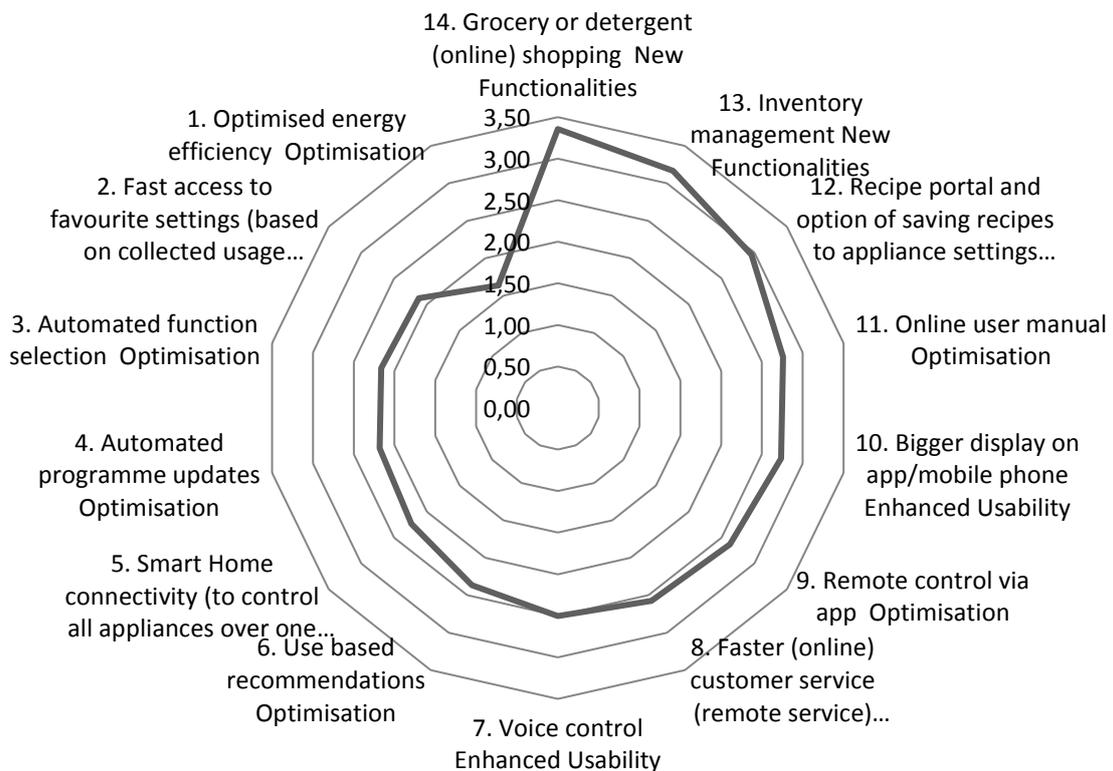


Figure 8: Heat Map for most appealing Smart Kitchen functionalities

Source: own research

In addition to the aforementioned facts, the following points were investigated:

There was no relationship between place of residence of the respondents and whether or not someone has heard about „Smart Home” ($p = 0.331 > 0.5$). But there was a significant difference ($p\text{-value} = 0,00 < 0.05$) in the place of residence and interest in “Smart Home”. The mean for the group “Major city” is the lowest and for the group “Rural community” the highest.

There was no relationship between the level of education and whether or not someone has heard about „Smart Home”. Given that 91.2% of the respondents answered with “yes, I have heard about ‘Smart Home’”, one can presume that the technology is well communicated throughout manufacturers and media. Here the p -value is not significant ($p = 0.359 > 0.05$). However, observing the level of education, there was a significant relationship between the level of education and the level of being informed about “Smart Home”.

In terms of age, there was no significant relationship between age and the level of feeling informed about “Smart Home” ($p = 0.140 > 0.05$). When asked about being interest in “Smart Home”, there was only a (very small) correlation between age and interest. The younger showed a slightly higher interest.

After analysing the relationship between gender and feeling informed, the results showed a significant relationship between male and female. Males felt better informed than females. This result got also confirmed when looking at gender specific interest in “Smart Home” ($p\text{-value} = 0.00 < 0.05$). The mean for males is 2.53 and lower. Males’ interest was higher than females’.

To “Was connectivity an important aspect when you last bought a kitchen home appliances?” 83.13% replied with “no”. “Will it be of interest when you buy a kitchen home appliance next time?” only 33.23% answered “yes”. The biggest group, 42.15% was indifferent. 24.62% stated “no”.

3. Discussion & Conclusion

No matter what education level the respondents gained or where they lived within Germany, “Smart Home” was a technical evolution that most of the consumers (91.2%) have already heard of. 44.92% (nearly half) of the respondents were interested or very interested in this field. For marketers and manufacturers of “Smart Home” appliances this is noticeable, hence it implies that nearly every second respondent (44.92%) potentially had “Smart Home” in its evoked mind set. For an even more precise consumer targeting, it is beneficial to acknowledge that of those respondents, who stated an interest, inhabitants of major cities stood out. As well as did male. Age did not play a big role.

When asked about their interest in “Smart Home” functionalities, “House/Home” use cases are ranked before “Appliance Control”, the level of interest – specifically in “Smart Kitchen Home Appliances” – only ranked at 5th position (out of 9).

In order to gain a better overall picture, specific functionalities for connected kitchen home appliances were also investigated and grouped into three main topics. Research results showed that consumers strive more for topic in the cluster of “Optimisation” than for topics in the cluster of “New Functionalities”.

The most relevant (smart) functionalities within the cluster “Optimisation” were “Optimised energy consumption” and “Fast access to favourite functions based on consumer usage”. It is interesting to note, that both functionalities/benefits could also be realised in analogue devices and do not depend on connectivity. This underlines the general

observation that German consumer look at smart kitchen home appliances as (not integrated) single appliances, meaning that they not necessarily refer to truly “connected” appliances within a network. There seems to be either missing comprehensive knowledge about the possibilities of connected appliances or a lack of interest in controlling kitchen appliances through an app or through a network. In general, functionalities, which require an internet/network connection or connected to App usage ranked weaker.

It might be a fair to infer that currently (Q4/2017) German consumer have no specific expectations in regard to connected kitchen home appliance.

Digital use cases are considered to be an extra set of features that come with the respective appliance. In the eye of the consumer, a smart device remains a “solo” or “stand-alone” object. The consumer has not yet internalised the use cases of possibilities of connected appliances within a smart network. Consumers’ expectations seemed to mainly be derived from the analogue world, with a lacking motivation to exploit more of the given digital possibilities.

This observation might be linked to two factors: First, smart kitchen appliances are only available since 2015 and not widely known to consumers yet. Second, replacement cycles for kitchen appliances take 10 years and longer (European Commission, 2017). This potentially explains the overall slower adoption of larger smart appliances in comparison to smaller ones. If a pull effect was created based on an outstanding smart functionality, changes can of course stimulate shorter replacement cycles. An example where replacement cycles got shorter due to innovation is the TV, due to LED and Plasma technology in the first step and internet connectivity in the second step.

Connected kitchen home appliances will become an essential part of future households, similar to smart appliances like smart TVs, tablet PCs etc. In a few years there will only be connected appliances. Due to the long replacement cycle for kitchen home appliances, this status won’t be reached within the near future. In order to activate consumers desire for Smart kitchen home appliances it is recommended by the author that manufacturers and marketers focus on functionalities in the field of “Optimisation” (e.g. facial recognition to unlock “Child Lock” functionality at a cooktop) short term and network functionalities (e.g. the hood light goes on, when the connected car signals itself approaching the house) in long term.

Another reason why consumer do not show a great interest in the field of “Digital Kitchen” might be that consumer are not used to control or give further attention to kitchen appliances outside their daily routines (classic usage situations). User experience and new drivers for enhanced engagement are potential topics for further research.

References

- BOYCE, J. (2005). *Marketing Research 2e*. Sydney, Australia: Mcgrawhill.
- BRADLEY, N. (2013). *Marketing Research, Tools & Techniques*. Oxford, UK: Oxford University Press.
- Gfk. (2017). *Gfk.Com*. Retrieved 10 14, 2017, From Smart Home: The Truth Behind The Hype: <http://www.gfk.com/landing-pages/smart-home-white-paper/>
- HENN, M., WEINSTEIN, M., & FOARD, N. (2006). *A Short Introduction To Social Research*. London, UK: Sage.
- MCLAFFERTY, S. (2010). Conducting Questionnaire Surveys. In N. Clifford, G. Valentine, & 2nd (Ed.), *Key Methods In Geography*. London, UK: Sage Publications.

- Statista. (2018). *Statista*. Retrieved February 20, 2018, From Prognose Zur Anzahl Der Vernetzten Geräte Im Internet Der Dinge (Iot) Weltweit In Den Jahren 2016 Bis 2020 (In Millionen Einheiten):
<https://de.statista.com/statistik/daten/studie/537093/umfrage/anzahl-der-vernetzten-geraete-im-internet-der-dinge-iot-weltweit/>.
- Statista. (2018). *Statista*. Retrieved February 22, 2018, From Anteil Der Privaten Haushalte In Deutschland Mit Einem Kühlschrank Oder Kühl-Gefrierkombination Von 2009 Bis 2017:
<https://de.statista.com/statistik/daten/studie/410657/umfrage/private-haushalte-in-deutschland-mit-kuhlschrank/>.
- SUE, V., & RITTER, L. (N.D.). *Conducting Online Surveys* (2nd Ed.). London, UK: Sage.
- The European Commission. (2017). <http://ec.europa.eu>. Retrieved 2 24, 2018, From Briefing Note 5: Consumer Behaviour And White Goods:
http://ec.europa.eu/environment/enveco/pdf/Realworld_Briefing5WhiteGoods.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The role of NGOs in making supply chains more transparent and sustainable

Agata Rudnicka¹

*¹Faculty of Management, University of Lodz, Matejki 22/26, 90-237, Lodz, Poland,
e-mail: agata.rudnicka@uni.lodz.pl*

Abstract

Sustainability and transparency in supply chain are one of strategic directions for current business organizations. Moreover it seems that sustainable supply chain must be transparent to manage business processes in a proper way.

There are many different tools and initiatives aimed at improvements of social and environmental conditions. The level of engagement and motivation to use them depends on pressures from external environment. One of the most important stakeholder groups oriented on making supply chains more transparent and sustainable is a third sector. Non-governmental organizations have social trust and are powerful in making changes of business behavior.

The aim of the paper is to characterize the role of third sector in changing supply chains into more transparent and sustainable and to discover methods used to make these changes possible. Research results are based on short case studies prepared based on in-depth interviews conducted in the well-recognized Polish non-governmental organizations active in the field of sustainability. The results suggest the main responsibility of NGO is to inform about the current situation in order to raise awareness of the supply chain and related social and environmental problems and to implement tools which will induce societal changes.

Keywords: sustainability, NGOs, transparency in supply chain, sustainable supply chain management, stakeholders

JEL Code: M10, M14, M19

1. Introduction

Sustainability as a strategic business orientation is relatively well recognized. Companies decide to implement different methods and tools which support minimization of negative impact on environment and society. Moreover there is a need to transfer issues related to sustainable development to entire supply chains.

The concept of a sustainable supply chain assumes that companies operating in a specific network of relations make much effort to ensure that the results of their activities

do not have a negative impact on the environment and society. The meaning of sustainable supply chain has been quite well described in the literature. (Carter and Rogers, 2008; Carter and Easton, 2011; Linton et al., 2007; Seuring and Müller, 2008). Regardless of the differences in the approach to defining the issue of supply chain sustainability, it is emphasized that non-economic aspects in the whole life cycle of the product should be taken into consideration.

In order to implement the idea of sustainability both throughout single companies and supply chains, there is a defined need to build transparency in these structures (Augustine, 2012; Mol, 2015). Transparency is also about availability of information for different stakeholders (Hebb, 2006). It can be motivated by different factors (Trinkenens et al., 2012). A transparency in supply chain can be understood as “two-way exchange of information and knowledge between customer and supplier.” (Lamming et al., 2011). The approach of transparency is tried to be defined directly as included to the sustainability concept. A transparency in sustainable supply chain can be defined as “the disclosure of supplier names and information about sustainability conditions at suppliers (Niklas Egels-Zandén and Hansson, 2016). As follows from the above definitions, the clutches of processes, procedures and results are key elements in building public awareness about supply chains. It is possible to identify social and environmental problems and manage risk only by knowing the real situation of the supply chain (Linich, 2014). This is due to the opportunity to reach all links and learn about the real conditions prevailing in each of all suppliers. It can be achieved by set of rules, tools and methods such as e.g. traceability of products, certification systems, audits, non-financial reporting etc. as stated in current literature (Egels-Zandén and Hansson, 2016).

In the simplest terms, transparency means an access to an information on the location of suppliers (minimum the most important ones), with more advanced forms it will be the access to a variety of data (location, conditions, work, production method, etc.) on the product from extraction of the raw materials to the end-of-use phase including the quality of information. Thus, sustainable supply chains should be transparent at the same time.

The issue of transparency is getting more and more attention because different groups of stakeholders including non-governmental organizations – NGOs (other terms from literature: third sector or Civil Society Organizations, CSO). The conducted literature review (including searching for the key words combining NGO and transparent or sustainable supply chain in such databases as Scopus, Web of Science or Ebsco) revealed that the topic is still not described well in the current literature. The main results suggest that CSO are present in the debate about the future shape of the sustainability approach in supply chain. NGOs are willing to know more about risks, processes and results of supply chains (Kas hmanian, 2017). As Doorey underlined there is a belief “that transparency can provoke learning and also positive institutional change by empowering private watchdogs to monitor and pressure business leaders to alter harmful behavior.” (Doorey, 2011). It is necessary to involve various stakeholders such as third sector representatives who, through various forms of impact from cooperation through pressure (e.g. consumers’ boycotts) will motivate and initiate changes in supply chains.

Non-governmental organizations are perceived in society as an actor who support the achievement of goals important for the development of society. They are social change-makers. Due to their nature and independence from other sectors, they can also, in some ways, affect business operations and decisions made in private sector. The scope and methods of activities depend on the access to funds, goals and main directions of each

organization. Regarding the diverse field of NGOs activities one can observe different factors and mechanisms that stand behind the beginning of a relationship with business regardless of the length of these relationships.

NGOs and their role in promoting sustainable development is to some extent described in the literature (e.g. Nikkhah and Redzuan, 2010; Kong et al., 2002; Hege and Demailly, 2018). It is also stated that stakeholders including NGOs can affect the sustainable supply chain management (e.g. Wolf, 2014; Rodriguez et al., 2016). However there is a lack of studies that directly concern the place of NGOs in developing sustainable and transparent supply chains. There are still many research questions regarding this area. The aim of the article is to understand the role of non-governmental organizations in creating sustainable and transparent supply chains and to recognize tools.

2. Methodology and Data

In order to achieve the goal of the paper in-depth interviews with polish well recognized non-governmental organizations were conducted. The sample consisted of 4 short case studies (Silverman, 2008; Yin 2014) of organizations engaged in promotion of sustainable approach in business and supply chain. The study was of qualitative character. Qualitative research is well-known and well-established methodologically in social sciences (e.g. Koncecki, 2010; Gibbs, 2011). The qualitative research allows to search a small sample to discover new phenomena. The research had exploratory character (Stebbins, 2001). The reason why the qualitative research was selected was the intention to learn the context in which NGOs dealing with the issues of sustainability and transparency and the possibility of creating a catalog of actions they undertake to improve conditions of supply chains. An additional advantage of qualitative research, in this case, is the opportunity to learn the answer to why and how to address the problem of sustainable and transparent supply chains in public discourse. The chosen method seems to be optimal to the aim and the scale of the research. It allowed to discover the meaning of sustainability and transparency from the non-business perspective. The questionnaire contained 7 open questions regarding various aspects of the organization's activities in the context of its commitment and actions for sustainable development in Poland. The research was conducted in January and February in 2018 in Poland.

Table 1 presents general information about organizations participated in the research.

Table 1: Main information about studied NGOs

| | NGO 1 | NGO 2 | NGO 3 | NGO 4 |
|--------------------------|--|---|---|--|
| Respondent | CEO | National team coordinator in Poland | Business Account manager | vice CEO |
| Main field of activities | human rights, workers rights sustainable development, CSR, environmental protection. | sustainable development and responsible consumption in fashion industry | human rights, sustainable development, strengthening of the poorest groups of small farmers | sustainable production and consumption |

in the coun-
tries of the
global South

Source: Own elaboration based on research results

Organizations are using different forms of business and society engagement in the issue of sustainability. It can be assessed by the scale of involvement from passive and to active.

Table 2: Forms of activities used by NGOs

| Activities taken by the studied organizations | |
|--|-----------------------------|
| Passive | Active |
| research | workshops |
| conferences | audits |
| publications | consumer's campaign |
| lectures | online events |
| | business oriented campaigns |
| | certification systems |

Source: Own elaboration based on research results

By the decision of the respondents, there will be no disclosure of the organizations' names. Collected data will be used to design further quantitative research in this area.

3. Results

The idea of sustainable and transparent supply chain is the result of increasing social and environmental problems. The respondents indicated that, according to them, the most important problems affecting the current supply chains are:

- lack of awareness that the company is, to certain extend, responsible for its supply chain,
- excess of intermediaries, lack of concern for the first producer (especially from developing countries),
- lack of sense of responsibility for the environment (having damaging impact on it) and ignoring the fact that resources are limited,
- limited number of innovative projects which will improve environmental conditions in supply chains,
- lack of transparency or lack of knowledge, and thus the lack of an appropriate strategy to address problems in the company's supply chain.
- -ignorance of the fact that workers and human rights are broken in supply chains,
- law wages below the minimum living level,

The second table presents answers on the question: what does transparent supply chain mean?

Table 3: The idea of transparency in supply chain – NGOs perspective

| Transparent supply chain is characterized by | |
|---|--|
| NGO 1 | a publicly available list of at least 1-row suppliers; a publicly available information on the supply chain, identified problems in the supply chain and actions taken to eliminate them and prevent them in the future; |
| NGO 2 | a full information (knowledge) about every element of supply chain, taking into account environmental and social aspects. full control of supply chain to be able to efficiently eliminate problems (e.g child labor, environmental pollution, etc. Consumers today have the right to know whether the money they spend does not support the production of exploitative employees or natural resources. |
| NGO 3 | a short chain, i.e. one with few participants, at each stage of the chain it is possible to verify where the raw materials and products come from, there are no information disturbances (there is appropriate quantity in terms of raw material introduced into a system, technological processing and quantity of products, which can be obtained from such quantities). |
| NGO 4 | transparency and availability of information on working conditions and environmental issues for consumers, employees and other interested groups and people taking into consideration needs and expectations of employees in the whole supply chain |

Source: Own elaboration based on research results

The next part of interviews were dedicated to possible ways of influencing business in the context of changes in supply chain management (Table 3).

Table 4: Opportunities and methods to impact on business of being more transparent and sustainable. NGO perspective

| How NGO can affect business? | |
|---|--|
| NGO 1 | There is a limited impact if the NGO activity is not supported by law regulations |
| NGO 2 | It is possible to make positive change by activities which aim to educate, exert pressure, criticize, show problems or present solutions. It is also important to initiate and lead activities encouraging consumers to express their interest of social and environmental aspects (e.g. in fashion). Motivation better affects business than punishment. |
| NGO 3 | Business need substantive support. It is also important to cooperate with different stakeholders (including public authorities) and do common work with societies to change the position of business (making it more beneficial or by preventing it from financial penalties) |
| NGO 4 | One of effective tools is monitoring of the companies' activities. NGOs are expected to pay attention on problems and to have dialogue with business. Cooperation with employees and local communities to obtain information about real situation in factories is also essential. The good form of impact on business are interventions (using media channels, consumer engagement to e.g. writing petitions to companies) |
| What are the most effective methods of making impact regarding sustainability issues | |
| NGO 1: | consumer boycott (especially in environmental and socially aware societies), education (addressed to workers, labor unions, business, support for business which is going to improve its current situation |

NGO 2: only a combination of several forms of impact can give the most effective results – education and involvement of customers and business; cooperation with different stakeholders including public administration

NGO 3: all methods that result in a material benefit for the company

NGO 4: combination of different tools and methods – dialogue with companies – (problem identification, cooperation on common solutions), putting attention on workers perspective in supply chains, social campaigns and customers involvement; presence in media, reports on social and environmental conditions of supply chains

Source: Own elaboration based on research results

As the respondent from NGO 1 notes, for changes to be possible, it is also necessary to involve other stakeholders such as trade unions, employees and industry organizations. Importantly, it is crucial that they recognize the value to respect human rights in the supply chain. All stakeholders should participate in consultations and dialogue to develop the necessary and real solutions. Equally important is the opportunity to assert your rights and, where possible and reasonable, put pressure to improve conditions, processes or procedures. To make it possible financial support for NGOs is required.

The second respondent put attention on customers who, next to the other stakeholders, mentioned in previous answer, are key actors of possible changes. They can affect business by changing own habits of purchasing (e.g. less clothes, clothes from local producers etc.) and by insisting on changes in producers' behavior. Due to the next respondent "Considering the various activities already carried out, it can be stated that three tools should be mentioned that can effectively influence the transparency of the organization's activities and their supply chains. Firstly consumers 'demands to implement various activities and tools which help to manage social and environmental aspect in effective way. [...] Secondly the introduction of legal solutions encouraging or obliging organizations to disclose non-financial data of supply chain. Thirdly, implementation of CSR strategy tools that support more responsible production. NGOs and multilateral initiatives can help with this, which thanks to the work of their experts are able to provide relevant knowledge, specialist reports, or give positive examples of real benefits for companies, encouraging greater transparency of companies operations." According to another respondent, effective (severe) penalties for companies that do not respect human rights or labor rights throughout supply chains are an effective tool for exerting influence and creating more transparent supply chains. The last NGO representative added to the list of engaged stakeholders media as an important communication and data disclosure channel. Employees were also mentioned as a valuable source of information. The respondent, as previous study participants, confirmed that CSR, legal regulations (e.g. Directive of disclosure of *non-financial* and diversity information) and dialogue with stakeholders are desired activities.

4. Conclusions

Non-governmental organizations are present in the debate on sustainable and transparent supply chains. They are aware of problems related to supply chain management. As active actors in the field of sustainable development, they set out the most important social and environmental challenges to face managers. Respondents proposed the complex list of characteristics which are associated with the idea of transparent supply chain. In

general, the understanding of transparency by representatives of non-governmental organizations is not different from the one that appears in scientific studies. The context of transparency for developing sustainability in supply chains was emphasized. Attention was also paid to the quality of relations and the length of the supply chain as elements affecting the level of transparency. Transparency for the surveyed organizations means both access to information about social and environmental conditions as well as identification of needs and problems in supply chains.

Research has shown a diversified approach to the ability to influence supply chains from awareness of the limited impact to positive impact and triggering changes through cooperation and business support. The limited impact in this case means limitations that the NGO cannot exceed in its relations with business. This is primarily about situations in which non-governmental activities are not sufficient to trigger a real change, especially on a large scale, and additional drivers are needed, such as legal regulations. An example of this is the EU Directive on disclosure of non-financial data and diversity, which opens up the possibility of cooperation of the third sector with companies ready or obliged to plan and implement the communication process in this field.

Another way to get influence is substantive support or, more broadly, education. In many cases there is still a lack of knowledge and awareness about the processes taking place in the supply chain. Companies do not go beyond the economic sphere of the relationship. Support from experts by putting attention on identification social and environmental risks and opportunities is essential. Understanding of supply chain from a non-financial perspective seems to be an invaluable contribution to the process of making changes. It also means the need for joint projects to achieve synergies. Different types of “negative” (in the meaning of potentially negative effects on business) activities are also possible: monitoring supply chains, paying attention to problems and public disclosure of information about irresponsible or illegal activities. In this case, non-governmental organizations act as watchdogs whose task is to map problems and disseminate information in order to take preventive and corrective actions.

NGOs can play different role for business in the change making process. They can be in a position of:

- confrontation –the main goal is to show negative business activity, publicize the problem in society, motivate to take corrective initiatives;
- consultation/ knowledge sharing – NGO as an expert shares knowledge with business. Indicates the most important problems and gives possible solutions.
- cooperation strategic partnership – business and NGOs cooperate with each other. They share resources. They design joint solutions. NGOs are involved in a strategic way.

Respondents emphasized that the best results are achieved by a combination of different tools and actions. NGOs are willing to cooperate in the organization of training, publishing activities, workshops, consultancy and technical assistance. Each of these forms gives the opportunity to build knowledge and awareness. It is difficult to expect a lot of business motivation to improve social and environmental performance without sense of responsibility which can be taught using education, monitoring or disclosure of information about supply chains.

For the surveyed organizations, other stakeholders such as employees and trade unions (access to information on working conditions, information on frauds), customers (especially aware of the role of their consumption and its consequences for others) or media (publicizing cases about unethical and irresponsible behaviors and promotion on good

practices) are equally important. In discussions about a sustainable and transparent supply chain one should not forget that this is a process that requires a lot of efforts made by business and all stakeholders. Determination of parties all is necessary to initiate and sustain a change in the approach to doing business in the entire supply chain.

Acknowledgements

The TrainERGY project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

This scientific work (publication/conference participation) is financed from financial resources for science in the years 2016-2018 granted (by the Polish Ministry of Science and Higher Education) for the implementation of the co-financed international project.

References

- AUGUSTINE, D. 2012. Good practice in corporate governance transparency, trust, and performance in the microfinance industry. *Business & Society*. 51(4): 659–676.
- CARTER, C. R. and EASTON P. L. 2011. Sustainable supply chain management: evolution and future directions. *International Journal of Physical Distribution & Logistics Management*. 41(1): 46–62.
- CARTER, C.R. and ROGERS, D. 2008. A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management* 38(5): 360–387.
- DOOREY, D. J. 2011. The Transparent Supply Chain: from Resistance to Implementation at Nike and Levi-Strauss. *Journal of Business Ethics*. 103:587–603.
- EGELS-ZANDÉN, N. and HANSSON N. 2016. Supply Chain Transparency as a Consumer or Corporate Tool: The Case of Nudie Jeans Co. *Journal of Consumer Policy*. 39 (4): 377–395.
- GIBBS, G. 2011. *Analizowanie danych jakościowych*. PWN, Warszawa.
- HEBB, T. 2006. The economic inefficiency of secrecy: Pension fund investors' corporate transparency concerns. *Journal of Business Ethics*. 63: 385–405.
- HEGE, E., and DEMAILLY, D. 2018. How do NGOs mobilize around the SDGs and what are the ways forward? A French-German comparison, Working Paper, IDDRI [Online]. Available at: <http://www.iddri.org/Publications/Collections/Idees-pour-le-debat/WORKING%20PAPER%20SDGs%20and%20NGOs.pdf>. [Accessed 2018 February 26]
- KASHMANIAN, R. 2017. Building Greater Transparency in Supply Chains to Advance Sustainability. 26(3): 73–104.
- KONECKI, K. 2000. *Studia z metodologii badań jakościowych. Teoria ugruntowana*. PWN, Warszawa.

- KONG, N., SALZMANN, O., STEGER, U. et al. 2002. Moving Business/Industry Towards Sustainable Consumption: The Role of NGOs. *European Management Journal*. 20(2): 109–127.
- LAMMING, R. C., CALDWELL N. D., HARRISON D. A. et al. 2001. Transparency in Supply Relationships: Concept and Practice. *Journal of Supply Chain Management*. 37 (3): 4–10.
- LINICH, D. The path to supply chain transparency A practical guide to defining, understanding, and building supply chain transparency in a global economy, [Online]. Available at: https://www2.deloitte.com/content/dam/insights/us/articles/supply-chain-transparency/DUP785_ThePathtoSupplyChainTransparency.pdf. [Accessed 2018 February 24]
- LINTON, J.D., KLASSEN, R. and JAYARAMAN, V. 2007. Sustainable supply chains: an introduction. *Journal of Operations Management*. 25(6): 1075–1082.
- MOL, A. P. J. 2015. Transparency and value chain sustainability. *Journal of Cleaner Production*. 107: 154–161.
- NIKKHAH, H. A. and REDZUAN, M. B. 2010. The Role of NGOs in Promoting Empowerment for Sustainable Community Development. *Journal of Human Ecology*. 30(2): 85–92.
- RODRIGUEZ, J. A., GIMENEZ THOMSEN, C. ARENAS, D. et al. 2016. NGOs' initiatives to enhance social sustainability in the supply chain: poverty alleviation through supplier development Programs. *Journal of Supply Chain Management*. 52(3): 83–108.
- SEURING, S. and MÜLLER, M. 2008. From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*. 16(15): 1699–1710.
- SILVERMAN, D. 2008. Interpretacja danych jakościowych. PWN, Warszawa.
- STEBBINS, R. A. 2001. Exploratory Research in the Social Sciences, Qualitative Research Methods, Volume 48, Sage Publications
- TRIENEKENS, J. H., WOGNUM, P. M., BEULENS A. J. M. et al. 2012. Transparency in complex dynamic food supply chains. *Advanced Engineering Informatics*. 26 (1): 55–65.
- WOLF, J. 2014. The Relationship Between Sustainable Supply Chain Management, Stakeholder Pressure and Corporate Sustainability Performance. *Journal of Business Ethics*. 119(3): 317–328.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Sustaining competitiveness through Lean manufacturing – Evidences from Small-Medium Sized Enterprises

Saumyaranjan Sahoo¹ and Sudhir Yadav¹

¹School of Petroleum Management, Pandit Deendayal Petroleum University in Gandhinagar, Gujarat – 382007, India, e-mail: saumya.sphd15@spm.pdpu.ac.in

Abstract

Implementation of lean manufacturing can bring many benefits, such as reducing waste and improving operational efficiency. The practice shows that lean production methods and instruments are not equally applicable to large and small manufacturing enterprises. Regardless its popularity in large enterprises, many small and medium sized enterprises (SMEs) still struggle to achieve a successful and lasting implementation. Despite many manufacturing SMEs being eager to implement lean, they are still unclear about how the lean strategy focusing on continuous improvement practices can help them to enhance their manufacturing competences to be sustainable in its market, where the competition is fierce and full. In order to address this concern, the paper analysed provides evidence regarding the effects that lean production practices have on performance of the organization. In addition, this paper aims to identify critical success factors and barriers towards adopting and implementing lean manufacturing in the context of Indian manufacturing sector.

Keywords: Lean production; Small-to-medium-sized enterprises; barriers to change

JEL Code: D02

1. Introduction

Increased global competition, production costs and scarce resources are currently forcing companies to think in new directions (Lodgaard, et al., 2016). In this era of competition, manufacturing enterprises are looking for methods and tools mainly in order to reduce costs (Antosz & Stadnicka, 2017). To remain competitive, it is important to have effective, precise and streamlined production processes (Lodgaard, et al., 2016), which leads to sustainable competitive advantage (Agus & Hassan, 2011). Consequently, many manufacturing firms choose to introduce lean with the aim to improve competitiveness by creating customer value (Lodgaard, et al., 2016) while eliminating any type of waste from manufacturing operations (Salonitis & Tsinoopoulos, 2016). Although, the term “lean” is widely

understood nowadays, implementing lean still poses a number of challenges (Alefari, et al., 2017). In manufacturing sector, SMEs act as specialist suppliers of components, parts and sub-assemblies to larger companies because the items can be produced at a cheaper price than the large companies could achieve in-house (Singh, et al., 2008). Lack of product quality supplied by SMEs could adversely affect the competitive ability of large companies as well (Achanga, et al., 2006; Singh, et al., 2008). Compared to large manufacturing firms, the implementation of lean in Small and Medium Enterprises (SMEs) pose even more challenges (AlManei, et al., 2017). Many SMEs are anxious of the unknown and that is in many cases the problem with the lean manufacturing concept (Antosz & Stadnicka, 2017). Even though academic and practitioners literature on its practical implementation is plentiful, the majority of companies fail when trying to adopt the lean concept in their organization (Lodgaard, et al., 2016; Lucey, et al., 2005). Nevertheless, it seems that only a few cases have achieved substantial progress in this area. Arguably, the lack of a clear understanding of lean-performance relationship and its inconsistent measurement by adopting firms is a significance reason that lean practices have failed (Behrouzi & Wong, 2011). Companies often achieve significant short-term results when implementing lean, before the actual implementation processes ultimately fall apart (Lodgaard, et al., 2016). In other words, it is not possible to manage lean without measuring its performance (Behrouzi & Wong, 2011). Consequently, when embarking the lean journey, it is important to identify and understand why the rate of failure is so high in order to plan implementation properly (Lodgaard, et al., 2016). Due to all these reasons, the idea of applying lean has not been adopted by meaning number of SMEs without any factual conviction (Achanga, et al., 2006). Hence, motivated by this research gap, this study makes an empirical attempt to examine the relationship between lean production practices and operational performance of small and medium sized manufacturing enterprises. In the present paper, the most prominent critical success factors for sustaining manufacturing competitive advantage under the prism of SMEs are discussed. The challenges for the SMEs in their lean journey are also discussed.

2. Literature review

2.1. The Concept of Lean

Lean manufacturing represents a multifaceted concept that may be grouped together as distinct bundles of organizational practices (Cirjaliu & Draghici, 2016). The literature review revealed a wide range of concepts and techniques related to implementation of lean that can be broadly summarized into three lean constructs, namely process improvement (PI), material flow management (FM) and waste reduction (WR) techniques. Waste in manufacturing processes include overproduction, waiting, transportation, unnecessary motion, inappropriate processing and defects (Wahab, et al., 2013). Lean manufacturing is about eliminating waste (the non-value adding component in any process) and satisfying customers (Alefari, et al., 2017). Lean is often defined as a proactive set of process improvement (PI) practices (Worley & Doolen, 2006) such as inventory reduction (Filho, et al., 2016); preventive maintenance (Filho, et al., 2016; Rahman, et al., 2010; Zhou, 2012); cycle time reduction (Seth & Gupta, 2006; Shah & Ward, 2007); new technology usage (Rahman, et al., 2010; Shah & Ward, 2007); and quick changeover techniques (Filho, et al., 2016; Zhou, 2012), that aims at identifying, analysing and improving upon existing

manufacturing processes within an organization for optimization and to meet new standards of process/production quality. Adoption of all these factors helps manufacturing firms to raise product quality, improve product technology and boost production efficiency, which are determinants of global manufacturing competitiveness. Lean is also defined a material flow management system that addresses and eliminates the muda of waiting, by creating a value stream of material flow activities involving minimum interruption (Näslund, 2008). Some of the important material flow management techniques identified in operations management literature are lot-size reduction (Filho, et al., 2016; Panizzolo, et al., 2012); focus on single supplier (Rahman, et al., 2010); and continuous/one piece flow (Filho, et al., 2016). Since material flow is an integral part of any manufacturing processes, material flow management (FM) is a prominent strategy for efficient management of material within a manufacturing setup, and is essential to become lean. Lean is based on the principle of eliminating all forms of wasted value within the enterprise using waste reduction (WR) techniques such as muda (waste) elimination (Rahman, et al., 2010; Shah & Ward, 2007); error-proofing technique such as poka-yoke (Panizzolo, et al., 2012; Rahman, et al., 2010; Zhou, 2012); Kanban i.e. pull-based production system (Filho, et al., 2016; Panizzolo, et al., 2012; Rahman, et al., 2010; Zhou, 2012); and bottlenecks removal (Rahman, et al., 2010; Shah & Ward, 2003). Essentially the core idea of lean manufacturing is to maximize customer value while minimizing waste (Wahab, et al., 2013). Lean manufacturing can improve financial returns by opening up new customers; competitive differentiation; reducing cost through waste reduction; and focusing on improving manufacturing competence, which makes lean a viable competitive strategy (Hartini & Ciptomulyono, 2015). The lean results elements consist of cost of manufacturing (C), quality conformance (Q), production rate (P), delivery (D), flexibility to change product mix (FP) and flexibility to change volume (FV) which are critical performance indicators that defines manufacturing competence of a firm (Belekoukias, et al., 2014; Bortolotti, et al., 2015; McKone, et al., 2001). In order to capture the multidimensional nature of manufacturing competence, all these performance parameters are manifested as firm performance (PERF) in the study.

2.2. Critical Success Factors and Barriers to Lean Manufacturing

The review of the papers with regard to implementation of lean manufacturing in SMEs identified several key critical success factors (Achanga, et al., 2006; AlManei, et al., 2017; Lodgaard, et al., 2016) and barriers (AlManei, et al., 2017; Salonitis & Tsinopoulos, 2016; Zhou, 2012). Among the operations management literature, the most identified success factors are management commitment and involvement, the need of knowledge by training and education, organize for lean including involvement of employees, and properly applying of tools and methods (Lodgaard, et al., 2016). However, limited number of studies on lean manufacturing implementation failures are reported, mainly because companies wish to protect and not disclose their investments that failed (Salonitis & Tsinopoulos, 2016). The barriers in the implementation of lean can be linked to management, lack of necessary resources, resistance to change, etc. (Salonitis & Tsinopoulos, 2016). Furthermore, many companies that attempt to introduce lean practices rely on consultants, thus resources for consultancy are key barrier as well (AlManei, et al., 2017). The quality of consultant is also critical, and in many cases superficial knowledge of the lean subject results into confusion about lean manufacturing practices and can become an obstacle in lean manufacturing implementation (AlManei, et al., 2017; Salonitis & Tsinopoulos, 2016; Zhou, 2012).

3. Methodology and Data Collection

The focal point of this research is on SMEs, which constitute the vast majority of enterprises in India. The items used in the questionnaire were developed from the literature review discussed in the earlier section. Likert-type scales were used to develop constructs for the study. The respondents were asked to indicate their perceived level of agreement and disagreement with statements provided in the questionnaire using a five-point scale where a value of 5 indicates strong agreement and 1 indicates strong disagreement. Survey data were collected from manufacturing SMEs in India, referring to a database that was obtained from the 2016 manufacturing SME business directory of the SME business development chamber of India. 320 companies were contacted via telephonic call and email, with 121 accepting for a personal interview (37.8% response rate). The data were collected from the participating firm predominantly via face-to-face interviews with the entrepreneur or equivalents having a higher level of responsibility in the manufacturing department in their company. The respondent companies competed in various manufacturing sectors that included automotive, electrical & electronics, chemical, packaging, food beverages, polymer, metals & machinery, and industrial equipment. In our study, 62% of the respondents worked for medium-sized manufacturing enterprises, whereas the remaining 38% worked for small companies in India.

4. Results and Discussion

A Structural Equation Modelling (SEM) was employed to investigate the strength of relationship between the predictor and dependent variables. The linkages between lean strategy and plant performance are depicted in Figure 1. The fit of the structural equation model to test our proposition was good, with $\chi^2/df = 1.54$, GFI = 0.87, NFI = 0.89, CFI = 0.96, RMR = 0.03 and RMSEA = 0.06. As hypothesized, there is a significant positive relationship ($\beta = 0.653$, C.R. = 5.597, $p < 0.01$) between lean production strategy and plant performance. Therefore, our supposition that lean production strategy positively affects plant performance is supported in the context of small and medium-sized manufacturing enterprises. Examining the results of bivariate correlations generated by SEM, the process improvement (PI) approach demonstrated the strongest relationship ($\beta = 0.596$, $p < 0.01$) among the all three lean approaches with operational performance, followed by waste reduction (WR) approach ($\beta = 0.545$, $p < 0.01$) and material flow management (FM) approach ($\beta = 0.477$, $p < 0.01$).

Our second objective was to reveal the challenges or barriers that may hinder or delay the lean implementation process in SMEs. Figure 2 shows the survey results for the perceived barriers to adoption of lean manufacturing practices in SMEs. The barriers in the implementation of lean manufacturing can be linked to workforce-related barriers, internal resources-related barriers, operational barriers, financial barriers and strategic barriers. The biggest five challenges or obstacles faced by SMEs in India include attitude of workmen, inadequate knowledge & lean expertise, employee resistance, lack of financial resources to invest and senior management commitment with a mean value of 3.81, 3.43, 3.27, 3.25 and 3.16 respectively. These major roadblocks of implementing lean in SMEs are primarily 'strategic management', 'financial' and 'work psychological' factors. Three of the top five impeding factors are considered people-related issues, including attitude of workmen, employee resistance and lack of senior management commitment. Clearly,

managing and allocating resources supporting lean initiatives and management commitment are the toughest issues for SMEs to start and sustain lean. The second group of challenges categorized as moderate level challenges include backsliding to old ways of working, organizational cultural changes, lack of clarity across functional groups and risk of disruption in operations, demonstrate that lean initiative should start from an optimistic and mutual understanding among people across all hierarchical levels. This category of challenges implies that lean concept and philosophy fundamentally transform a firm's operations, which lead to shocking changes in an organization environment (Zhou, 2012). These impeding factors are considered as some of the most challenging change in the initial phase of implementation. As firms become more engaged in lean practices, these hurdles tend to lose their relevance after a considerable period. The barriers that received the lowest mean score, categorized as least challenging, are inability to quantify benefits (mean = 2.80), need of integration with business associates (mean = 2.79) and lack of training and education (mean = 2.67).

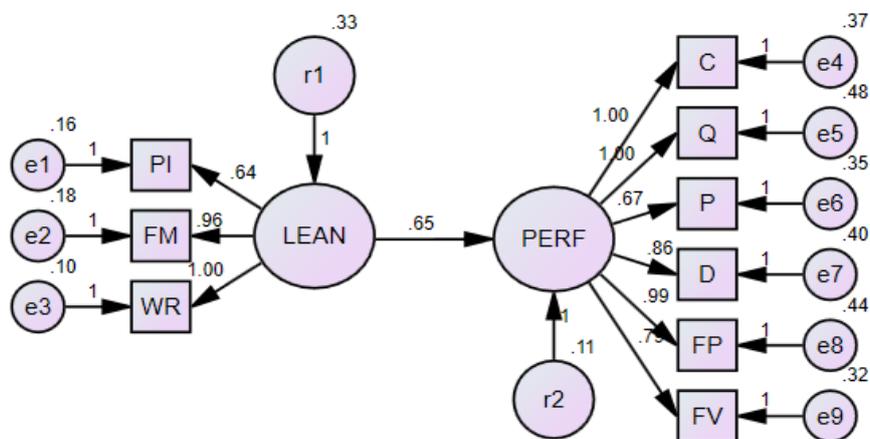


Figure 1: Results of Structural Equation Model

Another objective of the paper is to identify the critical success factors for a successful implementation of lean within a production setup. Respondents were asked to rank the critical success factors of Lean implementation from a predetermined list, with '5' representing the most important factor, the responses for which are summarised in Figure 3. In our survey results, the five critical success factors that will ensure lean strategic plans are successfully implemented are alignment to strategy & long-term plan (mean = 4.29), benchmarking & knowledge transfer (mean = 4.09), access to resources (mean = 4.06), working culture to sustain continuous improvement (mean = 4.02), and top management commitment & involvement (mean = 4.01).

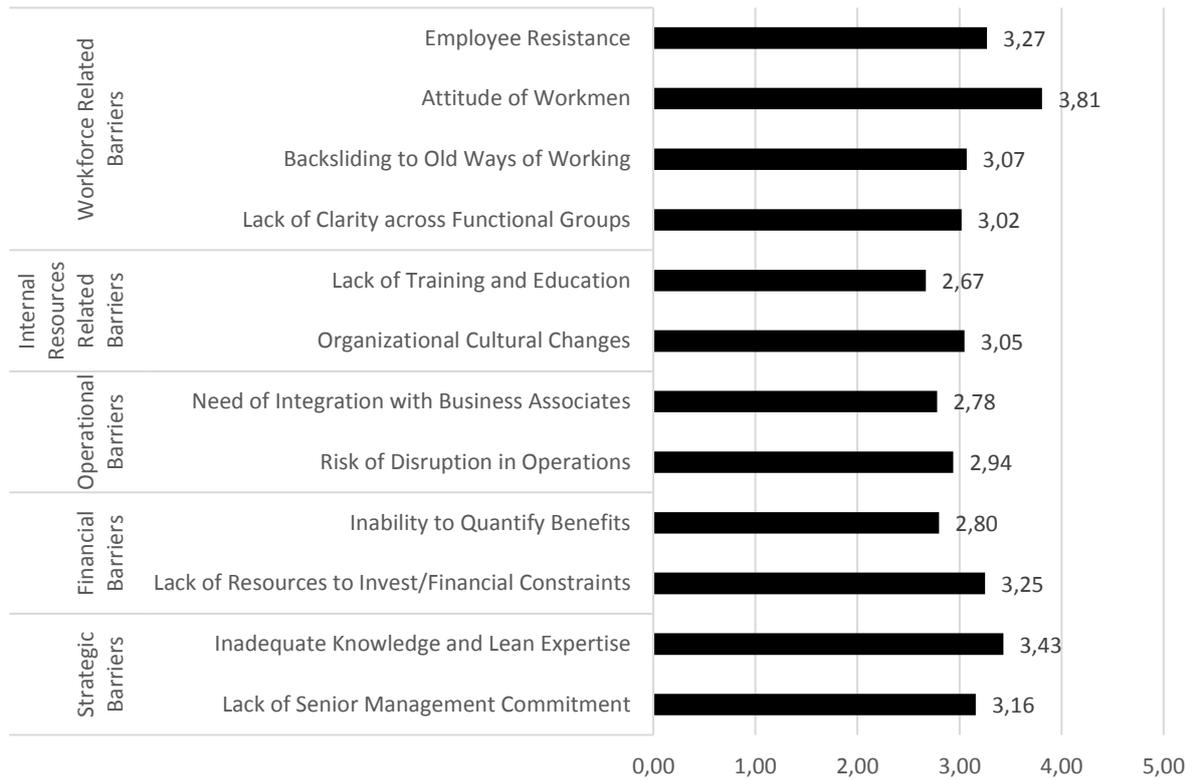


Figure 2: Lean barriers for Indian small and medium manufacturing enterprises



Figure 3: Critical Success Factors for Indian small and medium manufacturing enterprises

Alignment to strategy and long-term planning is the most critical factor in the determination of successful lean project. Long-term planning typically involves establishing goals that the manufacturing plant expects to achieve five or more years ahead. Strategic management involves assessing relationships to ensure that each functional department's objectives align to the company's overall goals by creating workplace model that grafts a culture of continuous improvement. Benchmarking best practices is a substantial way that helps manufacturers develop world-class manufacturing standards, by creating working conditions for successful knowledge transfer across heterogeneous value chains and organizational functional units. The way of introducing lean (internally or externally through a consultant) is critical as well (AlManei, et al., 2017). As identified, absence of knowledge and lean expertise is a significant barrier in the implementation process. Financial capacity is therefore another crucial factor in the determination of any successful project. This is because finance covers the avenues through which other useful provision like consultancy and training can be made (Achanga, et al., 2006). Lean consultants diagnoses the organization culture and understand the preferences of the workers, which can help to introduce changes into the working system (Wyrwicka & Mrugalska, 2017) and provides advice on how to make operational processes more efficient. Business entrepreneurs with the advice of external consultant become more decisive, determined, goal-oriented, knowledgeable, and consistent towards lean production, with the purpose of product and service improvements for the organization's survival in a competitive environment (Suwandej, 2015).

Interestingly, both critical success factors and barriers to lean implementation can be linked to management, resources and employee involvement. Management can be both a barrier and a critical driver for successful implementation. Resources are critical as well, and their lack is a major barrier. An interesting finding from the analysis is that most major challenges faced by SMEs fall under strategic and workforce related concern barriers. Nevertheless, these are still management or people related factors that pose serious challenges to lean adoption and implementation in manufacturing SMEs. The attitude of workmen was highlighted in the survey as first ranked impeding factor, as most manager felt difficult to transfer and defend the standardized work style of lean manufacturing to workers. Workers are less concerned about knowledge, tools and practices and have shown resistance emphasizing the act of change as exploitation of workmen by managers/entrepreneurs. It is observed through field interaction with workers that they were content with the relatively few tools and practices tried out at the shop floor. A more plausible interpretation is that many workers were so unfamiliar with lean that they did not quite know what to expect, and how the lean tools and practices could support their daily work (Lodgaard, et al., 2016). The engagement of the workers can be enhanced by inviting them to take active role in the decision making of such lean project initiation (Salonitis & Tsinopoulos, 2016). The second most challenging factor-'Inadequate knowledge and lean expertise' is related to lean understanding within the company. Indian small and medium sized manufacturing firms exhibit a different understanding to lean, as compared to the literature review findings. This misunderstanding spans in both management team and the employees within the Indian SME firms. It is not possible to have commitment from high management and workforce on something that they do not really understand (Salonitis & Tsinopoulos, 2016). Training on lean is critical for overcoming this challenge. On the contrary, lack of training and education is found out to be the least challenging factor in the results of survey. This implies although efforts being put forward by management through training and education aspect to imbibe the culture of lean in the organiza-

tion, these haven't been successful in converting the attitude of workmen and management, to bring about desired change in organizational culture. This interpretation is reasonable in light of perception of senior managers and middle managers, despite of undertaking training and education programs, lean knowledge was lacking in their organization. There can be many reasons, why training does not have the desired effect. It can be due to a poorly designed program, an ineffective trainer, staff being unable to implement the training in the workplace, or many other reasons. Effective training is essential for bringing both management and workforce to speed up with lean. The extent of such training, the focus and the breadth of content needs to be tailored to the needs and the function of the trainee. A different type of training is required for management to that of an operator of a machine. Hence, top management and leadership are of paramount importance for proper implementation and introduction of lean. SMEs often have limited resources in terms of man power, access to skills and financial strength for investments (Zhou, 2012). Lean promises cost savings, although senior management leaders in many cases fail to understand the cost saving are the results and not the objective of implementing lean (Alefari, et al., 2017). Lean implementation failures are attributed to different causes. Among these, company culture and change management are identified as a determinant factor and seen as one of the top most challenging (Achanga, et al., 2006; Lodgaard, et al., 2016). Nobody wish to come out of their comfort zone. Change management comes into picture before implementation, during implementation and after implementation (Jadhav, et al., 2015). Hence, when organizing a lean implementation program, it is important for senior management to include planning, monitoring and sharing gains, and allocating necessary resources (Lodgaard, et al., 2016) to observe tangible benefits in a long run. The strategy needs to be clear among senior management about vision and the direction of the company. The responsibilities and authority of the lean engaged personnel, the resources to be committed, the key performance indicators to be employed, the deliverable and milestones of the implementation, needs to be defined (Salonitis & Tsinopoulos, 2016). Unless the opinions of different groups at different hierarchical levels are listened to, efforts to implement lean and overcome barriers may be misguided (Lodgaard, et al., 2016). Change agents such as lean consultants or top managers should take care to consult different groups of employees and workers before choosing a path of action (Lodgaard, et al., 2016). Ample support and active involvement ranging from upper management to individual employees/workers are all crucial to the success of lean implementation (Zhou, 2012). Raising awareness of these differences of opinion may help the organization on correct way and increasing the odds of a successful lean implementation (Lodgaard, et al., 2016). It is important to create a lean culture that can be shared across the entire organization (Zhou, 2012).

Equally crucial to this study, is also outcome derived from the SEM analysis of direct relationship between a lean strategy and operational performance, which offers manufacturing enterprise and their owner/managers, a better understanding of the relationship and impact that some of the most essential lean techniques have on the performance of their operations. Evidence from the SEM results implies that all lean techniques i.e. process improvement, material flow management and waste reduction techniques have exhibited high degree of association with operational performance measures. The results of the study definitely provides sufficient ground for convincing business entrepreneurs toward justifying the adoption or implementation of lean production practices in order to enhance production performance and customer related performance.

5. Conclusions

The intense competitive situation is forcing manufacturing industry to continuously improve their business with innovative quality products, while at the same time keeping costs down (Lodgaard, et al., 2016). The study has provided important insights into lean related implementation issues in the context of Indian manufacturing SMEs. The results were discussed with experts in order to understand and document the root causes behind the observation. The managerial implications of this study are clear. The pursuit of lean manufacturing strategy comprising of process improvement, flow management and waste reduction techniques for improving production capabilities is not only requested by the market but also driven by the need of manufacturing enterprises to survive. As evident from the results of the study, a lean strategy would no doubt enhance the production processes, thereby producing value added products. This subsequently would lead to better customer-related performance in catering the changing customer's needs (Agus & Hassan, 2011), thereby improving firm's manufacturing competitiveness. Based on the study survey undertaken within the Indian manufacturing sector, the results indicated that leaders of an organization need to set the paradigm and clearly describe policy and strategy deployment that translates into objectives and actions for the middle management and operators (Alefari, et al., 2017). The implications highlighted in the study also offers senior management a set of propositions to understand the impeding factors that affect adoption of lean in their enterprises. Such knowledge can solve the present dilemma of business entrepreneurs regarding the misunderstood problems related to the idea of lean and its implementation.

References

- ACHANGA, P., SHEHAB, E., ROY, R. & NELDER, G., 2006. Critical success factors for lean implementation within SMEs. *Journal of manufacturing technology management*, Volume 17, pp. 460–471.
- AGUS, A. & HASSAN, Z., 2011. Enhancing Production Performance and Customer Performance through Total Quality Mangement (TQM): Strategies for Competitive Advantage. *Procedia Social and Behavioral Sciences*, Volume 24, pp. 1650–1662.
- ALEFARI, M., SALONITIS, K. & Xu, Y., 2017. The role of leadership in implementing lean manufacturing. *Procedia CIRP*, Volume 63, pp. 756–761.
- ALEFARI, M., SALONTIS, K. & Xu, Y., 2017. The role of leadership in implementing lean manufacturing. *Procedia CIRP*, Volume 63, pp. 756–761.
- ALMANEI, M., SALONITIS, K. & Xu, Y., 2017. Lean implementation frameworks: the challenges of SMEs. *Procedia CIRP*, Volume 63, pp. 750–755.
- ANTOSZ, K. & STADNICKA, D., 2017. Lean Philosophy Implementation in SMEs – Study Results. *Procedia Engineering*, Volume 182, pp. 25–32.
- BEHROUZI, F. & WONG, K. Y., 2011. Lean performance evaluation of manufacturing systems: A dynamic and innovative approach. *Procedia Computer Science*, Volume 3, pp. 388–395.

- BELEKOUKIAS, I., GARZA-REYES, J. A. & KUMAR, V., 2014. The impact of lean methods and tools on the operational performance of manufacturing organisations. *International Journal of Production Research*, 52(18), pp. 5346–5366.
- BORTOLOTTI, T., BOSCARI, S. & DANESE, P., 2015. Successful lean implementation : Organizational culture and soft lean practices. *International Journal of Production Economics* 160, pp. 182–201.
- CIRJALIU, B. & DRAGHICI, A., 2016. Ergonomic Issues in Lean Manufacturing. *Procedia Social and Behavioural Sciences*, Volume 221, pp. 105–110.
- DOMBROWSKI, U. & MIELKE, T., 2013. Lean leadership fundamental principles and their application. *Procedia CIRP*, Volume 7, pp. 569–574.
- FILHO, M. G., GANGA, G. M. D. & GUNASEKARAN, A., 2016. Lean manufacturing in Brazilian small and medium enterprises: implementation and effect on performance. *International Journal of Production Research*, 54(24), pp. 7523–7545.
- HARTINI, S. & CIPTOMULYONO, U., 2015. The relationship between lean and sustainable manufacturing on performance: literature review. *Procedia Manufacturing*, Volume 4, pp. 38–45.
- JADHAV, J., MANTHA, S. & RANE, S., 2015. Analysis of interactions among the barriers to JIT productions: interpretive structural equation modelling approach. *Journal of Industrial Engineering International*, 11(3), pp. 331–352.
- LODGAARD, E., INGVALDSEN, J. A. & ASCHEHOUG, S., 2016. Barriers to lean implementation : perceptions of top managers, middle managers and workers. *Procedia CIRP*, Volume 57, pp. 595–600.
- LUCEY, J., BATEMAN, N. & HINES, P., 2005. Why major lean transitions have not been sustained. *Management Services*, 49(2), pp. 9–13.
- MCKONE, K. E., SCHROEDER, R. G. & CUA, K. O., 2001. The impact of total productive maintenance practices on manufacturing performance. *Journal of Operations Management*, 19(1), pp. 39–58.
- NÄSLUND, D., 2008. Lean, six sigma and lean sigma : fads or real process improvement methods?. *Business Process Management Journal*, 14(3), pp. 269–287.
- PANIZZOLO, R., GARENGO, P., SHARMA, M. K. & GORE, A., 2012. Lean manufacturing in developing countries: evidence from Indian SMEs. *Production Planning & Control: The management of operations*, 23(10–11), pp. 769–788.
- RAHMAN, S., LAOSIRIHONGTHONG, T. & SOHAL, A. S., 2010. Impact of lean strategy on operational performance: A study of Thai manufacturing companies. *Journal Manufacturing Technology Management*, 21(7), pp. 839–852.
- SALONITIS, K. & TSINOPOULOS, C., 2016. Drivers and Barriers of Lean Implementation in the Greek Manufacturing Sector. *Procedia CIRP*, Volume 57, pp. 189–194.
- Seth, D. & Gupta, V., 2006. Application of value stream mapping for lean operations and cycle time reduction: an Indian case study. *Production Planning & Control*, 16(1), pp. 44–59.
- SHAH, R. & WARD, P. T., 2003. Lean manufacturing : context, practice bundles, and performance. *Journal of Operations Management*, 21(2), pp. 129–149.

- SHAH, R. & WARD, P. T., 2007. Defining and developing measures of Lean production. *Journal of Operations Management*, 25(4), pp. 785–805.
- SINGH, R. K., GARG, S. K. & DESHMUKH, S. G., 2008. Strategy development by SMEs for competitiveness : a review. *Benchmarking: An International Journal*, 15(5), pp. 525–547.
- SUWANDEJ, N., 2015. Factors influencing Total Quality Management. *Procedia – Social and Behavioral Sciences*, Volume 197, pp. 2215–2222.
- WAHAB, A. N. A., MUKHTAR, M. & SULAIMAN, R., 2013. A Conceptual Model of Lean Manufacturing Dimensions. *Procedia Technology*, Volume 11, pp. 1292–1298.
- WORLEY, J. & DOOLEN, T., 2006. The role of communication and management support in a lean manufacturing implementation. *Management Decision*, 44(2), pp. 228–245.
- WYRWICKA, M. K. & MRUGALSKA, B., 2017. Mirages of Lean Manufacturing in Practice. *Procedia Engineering* 182, pp. 780–785.
- ZHOU, B., 2012. Lean principles, practices, and impacts: a study on small and medium-sized enterprises (SMEs). *Annals of Operations Research*, Volume 241, pp. 457–474.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Economic Sanctions of the EU against Russia and Their Impact on the Defense Industry

Elena Daniela Sarau¹

¹*Department of Economics, Faculty of Business and Economics, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: xsarau@mendelu.cz*

Abstract

Although it has been pointed out by several scientists like Hufbauer, Schott, Elliott (1990) or Drezner (1999) that sanctions have only limited effect, they are being used increasingly by the EU after the end of the Cold War. Wälder (2001) stated that “*U. S. economic sanctions are basically the result of domestic political pressure and that their formal objective is sometimes nothing more than a fig leaf for Congressional action demonstrating symbolic action, support, and allegiance to (...) domestic pressure groups.*” In view of this, the question arises whether it could be that the EU – similar to the US – imposes sanctions under the pressure of domestic politics. Meunier and Nicolaidis (2006) have not only examined the economic power of the EU but have also explicitly stated that economic sanctions can be used to achieve any economic benefit. Their findings suggest that economic sanctions are not only of foreign but also of economic and domestic significance which would mean that sanctions serve not only the purpose of international policy but much more the purpose of economic policy and national interest groups. This paper summarizes the interactions of the defense industry with the use of economic sanctions and empirically analyzes the economic sanctions of the EU against Russia regarding their impact on the defense industry, on Russia and on the US as well as on itself.

Keywords: International Political Economy, Sanctions, Protectionism

JEL Code: F500, F510, F520

1. Introduction

Economic sanctions are an important foreign-policy tool used by main world powers in order to reach changes in the behavior of the respective target states. But since the end of the Cold War scientists have expressed concerns about the effectiveness of the economic sanctions. Hufbauer, Schott and Elliott (1990) examined a total of 115 sanctions imposed by the US between 1914 and 1990 and documented that only 40 of them were successful. According to them the effectiveness of US sanctions imposed after 1973 depreciated by

about 24%. In 1999 Drezner investigated the economic sanctions imposed by the Russian Federation in the 1990s and came to the conclusion that their effectiveness was only 38%. Given the relative low effectiveness level of the economic sanctions the question arises why main world powers continue to impose them. Drury (2005) presumes that “[p]oor economic conditions in the United States generally constrain the president from using economic coercion, while a large trade surplus is associated with sanctions use”. Wälder (2001) conceives that “(...) U. S. economic sanctions are basically the result of domestic policy pressures and that the formal objective is sometimes nothing more than a fig leaf for Congressional action demonstrating symbolic action, support, and allegiance to (...) domestic pressure groups.” (Drury, 2005) In his opinion, “[s]anctions, initiated by specific-interest or specific-value groups and carried out, often reluctantly and under pressure by states and sub-national governmental actors, are therefore increasingly likely to be a factor for internationally operating businesses” (Wälder, 2001).

In 2006 Sophie Meunier and Kalypso Nicolaidis (2006) concluded that the European Union uses its economic influence and experience to exert considerable influence on its current and future trading partners and pointed out to the possibility of using sanctions to pursue economic goals. Given the widespread use and significant economic leverage of sanctions imposed by great powers, it can be assumed that economic sanctions affect not only the targeted country but also interest groups within the sanctioning country (EU), e.g. the defence industry. Therefore, it can be hypothesized that interest groups in the sanctioning country (EU) could try to influence policy decisions on sanctions. Indications of such internal political dynamics, which influence foreign policy sanction decisions, can definitely be found in the literature. So, the hypothesis mentioned above finds a basis in the literature suggesting that sanctions serve economic interests and thus not only fulfill a foreign policy function, but also – and perhaps even above all – have a domestic political significance. Sanctions would also serve economic policy and the purposes of national interest groups, rather than just the goals of international politics. The definition of sanctions and the framework in which sanctions are analyzed and assessed should therefore be reconsidered because that would make the classic definition of sanctions in political science obsolete.

The objective of this paper is to analyze the use of sanctions in domestic and economic policy dimensions. It focuses on the EU sanctions against Russia and their impact on the defence industry. Therefore the following hypotheses are to be verified:

H1) Interest groups try to influence policy decisions on sanctions to protect their economic interests.

H2) The sanctions fulfill not only a foreign policy, but also a domestic political function.

H3) Sanctions serve not only foreign policy, but also economic policy.

2. Methodology and Data

The sanctions not only apply to economic sectors such as machinery, oil and gas, banking or insurance, but also have a significant impact on the defense industry due to the export ban on dual-use goods, which is usually seen as a permanent part of sanctions. Since little attention has been paid to the impact of EU sanctions on the defense industry in the literature, the results of this paper should help to gain new insights into this aspect of sanctioning effects. As the impact of all EU economic sanctions on the defense industry cannot be comprehensively examined in this work, only an evaluation of the EU’s sanctions on

Russia will be carried out by looking as well on the global development of the defense industry as at the changes in some components of the armaments industry hexagon like security situation, economic resources and political framework of the most important arms industry powers. i.e. the EU, Russia and the USA after the entry into force of sanctions. Thus, the development of the defense industry in the period 2012–2016, before and after the imposition of EU sanctions on the Russian Federation was examined in order to detect any changes in the defense industry. In addition, a comparison of EU sanctions against Iran, North Korea and Russia was essential to determine whether EU sanctions are in line with a basic pattern or whether they are repositioned differently depending on the case. This should provide insights into how the EU is acting in the event of sanctions. An analysis of the impact of EU sanctions on the Russian Federation on the security and political environment of the EU, Russia and the US, should provide new insights into the potential of economic sanctions as a sanctioning instrument and, in particular, desirable or undesirable effects of the political intervention in the arms market. The precondition of this project is to broadly outline the concept of the defense industry in its interaction with the concepts of economic sanctions, and on this basis to analyze in an empirical part not only the EU economic sanctions concerning their effects on the armaments industry and the purchase of armaments of the sanctioned country, but also the EU itself as well as non-participating third countries (USA). To accurately capture and predict this influence would contribute to a better understanding of the potential of economic sanctions as a sanctioning tool and, in particular, it would give a basic understanding of the complex effects of political intervention in the defense industry. Data, statistics and reports from the following institutions and organizations are processed: OECD, SIPRI, EUROFRAME, TASS Russian News Agency, Statista, etc.

3. Results

Restrictive measures (sanctions) of the EU against Russia

With regard to the restrictive measures against Russia, however, abnormalities were observed which do not correspond to the EU's standardized approach. While the EU has always acted on the basis of United Nations Security Council resolutions on sanctions i.e. against Iran (WKO, 2017) and North Korea (Resolution 2371, 2017 and WKO, 2017), in case of Russia it has already been active in the run-up to the "Reunification Referendum with Russia" (Standard, 2014). Striking is also the fact that the EU, only one day after the referendum and without any reaction from the UN, reverted with the COUNCIL DECISION 2014/145 / CFSP of March 17, 2014 concerning restrictive measures in the face of acts of territorial integrity, sovereignty undermining or threatening Ukraine's independence and imposed restrictive measures against Russia on the same day by means of Council REGULATION (EU) No 269/2014 of March 17, 2014, although there is no irrefutable evidence against Russia to date. The title of both as well as the CFSP decision of the Council and Regulation (EC) 269/2014 is also special, since there is no direct link with Russia. It is also unusual that the UN reacted only 10 days after the EU imposed the first restrictive measures, with Resolution 68/262 not being adopted as usual in the UN Security Council, but by a vote by the UN General Assembly. The title of Resolution 68/262 – "Territorial Integrity of Ukraine" – also makes it difficult to associate with the Russian Federation. It is interesting to note that the resolution merely states that "the referendum held on March 1, 2014 in the Autonomous Republic of Crimea and the city of Sevastopol has not been approved by Ukraine" or that "the UN is calling on all states "(...) of actions aimed at the

partial or total destruction of the national unity and territorial integrity of Ukraine, including any attempts to alter, abandon and refrain from the borders of Ukraine by the threat or use of force or other unlawful means ". There was nowhere explicitly stated that Russia was involved in the conflict. The term "all states" is an open term and may also be extended to the EU itself or to the US. Point 3 of Resolution 68/262 "*urges all parties to work immediately for a peaceful settlement of the situation in relation to Ukraine through direct political dialogue, restraint, all unilateral acts and inflammatory rhetoric that could exacerbate tensions, to refrain from and to fully engage in international mediation efforts*". Although the content of UN Resolution 68/262 is very vague and has no clear relation to any annexation of Crimea by Russia, the EU has used the Resolution as an opportunity to impose further sanctions on the Russian Federation. This gives the impression that the EU itself is not exercising the restraint demanded by United Nations General Assembly Resolution 68/262 nor working towards a peaceful settlement of the conflict through direct political dialogue. The imposition of restrictive measures (sanctions) on Russia had an impact not only on the global defense industry, but also on both the security situation and the political environment of the US, Russia and the EU, which also had consequences for military demands, economic armaments resources and the technological armaments advance. These restrictive measures have led to increase the competitive pressure of the major powers involved.

Defense Industry

According to SIPRI, 2 years after the EU imposed economic sanctions against the Russian Federation the world's largest arms exporters in the period 2012-2016, continue to be the United States with a global market share of 33%, Russia 23% and the EU 21.7%. It can be assumed that amongst others also the Ukraine conflict has contributed to a competitive advantage of the US. Not only have US arms exports steadily increased by 2% per annum since 2014, but the US has continued to maintain its market shares despite the fact that the total market shares of the three major powers US, Russia and the EU is 0.3% below the value of the year 2013, and dropped to 77.7% of the global market shares in 2016. Both, the EU and Russia have lost market shares since the imposition of sanctions on the Russian Federation, which may also be due to the Crimean crisis. On the whole, the imposition of sanctions should have led to a massive 5% decline in Russian arms exports over the past two years, in favor of the United States, which gained 4% over the same period. The EU has also lost market shares due to the EU sanctions imposed on Russia, triggered by canceled arms deals, leading to a continued decline of European market shares in international arms exports, which has weakened the EU position vis-à-vis its US and Russian competitors.

Table 1: The Three Largest Arms Exporters of the World (USA, RUS, EU) and the Share of International Arms Export (in %) 2013–2016

| Year | USA | RUS | DEU | FR | UK | SP | IT | EU |
|----------|-----|-----|-----|-----|-----|-----|-----|------|
| 2013* | 29 | 27 | 7 | 5 | 4 | 3 | 3 | 22 |
| 2014** | 31 | 27 | 5 | 5 | 4 | 3 | 4 | 21 |
| 2015*** | 33 | 25 | 4.7 | 5.6 | 4.5 | 3.5 | 2.7 | 21 |
| 2016**** | 33 | 23 | 5.6 | 6 | 4.6 | 2.8 | 2.7 | 21.7 |

* Cf. Stiftung Ebert Friedrich, 2014, **Cf. Jeppesen, 2015, ***Cf. Hein, 2016, ****Cf. SIPRI, 2017

Source: *Own presentation* in adaptation to Stiftung Friedrich Ebert Stiftung, 2014; Jeppesen, 2015; Hein, 2016; and SIPRI, 2017 in Sarau, 2018.

Security Situation

According to the results presented in this work, it can be assumed that the security situation has changed significantly in the wake of the Crimean crisis both within the EU itself and in the major powers of the USA and Russia. Many EU member states are dissatisfied with the common Russia policy. (Bendiek, 2015) President Putin's testimony of being "in two days in Riga, Warsaw or Bucharest" (vek/syd/AFP, 2018) has triggered uncertainty among most Eastern European EU Member States regarding Russia's geopolitical intentions too. The Russian troop movements of the past three years near the EU border have helped many EU Member States perceive Russia as a threat. They are demanding not only harsher restrictive measures from the EU, but also a transfer of NATO troops to the EU external border with the Russian Federation. (Kapern, 2014) There is also a call for closer cooperation within the framework of the CFSP. (Lorenz, 2017) By contrast, other EU member states point to the failure of Russia as an important trading partner and important raw material supplier and its economic consequences. (Bendiek, 2015) The Ukraine crisis has strengthened Russia's belief that Western alliances, notably NATO (Jedlaucnik, 2015), operating in the Russian neighborhood represent a significant source of danger with the aim of "encircling" Russia to extend the unipolar hegemony of the US led West also on Russia. From the Russian point of view, "revolutions" are only geopolitical instruments of the West, which are used to effect a system change in their own interest. Russia sees itself as the preserver and defender of the world against American interventionism. (Fischer, 2017) The US appears to be taking advantage of the Ukraine crisis to build a permanent US military presence on the EU's external border with Russia. (Pax von, 2015 and Dewitz, 2017) As part of the European Reassurance Initiative (ERI), the US has set up its own positions in Germany, Poland, Romania, Latvia and Bulgaria in addition to NATO activities. (Bischof, 2015)

Political Framework

The Ukraine crisis has created new political frameworks within the EU for a common military strategy. (Lorenz, 2017) For example, on June 28, 2016, Federica Mogherini, the High Representative of the EU for Foreign Affairs and Security Policy, presented to the European Council the Global Strategy for Foreign Affairs and Security Policy, which implies a significant change in EU security policy. (Genderen, 2017) The President of the European Commission, Jean-Claude Juncker, also baked up the EU's new Global Foreign and Security Policy with its proposal for a common headquarters, a European Defense Fund and permanent structured cooperation. (Barnier, 2016)

It seems that EU sanctions against Russia have strengthened the power of Russian President Putin both in the country and internationally. (Hill, 2016) According to the study published at the end of July 2017 by the state-run All-Russian Center for the Study of Public Opinion (WCIOM), over 83.5 percent of Russians were behind their president. (Sergeeva, 2018)

Joe Binder, the former US Vice President, presented his view on the power relations between the US, the EU and Russia in 2014. On one side stands the hegemon (the USA) and on the other side his vassals (EU and Russia). Biden publicly stated that the US, against its resistance, has led the EU to exert economic pressure on Russia. (JDS, 2014/Deutsche Wirtschafts Nachrichten, 2014/RT, 2018) Meanwhile, an increasing number of EU Member States are publicly opposed to EU policy of restrictive measures against Russia, as the entire EU has suffered economic losses of about 10% in 2014 from European-Russian trade, while at the same time American-Russian exchange of goods statistics increased by about 6%. (Roberts, 2018)

The US's latest Russia sanctions, passed in August 2017, have worsened relations between the US and the EU, as the EU expects the US to seek to secure market share for its liquefied natural gas. (Fieber, 2018)

4. Discussion and Conclusions

The hypothesis (H1) that different stakeholders are trying to influence policy decisions on sanctions to protect their interests may be validated in the light of the impact of EU sanctions against the Russian Federation on the defense industry. The US arms industry, as such an influential group, has seen a significant 4% increase in its market share over the past two years, which is likely due in large part to EU sanctions against Russia. This interpretation is supported by the fact that the EU imposed sanctions only under US pressure. In addition, the sanctions against Russia were atypical and deviated greatly from the Guidelines for Implementing and Evaluating Restrictive Measures (sanctions) in the context of the EU's common foreign and security policy. The confirmation of the first hypothesis also implies the confirmation of the second hypothesis that the sanctions not only fulfill a foreign policy function but also have a domestic political significance. Although the sanctions came from the EU, it is likely that the EU has acted as an instrument to enforce the interests of the US defense industry. Consequently, the third hypothesis, according to which the sanctions serve not only foreign policy but also economic policy, must be regarded as confirmed. These findings show that the sanctions have a more complex functionality than previously thought. Accordingly, their definition could be extended to classify them as an instrument of economic policy, which is used only under certain conditions. While it has been assumed to date that sanctions are only used to change the behavior of an international legal entity, it can now be assumed that sanctions may be imposed by various states or international organizations under pressure from various interest groups pursuing purely economic interests in order to secure economic benefits for these groups.

The present inquiry relates only to EU sanctions against the Russian Federation. Therefore, it would be useful to further analyze further sanctions not only from the EU but also from other major powers in order to verify the generalizability of the results presented here. In doing so, the focus of the investigations could be adapted to gain insights into the impact of sanctions on various sectors of the economy, such as machinery, oil and gas, banking or insurance. In addition, political science should in future not only analyze the economic interests of the sanctioning countries, but also of their allies – for example, from the USA as an ally of the EU – and derive further findings from it.

References

- Barnier: Gemeinsame Verteidigung der EU ist nicht gegen NATO gerichtet.* (2016, Sep 15). Retrieved Feb 13, 2018, from Deutsche Wirtschafts Nachrichten: <https://deutsche-wirtschafts-nachrichten.de/2016/09/15/barnier-gemeinsame-verteidigung-der-eu-ist-nicht-gegen-nato-gerichtet/>.
- BENDIEK, A. (2015, Feb 24). *EU-Außenpolitik: Ukraine-Krise könnte Katalysator für mehr Integration sein.* Retrieved Feb 13, 2018, from Stiftung Wissenschaft und Politik:

<https://www.swp-berlin.org/kurz-gesagt/eu-aussenpolitik-ukraine-krise-koennte-katalysator-fuer-mehr-integration-sein/>.

- BISCHOF, B. (2015, Juni 17). *Neues Wettrüsten mit Russland bahnt sich an*. Retrieved Feb 14, 2018, from Die Presse: <http://diepresse.com/home/ausland/aussenpolitik/4757008/Neues-Wettruerten-mit-Russland-bahnt-sich-an>.
- DEUTSCHE, W. N. (5. Oct 2014). *Deutsche Wirtschafts Nachrichten*. Abgerufen am 14. Feb 2018 von <https://deutsche-wirtschafts-nachrichten.de/2014/10/05/obama-vize-blamiert-merkel-usa-haben-eu-zu-sanktionen-gegen-russland-gezwungen/>.
- DEWITZ, C. (2017, Jan 07). *Operation „Atlantic Resolve“: Stärkung der NATO-Ostflanke*. Retrieved Feb 13, 2018, from Bundeswehr-Journal: <http://www.bundeswehr-journal.de/2017/operation-atlantic-resolve-staerkung-der-nato-ostflanke/>.
- DREZNER, D. W. (1999). *The Sanctions Paradox: Economic Statecraft and International Relations*. Cambridge: Cambridge University Press.
- DRURY, A. C. (2005). *Economic Sanctions and Presidential Decisions*. New York: Palgrave Macmillan.
- FIEBER, M. (2017, July 27). *Die USA und die EU streiten sich wegen der Russland-Sanktionen – Gewinner könnte dabei Putin sein*. Retrieved Feb 15, 2018, from Huffington Post: http://www.huffingtonpost.de/2017/07/27/russland-sanktionen-usa-e_n_17596338.html#.
- FISCHER, S. (2017, Jan). *Vom Getriebenen zum »Gestalter«: Russland in internationaler Krisenlandschaften*. Retrieved Feb 13, 2018, from SWP Stiftung Wissenschaft und Politik Deutsches Institut für Internationale Politik und Sicherheit: https://www.swp-berlin.org/fileadmin/contents/products/studien/2017S01_ild.pdf#page=31.
- G. C. HUFBAUER, J. J. (1990). *Economic Sanctions Reconsidered*. Washington: Institute for International Economics.
- GENDEREN, W. T.-v. (2017, Juni). *Außenpolitik: Ziele, Mechanismen und Ergebnisse*. Retrieved Feb 13, 2018, from Europäisches Parlament Service: Außenpolitik: Ziele, Mechanismen und Ergebnisse.
- HEIN, M. v. (2016, Feb 22). *SIPRI: Krise kurbeln weltweit Waffenhandel an*. Retrieved Sept 21, 2017, from DW Deutsche Welle: <http://www.dw.com/de/sipri-krise-kurbeln-weltweit-waffenhandel-an/a-19061116>.
- HILL, F. (2016, July 1). *Russland verstehen, Russland abschrecken: Taktiken und Strategien der USA*. Retrieved Feb 14, 2018, from Heinrich Böll Stiftung: <https://www.boell.de/de/2016/07/01/russland-verstehen-russland-abschrecken-taktiken-und-strategien-der-usa>.
- JDS. (6. Oct 2014). *Huffington Post*. Abgerufen am 14. Feb 2018 von https://www.huffingtonpost.de/2014/10/06/russland-sanktionen-usa-merkel_n_5938022.html.
- JEDLAUCNIK, H. (2015, Jan). *Die Auswirkungen der Ukraine-Krise auf die Budgetäre Situation der europäischen Streitkräfte*. Retrieved Feb 13, 2018, from Institut für Strategie und Sicherheitspolitik der Landesverteidigungsakademie Wien (ISS Aktuell): <http://ogs.oeg.at/wp-content/uploads/2016/02/ISS-Info-2015-01.pdf>.

- JEPPESEN, H. (2015, March 16). *Waffenexport boomt weltweit*. Retrieved Sept 21, 2017, from DW Deutsche Welle: <http://www.dw.com/de/waffenexport-boomt-weltweit/a-18314159>.
- KAPERN, P. (2014, May 8). *NATO-Truppen in Osteuropa Keine Eskalation, sondern vernünftiges Krisenmanagement*. Retrieved Feb 13, 2018, from Deutschlandfunk: http://www.deutschlandfunk.de/nato-truppen-in-osteuropa-keine-eskalation-sondern.694.de.html?dram:article_id=284740.
- LORENZ, C. (2017, July 5). *EU-Verteidigungspolitik: Durch Druck zu mehr Gemeinsamkeit?* Retrieved Feb 13, 2018, from Friedrich-Ebert-Stiftung: <https://www.fes.de/de/news-vorschau/eu-verteidigungspolitik-durch-druck-zu-mehr-gemeinsamkeit/>.
- MEUNIER S., N. K. (2006). The European Union as a conflicted trade power. In *Journal of European Public Policy* (pp. 906-925). UK: Taylor& Francis.
- PAX, W. v. (2015, Juni 15). *US-Armee will erneut schweres Kriegsgerät nach Osteuropa verlegen*. Retrieved Feb 13, 2018, from Neo Presse: <http://www.neopresse.com/europa/us-armee-will-erneut-schweres-kriegsgeraet-nach-osteuropa-verlegen/>.
- Resolution 2371*. (2017, Aug 5). Retrieved Feb 11, 2018, from Sicherheitsrat der Vereinten Nationen: http://www.un.org/depts/german/sr/sr_17/sr2371.pdf.
- ROBERTS, J. (30. May 2015). *Spiegel Online*. Abgerufen am 15. Feb 2018 von <http://www.spiegel.de/wirtschaft/soziales/russland-sanktionen-helfen-us-firmen-europa-verliert-a-1036204.html>.
- Russia, T. (10. Oct 2014). *Youtube*. Abgerufen am 14. Feb 2018 von <https://www.youtube.com/watch?v=ZDRBzk0ITVY>.
- SARAU, E. D. (2018). *Russland-Sanktionen der EU: Auswirkungen auf die Rüstungsindustrie Die restriktiven Maßnahmen (Sanktionen) der EU gegen die Rüssische Föderation und ihre Auswirkungen auf die Rüstungsindustrie*. p. 97.
- SERGEEVA, A. (8. Aug 2017). *Russia Today (RT)*. Abgerufen am 14. Feb 2018 von <https://www.rt.com/politics/400740-putin-approval-rating-at-83/>.
- SIPRI. (2017, Feb). *International arms transfers*. Retrieved Juli 07, 2017, from SIPRI: <https://www.sipri.org/research/armament-and-disarmament/arms-transfers-and-military-spending/international-arms-transfers>.
- Standard. (2014, March 15). *Moskau legt Veto gegen UN-Resolution ein*. Retrieved Feb 12, 2018, from Der Standard: <http://derstandard.at/1392688338171/Schiesserei-im-ostukrainischen-Charkiw>.
- STIFTUNG, F. E. (2014). *SIPRI Yearbook 2014*. Retrieved Sept 21, 2017, from Friedrich Ebert Stiftung: , <https://www.sipri.org/sites/default/files/2016-03/SIPRIYB14SummaryDE.pdf>.
- vek/syd/AFP. (18. Sept 2014). *Putin drohte mit Einmarsch in Riga und Warschau*. Abgerufen am 13. Feb 2018 von Spiegel Online: <http://www.spiegel.de/politik/ausland/putin-drohte-mit-einmarsch-in-polen-und-rumaenien-a-992298.html>.

WÄLDER, T. W. (2001). *Managing the Risk of Sanctions in the Global Oil& Gas Industry: Corporate Response Under Political, Legal and Commercial Pressures.*

WKO. (2017, Juli 25). *Aktueller Stand der Sanktionen gegen den Iran.* Retrieved Feb 11, 2018, from WKO: <https://www.wko.at/service/aussenwirtschaft/Aktueller-Stand-der-Sanktionen-gegenueber-dem-Iran.html>.

WKO. (2017, Aug 11). *Aktueller Stand der Sanktionen gegen Nord-Korea.* Retrieved Feb 11, 2018, from WKÖ: https://www.wko.at/service/aussenwirtschaft/Aktueller_Stand_der_Sanktionen_gegen_Nord-Korea.html.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

MiFID “Gold-plating”: Divergences in the EU’s Capital Markets Union

Daniel Scire¹

*¹Department of Economics, Faculty of Business and Economics, Mendel University in Brno,
Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: xscire@mendelu.cz*

Abstract

One of the objectives of the European Commission’s Capital Markets Union (CMU) initiative from 2014/2015 is to achieve a single rule book in the EU. This initiative was kicked off in parallel with a significant revision of the Markets in Financial Instruments Directive – originally implemented in 2004. This paper analyses the level of divergences in the implementations of the Markets in Financial Instruments Directive (MiFID) which has strong impact on financial markets participants. Unlike EU regulations that become directly applicable in all member states, EU Directives require an additional national implementation. Seven countries including some of the largest EU financial markets (incl. UK and Germany) are in scope of the national implementation analysis. The research results show that the type of divergences contrast with the CMU initiatives. These divergences referred to as “gold-plating” can cause significant operational hurdles for cross-border market activities within and outside of the EU.

Nevertheless, with exception of UK, the number of gold-plating under MiFID II was found relatively low, but in some member states a divergence is identified due to early implementation of MiFID II measures. The paper concludes with a summary of observations and recommendations (including the implementation of a score methodology) for EU policy makers who intend to reduce or avoid unwanted divergences from the CMU initiative’s goals.

Keywords: Capital Markets Union, Financial Markets, Regulation

JEL Code: F30, G10, K20

1. Introduction

This paper discusses the divergences identified as part of the research into the national implementation of the Markets in Financial Instruments Directive (MiFID, the Directive)⁵³, which are believed to be potentially in contrast with the European Commission's efforts on the Capital Markets Union (CMU). One of the CMU's goals is to achieve a single rule book across the EU member states.⁵⁴

Divergences can arise from member states adding requirements that go beyond those contained in the respective EU Directive and consequently results in an unlevel playing field. This practice is also referred to as “gold-plating” and shall give member states a level of flexibility in the actual measures to achieve the goals of the directive. However, Bocci et al. (2014, p. 27) highlight that negative economic implications are not only to be expected for public administration due to higher transaction costs or inefficiencies, but in general, gold-plating can be disproportionate to achieve their expected benefits.

As a countermeasure, EU legislators are using more increasingly regulation to achieve higher level of consistency in the EU. Regulations do not require additional implementation into national law. More recent examples are the Market Abuse Regulation, the European Market Infrastructure Regulation or the General Data Protection Regulation. MiFID was implemented together with a set of rules that have been implemented as regulation (Markets in Financial Instruments Regulation, MiFIR) and Commission delegated regulations. These will not be considered for research, as regulations due to their nature do not trigger divergences per se. The European Commission had already considered in its December 2010 consultation paper to remove the opportunities of gold-plating, as they had seen member states only making relatively little use of this opportunity.⁵⁵

The first version of the Markets in Financial Instruments Directive became effective in 2007. The European Commission intended to achieve a single financial market for investment firms with harmonized investor protection across the EU. Shortly after the effective date, the financial crisis of 2008 revealed new challenges that had to be addressed with a revised version that became known as MiFID II.

MiFID II has become effective on 3 January 2018. One of the key goals of this directive is to further strengthen investor protection and to support market integrity.

The author intends to contribute to research information by adding more general understanding on the divergences caused by member states who opted for gold-plating. These measures will be analysed to assess the impact on the CMU goal of keeping a single rule book, e.g. by considering the cross-border implications for market participants, entry hurdles created or additional complexity. Kotz et al. (2017) have also identified that a more homogenous financial infrastructure may bear less risk of de-stabilisation in financial crises.

The results are expected to give a better insight into the level of the harmonisation in the financial markets and to identify those member states who are more at risk of achieving the EU's goals on harmonisation. Given that an indexing methodology is being applied to express the level of divergence, the European Commission may consider such approach for other legislative measures that are expected to potentially lead to gold-plating.

⁵³ Directive 2014/65/EU of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.

⁵⁴ See also European Commission (2015), Green Paper “Building a Capital Markets Union” (p. 5).

⁵⁵ European Commission (2010), Review of the Markets in Financial Instruments Directive (p. 76).

2. Methodology and Data

2.1. General Research approach

To achieve the paper's objectives, a legal comparison will take place between the original directive text of MiFID II and relevant texts of the national implementation by identifying those parts where the legislators would allow a divergence. Such texts are made available by the national competent authorities (incl. regulator's websites), public legal databases and the Commission's website. The author will make specific use of the EUR-Lex database.⁵⁶ The paperwork in relation to MiFID II consists of more than 20,000 pages when including any regulatory technical guidelines, supplements, consultation papers etc. To narrow the scope of and search for gold-plating measures to look for, Clifford Chance International Regulatory Updates (weekly newsletters) in the period from 10 September 2013 to 3 January 2018 are being evaluated (a total of 193 regulatory updates). These newsletters had been collected and archived as part of the author's professional role. New subscriptions are available from the legal firm's website.⁵⁷ The author has been involved in the last years in the implementation of MiFID requirements and was regulatory subject-matter expert of the MiFID 2 project at the employer's MiFID project team.

An additional source to identify any gold-plating measures and to validate against Clifford Chance information, the fee-based subscription service by Simmons & Simmons is being used.⁵⁸ It is believed that the combination of these sources are designed to create a full picture of the number of gold-plating measures and to allow the actual assessment of divergence of these legal measures. Where necessary, any of the individual regulatory measures are being checked against the member states' legislative implementation measures from the EUR-Lex database.

The countries in focus of this analysis are some of the biggest and/or well-established financial markets within the EU who have fully implemented MiFID II: UK, Ireland, Germany, France, Italy, Belgium and Netherlands.

While focus is on MiFID II, some of the member states have implemented financial market rules that gold-plate MiFID I, e.g. by creation of an additional regulatory framework. Some countries are also known to have adopted rules prior to the implementation requirement of MiFID II, which will be considered as part of the analysis.

The author also has long-standing professional experience (more than 20 years) as regional regulatory expert in the financial service industry.

2.2. Gold-Plating Index – GPI (MiFID II)

The results will feed into a divergence-based gold-plating index GPI (MiFID II) that will consider the following factors with a combination of points and weightings (applying the

⁵⁶ The MiFID II text is accessible at URL: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0065>, while the national implementations are published at URL: <http://eur-lex.europa.eu/legal-content/EN/NIM/?uri=CELEX:32014L0065> (both last accessed at 2/17/2018).

⁵⁷ Free-of-charge subscription is available upon request from Clifford Chance (legal firm) e.g. at URL: <https://financialmarketstoolkit.cliffordchance.com/en/home.html> (last accessed at 3/21/2018).

⁵⁸ The charged subscription service "MiFID 2 Manager" is accessible in the login-protected area of the Simmons & Simmons website at URL: <http://www.elexica.com/en/resources/microsite/mifid-2-tracker/mifid2-manager/mifid2-manager-access> (last accessed at 3/21/2018) after successful registration.

logic of a decision-making matrix). The higher the score, the more gold-plating measures are being observed in any of the jurisdictions.

I.(nL) Number of individual legislative texts used or required to transpose the directive into national law. This information will be obtained from the EUR-Lex web database. A high number of transition requirements indicates that the country has a fragmented legislation, which contrasts with a single rule book approach and adds to the complexity within the EU.

This item will receive a 10% weighting reflecting that this factor does not constitute gold-plating per se, but a higher number of rules results in more fragmentation rather than the simplicity of having a single rule book. Per number of legislation, half a point (0.5) will go into the GPI (MiFID II).

II.(nD) Number of actual thematic divergences. For analysis purposes, the Directive will be split into 4 impact areas consisting of Sales & Distribution, Research & Trading, Operations and Governance & Organisational. This categorisation follows the directive's themes with a total of 33 categories. This factor will receive a 60% weighting of the overall calculation given that these are actual gold-plating measures identified that have either a low (1 point), medium (5 points) or high impact (10 points). The significance has been assessed by the author (on the basis of his initial assessment and professional experience in implementing regulation across Europe as Regional Head of Compliance in the financial service industry)

A "low" categorisation does reflect that the economic impact for market participants is not expected in major magnitude. Medium ratings are assigned to those measures that can likely lead to market participants experiencing a level of unwanted disruption, e.g. in form of market entry hurdles, transaction costs etc. that go significantly beyond a low item. If these disruptions are actually expected to be very significant, then the category shall move to high impact. There can be more than one gold-plating measure in the legislation per category, so the overall measures within one category will be considered. All categories are equally weighted due to the same logic being applied. Given that the assessment can vary from one regulatory to the other, it could be considered that an independent expert team is being formed to finalise such assessment.

Table 1: MiFID Thematic Split

| Sales & Distribution | (continued) | Research & Trading | Operations | Governance & Organisation |
|---|----------------------------|---------------------------------------|---------------------------------------|------------------------------------|
| 1) Product Governance & Strategy | 9) Client Communications | 17) Unbundling of dealing commissions | 25) Transaction Reporting | 28) Training & Competence |
| 2) Inducements | 10) Client Classifications | 18) Best Execution | 26) Commodity Derivatives Pos. Limits | 29) Record keeping |
| 3) Appropriateness | 11) Suitability | 19) Post-trade transparency | 27) Clearing Obligation for ETDs | 30) Mgmt. Oversight & Organisation |
| 4) Client Asset Protection | 12) Conflicts of Interest | 20) Telephone & Electronic Recording | | 31) Remuneration |
| 5) 3 rd Country / extra-territorial req. | 13) Complaints handling | 21) Clock Synchronisation | | 32) Operational Risk & Compliance |
| 6) Product Definition | 14) Client Orders | 22) Pre-trade transparency | | 33) IT Security |
| 7) Independent advice | 15) Client Agreements | 23) Algorithmic trading | | |

| | | |
|-------------------------------------|--------------------------|------------------------|
| 8) Bundled Services & Cross-Selling | 16) Product Intervention | 24) Trading obligation |
|-------------------------------------|--------------------------|------------------------|

III. (nEI) Number of early implementations (ahead of MiFID II). As some member states may have already gold-plated legislative measures under MiFID I that did not require further implementation under MiFID II, this factor is being introduced to account for 1 point per measure. Given that these measures have now been aligned, the factor is supposed to demonstrate the level of timing-related divergences within the EU. Per early-adoption (prior to MiFID II become effective), 1 point is being assigned and a total of 30% weighting is being applied.

It will neither be analysed whether the implemented measures are actually in compliance with MiFID or EU law in general nor whether they are designed to meet the objectives of the policy-maker.

The overall result expressed by the GPI (MiFID II) score is supposed to answer the research question, in which magnitude the in-scope member states contribute to the divergence of legislation within the EU by using the example of a major financial markets legislative measure.

3. Results

The Commission reported an implementation status of 61% (17 out of 28), as 5 member states had still not communicated any measures and 6 member states had only partially communicated implementation.⁵⁹ In total, 19 member states have come under the European Commission's infringement proceedings triggered by late or incomplete notification of transposition of MiFID II into national law. As part of the research into gold-plating measures, there were some inconsistencies in the information provided by the legal firms Clifford Chance (CC) and Simmons&Simmons (S&S) as to what might be considered as implementation going beyond the directive's text. The following table highlights the level of those deviations identified by the author. In doubt, the author decided which of the legal firms' views to follow as the impact assessment will also sit with the author. The following table indicate some statistics on identified measures:

Table 2: Legal Database Research statistics

| Source / number of items | UK | BEL | FRA | GER | IRL | ITA | NED |
|--|-----|-----|-----|-----|-----|-----|-----|
| CC newsletter w/ ref. to country | 193 | 32 | 79 | 119 | 21 | 78 | 67 |
| CC newsletter with reference to MiFID1/2+country | 121 | 22 | 50 | 76 | 12 | 54 | 40 |
| CC Gold-plating measures MiFID1/2 identified | 19 | 3 | 3 | 7 | 2 | 2 | 2 |
| Gold-plating measures S&S MiFID 1/2 | 23 | 5 | 4 | 7 | 3 | 3 | 2 |
| Consolidated own results | 21 | 5 | 4 | 7 | 3 | 3 | 2 |

The identified items (table 2) have been consolidated in order to assign them to those categories as laid out in table 1. This resulted in case of UK a reduction of items, as multiple items were falling into the same category. When applying the indexing methodology, the results indicate that the member states do deviate in terms of gold-plating activities on

⁵⁹As of 13 February 2018

the level of implementing measures. The member states in scope of this analysis required up to 10 different legislative measures to implement MiFID II with Ireland, Germany requiring only one measure. UK and Belgium are at top of the league with 10 individual measures.⁶⁰

Table 3: GPI (MiFID II) Evaluation

| Member state | nL (10%) | 0,5 per nL | nEI (30%) | 1 per nEI | nD (60%) | low: 1; medium: 5; high: 10 per nD ⁶¹ | GPI (MiFID II) | |
|--------------|----------|------------|-----------|-----------|----------|---|----------------|------|
| | | | | | | Kat.1) medium; Kat. 2) low; Kat. 9) low; Kat. 10) low; Kat. 11) low; Kat. 12) medium; Kat. 13) low; Kat. 14) low; Kat. 15) low; Kat. 18) low; Kat.20) low; Kat. 28) low; Kat. 29) low; Kat. 30) low; Kat. 32) low | | |
| UK | 10 | 5 | 6 | 6 | 15 | | 23 | 16.1 |
| Germany | 1 | 0.5 | 9 | 9 | 0 | N/A | 0 | 2.8 |
| Belgium | 10 | 5 | 5 | 5 | 0 | N/A | 0 | 2.0 |
| France | 6 | 3 | 3 | 3 | 1 | Kat. 30) low | 1 | 1.8 |
| Ireland | 1 | 0.5 | 2 | 2 | 1 | Kat. 4) low | 1 | 1.3 |
| Netherlands | 4 | 2 | 1 | 1 | 1 | Kat. 2) low | 1 | 1.1 |
| Italy | 2 | 1 | 3 | 3 | 0 | N/A | 0 | 1.0 |

The review of the member states' measures to implement MiFID II reveals that 3 countries have not applied any gold-plating measures, however, this is mainly due to those countries (Belgium, Germany and Italy) had already implemented few measures ahead of MiFID II resulting in stricter standards in the EU as expected (see nEI).

While research indicates that these countries cannot be classified as "gold-platers" under MiFID II, it does not necessarily mean that full harmonisation is being achieved in these markets. Germany has decided to leave around 37,000 financial advisors yet exempted from having to implement MiFID II requirements, as these market participants are under a different legislative act. Practically, this will mean that investors are to expect a lower level of investor protection, which contrasts with the aim of MiFID II despite Germany had officially reported of having fully transposed the directive. Both Belgium and Italy apply regulatory measures that go beyond the practices required in other member states. Belgium does require full submission of all marketing documents for financial instruments that are targeting the general public, which is practically adding a form of regulator approval. Italy has requested that all marketing material are submitted to the regulator (without a need for an approval), while e.g. in Germany no submission is required at all.

Although all previously mentioned examples are not material, it demonstrates the divergence of regulatory practices of financial regulators within the EU that can cause operational hurdles to market participants.

⁶⁰ Czech Republic who are not part of this analysis are leading on nL in the EU with a total of 73 and on the basis of the indexing methodology would achieve a score of minimum 3,65.

⁶¹ The category numbers correspond to those highlighted in table 1 on MiFID Thematic split.

Despite the UK already having gold-plated six different areas of MiFID II – this is mainly due to the so-called UK Retail Distribution Review, which introduced stricter requirements on inducements and selling practices towards the general public, this member states tops the league with almost every second MiFID theme (see categories from table 1) having become subject to gold-plating measures.

The second highest “gold-platers” of MiFID II had each only one measure beyond the directive’s requirements (France, Ireland, Netherlands), which were all assessed to be low form of divergences. In Ireland, the client asset rules (Kat. 4) had been subject to gold-plating before MiFID became effective and constituted gold-plating both under MiFID I as well as under MiFID II.

4. Discussion and Conclusions

With home to the most important financial market in Europe, the UK are also by far the biggest “gold-platers” of their financial market. The Brexit, hence, the formal decision for the UK to leave the EU28 could actually lead to more harmonisation within the CMU once UK is no longer part of the EU.

Although the research indicates that gold-plating measures for the countries in scope have been relatively low, the behavior of other member states not to implement the rules in the first place should be an area of concern for the European Commission. With infringement imposed on 19 countries, it questions whether the pace of the MiFID II implementation was supported sufficiently by the national authorities.

While this area has not specifically been looked into, it is worth being followed up by the Commission to expand its research into divergences not only from legal analysis of implementation measures, but actual divergences from different regulatory practices. As for MiFID, most regulatory guidelines on the interpretation of such often principle-based directive at national level are expected to be issued during 2018, which are not yet reflected in this paper and that could have an impact on the scores.

Unlike the Financial Conduct Authority in the UK, many regulators in Europe have only administrative powers to release guidelines or additional requirements but those can still result in being in contrast with the spirit of the regulation and the CMU efforts though. Court rulings do not need to reflect the regulator’s interpretations or guidelines, however, are also known to follow such positions frequently.

BaFin (Bundesanstalt für Finanzaufsicht), the German financial regulator have announced on 15 February 2018 that, in principal, they would aim to adapt all guidelines or Q&As of the European Supervisory Authorities into their administrative practice in the interest of achieving harmonization of European Regulatory standards going forward.⁶² In the same announcement, BaFin claims that with roundabout 180 active guidelines and more than 3,000 Q&As, they would have only dismissed such practices in few cases and only limited to those scenarios where an adaption would have resulted in a clash with existing German regulatory practice. Such measure would also be welcomed for other national competent authorities under the CMU perspective.

Véron/Wolff (2016, p.146) opine that regulatory arbitrage should be avoided with market participants, if enforcement of capital markets regulation in the EU would sit more centralized with the European Securities Markets Authority (ESMA). Such arbitrage could

⁶² Accessible at URL: https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Meldung/2018/meldung_180215_leitlinien_q_and_as_der_esas.html (last accessed at 3/21/2018).

exist where market participants choose to establish their license in a country where they expect a preferential level of supervision.

The European Central Securities Depositories Association (ECSDA, 2015) have lobbied for measures that shall prevent divergences deriving from EU rules into national law in general, as these are also seen to create potential economic impact in form of competitive distortions. Such measures shall include monitoring, prevention or other forms of addressing actual divergences.

More legislative measures in form of regulation could lead to harmonisation within the EU, as the example of MiFID demonstrates that divergences are still observable. As a regulated market representative, ECSDA believe though that CMU goals will not only be achieved by regulation, but by allowing more market-driven solutions that they believe to be more effective. However, this is believed to be a measure that EU legislators would have to assess in the beginning any way whether the intended measures could be achieved in another form or whether self-regulation in the markets would be acceptable instead.

The Commission could lead an effort to measure GPI (*legal measure*) for all type of key directives or could expand this to an aggregated figure to introduce a measure for the consistency with the CMU efforts. Such GPI score could also result in incentives for those member states that support the CMU or sanctioning those who score in an unwanted magnitude.

Further research into the national regulatory administrative activities useful – even in case of regulations rather than directives – given that administrative measures by regulators become practically for those companies under their supervision a standard they can hardly ignore.

References

- BOCCI, M.; MAARTEN, J.; PAUER, A. (2014): European Parliament Study: 'Gold-plating' in the EAFRD. To what extent do national rules unnecessarily add to complexity and, as a result, increase the risk of errors?, checked on 2/17/2018.
- CLIFFORD CHANCE REGULATORY UPDATES (weekly newsletter updates from 10 September 2013 – 3 January 2018). URL: <https://financialmarketstoolkit.clifford-chance.com/en/home.html> (last accessed at 3/21/2018).
- BUNDESANSTALT FÜR FINANZDIENSTLEISTUNGS-AUFSICHT (2018): Europäische Aufsichtsbehörden: BaFin übernimmt grundsätzlich alle Leitlinien sowie Fragen und Antworten in ihre Verwaltungspraxis. URL: https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Meldung/2018/meldung_180215_leitlinien_q_and_as_der_esas.html, checked on 3/21/2018.
- ECSDA (2015): ECSDA comments on the Capital Markets Union Green Paper, checked on 2/16/2018.
- EUROPEAN COMMISSION (2010): Review of the Markets in Financial Instruments Directive (MiFID). Public Consultation – December 2010. Available online at http://ec.europa.eu/finance/consultations/2010/mifid/docs/consultation_paper_en.pdf, checked on 2/23/2018.

EUROPEAN COMMISSION (2015): Green Paper – Building a Capital Markets Union. Available online at http://ec.europa.eu/finance/consultations/2015/capital-markets-union/docs/green-paper_en.pdf, checked on 2/23/2018.

KOTZ, H.-H.; SEMMLER, W.; TAHRI, I. (2017): Capital Markets Union and monetary policy performance. Comes financial market variety at a cost? In *Vierteljahrshefte zur Wirtschaftsforschung* 86 (2), pp. 41–59. DOI: 10.3790/vjh.86.2.41.

SIMMONS & SIMMONS MIFID 2 MANAGER: URL: <http://www.elexica.com/en/resources/microsite/mifid-2-tracker/mifid2-manager/mifid2-manager-access> (last accessed at 3/21/2018).

VÉRON, N.; WOLFF, G. B. (2016): Capital Markets Union. A Vision for the Long Term. In *J Financ Regul* 2 (1), pp. 130–153. DOI: 10.1093/jfr/fjw006.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Implementation of the fully fluid responsive layout

David Schubert¹, Oldřich Trenz²

¹*Department of Informatics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: xschuber@mendelu.cz*

²*Department of Informatics, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic, e-mail: oldrich.trenz@mendelu.cz*

Abstract

This article deals with the design and implementation of a reusable fluid responsive layout for websites. The implemented solution includes an elastic grid layout that ensures responsive layout of the elements. The solution also includes an elastic typography that ensures smooth font size changes depending on the width of the browser window. The features of elastic typography are then used and applied to the box properties of selected elements placed on the page. Thank to these features, the implemented solution ensures smoothly changing sizes of fonts, elements and spacing between them and better maintains the relative proportions between the elements on the web page. This solution can be used to create webpages. It can be also used as an inspiration for extending existing libraries or frameworks, such as Bootstrap. The goal of this article is the implementation of fluid responsive layout and its description and summarizing the benefits in the production area.

Keywords: fluid layout, responsive design, typography

JEL Code: L86

1. Introduction

Already when designing web pages, their designers try to make them look, especially for the best possible clarity and readability. For better design of these pages are helped so-called grid system, which were originally taken from the area of printed publications (Boulton, 2014).

Various frameworks have been created to facilitate the creation of website templates. These frameworks include their own implementation of a grid system such as Bootstrap (Bootstrap, 2018), Foundation (Foundation, 2018) or Materialize (Materialize, 2018). At present, every significant framework (such as Bootstrap or Foundation) also provides a responsive behavior for this system. When it is used correctly, it will ensure good display of web pages on a variety of devices, such as tablets, mobile phones, etc.

Frameworks implementing the responsive behavior of the grid system define the widths of individual columns using percentage values to preserve fluid distribution which is the basic assumption of responsive design (Marcotte, 2010). To facilitate the creation of templates, they also define margin and padding helper classes applicable to any elements. Font sizes are typically set to a default browser value of 16px. If it is necessary for a web page to change the font size or element size for a certain width (using a media query) it is appropriate to use the rem units based on the default browser font size or change this default value. (Kadlec, 2014).

It is common practice that the changes in the size of the elements and the fonts, or the horizontal or vertical spacing, are jumps. Due the jump changes, in some situations (just before the next media query), there may be a significantly inappropriate web page layout. For this reason, it is designed and implemented the solution which solves this problem and ensures the smooth changes.

This article deals with the elimination of this behaviour and uses the knowledge of elastic typography. Thanks to this, it is possible to provide fluent changes in font sizes or horizontal or vertical paddings and margins and ensure a better proportionally balanced distribution of elements relative to screen size on most devices.

The described solution can be used to create websites or as an inspiration for extending existing frameworks or own websites.

2. Methodology and Data

Implementing a solution that provides elastic typography and eliminates jump changes when applying CSS rules at specified breakpoints makes sense if it does not already contain one of the frameworks.

Therefore, it is necessary to conduct a research. The research should be done in the most common and most widely used CSS frameworks. Because it is not possible to accurately determine the representation of the individual frameworks on the Internet another method should be chosen using the own methodology described in the following text.

2.1. Current state

The research needs to be started in a rather vague way by browsing the popular educational articles on the Internet. In these articles, we can find the views and experiences of people who are interested in CSS frameworks and their references can be considered as the initial guideline for collecting a group of more important and competitive frameworks. Based on this data collection, it is necessary to establish objective evaluation criteria. These criteria include the popularity of GitHub which tells a certain degree of popularity among developers. Other criteria include quality of documentation, modularity, browser support, responsive behavior, preprocessor usage, license and the number of commits demonstrating active development. Certain value can also be the company behind the development. Based on the set criteria, 5 significant CSS frameworks have been selected, which are listed in the following table by popularity on GitHub.

Based on this research it has been determined whether individual frameworks provide responsive behaviours using elastic typography and whether they provide smooth font size changes or fluent changes in vertical or horizontal gaps and prevent jump changes in layouts.

Table 1: The current state of the CSS framework area as of February 26, 2018

| Framework | GitHub stars | Commits | Modularity | Preprocessor | Licence | Creator |
|-------------|--------------|---------|------------|--------------|---------|-----------|
| Bootstrap 4 | 122228 | 17557 | Yes | SASS | MIT | Twitter |
| Semantic UI | 39757 | 6508 | Yes | LESS | MIT | J. Lukic |
| Materialize | 31532 | 3687 | Yes | SASS | MIT | Google |
| Foundation | 27020 | 15291 | Yes | SASS | MIT | ZURB |
| Bulma | 24767 | 879 | Yes | SASS, Stylus | MIT | J. Thomas |

Source: Bootstrap, 2018; Semantic UI, 2018; Materialize, 2018; Foundation, 2018; Bulma, 2018

It has been found that this behaviour does not provide any of the frameworks examined and therefore a solution has been proposed and implemented that eliminates jump changes in font sizes and layouts and contribute to better proportional changes.

The implementation of a fully fluid responsive layout can be divided into three basic parts. The first part is the implementation of so-called elastic typography. The second part is the implementation of responsive layout grid. The last part it the implementation of helper classes using elastic typography features.

2.2. Elastic typography

Typography can be described as an atomic and basic unit for designing and creating a website. Typography of a web page basically determines the framework for everything that attempts to communicate in some way with boxes, grids, CSS properties, and other elements that make up the page itself. It is necessary to have a well-designed and implemented typography for the creation of the web because it represents its foundations. (Rutter, 2017).

The development of responsive websites generally recommends using relative units, especially rem, em and percent. These units can be flexibly changed using so-called breakpoints (depending on the screen size) by setting their base. Because of the setting of these breakpoints, there are skip changes of these sizes and these changes are related to skip changes in the layout.

Another problem may be the disproportionate size of the font as well as the paddings and margins of the elements or their size and distance between them just before applying the breakpoint (Kadlec, 2014).



Figure 1: Smooth and skip changes

These skip changes can be eliminated using relative units calculated from the screen size of the browser (so-called viewport units). If the browser window size is changed, the property sizes defined in those units in the appropriate ratio will change. This property is why these units are suited to creating elastic typography that prevents skip changes of font sizes and greatly contributes to preserving individual proportions relative to the size

of the browser window. The following units can be calculated from the window size (W3C, 2016):

- **vw** – (“viewport width”) is equal to 1% of the viewport’s width.
- **vh** – (“viewport height”) is equal to 1% of the viewport’s height.
- **vmin** – (“viewport minimum”) represents the smaller value of 1vw and 1vh.
- **vmax** – (“viewport maximum”) represents the bigger value of 1vw and 1vh.

The basis for elastic typography is the continuous calculation of font size values. This calculation is done using the CSS function Calc. The formula for calculating the font size is shown in the following figure.

When resizing the screen, this function always returns the current font size. In this function can be commonly used units such as pixels, ems and rems. The limitation is only to use units of the same type.

$$\text{font-size: calc(16px + (24 - 16) * (100vw - 400px) / (800 - 400));}$$

Figure 2: Mathematical function for smooth font size changes
Source: Riethmuller, 2016

2.3. The grid

The grid system is a structure comprising a series of horizontal and vertical lines, used to arrange content. When implementing a response grid, it is necessary to determine the basic building blocks for the layout. Generally, they are a wrapping container, a row, a column, and gaps between them. The wrapping container determines the overall width of the website's content (Hampton-Smith, 2016).

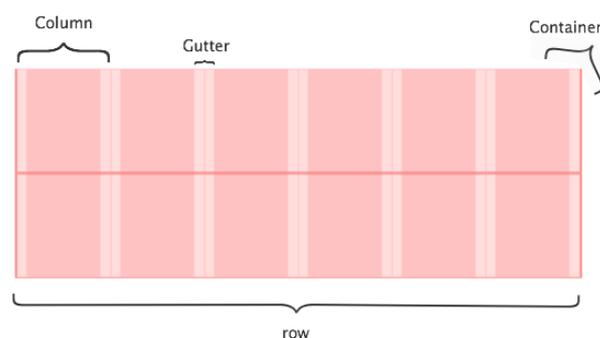


Figure 3: Elements of the grid system
Source: Drewniak, 2014

The most important part is the determination of the approach for the implementation of individual columns. An approach based on identifying the column as an inline-block element was chosen. When the column is displayed as an inline-block element, the columns are stacked in sequence and no other properties are needed (e.g. float). The advantage of this approach is the ability to apply text alignment to these columns.

Elimination of spaces (as spaces between letters) between columns due to display as an inline-block element is solved by a negative letter spacing value (Casario et al., 2013).

For each column in the grid is set the box property to the value border-box. This feature ensures that the overall width includes paddings and borders (W3C, 2017).

When implementing the columns, it was also necessary to determine how the spaces between the columns would be created. Below you can see possible approaches to creating spaces between the columns. In this implementation was selected approach using a one-sided left gutter (Hampton-Smith, 2016).

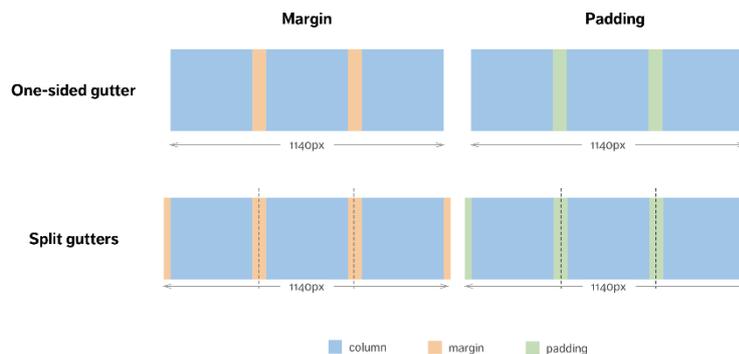


Figure 4: 4 possible ways to create columns and gutters
Source: Liew, 2016

2.4. Elastic properties

For implementation of the fluid distribution of elements, it is necessary to determine the properties for which it is meaningful to implement the solution. If the font size is lost, the remaining properties can be determined from the structure of the elements themselves. This element structure is standardized by the W3C consortium using the so-called box model, which is determined by the width of element content, padding, outer border, and margin (W3C, 2017).

According to the specification, the width of the box is primarily determined by its own content. It can also be set by block layout and limited by the grid column or directly set by the width property. In this case, it is not appropriate to apply elastic properties to the width element even if possible.

The outer border of the elements is appropriate to set by the specification (and practice confirms this) via fixed values and therefore the use of elastic properties is inappropriate.

Paddings and margins are typically set for individual elements such as headings, tables, lists, etc., and determine the proportions of the individual elements and it is therefore appropriate to apply elastic properties to them. These properties can be applied using general classes such as the Bootstrap framework (Bootstrap, 2018).

For the application of elastic properties, it is appropriate to use the aforementioned equation for calculating the font size. Instead of the minimum and maximum font sizes, the minimum and maximum padding or margin will be determined.

3. Results

The result of this article is the design and implementation of a fully fluid responsive layout. The whole process is described below. The solution can be used as a framework for website development, which implements typography and a responsive layout of elements that enriches fluid properties, making it easier to maintain proportions on the page. This solution is created as an alternative to the current CSS frameworks, and it is a standalone solution, not an extension of any of the existing frameworks.

3.1. Implementation

The solution is implemented only in CSS and HTML. The Stylus preprocessor was used to simplify code management and automate production processes. Stylus makes it very simple to write, and its programming features adds to the solution an elegant source code. For source code translation and automation of the whole process, was used the Grunt.js automation tool running in the JavaScript ecosystem Node.js.

The implementation has been divided into three parts. The first part concerns the implementation of elastic typography. The next part involves implementing a responsive layout grid. In the last part are created helper classes using elastic typography features for smooth and proportional changes.

Elastic typography is based on continuous font size calculations between boundary points. This calculation can reach maximum values corresponding to the maximum font size (see calculation functions) depending on the screen width. On the contrary, the minimum value corresponds to the minimum font size depending on the screen width.

Implementation in the Stylus preprocessor has been divided into three files:

- File with variables – this file contains variables with metrics (modular scales) – font sizes, line heights and breakpoints. Here is appropriate to use the object notation for definition the properties.
- File with mixins – this file contains so called mixins that will generate fluid CSS properties, namely fluid typography and fluid vertical spacing. Mixins take as parameters: the property that has to be fluid, their minimum and maximum size and optional parameters that determine the fluid behavior at set screen width intervals.
- File with definitions of CSS properties for content elements – the file contains properties for definition the appearance of content elements, such as headings, paragraphs, lists, etc. Here can be called created mixins.

The second part of the implementation was focused on creating a grid system. It contains the creation of a mixin that generates individual columns (classes defining their width). This mixin takes three parameters. These parameters are the number of generated columns (12, 16, 20, ...), the name of class prefix and the name of class postfix. The class prefix serves to indicate that it is a column, in this case it is marked as `.gcol` (g as grow). Postfix is used to marking the device (width of viewport) for which it is defined and identifies the media queries that will be apply to it. For simplicity were created three postfixes (ds – desktop style, ts – tablet style, ms – mobile style).

The last part of the implementation deals with the creating of helper classes with the elastic typography features. For automation of generate these properties were created two mixins. The first mixin is used to create the margin property and the second for the

padding property. Both mixins generate several classes (based on variable values) similarly to the Bootstrap framework. Generally, the class names are in the following format: {property}{side}-{size}, where

property is:

- **m** – for a class that sets the margin,
- **p** – for a class that sets the padding,

side is:

- **t** – for a class that sets the top margin or padding,
- **r** – for a class that sets the right margin or padding,
- **b** – for a class that sets the bottom margin or padding,
- **l** – for a class that sets the left margin or padding,
- **h** – for a class that sets the horizontal margin or padding,
- **v** – for a class that sets the vertical margin or padding,

and size is (depending on the content of the variable):

- **xs** – value for class with postfix xs (min. 4px, max. 5px),
- **small** – value for class with postfix small (min. 8px, max. 12px),
- **normal** – value for class with postfix normal (min. 16px, max. 20px),
- **large** – value for class with postfix large (min. 20px, max. 32px),
- **xl** – value for class with postfix xl (min. 24px, max. 48px).

The result of the implementation is a responsive layout grid that adapts flexibly to different screen sizes. A key part of the solution is the implementation of elastic typography, which ensures smooth font size changes depending on the width of the browser window and eliminates their jump changes. Based on the elastic typography was also implemented a solution using smooth font size changes. This solution produces helper classes to determine the size of the paddings and margins of the elements and provides smooth changes in their size depending on the current browser window size. The implemented solution responds flexibly to different browser window sizes and also contributes to fluent font size changes and padding and margin size changes to better maintain the relative proportions of elements on the page.

The resulting solution can be used as a framework for creating websites without using another CSS framework or thanks to the implemented elastic typography and elastic properties it can be used as inspiration or extension for any of the existing frameworks that do not provide this behavior.

The benefit of this solution is to eliminate jump changes. When the size of the browser window changes it provides smooth changes to the font sizes, padding sizes, and margin sizes and making it easier to maintain the relative proportions of the elements on the page. From a financial point of view, it is not possible to make a clear benefit to the use of this solution for website development. This solution is more to be seen as added value to websites that can offer their visitors a more compact look, better user friendliness and more professionalism. The main benefit of this solution is therefore the competitive advantage that it offers through the implemented behavior compared to other frameworks.

The solution is available at: <https://akela.mendelu.cz/~xschuber/elastic-layout>. The code and the documentation are released under the MIT License.

4. Discussion and Conclusions

In general, the implemented solution may be in some cases limited by the used units. While using the viewport-percentage lengths there can be some problems with support in older browsers. In this article will be used only vw units that have the following support: Internet Explorer 9+, Mozilla Firefox 19+, Google Chrome 20+, Safari 6+, Opera 15+. Mobile platforms: iOS 6.1+, Android 4.4+ and Opera Mobile 37+ (Can I use, 2017). For browsers that do not support these units is appropriate to offer a fallback option in pixels. However, currently it is losing importance because fewer and fewer users are using older browsers.

The specific constraints are in the used implementation tools. The solution was implemented in the Stylus preprocessor, and the translation of source codes was provided by the Grunt.js automation tool running in the JavaScript ecosystem Node.js. However, these technologies are widely used and well documented, so I do not see a major barrier to use.

Because the framework is designed and implemented as a standalone solution, it is not entirely appropriate to combine it with other frameworks because there may be conflicts between class naming. However, this is a common problem when using multiple frameworks at a time.

As is clear from the previous research, most of the widely used frameworks are implemented the SASS preprocessor. The current solution is created via the Stylus preprocessor, which is better suited for this implementation. Bootstrap, which uses the SASS preprocessor, is the most widely used framework of the present time, and it would be a good idea to implement the whole solution in this preprocessor. Another next step could be to design an implementation process in Bootstrap or other framework.

Acknowledgements

This article is the result of a research project supported by the Internal Grant Agency of the Faculty of Business and Economics, Mendel University in Brno no. PEF_DP_2017024 “Design and implementation of CSS framework in preprocessor Stylus”.

References

- BOOTSTRAP. 2018. Bootstrap. [online]. Available at: <https://getbootstrap.com/>. [Accessed: 19 February 2018].
- BOOTSTRAP. 2018. Grid system. [online]. Available at: <https://getbootstrap.com/docs/4.0/layout/grid/>. [Accessed: 19 February 2018].
- BOOTSTRAP. 2018. Spacing. [online]. Available at: <http://getbootstrap.com/docs/4.0/utilities/spacing/>. [Accessed: 19 February 2018].
- BULMA. 2018. Getting started. [online]. Available at: <https://bulma.io/documentation/overview/start/>. [Accessed: 26 February 2018].
- BULMA. 2018. Modular. [online]. Available at: <https://bulma.io/documentation/overview/modular/>. [Accessed: 26 February 2018].

- BOULTON, M. 2014. *A Practical Guide to Designing for the Web*. Penarth: Mark Boulton Design Ltd., 264 pages. ISBN: 978-0956174017.
- CAN I USE. 2018. Viewport units: vw, vh, vmin, vmax. [online]. Available at: <https://cani-use.com/#search=vw>. [Accessed: 26 February 2018].
- CASARIO, M., WORMSER, N., SALTZMAN, D., BRADFORD, A., REID, J., IMPROTA, F., CONGLETON, A. 2013. *CSS3 Solutions - Essential Techniques for CSS3 Developers*. Berkeley, CA: Apress, 340 pages. ISBN 978-1-4302-4335-9.
- DREWNIAK, J. 2014. Creating your own CSS grid system. [online]. Available at: <http://j4n.co/blog/Creating-your-own-css-grid-system>. [Accessed: 22 February 2018].
- HAMPTON-SMITH, S. 2016. *Pro CSS3 Layout Techniques*. Berkeley, CA: Apress, 183 pages. ISBN 978-1-4302-6502-3.
- KADLEC, T. 2014. *Responzivní design profesionálně*, Brno: Zoner Press, 246 pages. ISBN: 978-80-7413-280-3.
- LIEW, Z. 2016. How to build a responsive grid system. [online]. Available at: <https://zellwk.com/blog/responsive-grid-system/>. [Accessed: 22 February 2018].
- MARCOTTE, E. 2010. Responsive web design. [Online]. Available at: <https://alistapart.com/article/responsive-web-design>. [Accessed: 15 February 2018].
- MARIA, J. S. 2014. *On Web Typography*. New York: A Book Apart, 152 pages. ISBN: 978-1-9375570-7-2.
- MATERIALIZE. 2018. Getting Started. [online]. Available at: <http://next.materializecss.com/getting-started.html>. [Accessed: 26 February 2018].
- MATERIALIZE. 2018. Grid. [online]. Available at: <http://materializecss.com/grid.html>. [Accessed: 19 February 2018].
- RIETHMULLER, M. 2016. Responsive and fluid typography with vh and vw units. [online]. Available at: <https://www.smashingmagazine.com/2016/05/fluid-typography/>. [Accessed: 22 February 2018].
- RUTTER, R. 2017. *Web Typography: A handbook for designing beautiful and effective typography in responsive websites*. Brighton: Ampersand Type, 334 pages. ISBN: 978-0995664203.
- SEMANTIC UI. 2018. Integrations. [online]. Available at: <https://semantic-ui.com/introduction/integrations.html> [Accessed: 26 February 2018].
- SEMANTIC UI. 2018. Semantic UI. [online]. Available at: <https://semantic-ui.com/>. [Accessed: 26 February 2018].
- W3C. 2017. Box model. [Online]. Available at: <https://www.w3.org/TR/CSS2/box.html>. [Accessed: 18 February 2018].
- W3C. 2016. CSS Values and Units Module Level 3. [Online]. Available at: <https://www.w3.org/TR/css3-values/>. [Accessed: 18 February 2018].
- ZURB FOUNDATION. 2018. Installation. [online]. Available at: <https://foundation.zurb.com/sites/docs/installation.html>. [Accessed: 26 February 2018].

ZURB FOUNDATION. 2018. The Grid. [online]. Available at: <https://foundation.zurb.com/sites/docs/grid.html>. [Accessed: 19 February 2018].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Hospitals’ debt and profitability. Does a form of activity make a difference?

Rafał Siedlecki¹, Agnieszka Bem², Paweł Prędkiewicz³, Paulina Ucieklak-Jeż⁴

¹*Department of Corporate Finance and Public Finance, Faculty of Management, Informatics and Management, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: rafal.siedlecki@ue.wroc.pl*

²*Department of Corporate Finance and Public Finance, Faculty of Management, Informatics and Management, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: agnieszka.bem@ue.wroc.pl*

³*Department of Finance, Faculty of Economic Sciences, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: pawel.predkiewicz@ue.wroc.pl*

⁴*Wydział Filologiczno-Historyczny, Jan Długosz University in Częstochowa, Waszyngtona 4/8, 42-200 Częstochowa, e-mail: p.ucieklak@ajd.czyst.pl*

Abstract

The aim of the study is analysis of the financial situation of Polish hospitals, commercial and non-commercial ones. While non-commercial hospitals constitute quite homogenous group, commercial ones are very diversified – comprised of small private entities, as well as big, commercialised public hospitals. We pose the following research hypotheses: (H1) hospitals operating in the form of companies have higher profitability; (H2) hospitals operating in the form of companies have lower debt indicators, (H3) hospitals operating in the form of companies are in better financial condition. Our major findings: (1) hospitals operating in the form of companies do not reach higher profitability or efficiency; (2) in the case of non-commercial hospitals debt ratios are significantly higher than in the case of companies; (3) financial health is generally poor, although clearly better in the case of hospitals operating as a company. We analyse 184 hospitals (2015 year). Data comes from EMIS Database.

Keywords: hospitals, debt, profitability, form of activity

JEL Code: I10, I11, L31, G30

1. Introduction

The literature clearly confirm, that hospital’s financial health affect the quality of provided services. Many hospitals in Poland struggle with financial problems. The causes of this condition are very different – from the low level of health care funding to poor management. As a result, most hospitals passed, or passes, the restructuring processes. Part of

hospitals was commercialized – transformed into a commercial companies (a limited liability company or, rarely, joint-stock company). This applies above all to the hospitals, which were highly indebted – changing the form of business is to limit the process of accumulation of debt. This way, on the market of stationary benefits, next to public hospitals operating in the form of SPZOZ⁶³ and strictly private entities, hospitals operating in the form of companies with majority public capital appeared (non-public hospitals owned, fully or partially, by local authorities, comp. Dubas, 2010; Bokiej, 2006; Węgrzyn, 2006).

This process encourage us to formulate the research question: whether the form of activity stimulate managers to different behaviour? The aim of this study is to analyse, if hospitals operating in the form of commercial companies, obtain better financial results. We pose several research hypotheses:

(H1) hospitals operating in the form of companies have higher profitability;

(H2) hospitals operating in the form of companies are characterised by higher efficiency;

(H2) hospitals operating in the form of companies have lower debt indicators.

In the design of the study, we assume, that the change of a form of activity stimulates managers to change their behaviour hospitals (Czypionka, Kraus, Mayer i Röhring, 2014) (Deily, McKay i Dorner, 2000). The form of activity affect the mix of benefits offered. Public hospitals, acting in the public interest, often offer benefits, which are unlikely to provide by other type of hospitals, for example unprofitable ones (Horwitz, 2005), (Horwitz, 2007), (Chen, Bazzoli and Hsieh, 2009). Generally, the objective of hospital-companies should be to maximise profit – this assumption seems to be valid in the case of hospitals (expect non-profit entities), having a private owner, however, even if the owner is a public, or a hospital is non-profit, or not-for-profit one, it should at least maintain financial stability and generate a profit to finance future investment (Gentry, 2002).

We also assume, that hospitals operating in the form of companies should strive to minimize costs, reduce debt and improve efficiency. Transition into a company create incentives to minimize costs of service (Carter, Massa and Power, 1997), (Kessler and McClellan, 2001) and hence to eliminate unused or underused capacity (Hansmann, Kessler and McClellan, 2003), to reduce unprofitable services (Alkhamis, 2017), (Villa i Kane, 2013). In the case of Polish hospitals improving efficiency can result from the increase of different financing sources availability (Rój, 2006)

Literature suggest, that public hospitals are less efficient than private hospitals (Chang, Cheng and Das, 2004), (Burgess Jr and Wilson, 1996), (Votápková and Šťastná, 2013). The conversion into a for-profit hospital can increase efficiency, productivity (Ramamonjiarivelo, 2016) and profitability (Picone, Chou and Sloan, 2002), (Villa and Kane, 2013), (Herr, Schmitz i Augurzky, 2011). This improvement of profitability, however, may affect the quality of benefits, though it can be transparent to patients (Picone, Chou and Sloan, 2002), (Shen, 2002). On the other hand, it should be stressed that there are also evidence, that private ownership is not necessarily associated with higher efficiency compared to public ownership (Tiemann, Schreyögg and Busse, 2012).

A separate issue is the level of debt. We assume that better financial management should limit indebtedness. An important premise is also the need to declare bankruptcy, in the case of hospitals operating in the form of commercial companies. On the other hand, Magnus, Smith and Wheeler (2003) claim, that the increased debt may more effectively stimulate not-for-profit (public) hospital managers, because, in the case of for-profit entities this situation helps to resolve an agency conflict. In the case of Polish hospitals, it is

⁶³ SPZOZ – Independent Public Health Care Centres, a special form of activity, employed only in a health care system.

also important, that their managers practically are not responsible for the increasing debt and difficulties with financial liquidity. Additionally, public hospitals, despite the bad financial condition, can count on financing of investments by their owners (Prędkiewicz and Prędkiewicz, 2013).

2. Data and Methods

We collect our research sample, by hand, from the Emerging Markets Database (EMIS). Data cover the year 2015. First we select 369 medical entities. Finally 184 hospital are qualified for this study – we are force to reject entities for which stationary hospital services are not a primary field of activity. We also exclude from this study entities with a negative value of equity. Finally, the research group is divided into two subgroups:

- hospitals operating in the form of a commercial company (*companies*), regardless of the ownership – private or public (93 hospitals);
- hospitals operating in the form of SPZOZ⁶⁴ (*SPZOZ*) (91 hospitals), which are always owned by public entities (generally local authorities or the Ministry of Health).

Based on previous research we select several financial ratios (Table 1), which consist of indicators of profitability, liquidity, efficiency and debt (Bem, Siedlecki, Predkiewicz, Ucieklak-Jez i Hajdikova, 2015), (Siedlecki, Bem, Prędkiewicz i Ucieklak-Jeż, 2015).

Table 1: Selected financial ratios

| Ratio | Formula |
|---|---|
| Operating Margin (OPM) | EBIT / Operating revenue |
| Net Income Margin (NIM) | Net income / Operating revenue |
| EBITDA Return on Assets (EBITDA/ASSETS) | (Net Profit + Interest + Taxes + Depreciation) / Total Assets |
| Cash Flow Margin (ROCF) | (Net Profit + Depreciation) / Total Assets |
| Assets Turnover (TAT) | Sales / Total Assets |
| Return on Assets (ROA) | Net Income / Total Assets |
| Loan to Equity Ratio (D%) | (Long term debt + Short-term loans) / Total assets |
| Loan to Turnover Debt Ratio (LTD) | (Long term debt + Short-term loans) / Operating Turnover |
| Cash Flow to Debt Ratio (CF/Debt) | Operating Cash Flow / Total Debt |
| Current Ratio (CR) | Current assets / Short-term debt |

Source: own study

Profitability ratios include both profit margins (the proportion of costs to revenues) as well as typical return on assets. According to the theory of non-commercial hospitals should be lower than commercial due to higher community costs. ROE, ROCF and EBITDA for commercial should be a benchmark for non-commercial (Nicholson, Pauly i et al., 2000). Liquidity analysis base on a current ratio, which is often used in models of hospital bankruptcy prediction (Bem, Siedlecki, Predkiewicz, Ucieklak-Jez i Hajdikova, 2015). Next TAT indicator describes size and the effectiveness of the use of assets. The indices chosen

⁶⁴ SPZOZ – Independent Public Health Care Centres, a special form of activity, employed only in a health care system.

for financial leverage analysis were indicated as the most suitable for hospitals, which was proved in the previous papers (Siedlecki, Bem, Prędkiewicz i Ucieklak-Jeż, 2015).

In this study we analyse the differences between average values of selected financial indicators for two research subgroups – companies and SPZOZ. Due to the abnormal distribution of analysed ratios, we are forced to use a semi-parametric Mann-Whitney-Wilcoxon test of similarity between groups.

3. Results and Discussion

First, we analyse 5 indicators of profitability – return on assets, EBITDA return on assets, cash flow margin, operating margin and net income margin. Regardless of a chosen indicator, results suggest that, there is no statistically significant differences in profitability between hospitals operating in a form of a company and hospitals operating in a form of SPZOZ. We can only observe that that SPZOZ are significantly bigger in the context of revenue (Table 2).

Table 2: Results of Mann-Whitney U test for differences of profitability (2015)

| | Sum of rangs I (companies) | Sum of rangs II (SPZOZ) | U | Z | p |
|---------------|-------------------------------|----------------------------|----------|----------|-------------|
| ROA | 8307.000 | 8713.00 | 3936.000 | -0.81670 | 0.414098 |
| EBITDA/Assets | 8119.000 | 8901.00 | 3748.000 | -1.33718 | 0.181165 |
| ROCF | 8056.000 | 8964.00 | 3685.000 | -1.51159 | 0.130638 |
| OPM | 8469.000 | 8551.00 | 4098.000 | -0.36821 | 0.712718 |
| NIM | 8248.000 | 8772.00 | 3877.000 | -0.98004 | 0.327065 |
| Ln (Revenue) | 7116.000 | 9904.00 | 2745.000 | -4.11397 | 0.000039*** |

* significance level $\alpha = 0.1$, ** significance level $\alpha = 0.05$ *** significance level $\alpha = 0.01$

Source: own study

We found, as we might expect, that public hospitals are significantly larger than private (see tab. 2). This may be due to the fact that public hospitals also serve patients with less profitable procedures. Taking into account the overall problems with health care financing, it seems, that the results (profitability and efficiency) should be significantly worse.

By analysing the data from the companies it can be noted, however, a part of companies is more profitable than SPZOZ, however, a part of companies is much worse, what

shows the range and the variance for analysed indicators, that for companies is significantly higher (see fig. 1)

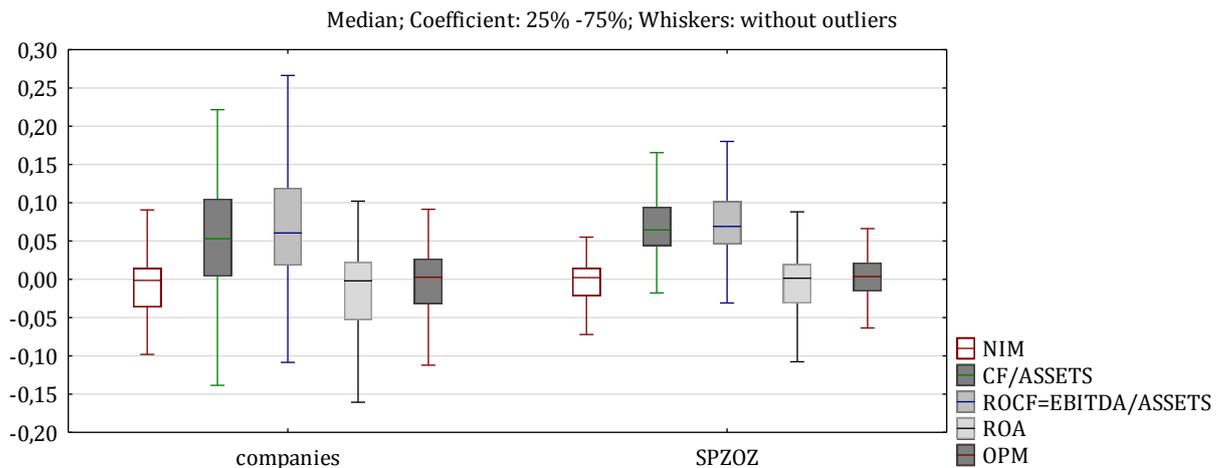


Figure 1: Profitability ratio for Companies and SPZOZ without outliers
Source: own study

This observation seems to be a little bit confusing and surprising – the form of commercial company should create incentives to generate profit for shareholders. *This finding force us to reject the H1 hypothesis.*

Then we analyse one indicator of efficiency (assets turnover) and one indicator of financial liquidity (current ratio). Again we do not observe any significant differences, both in the case of indicators of efficiency and liquidity (Table 3). *That observation also force us to reject the H2 hypothesis.*

As in the case of the profitability, the assets turnover is characterized by greater volatility, while the current ratio is insignificantly different (Fig. 2).

Table 3: Results of Mann-Whitney U test for differences of liquidity and efficiency

| | Sum of rangs I (companies) | Sum of rangs II (SPZOZ) | U | Z | p |
|-----|-------------------------------|-------------------------------|---------|---------|----------|
| TAT | 8676.00 | 8344.00 | 4158.00 | 0.20210 | 0.839839 |
| CR | 8763.00 | 8257.00 | 4071.00 | 0.44296 | 0.657796 |

* significance level $\alpha = 0.1$, ** significance level $\alpha = 0.05$ *** significance level $\alpha = 0.01$

Source: own study

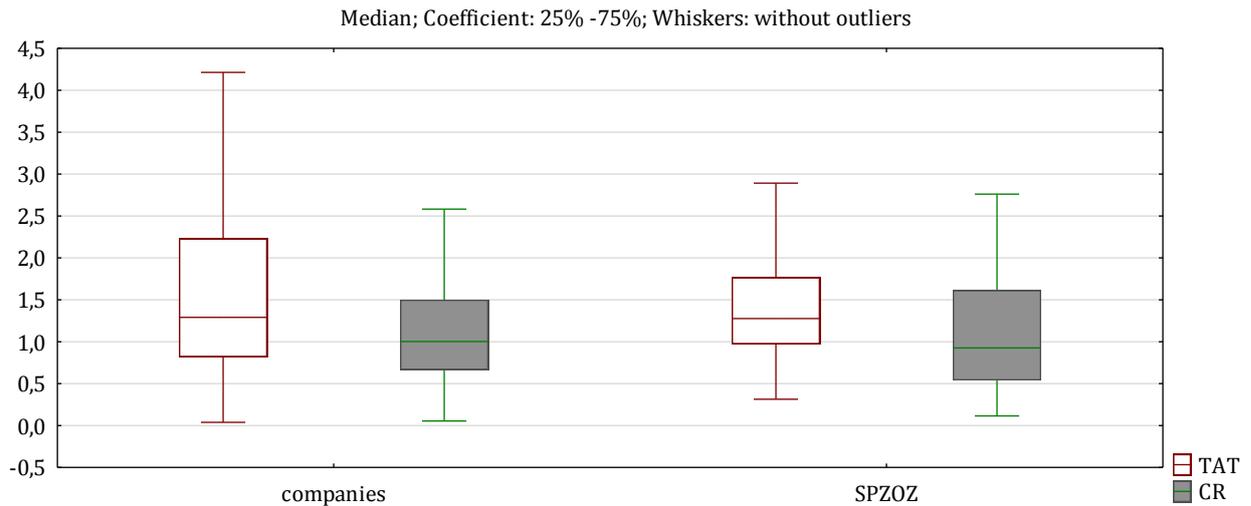


Figure 2: TAT and CR for Companies and SPZOZ without outliers
Source: own study

In the next part of the study, we analyse the variation of debt ratios between subgroups. Expectably we can observe that SPZOZ have higher values of all debt ratios and this differences are highly statistically significant (Table 4). *This observation allow us to adopt the H3 hypothesis.*

Table 4: Results of Mann-Whitney U test for differences of financial leverage (debt)

| | Sum of rangs I (companies) | Sum of rangs II (SPZOZ) | U | Z | p |
|---------|-------------------------------|----------------------------|----------|----------|-------------|
| D% | 7145.000 | 9875.00 | 2774.000 | -4.03369 | 0.000055*** |
| LTD | 7109.000 | 9911.00 | 2738.000 | -4.13335 | 0.000036*** |
| CF/Debt | 9116.000 | 7904.00 | 3718.000 | 1.42023 | 0.155540 |

* significance level $\alpha = 0.1$, ** significance level $\alpha = 0.05$ *** significance level $\alpha = 0.01$

Source: own study

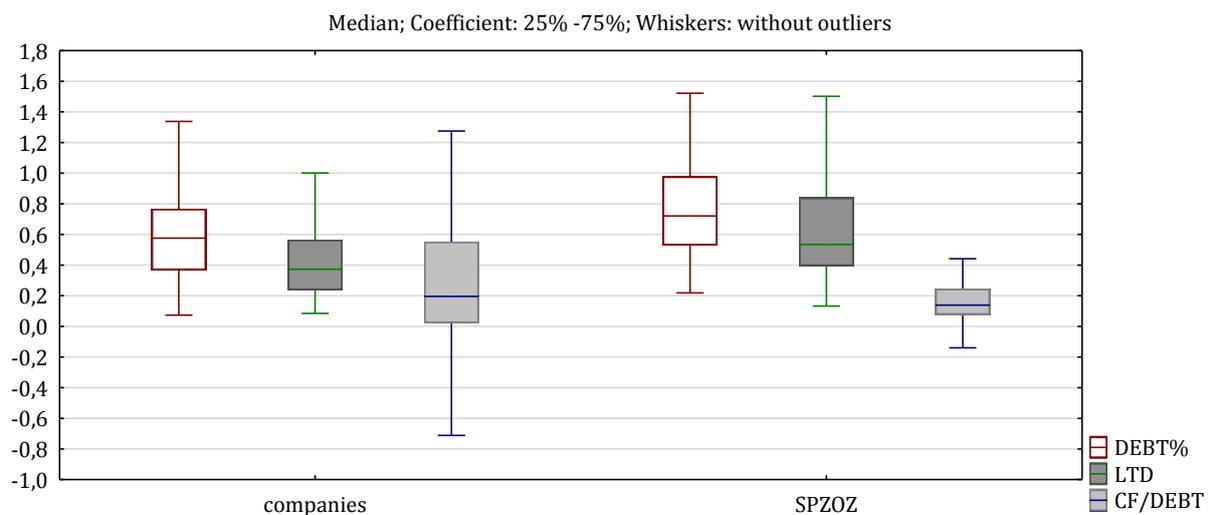


Figure 3: TAT and CR for companies and SPZOZ, without outliers
Source: own study

Additionally to the debt ratio, which is characterised by quite similar variation, both for companies and SPZOZ, in the case of CF/Debt and LTD We observe a much larger spread and volatility looks similar to profitability.

4. Conclusions

At the study's design stage we assume, that the form of a company forces a more efficient management of the hospital resources. The company should therefore achieve a higher profitability – after all, the objective of commercial companies' activity is to generate profits for the owner. Companies should also be characterised by better liquidity and lower debt. Not all of these assumptions are confirmed empirically.

We can observe, that the form of company doesn't create strong enough incentives to generate profits. One of explanation of this phenomena may be the fact, that part of hospitals operating in the form of company are fully owned by public entities, primarily local authorities. Only some part of hospital's companies are fully private and profit-oriented. Additionally, we cannot observe more favourable values of efficiency or liquidity indicators. Those findings are a little bit inconsistent with the literature's acquis.

It is interesting, that although we cannot indicate statistically significant differences in profitability or efficiency, SPZOZ are significantly higher indebt than hospital's companies. This phenomenon can be explain in, at least two ways: (1) we can assume that lower values of debt ratios for companies can be rooted in legal restrictions of debt level or the necessity of current debt servicing, (2) hospitals which were converted into companies as a result of a commercialisation process benefited of full reduction of liabilities. In this sense we can suspect, that maybe they just didn't manage to accumulate a new debt. In assumption require the analyses of longer time-series. On the basis of the data on debt of commercialised hospitals, for the years 2011–2013, it can be concluded that the situation is rather difficult. The increase in debt can lead to a situation in which hospitals wuld lose financial liquidity (Marcinkowska, 2016).

References

- ALKHAMIS, A. A. 2017. Critical analysis and review of the literature on healthcare privatization and its association with access to medical care in Saudi Arabia. *Journal of infection and public health* (3), 258–268.
- BEM, A., SIEDLECKI, R., PREDKIEWICZ, P., UCIEKLAK-JEZ, P. and HAJDIKOVA, T. 2015. Hospital's financial health assessment. Gradient method's application. *Enterprise and Competitive Environment. Conference Proceedings*, 76–85.
- BOKIEJ, B. 2006. Korzyści z prywatyzacji SPZOZ-wynik doświadczeń praktycznych. *Prace Naukowe Akademii Ekonomicznej we Wrocławiu* (1103 Komerccjalizacja i prywatyzacja ZOZ: kluczowe warunki osiągnięcia sukcesu), 71–84.
- BURGESS JR, J. F. and WILSON, P. W. 1996. Hospital ownership and technical inefficiency. *Management science* (1), 110–123.
- CARTER, R. B., MASSA, L. J. and POWER, M. L. (1997). An examination of the efficiency of proprietary hospital versus non-proprietary hospital ownership structures. *Journal of Accounting and Public Policy* (1), 63–87.

- CHANG, H., CHENG, M. A. and DAS, S. 2004. Hospital ownership and operating efficiency: evidence from Taiwan. *European Journal of Operational Research* (2), 513–527.
- CHEN, H. F., BAZZOLI, G. J. and HSIEH, H. M. 2009. Hospital financial conditions and the provision of unprofitable services. *Atlantic Economic Journal* (3), 259–277.
- CZYPIONKA, T., KRAUS, M., MAYER, S. and RÖHRLING, G. 2014. Efficiency, ownership, and financing of hospitals: The case of Austria. *Health care management science* (4), 331–347.
- DEILY, M. E., MCKAY, N. L. and DORNER, F. H. 2000. *Journal of Human Resources*. Exit and inefficiency: The effects of ownership type (4), 734–747.
- DUBAS, K. 2010. Szpitale niepubliczne w województwie małopolskim – profil działalności oraz znaczenie w systemie lecznictwa. *Zdrowie Publiczne i Zarządzanie* (Numer 1), 137–148.
- GENTRY, W. M. 2002. Debt, investment and endowment accumulation: The case of not-for-profit hospitals. *Journal of Health Economics* (5), 845–872.
- HANSMANN, H., KESSLER, D. and MCCLELLAN, M. B. 2003. Ownership form and trapped capital in the hospital industry. In: *The governance of not-for-profit organizations* (45–70). University of Chicago Press.
- HERR, A., SCHMITZ, H. and AUGURZKY, B. 2011. Profit efficiency and ownership of German hospitals. *Health Economics* (6), 660–674.
- HORWITZ, J. R. 2005. Making profits and providing care: comparing nonprofit, for-profit, and government hospitals. *Health affairs* (3), 790–801.
- HORWITZ, J. R. 2007. Does Nonprofit Ownership Matter? *Yale Journal on Regulation* (1), 139–204.
- KESSLER, D. and MCCLELLAN, M. 2001. The effects of hospital ownership on medical productivity. *National Bureau of Economic Research* (No. w8537), 488–506.
- MAGNUS, S. A., SMITH, D. G. and WHEELER, J. R. 2003. Agency implications of debt in not-for-profit hospitals: a conceptual framework and overview. *Research in Healthcare Financial Management* (1), 7–18.
- MARCINKOWSKA, E. 2016. Sytuacja finansowa szpitali w kontekście procesu komercjalizacji. *Research Papers of the Wrocław University of Economics/ Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu* (440), 420–432.
- PICONE, G., CHOU, S. Y. and SLOAN, F. 2002. Are for-profit hospital conversions harmful to patients and to Medicare? *RAND Journal of Economics* (3), 507–523.
- PRĘDKIEWICZ, K. and PRĘDKIEWICZ, P. 2013. Płynność finansowa szpitali samorządowych w Polsce – wyniki badań empirycznych. *Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse. Rynki finansowe. Ubezpieczenia*, 169–179.
- RAMAMONJIARIVELO, Z. 2016. The impact of privatization on efficiency and productivity: The case of US public hospitals. *Journal of Health Care Finance* (2), 105–123.
- RÓJ, J. 2006. Forma organizacyjno-prawna a gospodarka finansowa szpitala. *Prace Naukowe Akademii Ekonomicznej we Wrocławiu* (1103 *Komercjalizacja i prywatyzacja ZOZ: kluczowe warunki osiągnięcia sukcesu*), 53–57.

- SHEN, Y. C. 2002. The effect of hospital ownership choice on patient outcomes after treatment for acute myocardial infarction. *Journal of Health Economics* (5), 901–922.
- SIEDLECKI, R., BEM, A., PRĘDKIEWICZ, P. and UCIEKLAK-JEŻ, P. 2015. Measures of hospital's financial condition—empirical study. *Strategica. Local versus global. International academic conference*, 666–675.
- TIEMANN, O., SCHREYÖGG, J. and BUSSE, R. 2012. Hospital ownership and efficiency: a review of studies with particular focus on Germany. *Health Policy* (2), 163–171.
- VILLA, S. and KANE, N. 2013. Assessing the impact of privatizing public hospitals in three American states: implications for universal health coverage. *Value in Health* (1), S24–S33.
- VOTÁPKOVÁ, J. and ŠŤASTNÁ, L. 2013. Efficiency of hospitals in the Czech Republic. *Prague Economic Papers* (4), 524–541.
- WĘGRZYN, M. 2006. Komerccjalizacja i prywatyzacja placówek ochrony zdrowia w Polsce a globalny rynek usług medycznych. *Prace Naukowe Akademii Ekonomicznej we Wrocławiu* (1103 *Komerccjalizacja i prywatyzacja ZOZ: kluczowe warunki osiągnięcia sukcesu*), 15–28.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Procedures of internal audit in local government units – selected empirical research results

Piotr Sołtyk¹

¹Department of Finance Government, Faculty of Finance and Law, Cracow University of Economics, Rakowiecka str. 27, 31-510 Cracow, Poland, e-mail: piotr.soltyk@uek.krakow.pl

Abstract

Modern internal audit in the public sector is an independent instrument of assessing the performance of management systems. Its efficiency depends on many factors. One of them is the observance of legal principles and other standards by the auditors during the conducted research. In the article the author presents selected results of a survey the subject of which was the assessment of procedures of internal audit in selected local government units in Poland.

Keywords: internal audit, local government, quality of internal audit

JEL Code: H72, M42

1. Introduction

Modern needs of managing public organisations require from decision-makers high levels of effective performance, as well as skills and specialist knowledge essential for effective management. (Sołtyk, 2017). In the sector of public finance the process of organisation management highly differs from that of business entities. It can be assumed that the basic aim of business activity is to maximize profits and, next, to distribute the dividend. Whereas, units of the public finance sector perform public utility tasks without the necessity of making high profits. Public institutions – including Local Government Units (LGU), by virtue of law, were obliged to operate through producing and distributing various goods and public services which meet the collective social needs (Kurowski, Ruśkowski i Sochacka – Kryśak, 2000, p. 10).

One of modern instruments of the public sector supporting decision-makers in achieving their intended objectives and tasks is the internal audit. Bearing in mind more and more complex management processes, its role is of major importance for the assessment of control systems and the efficiency of risk management. The literature emphasizes that with the growing need for creating instruments supporting effective management in

public organizations, there appeared a necessity to introduce a much more precise auditing process as an expert function, conducted by entities on their own (Kuc, 2007, p. 119).

However, in order to make the internal audit effective, it should observe the principles of law and other norms (codes, internal policies) which shape the principles of its performance in a public organisation. The purpose of the article is to present some selected results of the author's own research, the subject of which was the assessment of the observance of legal regulations in the operations of internal audit in selected LGUs.

2. Literature Review

Internal audit appeared in Poland only in the 21st cent. although it has a centuries-long tradition in the world (Winiarska, 2007, pp. 7–10). It was introduced to the sector of public finance on 1st January 2002 pursuant to the Act of 27 July 2001 on amending the Public Finance Act, the Act on organisation and operation of the Council of Ministers and the scope of operations of ministers, the Act on government administration and the Act on civil service (Journal of Laws No. 102, item 1116). Although internal audit in the public sector has appeared quite recently, the concept of this management supporting tool has undergone quite a lot of changes.

The current Public Finance Act of 27 August 2009 (i.e., Journal of Laws of 2017, item 2077), defines internal audit as an independent and objective activity whose aim is to help the entity manager realise goals and tasks through systematic evaluation of managerial control and advisory activities. In the literature it is defined as “an independent, objective activity in the performance of assurance and advisory tasks, conducted in order to bring value added to an entity and to improve its functioning. It supports an organisation in the accomplishment of its objectives through systematic and consistent actions to evaluate and improve the efficiency of risk management, control systems and management processes of an organisation” (Czerwiński, 2004, p. 9).

The task of modern audit is to provide current information on efficiency and effectiveness of control mechanisms, which reduces the risk of damage or fraud. Its role is to support decision-makers in risk management through providing them with advisory services. Beside rational assurance for an LGU manager that it functions properly, the aims of internal audit also include (Podręcznik audytu ... 2003, p. 7):

- *analysing the risk* facing an entity and the environment of internal control, which allows the audit program to be prepared based on risk assessment and evaluation of the efficiency of the risk management process;
- *submitting reports on findings* and, if appropriate, presenting conclusions and recommendations aimed at improving the existing situation;
- *expressing opinions on the effectiveness of control mechanisms* in the existing system.

The audit evaluates proper functioning of the internal control system and, by comparing the factual state with the desired situation, it states whether the existing procedures are effective, whether they comply with models, whether they are observed and, also, it indicates the areas requiring improvement and suggests proper action to be taken (Rola, 2003, p.91).

3. Methodology and Data

Primary empirical material was acquired by means of a questionnaire. The questionnaire used was directed exclusively at LGUs in which internal auditing is conducted. It referred to the verification and evaluation of the reliability of internal auditing and its compliance with the requirements described in legal regulations.

The selection of entities to the surveyed group included the data coming from budgetary reports submitted by LGUs which, in terms of their territory, belong to particular regional chambers of audit. Excel 2000 spreadsheet was used to conduct statistical analysis. The secondary analysis was conducted on 72 questionnaires. The criteria, dividing the entities into those which are obliged to implement and perform internal auditing, result from legal principles in force⁶⁵.

Of LGUs obliged to conduct internal audits in the area of south-eastern Poland (Podkarpacie, Świętokrzyskie and Lubelskie voivodships), the author selected a research sample which constituted, respectively, of: 3 marshal's offices – 5,3% of the sample, 16 town offices – 28% of the sample, 9 commune offices (gmina) – 16% of the research sample and 28 district offices (Poviat Starost) – 50% of the sample. The research group adopted for the analysis is statistically representative because the research included all the LGUs in the research territory in which internal audit is conducted. The questionnaire questions were based on the guidelines for professional standards of internal audits for the entities of the public finance sector⁶⁶. The guidelines for managerial control standards for the public finance sector also appeared helpful⁶⁷.

In order to conduct the analysis and evaluation of the observance of procedural rules and principles by internal auditors during the audit, the following questions were asked:

1. Do the management participate in the selection of risk analysis areas?
2. Which areas are most frequently chosen for risk analysis?
3. Which method of risk analysis is adopted in the LGU?
4. Which were the subjects of audited tasks of the highest risk resulted from the annual audit plan?
5. Are the internal audit plans prepared according to deadlines defined by the principles of the Public Finance Act?

4. Results

Question 1. Do the management participate in the selection of risk analysis areas?

The participation of management in the selection of risk analysis areas in a very important aspect of LGU functioning. The statements given by respondents prove that the vast majority of local government decision-makers participate in identifying risk areas for the purpose of risk analysis. This opinion was mainly presented by 70% of town offices surveyed, 66.7% of the marshal offices surveyed and 66.7% of the commune offices surveyed. Entity managers frequently reported their priorities which are closely connected with the areas of financial administration. According to decision-makers, these are the

⁶⁵ Public Finance Act of 27 August 2009, Journal of Laws of 2017, item 2077.

⁶⁶ Communication of 12 December 2016 of the Minister of Development and Finance on internal audit standards for the entities of the public finance sector, Official Gazette of the Minister of Development and Finance of 2016, item 28.

⁶⁷ Communication No. 23 of 16 December 2009 of the Minister of Finance on managerial control standards for the public finance sector, Official Gazette of the Ministry of Finance of 2009, No. 15, item 84.

risk areas related to budget reporting, inventory and granting and clearing budgetary subsidies.

60% of district office managers and 30% of the managerial staff of the remaining LGUs, i.e., district offices, town offices and commune offices, do not take part in the process of identification and selection of risk areas. These statements are rather alarming because they may indicate their failure to observe legal regulations, as well as the negligence of the entire process of risk analysis.

The results of the survey on management participation in selecting risk areas for risk analysis are presented by Figure 1.

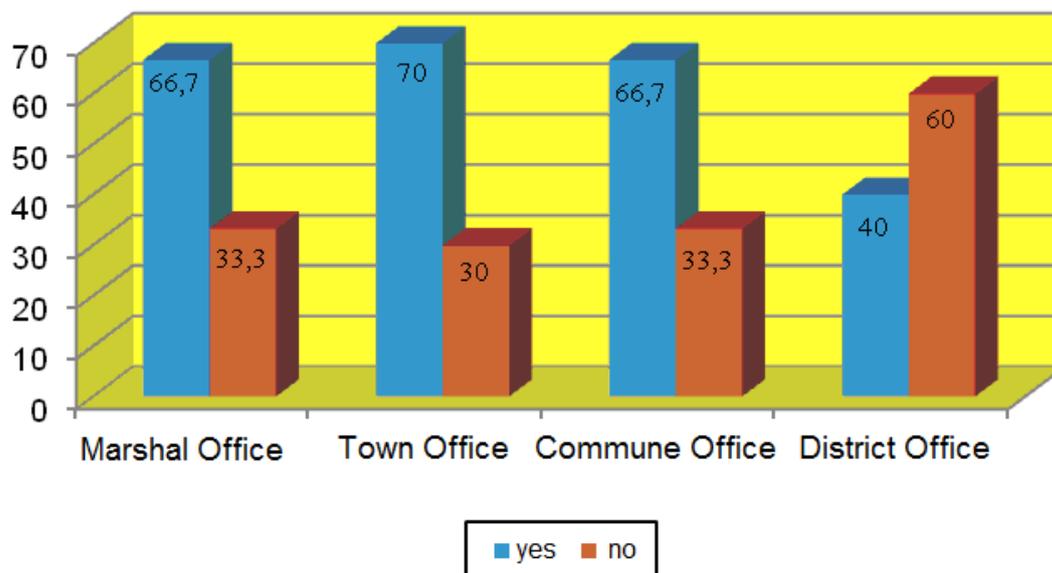


Figure 1: LGU management participation in selecting risk areas for risk analysis
Source: Author's own calculation based on the survey.

Question 2. Which areas are most frequently chosen for risk analysis?

The risk area chosen for risk analysis is one of the most important issues of internal auditor's work. Therefore, the survey also focused on this aspect.

Having analysed the statements of auditors surveyed, it was found that 96% of the respondents stated that the areas selected for analysis are most frequently the systems connected with awarding public contracts. Such responses confirm that the whole procedure of public procurement is subject to high risk. It refers not only to the liability for the breach of public finance discipline but also to the criminal liability for violating legal principles.

Rationalisation of budgetary expenditure is the next important area in which auditors often see the risk of irregularities and mismanagement. This opinion was expressed by 100% of the respondents from marshal offices, which constitutes 9% of all the polled, and 100% of the respondents from commune offices, which constitutes 16.1% of the respondents polled.

It appears that another area of interest for internal auditors are the systems connected with internal control functioning. 77% of respondents agree with that.

A large group of respondents definitely stated that high risk of irregularities for LGUs lies in the area of budget implementation, including collection of income, revenue, as well

as the stream of expenditure and disbursements of the budget. This answer was given by 100% of auditors from marshal offices and 71% of respondents from district offices.

Question 3. Which method of risk analysis is adopted in the LGU?

An important aspect of auditor's job is a risk analysis method adopted by a local government unit. The survey found that 51% of auditors questioned conduct risk analysis using the mathematical method – a method based on the spreadsheet. In favour of this risk analysis method were 63% of the respondents from town offices and 66% of the auditors from commune offices.

Another risk analysis method selected by auditors is a mixed method which is preferred by 25% of all the polled. This group includes 18.2% respondents from town offices and 40% respondents from district offices. 14% of the surveyed conduct risk analysis by means of the expert method – Delphi method, while 8% of the respondents estimate risk on the basis of auditor's professional opinion.

The information on risk analysis methods adopted in various types of LGUs is presented in Figure 2.

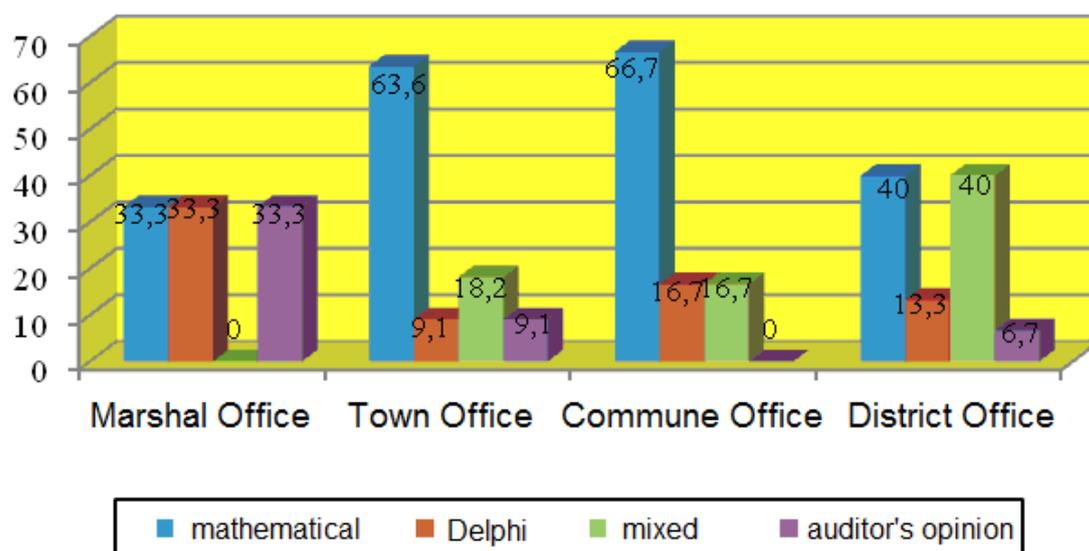


Figure 2: Risk analysis method adopted in LGUs
Source: Author's own calculations based on the survey.

Question 4. Which were the subjects of audited tasks of the highest risk resulted from the annual audit plan?

The next important issue in terms of the tasks of internal auditing in LGUs was to establish which types of auditing tasks are most often conducted. Considering the division into the types of audit tasks, most auditing tasks included: 36% – performance audit, 23% – financial audit, 19% – compliance audit, 15% – audit of EU fund management, whereas 6% – IT audit.

Question 5. Are the internal audit plans prepared according to deadlines defined by the principles of the Public Finance Act?

It is also essential that internal audit plans be prepared to deadlines defined by the principles of the Public Finance Act. 82% of the respondents admitted that audit plans are made to deadlines indicated in the Public Finance Act. Statutory deadlines for preparing

audit plans are observed by 100% of auditors from marshal offices and by 100% of auditors from town offices. Keeping deadlines of task planning, as well as the settlement of work plan for the previous year, looks much worse. These problems were recorded in the statements of 8% of the respondents. This group includes auditors from commune offices – 33% and auditors from district offices – 6%.

Obtained research findings on meeting statutory deadlines while preparing annual audit plans for the next year and reports on plan completion for the previous years are presented in Figure 3.

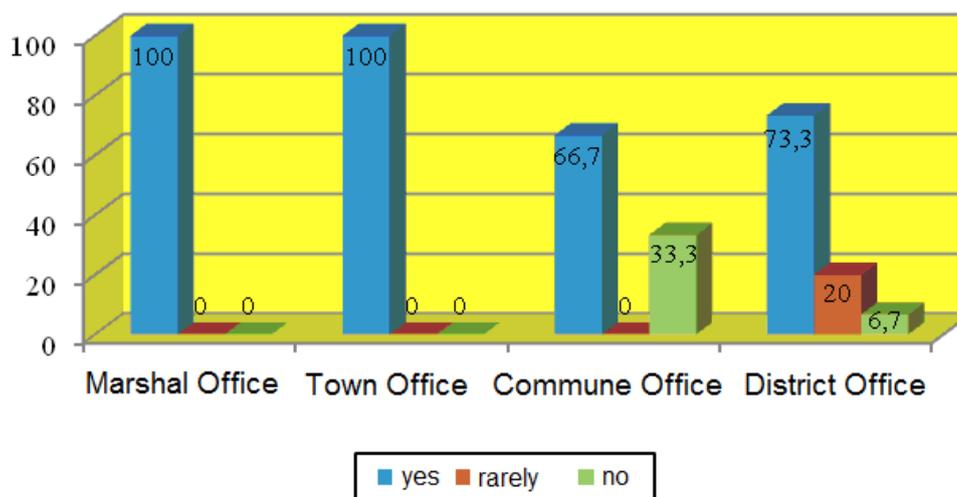


Figure 3: Preparing audit plan for the next year and reports on plan completion for the previous year to deadlines indicated by the Public Finance Act

Source: Author's own calculations based on the survey.

5. Conclusions

Vast majority of local government decision-makers participate in the process of risk area identification in order to conduct risk analysis. Such an opinion was presented mainly by the respondents from town offices – 70%. Over 51% of surveyed auditors conduct risk analysis using the mathematical method – a method based on the spreadsheet. Considering different types of internal audits, most audits included: 36% performance audit, 23% financial audit, 19% compliance audit, 15% audit of EU fund management and 6% IT audit. Internal auditors complete annual audit plans to the deadline defined in the Public Finance Act. The research indicates that not all the LGUs prepare a multi-annual internal audit plan.

On the basis of the research carried out, it can be generally concluded that LGU internal auditors respect the principles of law in the course of realised tasks.

References

CZERWIŃSKI, K. 2004. Audyty wewnętrzny (Internal Audit), InfoAudi.

- KUC, B., R., 2007. *Kontrola i audyt w sektorze publicznym (Control and Audit in the Public Sector)*, Wydawnictwo Menedżerskie PTM.
- KUROWSKI, L., RUŚKOWSKI, E., SOCHACKA – KRYSIAK H., 2010. *Kontrola finansowa w sektorze publicznym (Financial Control in the Public Sector)*, Polskie Wydawnictwo Ekonomiczne.
- Podręcznik audytu wewnętrznego w administracji publicznej (*Book of Internal Audit in Public Administration*), 2003. Ministerstwo Finansów, Warszawa.
- ROLA, Z. 2003. *Kontrola wewnętrzna, Kontrola finansowa i audyt w jednostkach sektora finansów publicznych (Internal Control, Financial Control and Audit in Entities of the Public Finance Sector)*, ALPHA.
- SOLTYK, P. 2017. *Usługi doradcze audytu wewnętrznego w samorządzie terytorialnym według badań ankietowych (Advisory services of the internal audit in the local government, based on a survey)*. *Zeszyty Naukowe Uniwersytetu Szczecińskiego, Finanse, Rynki Finansowe, Ubezpieczenia*, 3 (87): 43–53.
- Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych (*Public Finance Act of 27 August 2009*) (i.e., *Journal of Laws of 2017, item 2077*).
- WINIARSKA, K. 2007. *Audyt wewnętrzny w 2007 roku. Standardy międzynarodowe – Regulacje krajowe (2007 Internal Audit. International Standards – Polish Regulations)*, Wydawnictwo Difin.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Human resources as a part of corporate culture

Marta Sukiennik¹, Barbara Kowal², Patrycja Bąk³

¹AGH University of Science and Technology, Department of Economics and Management in Industry, Al. Mickiewicza 30, 30-059 Cracow, e-mail: marta.sukiennik@agh.edu.pl

²AGH University of Science and Technology, Department of Economics and Management in Industry, Al. Mickiewicza 30, 30-059 Cracow, e-mail: bkowalk@agh.edu.pl

³AGH University of Science and Technology, Department of Economics and Management in Industry, Al. Mickiewicza 30, 30-059 Cracow, e-mail: e-mail: pbak@agh.edu.pl

Abstract

This article presents the assumptions of the impact of human resources on the shape and level of organizational culture in enterprises. Particular emphasis was placed on the impact of these resources on the company's ability to maintain an appropriate level of culture. Different models of organizational cultures were presented. The so-called the “old” way of interpreting the organizational culture and cited the “new” – contemporary, currently defined in enterprises. The aim of this article, which is a pilot article, beginning a series of authors' research on the subject, is to indicate these interactions between the employee and the organization, which significantly contribute to shaping the organizational culture. companies.

Keywords: corporate culture, human resources, management

JEL Code: O15

1. Introduction

Corporate culture is a concept present in every organisation. However, organisations are not always aware, that its established culture may negatively affect the efficiency of its operations. The above results from the fact, that organisations often do not recognise the impact of the organisational culture, and of its scope of influence. However, one may constantly remind that “there is no enterprise without employees”. Therefore, it is the employees that shape and influence the level of the established and maintained culture of the enterprise, despite whether the company managers are aware or unaware of this knowledge. In the literature you can find many studies and studies describing the significance and influence of various factors, including the human factor on corporate culture (Nesmeianova, 208), Aleksandrovna, 2017), (Nemeth, 2017).

The development of each enterprise is determined by a wide array of factors. Market competitiveness, the gradually increasing risk related to conducting business, and the ever increasing customer expectations, force an accordingly increasing expectations regarding employees. The above results from the fact, that human resources are precisely the most influential factor regarding an increase or a decrease of efficiency. The direction depends not only on the quality of the workforce employed, but additionally, on the ways of their management. In the aspect of enterprise functioning according to the sustainable development principle, the circular economy theory, or even the CSR principles, it is essential to implement an appropriate scheme of employee performance. The appropriate performance of employees may, or even should be closely related to the culture of their place of employment.

Currently, enterprises function within the sustainable development principles (Flammer, 2017), (Polychroniou, 2018), (Yawar, 2018). Organisational culture, as well as, human resources management are some of the key aspects of operating in business. Another set of principles regarding the functioning of enterprises, within the circular economy framework, essentially forces employees to exhibit an adequate level of, obviously appropriately directed, organisational culture. In regard to the above, the research determining the place of Polish enterprise within the European Union, in regard to the sustainable development, is not without meaning. Poland is a country, which is still struggling to reach the average level of sustainable development of the member states. In the environmental ranking, Poland was ranked sixteenth. The country was ranked eighteenth regarding social issues, while regarding the economic aspect, it was ranked twenty-second. According to the aggregate relative measure of sustainable development, Poland was ranked twentieth. (Bluszcz, 2015) The research indicates, that there still remains much to do in order to improve the reasoning and work performance of the employees, and therefore, the conscious shaping of corporate culture. The aim of this article, which is a pilot article, beginning the series of authors' research on the subject is to indicate these interactions occurring in Polish enterprises on the line: employee – organization that significantly contribute to shaping the organizational culture. companies.

2. Human resources as an element of enterprise development

Human resources within an enterprise, constitute the assortment of resources that are not depleted during the operation process within the company, but additionally, regarding the shaping of the intellectual capital, may “increase”. The development of employees, often related to appropriate motivation, constitutes this “increase”. The above idea is a positive aspect of the human resource management. Within this field, one may also encounter types of negative influence, i.a. the necessity to motivate employees to execute planned tasks.

According to the literature (Zajac, 2008), (Javidan, 1998), in the resource approach, employee skills are divided into competences and key competences. Competences are regarded as specific skills resulting from the enterprise specifics shaped, i.a. by the profile, the character and the scale of operation, the trade affiliation, and the level of the company's technological sophistication. The competences determining the enterprise competitive capabilities, therefore, its strategic advantage, are referred to as key competences. Therefore, it seems that particularly within the framework of key competences,

the management staff should place emphasis on maintaining and even on the development of the level of corporate culture established in a particular enterprise.

3. Organisational culture as a contemporary element of determining the value of an organisation.

The concept of organisational culture, lately, often employed interchangeably with the corporate culture concept, expands onto many fields within the source literature. An assortment of various approaches, methods and techniques employed to define organisational culture, may be found. Starting with the “autonomous nervous system” of the enterprise (Kilmann, 1985), the “general assortment of principles, rules and modes of operating” a company (Nowa, 1996), the above is also referred to as a form of enterprise capital (Strategor, 2001), or a classical pyramid of premises, values and artefacts within the Schein model (Aniszewska, 1999). However, the authors of the following article assume (Bąk, 2016), that the most adequate definition is the one stating that organisational culture is a pattern of basic premises, invented, discovered or developed by a group during the process of learning, regarding how to tackle the issues of external adaptation and internal integration, that is considered as significantly valuable, and should be adopted by new members, as an appropriate mode of perceiving, reasoning and feeling regarding the aforementioned issues.

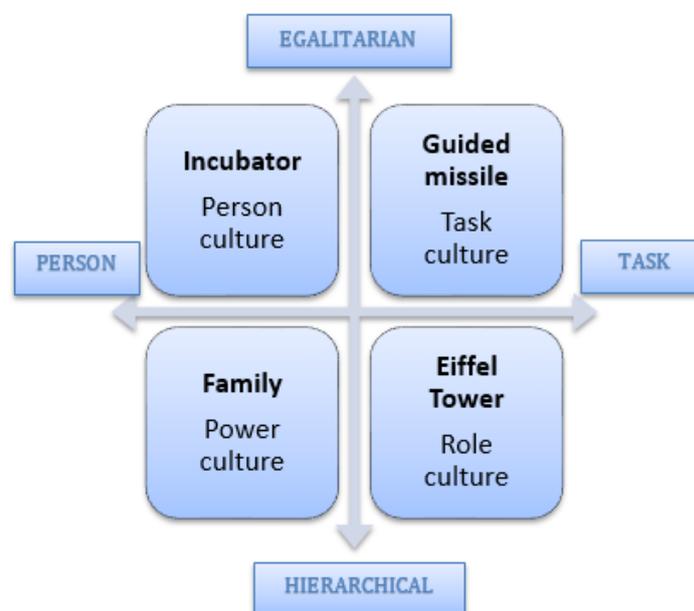


Image 1: Organisational culture models
Source: (Bąk, 2017)

Just as there are many definitions of organisational culture, there exists a wide variety of cultural models, which may be regarded as distinguished types, differing by means of particular factors and of the approach towards the execution of tasks and processes

within an enterprise. One of the most popular classifications is the one presented by image 1, distinguishing the different models on the base of two criteria: egalitarian – hierarchical, as well as, relationship-oriented – task-orientated.

The distinction between different types of culture, depends on both the emphasis on the person or the task in an organisation, as well as, on the hierarchical or egalitarian approach to the accomplished tasks. In result, we can distinguish four combinations of various types of culture.

The family type of culture, also referred to as the culture of power, is characterised by the definitive attitude towards the employee, however, the established hierarchy plays a major role in an organisation. In relation to the personal attitude, employees are usually long-term workers and they are loyal to their employers. Enterprises employing this particular model often exhibit centralisation and a limited amount of procedures, as resulting from few leaders. (Rozkwitalska, 2005). Power struggles are occasionally present, as power is treated as a priority.

The role culture, also referred to as the Eiffel Tower is often present within bureaucratic organisations, with their typical task attitude and a significant distance of power. The manager is considered a function, not a person, resulting in regular position rotation in case of failure to meet the specified requirements. Career at companies that employ the Eiffel Tower culture model, depends on professional qualifications. Employees are evaluated on the base of their results, and promoted on the base of their increasing qualifications. At the office, the members of an organisation follow strict rules and procedures. (Trompenaars, 2002)

The task – the guided missile culture, is egalitarian, and focused on the task at hand, where the accomplishment of strategic aims is essential. Work within this culture is based on work teams. The teams often consist of professionals from particular, narrow fields, constituting an interdisciplinary team. Employees are motivated by the final result of their effort, as they draw satisfaction from the work itself.

The person culture – the incubator, is characterised by the emphasis on the person and on a significant level of egalitarianism. In this case, the essence of the functioning of an organisation is to allow its members self-fulfilment. The organisation serves a menial task in regard to the employees. Employees are characterised by individualism and the passion of creation, as well as, an emotional involvement in their work. Incubators exhibit a minimal formal structure and hierarchy. (Trompenaars, 2002)

Analysing the above types of organisational culture and considering human beings as employees, one may notice, that not every employee will accomplish and achieve self-fulfilment as an employee within a given culture model. Personal conditioning, character traits or the emotional side of the employees, significantly determine their work performance. Therefore, culture established in a particular organisation, often determines the value of this very organisation. However, this culture is significantly determined by the human factor present in every organisation, as well as, by the human research management system employed by the management staff.

The issue of employees identifying with organisation culture is also apparent. Along the years, the attitude towards understanding, perceiving and defining, has changed – it became explicit and visible. Image 2 presents two types of approach towards understanding the organisation culture – the former and the new approach, i.e. the one that becomes more visible in companies.

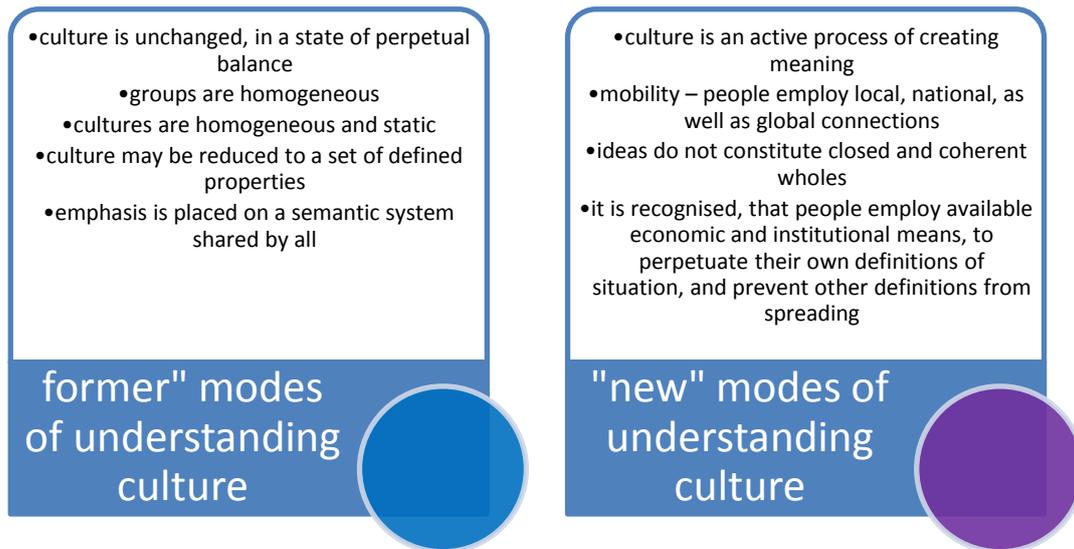


Image 2: The perception of organisation culture

Source: Own research based on (Wright, 1998) and (Krzyworzeka, 2012)

Summarising the above types of approach, one may notice, that the organisation culture definitely prevails in the aspect of establishing the value of an organisation. Explicitly, corporate culture emerges as an active process which may determine the shape of an organisation, therefore, the overall performance.

4. Human resources as an element shaping the culture of an organisation

Human resources management is one of the essential issues regarding management processes in enterprise, regarded as a strategic, coherent and comprehensive overview regarding the issues related to the management and the development of people within the frameworks of an enterprise, with each aspect constituting an essential element of managing an organisation as a whole (Armstrong, 2000). In the source literature, the process is variously defined, and a significant number of personal process classifications are available. One of the basic classifications (Pocztowski, 2008), distinguishes between the following personal processes:

1. Employee organisation entry processes
2. Processes regarding people functioning within an organisation
3. The processes regarding people leaving an organisation

During each of the above phases, the employee should be managed well and efficiently. Currently, an increasing emphasis is placed on the fact, that employees may shape the culture of an organisation in which they work. Therefore, the process of managing this resource is of no lesser significance, as proper management may positively shape and maintain an appropriate level of culture in a company.

The functioning of an employee in a company, divided into three phases mentioned above, affects the shape and the level of organisational culture. Image 3 presents the pro-

cess of interaction in the shaping of organisational culture. These interactions were indicated on the basis of interviews, observations and conversations with middle-level managers in Polish energy companies.

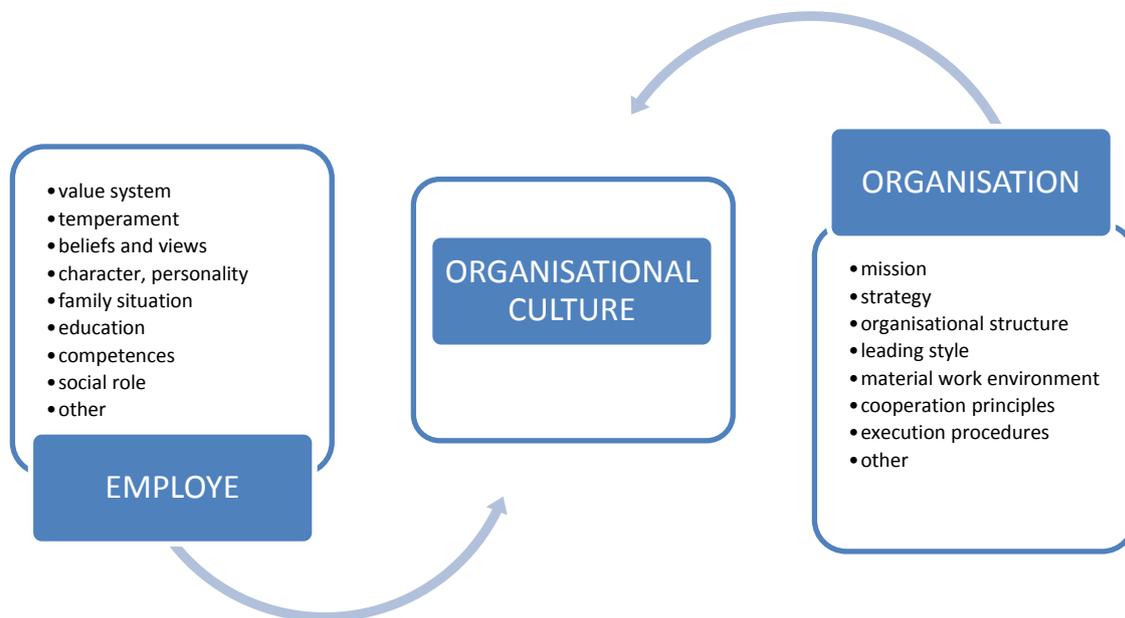


Image 3: Employee-organisation interactions in the process of shaping of the organisational culture.
Source: Own research

In further research, the authors of the article will try to show that these interactions have a significant impact on both the shape and the level of organizational culture. They can also transform it completely, change it. The employee enters an organisation, “equipped” with own value system, temperament, own beliefs and views. He enters an organisation employing an established system of norms, values, i.e. an organisational culture. Both these statuses begin to mutually overlap. Here it is clearly seen, that appropriate human resources management should cause the employee to “lean” towards the organisation culture, to accept its principles and guidelines, improving its level. Without appropriate management, the culture of organisation may be weakened by the individual nature of the employee.

Expanding the personal processes, towards a more detailed description, one may present further aims of human resources management. A more detailed distinction of processes, allows for an increased possibility of controlling the management processes regarding corporate culture. A detailed distinction of personal processes (Pocztowski, 2008) in image 4, was presented in regard to influencing both the shape and the level of organisational culture.



Image 4: Personal processes and their influence on the level of organisational culture
Source: Own research

Each phase of the employees functioning in an enterprise or in an organisation, shows that there is a dependence and influence between that phase and the culture present within an organisation. Proper control of the employee, with the use of appropriate HR instruments may, or even should contribute to the adoption by the employee, of the principles of the functioning corporate culture. Further, the employee may enhance and maintain the culture, on a temporary level accepted by the executive level of an organisation.

5. Discussion and Conclusions

The aim of the following article is an attempt to present, that there is a relation of dependence between human resources management and the shape of the corporate culture in enterprise. The essence of organisational culture has increased significantly over the recent years, companies increasingly realise that the properly shaped and maintained culture in a company, positively affects the achieved efficiency. This is evident in the literature, where scientists increasingly present the concept of interdependence of human resources in enterprises and the level of enterprise effectiveness understood in accordance with contemporary trends, organizational culture, CSR principles or effective management, for example (Schiffeler, 2016), (Ketschau, 2017), (Mullakhmetov, 2018).

The literature also presents the concept of a negative impact on the level of organizational culture in the case of outsourcing. (Wang, 2011). Employees who do not identify with the workplace are not interested in raising the level of organizational culture or the brand of a given company. The question arises whether you can take action that will change this approach? Another issue is whether these interactions are the same in each country? Or maybe the culture of a given country also affects the level of organizational culture of enterprises? Studies (Lorincova, 2017) and (Wang, 2011) and (Betzaida, 2017) present approaches and observations in various countries.

The enumeration of the subsequent phases of human resources management in a company, may contribute to the increasingly efficient shaping of the employee – corporate culture relation.

The management staff should realise and consider, that an employee exist in a company in three key phases – entry, functioning and leave. Each of the aforementioned phases includes a strong relation that affects the level and the shape of organisational culture. Proper employee management in every phase, may positively affect the corporate culture, and in result, the entire company.

Acknowledgements

This paper was supported by AGH University of Science and Technology [nr11.11.100.693].

References

- ALEKSANDROVNA, T., ALEKSEEVNA, V., ALEXANDROVNA K. L., 2017, Actual questions of human resources management, *Turkish Online Journal Of Design Art And Communication*, V 7, p: 1208–1218 , DOI: 10.7456/1070ASE/147.
- ANISZEWSKA G., GIELNICKA I. 1999. Firma to ja, firma to my. Poradnik kultury organizacyjnej firmy: Ośrodek Doradztwa i Doskonalenia Kadr, Gdańsk.
- ARMSTRONG M. 2000. Zarządzanie zasobami ludzkimi. Strategia i działanie: Wydawnictwo Profesjonalnej Szkoły Biznesu, Kraków.
- BAK P, SUKIENNIK M., KOWAL B. 2016. Kultura korporacyjna w aspekcie procesów zarządczych w polskich przedsiębiorstwach wydobywczych: *Journal of the Polish Mineral Engineering Society*, Vol. 17, No 2. p. 135–144.
- BETZAIDA , Oliveros de Sarmiento,2017, Culture Of Work And Management Of Human Resources In Venezuela , *ORBIS* , Volume: 13 , I 37, p. 73–90.
- BLUSZCZ A. 2015. Classification of the European Union member states according to the relative level of sustainable development: *Quality and Quantity* vol. 50. Iss. 6. P. 2591–2605.
- FLAMMER C., LUO J., 2017, Corporate social responsibility as an employee governance tool: evidence from a quasi-experiment, *Strategic Management Journal* Vol. 38, I . 2, p: 163–183, DOI: 10.1002/smj.2492.
- JAVIDAN M. 1998. Core competencies: what does it mean in practice: *Long Range Planning*. Vol. 31.
- KETSCHAU, THILO J, A., 2017, Conceptual Framework for the Integration of Corporate Social Responsibility and Human Resource Development Based on Lifelong Learning Sustainability Vol. 9, I. 9, (1545), DOI: 10.3390/su9091545.
- KILMANN R.H., SAXTON M.J., SERPA R. 1985. *Gaining Control of the Corporate Culture*: Jossey-Bass, San Francisco.
- KRZYWORZEKA P. 2012. Kultura organizacyjna – ślepa uliczka teorii organizacji: *Management and Business Administration*. Central Europe Vol. 1/2012 (108). p 72–81.

- LORINCOVA S., HITKA M., BALAZOVA Z., 2017, Corporate Culture In Slovak Enterprises As A Factor Of Hrm Quality – Case Study, *International Journal For Quality Research*, vol. 10, I. 4, p 719–732 , DOI: 10.18421/IJQR10.04-04.
- MULLAKHMETOV, K S., SADRIEV, R., KROTKOVA, E.V., SHARAFUTDINOV, R. I., 2018, Culture as a Factor of Influence on the Management Potential of Modern Organizations, *HELIX* 8(1) p. 2843–2846, DOI: 10.29042/2018-2843-2846.
- NEMETH J. 2017, Human Capital Theory in the Framework of Organization Theory, *Strategic Management*, Vol. 22, I. 3, p: 29–35.
- NESMEIANOVA, R. K ,2017, The relationship between the socio-demographic characteristics of employees and their organizational identification and their perceived attractiveness of corporate culture, *Social Psychology And Society* , 9 (1)pp. 67–77 2018.
- Nowa Encyklopedia Powszechna, 1996, str.618.
- POCZTOWSKI A. 2008. Zarządzanie zasobami ludzkimi: PWE, Warszawa
- POLYCHRONIOU P, TRIVELLAS P., 2018, The impact of strong and balanced organizational cultures on firm performance: Assessing moderated effects, *International Journal Of Quality And Service Sciences* Volume: 10, p: 16–35, DOI: 10.1108/IJQSS-09-2016-0065.
- ROZKWITALSKA M., FRYZEŁ B., 2005. Kultura korporacyjna. Poglądy, teorie, zarządzanie: Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków.
- SCHIFFELER, N., BEHRENS W., STIEHM S., RICHERT A., JESCHKE S., 2016, Encouraging Organizational Change – Developing A Certificate For Holistic Demography Management Systems, *Edulearn16: 8th International Conference On Education And New Learning Technologies*, EDULEARN Proceedings , P: 9167–9176.
- STRATEGOR. 2001, Zarządzanie firmą. Strategie, struktury, decyzje, tożsamość: PWE. Warszawa.
- TROMPENAARS F., HAMPDENTURNER CH., 2002. Siedem wymiarów kultury. Znaczenie różnic kulturowych w działalności gospodarczej: Oficyna Ekonomiczna, Kraków.
- WANG, I-Ming, SHIEH, Chich-Jen, CHEN, Kuan-Hung, 2011, Study On The Human Resource Management Outsourcing Risks, *Actual Problems Of Economics* , Issue: 125, P. 364–375.
- WRIGHT S. 1998. The politization of “culture”: *Anthropology Today*, Vol. 14(1), s. 7–15.
- YAWAR S.,A., SEURING S., 2018, Management of Social Issues in Supply Chains: A Literature Review Exploring Social Issues, Actions and Performance Outcomes, *Journal Of Business Ethics* Vol. 141, I 3, p: 621–643, DOI: 10.1007/s10551-015-2719-9.
- ZAJĄC CZ. 2008. Zasoby ludzkie jako kluczowy czynnik rozwoju przedsiębiorstwa [online]. <http://www.dbc.wroc.pl/Content/4166/Lichtarski.pdf>. [Accessed: 29.01.2018].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Causes and Limits of Local Government Indebtedness in Poland

Krzysztof Surówka¹

*¹Department of Local Government Finance, Faculty of Finance and Law, Cracow University of Economics, Rakowicka 27, 31-510 Cracow, Poland,
e-mail: krzysztof.surowka@uek.krakow.pl*

Abstract

Local government is a part of the public finance sector. Therefore, a significant part of its income has a strictly defined purpose. Such focusing of income on the financing of specific tasks limits the scope of financial autonomy of local government and reduces it to the role of administering public funds and spending them on financing particular tasks. Supervision and control over local government are also a limitation of local government units (LGUs) – municipalities (gminas), districts (poviats) and voivodeships – financial independence. At the same time, however, the essence of local government lies in the fact that it is focused on local development. Owing to this, local authorities have their own income at their disposal and can also reach extraordinary sources of financial power, such as loans and credits. This duality resulting from the essence of local government functioning can be the cause of its numerous real and financial problems, especially when the repartition of public funds between central authority and local government will be made incorrectly. The presented article focuses on some problems related to the issues of local government units indebtedness of in Poland.

Keywords: LGUs, indebtedness, operating surplus, current revenues, current expenditures, Poland

JEL Code: H7

1. Introduction

Local government operating in Poland since 1990 plays an important role in the public finance sector. It provides services of basic importance for satisfying public needs. These are services in the field of education and upbringing, social welfare, culture, but also housing and communal economy. The quality of the provision of these services is significantly influenced by two factors, i.e. the amount of funds provided to the local government and the ability to manage money by local authorities.

Due to the fact that the level of income provided to local government units is limited and satisfying needs also requires investment outlays, LGU in Poland have the right to use

returnable revenues. At the same time, however, legal regulations specify limits on indebtedness of local government units. The presented article focuses on some problems related to the issues of local government units indebtedness of in Poland.

2. The essence of local government indebtedness

Income from taxes, public property as well as general and targeted subsidies (except income from the sale of property and investment subsidies) is intended to finance the current tasks of local government units. Generally, it is rarely the case that the generated surplus of current income over current expenditures would be an efficient source of funding for property expenditures. Meanwhile, local government authorities are undertaking various development decisions on their territory. At that time they must reach for extraordinary financial sources such as loans, credits, or issued bonds.

Basically in all countries, LGUs have the right to use this form of financial support (Bolivar, Galera, Muñoz and Subirés, 2016). In western countries there is an extensive system of potential lenders. They are municipal banks, self-government compensatory funds, insurance institutions, various state agencies. In addition, local government authorities collect funds for development activities through the issue of securities. Local government generally has no problem with access to repayable financial sources. It is an entity that, in the opinion of lenders, is characterized by credibility and high financial liquidity, due to constant cash inflow.

Loans and credits differ, however, from other budgetary income. They are returnable and should be handled continuously. Consequently, this may lead to excessive debt of LGUs. At that time, financing the basic, current needs of residents in education, social care and living may be at risk (Wollmann, 2016).

For banks and other institutions providing LGUs with credits and loans, the budget plan is not a binding document. The repayment of liabilities is legally guaranteed in every credit and loan application. In the case of insolvency of LGU, financial institutions (due to the legal security of the credit and the loan) have the right to demand repayment of debt (conducting enforcement proceedings). Even in the situation when it would threaten carrying out public tasks (Kluza, 2017). Therefore, for safety reasons, both for local government and for lenders themselves, there are statutory restrictions on the use of the repayable system of financing LGUs. Such restrictions do not apply to private entities, where the only barrier to the granting or non-granting of credit and loans is credit capacity (Kluza, 2016).

In the case of LGUs, these statutory restrictions are on the one hand to determine the needs that can be financed by return revenue and on the other hand to determine the limits of local government debt (Guillamon, Benito, Bastida, 2011). A public debt is a consequence of taking out credits and loans by LGUs. It is a commitment of the local government authorities for taken out credit and loans and issued securities. As a consequence, the funds for future periods must include planned resources for the service. However, these expenditures limit the possibility of financing other budgetary expenditure, especially current expenditure.

The model of division of tasks and financial resources between government administration and local government has a significant impact on the amount of loans taken by the local government (Wollmann, 2012). The burden of local government with excessive tasks in relation to the received income may cause the rise of local government debt. Then

the state budget deficit is transferred to the budget of LGUs. With limited public resources such a situation is very likely.

The debt of a local government is the sum of the various financial liabilities incurred by that entity in connection with expenditures that exceed the income possible to finance them (Albaladejo, Lopez, 2005). The basic debt category of LGUs is still taken out loans and bank credits. However, the target on which the local self-government authorities take out loans and credits is essential.

Indebtedness policy of the self-government units and binding constraints are very important elements of procedures ensuring the security of the public finance system (Denek, 2011). Self-government debt is an integral part of state public debt, which according to a number of legal regulations is subject to numerous statutory regulations.

3. The role of the operating surplus in financing the development activities of LGUs in Poland and the problem of public debt

Assets at the disposal of local government units must be modernized and recreated. This applies to all groups of LGUs, but especially to large cities with an extensive technical and social infrastructure. Therefore, these entities must conduct investment activities. Investing is necessary to meet public needs. Otherwise, the level of services provided will be limited.

However, investments require expenditures whose source of financing is generally not current income. These are returnable revenues that, after a grace period, must be returned and they should be operated, as mentioned above, on a regular basis. This applies to both funds obtained on commercial terms as well as on preferential terms, e.g. from the European Union budget, from subsidies and loans from other entities, including government administration. Loans incurred are related to their service and even the preferential ones require their own contribution.

The main sources of credits and loans repayment are operating surpluses, i.e. surpluses of current income over current expenses as well as income from the sale of assets. The latter source, however, is limited, because local government;

- *firstly*, can not dispose of all the assets,
- *secondly*, there are legal restrictions on the sale.

Operating surpluses indicate the economic condition of local government units. Therefore, LGUs whose budgets are based on own income generally have greater opportunities to develop operating surpluses than local governments financing their tasks with transfers from the state budget. Tables 1–4 present current revenues and current expenditures of individual LGUs groups in Poland in 2003–2016, in constant prices of 1999.

Table 1: Current revenues and current expenditures of municipalities in Poland in the years 2003-2016 (in billion zł)

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Current revenues | 30.2 | 32.6 | 36.3 | 40.6 | 43.6 | 45.6 | 45.1 | 47.2 | 47.1 | 45.2 | 48.6 | 51.2 | 53.9 | 60.9 |
| Current expenditures | 25.4 | 27.0 | 29.6 | 33.2 | 36.4 | 37.1 | 38.2 | 41.3 | 40.7 | 41.2 | 42.1 | 44.2 | 45.8 | 57.3 |

Source: The author's own calculations, in constant prices of 1999.

Table 2: Current revenues and current expenditures of cities with district rights in Poland in the years 2003–2016 (in billion zł)

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Current revenues | 23.0 | 25.7 | 28.8 | 31.4 | 35.8 | 36.2 | 35.1 | 35.8 | 35.6 | 34.3 | 37.8 | 40.0 | 42.0 | 43.7 |
| Current expenditures | 20.5 | 22.2 | 24.3 | 25.9 | 27.2 | 29.1 | 30.7 | 31.7 | 32.1 | 32.7 | 33.3 | 35.0 | 36.5 | 41.5 |

Source: The author's own calculations, in constant prices of 1999.

Table 3: Current revenues and current expenditures of districts in Poland in the years 2003–2016 (in billion zł)

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Current revenues | 9.3 | 10.1 | 10.9 | 11.6 | 12.4 | 13.2 | 13.8 | 14.4 | 14.7 | 13.3 | 14.0 | 14.4 | 14.7 | 14.2 |
| Current expenditures | 8.1 | 9.0 | 9.8 | 10.4 | 10.7 | 11.4 | 12.1 | 12.9 | 13.0 | 12.6 | 12.8 | 13.0 | 12.8 | 13.6 |

Source: The author's own calculations, in constant prices of 1999.

Table 4: Current revenues and current expenditures of voivodeships in Poland in the years 2003–2016 (in billion zł)

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Current revenues | 3.9 | 5.7 | 5.6 | 7.5 | 8.7 | 8.6 | 7.5 | 7.5 | 7.6 | 7.4 | 7.2 | 7.8 | 7.6 | 7.5 |
| Current expenditures | 2.6 | 3.4 | 4.0 | 5.0 | 5.4 | 6.0 | 7.5 | 6.4 | 6.4 | 6.2 | 6.4 | 6.6 | 6.0 | 6.7 |

Source: The author's own calculations, in constant prices of 1999.

The numerical data contained in Tables 1–4 show that in 2003–2016 operating surpluses in individual LGUs groups, calculated in constant prices of 1999, were decreasing. For example:

- **In 2003, they were in the case of;** municipalities – 16% of their income, cities with district rights – 33% of their income, districts – 13% of their income, voivodeships – 33% of their income.
- **In 2010 they were respectively in the case of;** municipalities – 12% of their income, cities with district rights – 11% of their income, districts – 10% of their income, voivodeships – 12% of their income,
- **Whereas, at the end of 2016, these figures were as follows;** for municipalities – 6% of their income; for cities with district rights – 5% of their income; for districts – 4% of their income; for voivodeships – 11% of their income.

Declining operating surpluses related to current income indicate a deteriorating financial situation of Polish local government.

Presentation of LGUs current income in constant prices allows to eliminate its growth caused by inflation (or deflation which took place in 2014–2016). However, presenting current expenses of LGUs in constant prices, apart from eliminating inflation (deflation), indicates an increase in the scope of tasks performed by particular groups of local government units in the analysed period.

The figures show that in all LGUs groups, year by year current expenditures absorb more and more current revenue. This limits the possibility of engaging operating surpluses to support investment processes. Despite the large potential opportunities to acquire preferential funds for investment activities, especially after Poland's accession to

the European Union, after 2015 the dynamics of their use are decreasing. As a consequence, the share of expenses on investments in LGUs budgets in Poland is decreasing. For example, property expenditures in 2003, i.e. before Poland's accession to the European Union, accounted for 15% of total LGUs expenses, in 2006–2012 it was over 20% (up to 26% in 2009), and at the end of 2016 they decreased to 13%.

The growing share of property expenditures in the total expenditure of LGUs in Poland in the period 2006–2014, with decreasing operating surpluses, contributed to the increase in the indebtedness of communities, cities with districts rights, districts and voivodeships. In many local government units in Poland, there have been problems with financial liquidity. This forced the most indebted LGUs to reach for high-interest loans to parbank institutions, because banks refused to give them credits. In order to counteract unfavourable occurrence of excessive indebtedness of LGUs as a result of interference of the supervisory authorities, after 2014 the investment activity in the Polish local government was slowed down. The reason is not overinvestment, because the infrastructure development needs are still high, but the lack of funds for servicing debt due to decreasing operational surpluses.

4. Relations between current expenditures and current revenues of local government units in Poland

In the elaborated linear regression model: $Y = \alpha + \beta X + \varepsilon$ the response variable (dependent variable Y) is the current revenues of local government units in Poland, and the explanatory variable (independent variable X) are the current expenditures of these LGUs. The parameters of the model are free term α (the point of intersection of the regression line with the axis OY) and the direction coefficient β (measure of the slope of the regression line in relation to the axis OX). The parameter estimators α and β obtained by the least squares method are respectively a and b . t Stat is a test of linear relationship occurrence between current revenues and current expenditures of LGUs in Poland. This statistical test allows to verify the authenticity of the so-called null hypothesis that the parameter of the regression function I type β is equal to zero, with the alternative hypothesis that it is not equal to zero ($H_0: \beta = 0; H_A: \beta \neq 0$). The acceptance of the null hypothesis that the parameter $\beta = 0$ would mean that the increase in the value of current expenditures of LGUs on State aid by PLN 1 billion will not cause any changes in the size of current revenues which means the lack of any relationship between current expenditures and current revenues of LGUs. In other words, the acceptance of the null hypothesis means the lack of the influence of current expenditures on the size of current revenues. From the perspective taken in this paper it will be essential to reject the null hypothesis in favor of the alternative hypothesis which states that between the studied phenomena – current expenditures of LGUs and their current revenues – there is a significant statistical relationship. From the tables of critical values of t -Student it is seen that $\pm t_{\frac{\alpha}{2}} = \pm 2.179$ for $\alpha = 0.05$ and $n - 2 = 12$ degrees of freedom. The null hypothesis can be rejected in favor of the alternative hypothesis only when $t_b < t_{\frac{\alpha}{2}}$ or $t_b > t_{\frac{\alpha}{2}}$, that is when $-t_b < -2.179$ or $+t_b > +2.179$.

Table 5 presents estimates of the regression model parameters for individual LGU, standard errors of b estimator, ends of confidence intervals for regression parameters and values of tests for the linear relationship between current expenditures and current revenue of LGUs in Poland.

Table 5: Estimates of the regression model parameters for LGUs in Poland.

| LGUs | Regression coefficient <i>b</i> | Standard error <i>S_b</i> | <i>t</i> Stat <i>tb</i> | Lower 95% | Upper 95% |
|-----------------------------|------------------------------------|--|----------------------------|--------------|--------------|
| Municipalities | 1.104872 | 0.046798 | 23.60913 | 1.001869 | 1.207874 |
| Cities with district rights | 1.19877 | 0.08565 | 13.9961 | 1.010255 | 1.387285 |
| Districts | 1.226791 | 0.077312 | 15.86797 | 1.056628 | 1.396955 |
| Voivodeships | 1.033927 | 0.145763 | 7.093219 | 0.713105 | 1.354748 |

Source: The author's own calculations.

The data presented in Table 5 shows that there are no statistical grounds to reject the hypothesis about a linear relation between current expenses and income for all local government units in Poland.

For all LGUs, *b*-ratings take positive values, which means that the increase in current expenditures by PLN 1 billion is accompanied by an increase in current revenues respectively by PLN 1.10 billion (municipalities), PLN 1.20 billion (cities with district rights), PLN 1.27 billion (districts) and PLN 1.03 billion (voivodeships). Errors in estimates amount to PLN 46 million, PLN 86 million, PLN 77 million and PLN 146 million, respectively. However, taking into account the confidence interval for the regression coefficient, it can be stated with 95% probability that the increase in current expenditures of LGUs by PLN 1 billion will cause an increase in current revenues of LGUs approximately by the value from the range (PLN 1 billion; PLN 1.21 billion) for municipalities (PLN 1.01 billion; PLN 1.39 billion) for cities with district rights, (PLN 1.06 billion, PLN 1.40 billion) for districts and (PLN 713 million, PLN 1.35 billion) for voivodeships.

When analysing the values of the correlation coefficient (Table 6), it should be noted that for all LGUs groups, there is a strong positive linear relation between current expenditures incurred by these units and their current revenues.

Table 6: Values of correlation and determination coefficients between current expenditures and current revenues of LGUs in Poland and standard regression error

| LGUs | Correlation indicator | Determination coefficient | Standard error |
|-----------------------------|-----------------------|---------------------------|----------------|
| Municipalities | 0.990276 | 0.980647 | 1.022335 |
| Cities with district rights | 0.973053 | 0.946832 | 1.689194 |
| Districts | 0.978847 | 0.958142 | 0.370671 |
| Voivodeships | 0.905867 | 0.820595 | 0.919238 |

Source: The author's own calculations.

In the case of municipalities, cities with district rights and districts the determination coefficient is close to 1, which means a very good adjustment of the regression line to the observation results. The variability of current expenditures explains respectively 99.03% (municipalities), 97.31% (cities with district rights), 97.88% (districts) the variability of current income of these local government units. For voivodeships, the determination coefficient is 0.820595, which means that the variability of current income obtained by them was explained in 82.06% by the variability of their current expenditures (satisfactory adjustment of the regression function to empirical data). In other words, only in relation to voivodeships, the determination coefficient drops below 0.9, which still does not exclude the accuracy of the forecasts created on the basis of this model.

5. The limits of indebtedness of local government in Poland and the problem of independence of local government authorities

Legal regulations defining the scope of independence of local government in the process of contracting and servicing liabilities have been included in many normative acts. The canon of legal norms should undoubtedly include:

1. art. 104c of the Maastricht Treaty introducing the limit of the nominal value of consolidated debt within the *general government* sector (the Sector of Government and Local Government Institutions), the value of which should not exceed 60% of GDP calculated at market prices,
2. art. 216 para. 5 of the Constitution of the Republic of Poland, which is an adaptation of the provisions of the Treaty on European Union to the norms contained in the Basic Law, prohibiting all actions that would result in the increase of public debt above $\frac{3}{5}$ of GDP,
3. a number of specific regulations included in the Public Finance Act.

Generally, it can be stated that by the end of 2013 there were two safeguards in Poland that limited the possibility of excessive indebtedness of local government units (Surowka, 2013).

In accordance with the legal regulations in force until the end of 2013, local government units in Poland **could not devote annually:**

- for the repayment of credit and loan instalments and the purchase of securities intended to finance the planned budget deficit,
- for the repayment of previously contracted liabilities due to the issue of securities and incurred loans and credits,
- for interest on credits and loans, including those incurred to cover the transitional budget deficit during the financial year,
- for potential repayment of amounts resulting from granted guarantees and sureties **more** than 15% of their income.

The second limitation was that the total amount of the local government unit debt at the end of the budget year could not exceed 60% of the total income of this unit, and at the end of the quarter 60% of its income planned in a given budget year. The above restrictions did not apply to issued securities, credits and loans incurred in connection with the funds specified in the agreement concluded with the entity administering EU funds. However, if the EU funds were not transferred or after the transfer their return was imposed, LGUs were not able to issue securities, incur credits and loans or grant sureties and guarantees until the conditions mentioned above were met.

The Public Finance Act, which entered into force on January 1, 2010, maintained the rules for regulating the level of indebtedness of local government units.

The Act specifies the principle that the legislative body of LGUs can not adopt budget, the implementation of which will cause that in the budget year and in any year following the budget year, **the relation** of the total amount of repayment in a given financial year of credit and loan instalments and purchase of securities along with the interest due as well as potential repayment of amounts resulting from granted sureties and guarantees, to planned total budget income **will exceed** the arithmetic average of the relation calculated for the last three years of its current income, increased by income from the sale of assets and decreased by current expenses, to the total budget income.

The following formula is used to calculate the limits of LGUs indebtedness:

$$\left(\frac{R+O}{D}\right)_n \leq \frac{1}{3} * \left(\frac{Db_{n-1} + Sm_{n-1} - Wb_{n-1}}{D_{n-1}} + \frac{Db_{n-2} + Sm_{n-2} - Wb_{n-2}}{D_{n-2}} + \frac{Db_{n-3} + Sm_{n-3} - Wb_{n-3}}{D_{n-3}} \right)$$

where the individual symbols mean:

R – total amount due to the repayment of credit and loan instalments and purchase of issued securities, planned for the financial year,

O – interest on credits and loans, interest and discount on securities issued and repayment of amounts resulting from granted sureties and guarantees, planned for the financial year,

D – total budget income in a given budget year,

Db – current income,

Sm – income from the sale of assets,

Wb – current expenses,

n, n-1, n-2, n-3 – the financial year and the preceding years

The new ratio design **in force since January 2014**, on the one hand, abolishes the limitations binding until the end of 2013 of the local government unit with significant development potential, for which contracting even significant financial liabilities could be an instrument of safe development policy, and on the other hand disciplines entities whose high burden of income with repayment of liabilities requires extreme caution when incurring new credits and loans. This formula strictly conditions the burden of LGUs due to contracted liabilities from the operational surplus adjusted for income from the sale of assets.

The upper limit of the burden level of LGU budget with instalment repayment of previously incurred debt along with the annual costs of its servicing – determined so far by the ratio arbitrarily established by the act of 15% and 60% for all LGUs – has been replaced by a variable ratio, calculated every year, individual for each local government unit, based on the so-called operating result of the budget. Such construction of the ratio should promote an increase in the share of current income in total income and undertaking activities aimed at reducing current expenses. However, it should be noted that the independence of local government units in this area is significantly limited by the structure of their income streams resulting from the applicable regulations. This is particularly evident in the case of district budget income.

The current formula carries a number of dangers for local government in terms of incurring repayable revenues. It takes into account historical data, when its essence is to present a realistic long-term financial forecast. Thus, the new limit does not inform about creditworthiness, but significantly limits the possibility of LGUs indebtedness. Restrictions particularly apply to small LGUs with low tax potential, district local governments, in which transfers dominate from the state budget, but also from large and rich LGUs (with regard to cities with district rights), which are significantly indebted and in which the repayment of liabilities to income budget is high.

The formula of debt limits binding since 2014 practically deprives the LGU in Poland of reaching for returnable sources of financial power. It results from the analysis of the long-term financial forecast of a large group of local government units. This is the main reason for the tendency to limit indebtedness of local government in Poland observed since 2016.

6. Analysis of indebtedness of local government units in Poland and its consequences for the public finance sector

Tables 7 and 8 present the size of liabilities of individual groups of local government units in Poland and their dynamics in 2003–2016.

Table 7: Size of liabilities of individual LGU groups in 2003–2016 (in PLN billion)

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LGUs | 17.2 | 19.2 | 21.2 | 25.0 | 25.9 | 28.7 | 40.2 | 45.0 | 65.8 | 67.9 | 69.2 | 72.0 | 71.6 | 69.0 |
| Municipalities | 6.6 | 7.6 | 8.1 | 9.6 | 10.0 | 10.8 | 14.6 | 21.9 | 26.0 | 26.2 | 25.8 | 26.4 | 25.4 | 23.9 |
| Cities with district rights | 8.8 | 9.5 | 10.4 | 11.3 | 11.3 | 12.8 | 18.7 | 23.4 | 28.1 | 29.6 | 30.9 | 32.4 | 33.2 | 32.6 |
| Districts | 1.2 | 1.5 | 1.8 | 2.5 | 2.6 | 2.9 | 3.9 | 5.4 | 6.1 | 6.0 | 5.9 | 5.9 | 5.8 | 5.7 |
| Voivodeships | 0.6 | 0.6 | 0.9 | 1.6 | 2.0 | 2.2 | 3.0 | 4.3 | 5.6 | 6.1 | 6.6 | 7.3 | 7.2 | 6.8 |

Source: The author's own calculations, in constant prices of 1999.

Table 8: The dynamics of liabilities of individual LGU groups in 2003–2016 (in%)

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| LGUs | 111.6 | 110.4 | 117.9 | 104.0 | 110.8 | 140.1 | 111.9 | 146.2 | 103.2 | 101.9 | 104.0 | 99.4 | 96.4 |
| Municipalities | 115.1 | 106.6 | 118.5 | 104.2 | 108.0 | 135.2 | 150 | 118.7 | 100.8 | 98.4 | 102.3 | 96.2 | 94.1 |
| Cities with district rights | 108 | 109.5 | 108.7 | 100 | 113.3 | 146.1 | 125.1 | 120.1 | 105.3 | 104.4 | 104.8 | 102.5 | 98.2 |
| Districts | 125 | 120 | 139 | 104.0 | 111.5 | 134.5 | 138.5 | 113.0 | 98.4 | 98.3 | 100.0 | 98.3 | 98.3 |
| Voivodeships | 100 | 150 | 178 | 125.0 | 110.0 | 136.4 | 143.3 | 130.2 | 108.9 | 108.2 | 110.6 | 98.6 | 94.4 |

Source: The author's own calculations, in constant prices of 1999.

The figures in Tables 7 and 8 indicate a significant increase in local government liabilities in the years 2003–2014. The dynamics of liabilities growth was high throughout the analysed period and exceeded the inflation rate. However, the increase in LGUs liabilities after 2008 should be alarming:

- *firstly*, due to the significant increase of its share in the structure of public debt and,
- *secondly*, due to the financial consequences for LGUs in the following years.

Liabilities of LGUs within 8 years (in the years 2007–2014) increased from PLN 26 billion to PLN 72 billion. During this period, the debt of all local government units in Poland increased almost threefold.

In 2015–2016, however, we are observing the stabilization of LGUs indebtedness. Not only dynamics falls, but even all LGUs groups are beginning to limit their indebtedness. At the end of 2016, LGUs debt decreased by over PLN 3 billion, i.e. up to PLN 69 billion. As a consequence, after 2013 it is possible to observe phenomena of limiting the development activity of LGUs. The share of property expenses in total expenses decreases and indebted local government units limit their liabilities so as not to exceed the individual debt ratio, which means a violation of the law.

This indebtedness reduction is aimed at adapting to the current ratio by consolidating credits and loans. The danger, however, lies in the fact that in many LGUs there is a shift of liabilities to the next years. This is a dangerous phenomenon and should be closely monitored by supervisory authorities in order to warn local governments about the debt trap. Therefore, in subsequent years, local government units should strive to minimize

the risk of losing financial liquidity, by managing debt and finances on the basis of rules set by themselves. Modern debt management is based on the calculation of creditworthiness based on fixed, and not incidental income, for example, from the sale of communal property.

7. Discussion and Conclusions

Local government is a part of the public finance sector. Therefore, a significant part of its income has a strictly defined purpose. Such targeting of income for the financing of specific tasks limits the scope of financial autonomy of local government and reduces it to the role of administering public funds and spending them on financing of specific tasks. Limitation of LGUs financial independence is also the exercise of supervision and control over the local government.

At the same time, however, the essence of local government lies in the fact that it is focused on local development. Owing to this, local authorities have their own income at their disposal and can also reach extraordinary sources of financial power, such as loans and credits. This duality resulting from the essence of the functioning of local government can be the cause of its numerous real and financial problems, especially when the repartition of public funds between the central authority and local government will be made incorrectly. The presented article draws attention to some issues related to the problem of indebtedness of local government units in Poland.

Acknowledgements

The publication was financed from means granted to the Faculty of Finance and Law of Cracow University of Economics, in framework of subsidy to keeping the research capacity.

References

- ALBALADEJO, F.J.B., LOPEZ, B.B. 2005. Analysis of local governments indebtedness: An empirical study. *Revista Espanola de Financiacion y Contabilidad*, 34(126): 613–635.
- BOLIVAR, M.P.R., GALERA, A.N., MUÑOZ, L.A. and SUBIRÉS M. D. L. 2016. Risk factors and drivers of financial sustainability in local government: An empirical study. *Local Government Studies*, 42(1): 29–51.
- DENEK, E. 2011. Ryzyko w gromadzeniu dochodów przez samorząd powiatowy w świetle jego zadań (wybrane problemy). In Patrzalek L. (Ed.), *Finanse-nowe wyzwania teorii i praktyki. Finanse publiczne*. Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.
- GUILLAMON, D.M., BENITO, B., BASTIDA, F. 2011. Evaluation of local government debt in Spain. *Revista Espanola de Financiacion y Contabilidad*, 40(150): 251–285.
- KLUZA, K. 2016. Sustainability of local government sector debt. Evidence from monte-carlo simulations. *Lex Localis*, 14(1): 115–132.

- KLUZA, K. 2017. Risk assessment of the local government sector based on the ratio analysis and the DEA method. Evidence from Poland. *Eurasian Economic Review*, 7(3): 329–351.
- SURÓWKA, K. 2013. *Samodzielność finansowa samorządu terytorialnego w Polsce*. Warszawa: Polskie Wydawnictwo Ekonomiczne.
- WOLLMANN, H. 2012. Local government reforms in (seven) European countries: Between convergent and divergent, conflicting and complementary developments. *Local Government Studies*, 38(1): 41–70.
- WOLLMANN, H. 2016. Local government reforms: Between multifunction and single-purpose organizations. *Local Government Studies*, 42(3): 376–384.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Regional distribution of health care non-financial resources in Poland

Paulina Ucieklak-Jeż¹, Agnieszka Bem² Paweł Prędkiewicz³ and Rafał
Siedlecki⁴

¹*Wydział Filologiczno-Historyczny, Jan Długosz University in Częstochowa, Waszyngtona 4/8, 42-200 Częstochowa, e-mail: p.ucieklak@ajd.czyst.pl*

²*Department of Corporate Finance and Public Finance, Faculty of Management, Informatics and Management, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: agnieszka.bem@ue.wroc.pl*

³*Department of Finance, Faculty of Economic Sciences, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: pawel.predkiewicz@ue.wroc.pl*

⁴*Department of Corporate Finance and Public Finance, Faculty of Management, Informatics and Management, Wrocław University of Economics, Komandorska 118/120, 53-345 Wrocław, Poland, e-mail: rafal.siedlecki@ue.wroc.pl*

Abstract

Redistribution of infrastructure resources in the hospital health care sector can affect both the competitiveness, as well as inequalities in access to services. The aim of the study is to analyse the relationship between redistribution of health care system's infrastructural resources at regional level. This research try to assess inequalities in health care resources in Poland and competitiveness at regional level, calculated using indicators of concentration. We indicate regions with insufficient resources and regions well equipped with infrastructure, diagnostic equipment and medical staff. The following hypothesis are formulated: *(H1) there is a stable level of concentration of infrastructural resources in Poland in the period 2008–2016; (H2) the concentration of non-financial resources is uneven between the voivodships in the years 2014–2016.* To verify the hypotheses we use indicators of concentration i.e. Hannah-Kay, Rosenbluth/Hall-Tideman, Gini coefficient. We found, that at the country level a varied level of concentration of non-financial resources can be observed – in the case of hospital beds and operating rooms it is definitely lower, than in the case of diagnostic equipment. What's more, it is confirmed that the level of concentration not to increase in time. The data come from The Centre of Health Information Systems and cover the period 2008–2016 for NTS1 and 2014–2016 for NTS2.

Keywords: health care, non-financial resources, redistribution, Hannah-Kay, Rosenbluth/Hall-Tideman, Gini coefficient.

JEL Code: A13, H40, H51

1. Introduction

One of the most important objectives of the health system is to provide equal access to benefits. The problem of availability of health care benefits can be seen in many aspects, as the potential availability versus revealed one (Luo and Wang, 2003), (Lin, Crawford and Salmon, 2005) or spatial versus non-spatial factors (Wang and Luo, 2005). We can assume, that potential, spatial, availability has a fundamental, primary character as a result of uneven distributions of healthcare providers. We can measure this phenomenon using indicators of spatial distribution, especially density's indicators. In order to ensure equal and fair access to health care benefits, the distribution of resources should reflect population's need, taking into account also non-spatial aspect, like gender, age or economic status (Wang and Luo, 2005), (Tkacova, Gavurova and Behun, 2017), (Barešová, Horáková and Urbánek, 2018).

This study is a continuation of our previous research, which show the relationship between population's state of health and redistribution of non-financial resources (infrastructure, human resources, equipment), especially in the case of women, which are generally much more at risk of unmet health care needs compared to men (Bem, 2013) (Ucieklak-Jeż, 2016a, 2016b), (Manuel, 2017), (Bem, Ucieklak-Jeż & Prędkiewicz, 2013). Then we employ selected measures of concentration (HHI, GIH) in order to prove, that there are several provinces characterised by the high level of concentration of some resources⁶⁸. The indicators of concentration are usually employed to measure a level of competitiveness by the analysis of the level of competition (Baker, 2001), which can be a result of mergers and acquisitions in the healthcare sector, what can limit the potential access to health care benefits (Posnett, 1999). Our findings are generally consistent with other's authors results who used HHI index – they confirm the existence of uneven redistribution, but calculated levels of concentration are slightly different (Rój, 2016), (Lyszczarz, 2014), (Michalski, 2016b).

In this study we employ another measures of concentration, hence *the aim of this study is to analyse, whether the change of methodology affect obtained results*. We propose two concentration indexes as an alternative method which allow to measure regional redistribution of non-financial resources. The concept is based on previous results, which prove the relationship between concentration's indices and inequalities (Bajo and Salas, 2002).

This research concentrate on infrastructural resources (infrastructure and equipment). We assume that high concentration of healthcare providers, in certain areas lower potential access to healthcare benefits. It should be mentioned, that in Poland there is the division between health care facilities' ownership and health care funding – financial resources can allocated only if some appropriate infrastructure exist (Bem, 2013), (Ivanová and Čepel, 2018), (Veliu et al. 2018).

Our results should be a source of some corrective actions, which should allow to achieve better health care outcomes (Wilson and Rosenberg, 2004), (Harding, 1999), by identifying regions where availability should be higher and those, where some increase in infrastructural resources will not improve population's health state (Fransen et al.,

⁶⁸ The paper entitled "Concentration of hospital infrastructural resources as a source of inequalities in access to health care benefits in Poland" presented during the conference "Finance and Sustainability", 20th of October 2017, Wroclaw, not publish yet.

2015). Capabilities for corrective action vary, depending on employed healthcare financing system – it seems that budgetary financing system creates, in this aspect, the greatest opportunities, having means of a direct impact on healthcare providers.

We formulate following research hypotheses:

(H1) there is a stable level of concentration of infrastructural resources in Poland in the period 2008–2016;

(H2) the concentration of non-financial resources is uneven between the voivodships in the years 2014–2016.

The hypothesis H1 assumes, that the level of concentration of non-financial resources indicates the stability of health resources in Poland. The hypothesis H2 assumes that there are regional competitiveness in health care resources calculated using concentration indices. That means that there are regions deficient in resources and the region well equipped with infrastructure, diagnostic equipment and medical staff. The verification of H2 hypothesis includes not only the analysis of calculated concentration's measures but also indicates the regions with the lowest and highest inequality of non-financial resources.

The data come from The Centre of Health Information Systems and cover the period 2008–2016 for NTS1 and 2014–2016 for NTS2.

2. Methodology and Data

In this research we employ measures of concentration for selected resources in the Polish healthcare system. This method is based on the assumption, that regions that are characterised by similar values of the selected indicators are similar – in terms of the analysed variables, representing health care resources.

We choose indicators characterizing the availability of infrastructure (e.g., number of beds, number of operating theatres) and diagnostic equipment (eg. CT scans, MRI scans). The set of variables is selected on the basis of previous studies, which allow to select non-financial resources which are importantly related to population's health status (Ucieklak-Jeż and Bem, 2015), (Ucieklak-Jeż, Bem and Prędkiewicz, 2015), (Bem, Ucieklak-Jeż and Siedlecki, 2016), (Blendinger and Michalski, 2018). Diagnostic variables, characterizing availability of infrastructure and diagnostic equipment are as follow:

HOB – number of hospital beds;

ECHO – number of echocardiograph units;

PET – number of Pet scanning units;

MRU – number of MR units;

OPT – number of operating theatres

Based on diagnostic variables we calculate two measures of concentration: The Hannah & Kay Indicator (HKI) and Rosenbluth/Hall-Tidemana Indicator (ROS/HTI). Both indicators are a sum of standardized indexes, describing selected healthcare resources. The above indicators are similar to the Herfindahl-Hirschman Index (HHI), which are aimed at solving its underlying defects – the primary influence on his values have the largest players in the market, and the impact of smaller ones is basically irrelevant (Matczak, 2016).

Table 1: Summary Characteristics of Concentration Indices

| Index | Range | Number of Categories | Size Distribution | Relationship between Index and Concentration |
|----------------|--------------------|----------------------|--|--|
| <i>HHI</i> | $1/n, \dots, 1$ | All categories | Greater emphasis on large categories | + |
| <i>ROS/HTI</i> | $0, \dots, 1$ | All categories | Sensitive to changes in smaller categories | + |
| <i>RI</i> | $0, \dots, 1$ | All categories | Sensitive to changes in larger categories | - |
| <i>CCI</i> | $0, \dots, 1$ | All categories | Reflects both dispersion and magnitude | + |
| <i>HKI</i> | $1/S_{1,\dots,n}$ | All categories | Ambiguous | - |
| <i>ENT</i> | $0, \dots, \log n$ | All categories | Irregular | - |
| <i>DivI</i> | $0, \dots, 1$ | All categories | Uniform sensitivity | + |

Source: Meilak, C, Measuring export concentration: the implications for small states. Bank of Valletta Review, 37, 2008, p. 40

The Hannah & Kay Indicator (HKI) is given by the following formula (Bikker and Haaf, 2002), (Michalski, G. 2016a):

$$HKI = \left(\sum_{i=1}^n R_i^\alpha \right)^{1/(1-\alpha)} \quad (1)$$

where the indicator of flexibility $\alpha > 0$, $\alpha \neq 1$ reflects the perception of changes in concentration, resulting from the input/output of an entity from the market. When $\alpha = 2$ the HKI indicator reaches a value equal to HHI.

The Rosenbluth/Hall-Tideman Indicator (ROS/HTI) is described as follow (Hall and Tideman, 1967):

$$ROS / HTI = 1 / \left(2 \sum_{i=1}^n R_i - 1 \right) \quad (2)$$

This index is more sensitive to the number of entities (e.g. provinces in the region) than to their shares in the total number of entities. The more actors operates on the market, the greater is the importance of smaller shareholders.

$$GIH(x) = \frac{\sum_{i=1}^n (2i - n - 1)x_i}{n^2 \bar{x}} \quad (3)$$

Gini index (3) values range from 0 to 1 and it is a relative measure that allows to compare easily the degree of inequality in populations characterized by different strength and different, average, medical needs (Kennedy et al., 1998), (Navarro et al., 2006).

Technically, by dividing the interval $[0, 1]$ into three parts: $<0-0.3(3)>$, $<0.3(3)-0.6(6)>$ and $<0.6(6)-1>$, we can give the values of the Gini coefficient respectively: low, moderate and high level (Kurowska, 2011), (Szajt, 2014).

3. Results

In the first stage, we analyse the level of concentration for the whole country calculated using data for regions (voivodships). The analysis of the concentration of medical infrastructure, using the HKI indicator, do not offer any conclusive results. In terms of the number of hospital beds' concentration the HKI indicator doesn't show significant fluctuations (min. 12.216, max. 12.246). Similarly, in the case of the number of operating rooms (OPT) we do not observe changes in the level of concentration (table 2).

Table 2: HKI concentration indicator for the years 2008–2016

| | HOB | ECHO | PET | MRU | OPT |
|------|--------|--------|--------|--------|--------|
| 2008 | 12.216 | 12.080 | 5.918 | 7.359 | 12.410 |
| 2009 | 12.256 | 11.839 | 3.765 | 8.641 | 12.424 |
| 2010 | 12.246 | 12.303 | 5.000 | 9.685 | 12.333 |
| 2011 | 12.415 | 11.888 | 4.129 | 5.000 | 12.350 |
| 2012 | 12.326 | 11.605 | 6.811 | 10.279 | 12.046 |
| 2013 | 12.257 | 12.118 | 11.082 | 9.067 | 12.374 |
| 2014 | 12.296 | 10.462 | 6.373 | 9.977 | 12.035 |
| 2015 | 12.305 | 11.734 | 7.529 | 10.55 | 12.216 |
| 2016 | 12.285 | 11.698 | 6.373 | 9.977 | 12.035 |

Source: own study

A little differently behave variables representing the diagnostic equipment. In the case of ECHO variable (number of echocardiograph units) we observe a slight increase in the level of concentration (decline in value of HKI). In the case of MRU variable (number of MR units) it is difficult to identify any trends, while the lowest level is reached in 2015 year. When it comes to the PET variable (number of Pet scanning units), from 2009–2013 we can observe a decrease in concentration, and during 2013–2016 – an increase in concentration's level (table 2).

Table 3: ROS/HTI concentration indicator for the years 2008–2016

| | HOB | ECHO | PET | MRU | OPT |
|------|-------|-------|-------|-------|-------|
| 2008 | 0.089 | 0.088 | 0.168 | 0.136 | 0.088 |
| 2009 | 0.089 | 0.089 | 0.267 | 0.123 | 0.088 |
| 2010 | 0.089 | 0.088 | 0.217 | 0.111 | 0.088 |
| 2011 | 0.088 | 0.091 | 0.258 | 0.217 | 0.088 |
| 2012 | 0.088 | 0.091 | 0.160 | 0.104 | 0.089 |
| 2013 | 0.088 | 0.089 | 0.096 | 0.111 | 0.089 |
| 2014 | 0.088 | 0.100 | 0.161 | 0.103 | 0.089 |
| 2015 | 0.088 | 0.091 | 0.136 | 0.101 | 0.088 |
| 2016 | 0.088 | 0.091 | 0.161 | 0.103 | 0.089 |

Source: own study

The use of the ROS/HTI indicator brings slightly different results. In the case of the number of hospital beds (HOB) we observe the stable, high level of concentration, similarly as in the case of the number of operating rooms (OPT) and ECHO (number of echocardiograph units)(with the exception of the year 2014). In the case of MRU (number of

MR units) we identify a constant, low level of concentration, while for PET (number of Pet scanning units) relatively constant low level of concentration, but only in the years 2012–2016 (table 2). This estimation shows that ROS/HTI indicator is sensitive to the number of observations and results for a small sample (16 voivodships) do not indicate fluctuations in the level of concentration. These observations provide arguments in favour of the H1 hypothesis assuming that there is a stable level of concentration of infrastructural resources in Poland in the period of 2008–2016.

In the next part of the study we calculate the HTI indicators, at the level of regions in order to identify the level of concentration inside regions. Obtained results are compared with the values of the GINI coefficients (GIH) for selected resources (table 3).

Table 4: Measures of concentration (ROS/HTI, GIH) for HOB variables, by voivodships, in the years 2014–2016

| Voivodeships | HKI | | | ROS/HTI | | | GIH | | |
|---------------------|--------|--------|--------|---------|-------|-------|-------|-------|-------|
| | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Dolnośląskie | 6.897 | 6.849 | 6.803 | 0.083 | 0.085 | 0.086 | 0.571 | 0.578 | 0.584 |
| Kujawsko-pomorskie | 6.410 | 6.408 | 6.380 | 0.111 | 0.110 | 0.110 | 0.589 | 0.586 | 0.588 |
| Lubelskie | 7.500 | 7.570 | 7.582 | 0.080 | 0.080 | 0.080 | 0.482 | 0.479 | 0.480 |
| Lubuskie | 9.023 | 8.795 | 8.464 | 0.117 | 0.118 | 0.124 | 0.388 | 0.395 | 0.424 |
| Łódzkie | 4.402 | 4.561 | 4.388 | 0.114 | 0.112 | 0.117 | 0.620 | 0.613 | 0.627 |
| Małopolskie | 5.298 | 5.346 | 5.342 | 0.098 | 0.098 | 0.097 | 0.535 | 0.512 | 0.534 |
| Mazowieckie | 4.482 | 4.648 | 4.441 | 0.076 | 0.075 | 0.076 | 0.646 | 0.896 | 0.645 |
| Opolskie | 6.013 | 6.298 | 6.417 | 0.148 | 0.143 | 0.141 | 0.437 | 0.418 | 0.410 |
| Podkarpackie | 12.133 | 11.857 | 11.984 | 0.073 | 0.073 | 0.072 | 0.426 | 0.407 | 0.425 |
| Podlaskie | 4.888 | 5.143 | 5.060 | 0.137 | 0.135 | 0.137 | 0.515 | 0.505 | 0.513 |
| Pomorskie | 6.941 | 7.242 | 6.961 | 0.101 | 0.099 | 0.102 | 0.449 | 0.441 | 0.453 |
| Śląskie | 19.593 | 19.535 | 19.262 | 0.049 | 0.050 | 0.050 | 0.422 | 0.424 | 0.423 |
| Świętokrzyskie | 7.842 | 7.890 | 7.877 | 0.117 | 0.116 | 0.116 | 0.390 | 0.385 | 0.385 |
| Warmińsko-mazurskie | 9.058 | 8.944 | 9.118 | 0.096 | 0.096 | 0.095 | 0.504 | 0.505 | 0.500 |
| Wielkopolskie | 5.948 | 6.054 | 6.319 | 0.068 | 0.067 | 0.066 | 0.555 | 0.547 | 0.542 |
| Zachodniopomorskie | 4.932 | 4.900 | 4.707 | 0.114 | 0.116 | 0.118 | 0.562 | 0.570 | 0.577 |

Source: own study

In the case of HKI index we observe a fairly low level of concentration in all provinces, and regions with the lowest level of concentration in: Podkarpackie and Lubuskie voivodeships. We can also conclude that the level of concentration is stable in time. By comparing the results with those obtained using a GINI coefficient, we observe a higher diversification. Especially, the level of concentration for all provinces should be considered as moderate.

In the case of the ROS index/HTI we observe a fairly low concentration level for all voivodships, while the regions of lowest level of concentration are: Dolnośląskie, Śląskie and Wielkopolskie. We can also conclude, that the level of concentration is stable in time. Comparing the results with those obtained using the GIH indicator we show some discrepancies, particularly the concentration's level in all voivodships should be considered as the average. Secondly, the analysis with the use of GIH indicate other regions as those characterised by lowest concentration (Świętokrzyskie i Lubuskie). Those differences are also stable in time (table 3).

The analysis of the distribution of the number of operating rooms (ROS/HTI) shows greater variation between regions – from the low level (11.108 for Śląsk) to high (2.883 for Małopolskie). In all provinces, we observe a decrease in the level of concentration. The results obtained using GIH correspond with those obtained using HKI (table 3). As in the case of ROS/HTI the concentration level decreases over time. These observations provide

arguments in favour of the hypothesis H2: the concentration of infrastructural resources is uneven between voivodships in the years 2014–2016.

Table 5: Measures of concentration (ROS/HTI, GIH) for OPT variables, by voivodships, in the years 2014–2016

| Voivodeships | HKI | | | ROS/HTI | | | GIH | | |
|---------------------|--------|--------|--------|---------|-------|-------|-------|-------|-------|
| | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Dolnośląskie | 4.014 | 3.731 | 4.518 | 0.124 | 0.137 | 0.093 | 0.712 | 0.739 | 0.614 |
| Kujawsko-pomorskie | 5.391 | 4.987 | 5.121 | 0.113 | 0.114 | 0.118 | 0.597 | 0.602 | 0.616 |
| Lubelskie | 6.291 | 7.005 | 5.571 | 0.094 | 0.092 | 0.093 | 0.558 | 0.548 | 0.550 |
| Lubuskie | 3.000 | 7.577 | 8.383 | 0.333 | 0.123 | 0.118 | 0.786 | 0.421 | 0.395 |
| Łódzkie | 3.602 | 3.306 | 3.674 | 0.123 | 0.128 | 0.121 | 0.648 | 0.659 | 0.641 |
| Małopolskie | 2.200 | 2.565 | 3.328 | 0.440 | 0.155 | 0.126 | 0.897 | 0.693 | 0.640 |
| Mazowieckie | 2.883 | 3.192 | 4.441 | 0.090 | 0.087 | 0.076 | 0.699 | 0.690 | 0.645 |
| Opolskie | 5.466 | 7.692 | 2.995 | 0.152 | 0.139 | 0.096 | 0.451 | 0.400 | 0.719 |
| Podkarpackie | 10.382 | 11.602 | 5.466 | 0.088 | 0.082 | 0.152 | 0.525 | 0.472 | 0.451 |
| Podlaskie | 3.373 | 3.089 | 4.306 | 0.173 | 0.180 | 0.145 | 0.615 | 0.630 | 0.540 |
| Pomorskie | 4.149 | 4.259 | 5.710 | 0.138 | 0.124 | 0.117 | 0.596 | 0.554 | 0.527 |
| Śląskie | 11.108 | 9.739 | 13.662 | 0.066 | 0.070 | 0.055 | 0.567 | 0.591 | 0.484 |
| Świętokrzyskie | 5.222 | 5.864 | 6.145 | 0.152 | 0.134 | 0.132 | 0.530 | 0.468 | 0.458 |
| Warmińsko-mazurskie | 7.446 | 8.766 | 6.891 | 0.113 | 0.097 | 0.103 | 0.578 | 0.508 | 0.537 |
| Wielkopolskie | 4.780 | 3.924 | 5.542 | 0.082 | 0.091 | 0.069 | 0.632 | 0.530 | 0.559 |
| Zachodniopomorskie | 3.010 | 2.899 | 4.681 | 0.163 | 0.160 | 0.115 | 0.694 | 0.687 | 0.563 |

Source: own study

4. Discussion and Conclusions

These observations provide arguments in favour of both research hypotheses. At the country a level varied level of concentration of non-financial resources can be observed – in the case of hospital beds and operating rooms it is definitely lower, than in the case of diagnostic equipment. What's more, it is confirmed that the level of concentration is stable in time.

On the other hand, our analysis reveal a diverse level of concentration at the level of the voivodships, from the low to medium level, even in the case of resources that are, at the country level, the least concentrated. We noticed, however, that the level of concentration slightly decreases over time. What's more, during the analysis of concentration of non-financial resources we also attempt to employ a new research tool. The most popular tool, known from literature, is GINI coefficient. In the study, we additionally employ two other indicators, such as ROS/HTI and HKI. While estimates of concentration using HKI gives similar results as GIH, the analysis using ROS/HTI suggests a different level concentration than GIN.

References

- BAJO, O. and SALAS, R. 2002. Inequality foundations of concentration measures: An application to the Hannah-Kay indices. *Spanish Economic Review* (4), 311–316.
- BAKER, L. C. 2001. Measuring competition in health care markets. *Health services research* (1 Pt 2), 223.

- BAREŠOVÁ, P., HORÁKOVÁ M. and URBÁNEK T. (2018). AN AGING POPULATION: A COMPETITIVE ADVANTAGE FOR COMPANIES. *Journal of Competitiveness*, 10 (1): 5–22.
- BEM, A. (2013). Public Financing of Health Care Services. *E-Finanse* (2), 1–23.
- BEM, A., UCIEKLAK-JEŽ, P. and PRĘDKIEWICZ, P., 2013. Effects of inequalities in access to health services in rural areas in Poland, *Management Theory and Studies for Rural Business and Infrastructure Development*, Aleksandras Stulginskis University, vol. 35, no. 4: 491–497.
- BEM, A., UCIEKLAK-JEŽ, P. and SIEDLECKI, R. 2016. The Spatial Differentiation of the Availability of Health Care in Polish Regions. *Procedia-Social and Behavioral Sciences* (220), 12–20.
- BIKKER, J. A. and HAAF, K. 2002. Measures of competition and concentration in the banking industry: a review of the literature. *Economic & Financial Modelling* (2), 53–98.
- BLENDINGER, G. and MICHALSKI, G. (2018), Long term competitiveness based on value add measures as part of highly professionalized corporate governance management of German DAX 30 corporations. *Journal of Competitiveness* 10 (2).
- FRANSEN, K., NETENS, T., DE MAEYER, P. and DERUYTER, G. 2015. A commuter-based two-step floating catchment area method for measuring spatial accessibility of daycare centers. *Health & Place* (32), 65–73.
- HALL, M. and TIDEMAN, N. 1967. Measures of Concentration. *Journal of the American Statistical Association* (62), 162–168.
- HARDING, O. 1999. What is access? What are 'whole systems'? *British Medical Journal* (319).
- IVANOVÁ, E. and ČEPEL, M. (2018). The Impact of Innovation Performance on The Competitiveness of The Visegrad 4 Countries. *Journal of Competitiveness*, 10 (1), 54–72.
- LIN, S. J., CRAWFORD, S. Y. and SALMON, J. W. 2005. Potential access and revealed access to pain management medications. *Social science & medicine* (8), 1881–1891.
- LUO, W. and WANG, F. 2003. Measures of spatial accessibility to health care in a GIS environment: synthesis and a case study in the Chicago region. *Environment and Planning B: Planning and Design* (6), 865–884.
- LYSZCZARZ, B. 2014. Market concentration and performance of general hospitals in Poland. *Ekonomia i Prawo* (4), 499–510. doi: <http://dx.doi.org/10.12775/EiP.2014.035>
- MANUEL, J. I. 2017. Racial/Ethnic and Gender Disparities in Health Care Use and Access. *Health services research*, 1–23. doi: 10.1111/1475-6773.12705.
- MATCZAK, M. 2016. Wykorzystanie strukturalnych miar koncentracji w analizie konkurencyjności rynku morskich przewozów kontenerowych. *Problemy Transportu i Logistyki*, (3 (Funkcjonowanie rynku usług transportowych)): 111–119.
- MEILAK, C. 2008. Measuring export concentration: the implications for small states. *Bank of Valletta Review*, 37, 35–48.

- MICHALSKI, G. (2016a), Full operating cycle influence on the food and beverages processing firms characteristics, *Agricultural Economics-Zemledelska Ekonomika* Volume: 62(2): 71–77
- MICHALSKI, G. (2016b) Risk Pressure and Inventories Levels. Influence of Risk Sensitivity on Working Capital Levels, *Economic Computation And Economic Cybernetics Studies And Research* 50 (1): 189–196.
- NAVARRO, V., MUNTANER, C., BORRELL, C., BENACH, J., QUIROGA, Á., RODRÍGUEZ-SANZ, M. and PASARÍN M.I., 2006. Politics and health outcomes, *The Lancet*, 368(9540): 1033–1037. doi.org/10.1016/S0140-6736(06)69341-0.
- KUROWSKA, A. 2011. Dynamika nierówności dochodowych w Polsce na tle innych krajów – najważniejsze wnioski z badań i statystyk, [online] http://ips.uw.edu.pl/pliki/analizyyps/analizy_IPS-2_2011_pl.pdf, access: 13 kwietnia 2015.
- POSNETT, J. 1999. The hospital of the future: Is bigger better? Concentration in the provision of secondary care. *BMJ: British Medical Journal* (319), 1063–1065.
- RÓJ, J. 2016. Competition measurement of hospitals in Poland: the Herfindahl-Hirschman index approach. *Ekonomika* (1), 166–181.
- TKACOVA, A., GAVUROVA, B. and BEHUN, M. (2017). The Composite Leading Indicator for German Business Cycle. *Journal of Competitiveness*, Vol. 9, Issue 4, pp. 114–133. DOI: 10.7441/joc.2017.04.08.
- UCIEKLAK-JEŻ, P. and BEM, A. 2015. Wpływ niefinansowych zasobów systemu ochrony zdrowia na stan zdrowia kobiet i mężczyzn w Polsce. *Prace naukowe Akademii im. Jana Długosza w Częstochowie. Pragmata tes Oikonomias*, 157–171.
- UCIEKLAK-JEŻ, P., BEM, A. and PRĘDKIEWICZ, P. 2015. Effectiveness of allocation of health system non-financial resources. Local versus Global, 647–656.
- UCIEKLAK-JEŻ, P. 2016a, Health Inequality Determined by Education and Income in European Countries, *Prace Naukowe Akademii im. Jana Długosza w Częstochowie. Pragmata tes Oikonomias*, red. P. Ucieklak-Jeż, nr 10, Wydawnictwo Akademii im. Jana Długosza w Częstochowie, Częstochowa:157–170. doi.org/10.16926/pto.2016.10.13
- UCIEKLAK-JEŻ, P. 2016b, Education and Income as Health Determinants in Central-Eastern Europe, *Prace Naukowe Akademii im. Jana Długosza w Częstochowie. Pragmata tes Oikonomias*, red. P. Ucieklak-Jeż, nr 10, Wydawnictwo Akademii im. Jana Długosza w Częstochowie, Częstochowa: 171–184. doi.org/10.16926/pto.2016.10.14.
- SZAJT, M. 2014. *Przestrzeń w badaniach ekonomicznych*, Wydawnictwo Politechniki Częstochowskiej, Częstochowa.
- WANG, F. and LUO, W. 2005. Assessing spatial and nonspatial factors for healthcare access: towards an integrated approach to defining health professional shortage areas. *Health & place*(2), strony 131–146.
- WILSON, K. and ROSENBERG, M. W. 2004. Accessibility and the Canadian health care system: squaring perceptions and realities. *Health Policy* (67), 137–148.

VELIU, L., MANXHARI, M., PODVORICA, N., FEJZA, E. and HYESNI V. (2018). Managing Smes in a Turbulent Context: A Case Study From a Kosovan Manufacturing Company. *Journal of Competitiveness*, 10 (1): 155–170.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Deterrence without sanctions: the influence of behavioural law and economics on prevention of anticompetitive conduct

Tereza Vaňkátová¹

¹*Department of International Economic and European Law, Faculty of International Relations, University of Economics in Prague, nám. Winstona Churchilla 1938/4, 130 67 Praha 3, Czech Republic, e-mail: ternovakova@seznam.cz*

Abstract

One of the main goals of the competition law is an optimal deterrence from an anticompetitive conduct. The essential tool to achieve such goal is a sanction competition policy which increases the costs of an anticompetitive conduct and therefore, if set at the optimal level, the breach of the competition rules does not pay off. The calculation of the costs and benefits of an anticompetitive conduct, however, requires a rationally thinking competitor. Human beings including professional managers have, nevertheless, bounded rationality, they suffer from systematic cognitive biases and therefore they often fail to act according to the principle of wealth maximization. The aim of this paper is to consider how it is possible to strengthen the deterrence effect of competition law, using the findings of behavioral law and economics, by non-sanction mechanisms that are relatively cheap and easy to implement. In particular, I consider how we can use a so called availability heuristic to influence *ex ante* decision of the competitors whether they breach competition rules or not. Thus, the findings of this paper, if implemented, could help prevent formation of new cartels even without modifying a costly enforcement system.

Keywords: cartels, deterrence, bounded rationality

JEL Code: K210

1. Introduction

Competition law is strongly influenced by economic theory whether in the field of mergers, abuse of dominant position or enforcement of competition rules.⁶⁹ The Office for the

⁶⁹ For deeper analysis of the influence of economic analysis on competition law, see e.g. Kovacic, W. E. (1992), The influence of economics on Antitrust Law. *Economic Inquiry*, 30: p. 294–306.

Protection of Competition (“the Office”) has its own department of Chief Economist which carries out economic (or econometric) analysis of the dominant position abuse cases, prohibited agreements or mergers. The influence of economy in the field of competition law can nowadays be seen also in the developing effect based approach⁷⁰ and departure from the so called *per se* approach.

Competition authorities impose higher and higher fines upon cartelists (but also upon other competitors breaching competition rules), we can observe a development of private enforcement of competition law in Europe⁷¹, while the private enforcement is a dominant⁷² pillar of enforcement in the USA where triple damages fulfil punitive function (punitive damages) rather than only a compensatory function, which further strengthens deterrence of competition law. In the USA but also in some European states⁷³, the persons liable for conclusion of prohibited cartel agreements face criminal proceedings, they may be imprisoned and can be also individually fined.

Yet, the main goal of competition law – an optimal deterrence of anticompetitive behaviour, has not been achieved. The goal of competition law is actually not a mere imposition of high fines or imprisonment of cartelists, thus a kind of *ex post* taxation of harmful behaviour. Competition law primarily aims to deter, to prevent such harmful anticompetitive conduct.

In the Czech Republic, public enforcement of competition law carried out by the Office still dominates nowadays. Investigation but also the administrative proceeding itself is costly and the resources of the Office are limited. The Office thus necessarily must choose how to spend such limited resources in order to promote competition according to its legal duty.⁷⁴ This costly activity of the Office should prevent anticompetitive conduct and thus increase social welfare.⁷⁵

The aim of this paper is to consider whether it is possible, apart from sanction mechanisms which are costly, to strengthen deterrence effect of competition law using means that are not costly and relatively easy to implement. In this regard I consider if and how the findings of behavioural law and economics can influence *ex ante* decision of the competitors whether they breach competition rules or not.

⁷⁰ Alden F. Abbot, A brief comparison of European and American Antitrust Law, The University of Oxford Centre for Competition Law and Policy, The Competition Law & Policy, Guest Lecture Programme – Paper (L) 02/05.

⁷¹ Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union Text with EEA relevance.

⁷² In the USA, the claims for compensation for damage caused by anticompetitive conduct are very attractive because the claimants are granted with wide investigative powers and possibility to claim triple damages. These strong investigatory powers are subject to criticism since even claimants with a very vague suspicion can enter business premises and “fish” for evidence for their claim. See Eric McCarthy, Allyson Maltas, Matteo Bay and Javier Ruiz-Calzado, Litigation culture versus enforcement culture A comparison of US and EU plaintiff recovery actions in antitrust cases, The Antitrust Review of the Americas 2007, a Global Competition Review, available online: https://www.lw.com/upload/pubContent/_pdf/pub1675_1.pdf, p. 38–39.

⁷³ E.g. France, UK, and in case of bid rigging agreements also Germany, Austria, Hungary, Poland and Italy.

⁷⁴ Act no. 273/1996 Coll., on Office for the Protection of Competition.

⁷⁵ Peitz, Martin. & Spiegel, Yossi. (2014). The analysis of competition policy and sectoral regulation. Singapore : Hanover, Md : World Scientific ; Now Publishers Inc, ISBN: 9789814616355, 497, p. 423–454.

2. Sanction competition policy in the Czech Republic and EU

2.1. Czech Republic

Fines imposed by the Office upon the competitors who breached the competition rules are *de facto* the only working enforcement mechanism in the Czech Republic nowadays. Although the criminal code *de iure* establishes in its section 248 paragraph 2 a crime of conclusion of anticompetitive agreements (including the bid rigging agreements) with a penalty of imprisonment for up to 3 years (and an act no. 418/2011 Coll. covers the same crime committed by legal persons), disqualification or confiscation of property but this is rather a theoretical provision which has never been applied in practice. Criminalization of anticompetitive conduct thus does not exist in the Czech Republic.

Similarly, on 1 September 2017 an act⁷⁶ on compensation for damage in the field of economic competition has become effective. This act includes rules that make the position of claimants that claim compensation for damage against competitors who breached competition rules easier. Boom of private enforcement of competition law has, however, so far not occurred and we will see in the future if this act really will enhance private enforcement and thus deterrence effect of competition law or not.⁷⁷

The fines imposed by the Office upon the competitors are even despite more active⁷⁸ sanction policy of the Office deeply under the optimal level and they do not prevent anticompetitive behaviour. From the Figure 1 below follows that the Office imposed upon the competitors who concluded anticompetitive agreements much higher fines in the last years (2015 and 2016) than in the previous years (2010–2013). In 2015 it even imposed a record fine to the cartel of the construction companies. Yet, it is not possible to talk about optimal level of fines for anticompetitive behaviour in the Czech Republic.

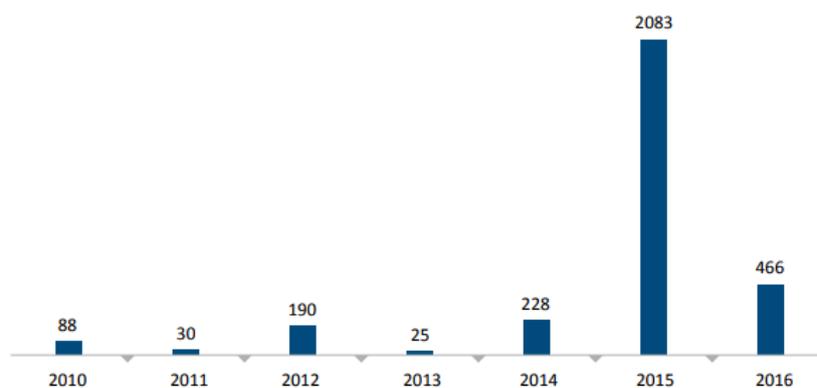


Figure 1: The amount of fines imposed upon competitors for conclusion of anticompetitive agreements (I. instance, in millions Czech Crowns)

Source: Annual report of the Office for the year 2016.

⁷⁶ Act no. 262/2017 Coll, on Damages in the Field of Competition, as amended.

⁷⁷ One of the few cases of antitrust damage claim in the Czech Republic is the action of Asiana against Student Agency for the abuse of dominant position (predatory pricing) which is, however, still pending.

⁷⁸ In 2010 and 2011 the Office issued 4 cartel decisions each year, in 2012 only 1 such decision, in 2013 two of them and in 2014 ten of them, in 2015 five and in 2016 thirteen. Source: Annual report of the Office for the year 2016.

The analysis⁷⁹ of the fines imposed upon competitors who concluded anticompetitive agreements in the Czech Republic in years 2009–2016 showed that the fines did not even took the cartel gains away (gains achieved by the competitors due to the existence of the cartel), much less they had deterrence effect considering a very low probability of detection and punishment. Such conclusion actually confirms the Office itself because since 2015 it declares⁸⁰ that a new guidelines on fines which would substantially increase the fines is needed. By now, however, new guidelines has not been adopted and the Office thus still imposes fines under optimal level.

2.2. European Union

European Commission substantially increased, after the adoption of the new Guidelines⁸¹ for imposition of the fines in 2006, the fines imposed to cartel members. Connor in his study⁸² found out that the fines imposed upon the cartel members since 2006 increased 141 times compared to the fines imposed according to the previous Guidelines from 1998. Allain and others in their study⁸³ concluded that in the period 2005–2012 around 30–80% of imposed fines had deterrent effect. Combe and others⁸⁴ on the contrary concluded that in the period 1975–2009 only 50% of all fines imposed were able to take the cartel gains away considering the probability of detection of 100%. Thus they concluded that the fines imposed upon cartel members were in the observed period rather suboptimal. In the last years, the European Commission imposes upon cartelists fines amounting to billions of Euros every year, as we can see in the Figure 2 below.

Nevertheless, it is still not possible to talk about an efficient prevention of cartels. The number of decisions in the field of prohibited anticompetitive agreements in the EU does not decline (see Figure 3 below). In the Czech Republic it even increases as the Figure 4 below shows. It is not, however, possible to clearly determine the cause of such increase. The anticompetitive agreements are kept secret by their participants and thus we cannot determine the number of cartels that stay uncovered. The increasing number of the detected cartels may be caused by the increase of probability of their detection and thus increase in the success rate of the competition authority. But it can equally be caused simply by the increase of the total number of cartels in the society.

The insufficient deterrence of anticompetitive behaviour can be proved also by the efforts to enhance private enforcement of competition law in Europe as well as imposition of individual sanction in some member states of EU.⁸⁵

⁷⁹ Nováková, T., Fill the Fines Imposed on the Cartel Participants Agreements Preventive Function? *Antitrust*. 2017. no. 2, pp. 51–58. ISSN 1804-1183.

⁸⁰ E.g. Annual report of the Office for the year 2014, p. 92.

⁸¹ **Guidelines on the method of setting fines imposed pursuant to Article 23(2)(a) of Regulation No 1/2003.**

⁸² John M. Connor, Has the European Commission Become More Severe in Punishing Cartels? Effects of the 2006 Guidelines (December 13, 2010). Available at SSRN: <https://ssrn.com/abstract=1737885> or <http://dx.doi.org/10.2139/ssrn.1737885>.

⁸³ Allain, Marie-Laure and Boyer, Marcel and Kotchoni, Rachidi and Ponsard, Jean Pierre, Are Cartel Fines Optimal? Theory and Evidence from the European Union (July 18, 2013). CIRANO – Scientific Publications 2013, p. 24. Available at SSRN: <https://ssrn.com/abstract=2342180> or <http://dx.doi.org/10.2139/ssrn.2342180>.

⁸⁴ Combe, Emmanuel and Monnier, Constance, Fines Against Hard Core Cartels in Europe: The Myth of Over Enforcement, *The Antitrust Bulletin*: Vol. 56, No. 2/Summer 2011 : pp. 235 – 275.

⁸⁵ France, UK, and in case of bid rigging agreements also Germany, Austria, Hungary, Poland and Italy.



Figure 2: Fines imposed by the European Commission upon the cartelists⁸⁶

Source: Cartel statistics of European Commission available online:

<http://ec.europa.eu/competition/cartels/statistics/statistics.pdf>.

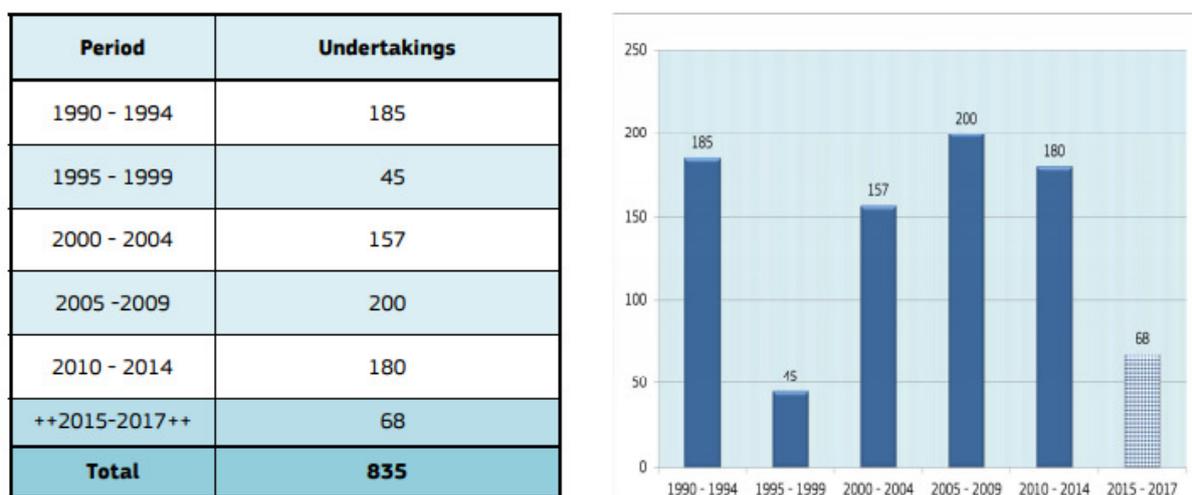


Figure 3: The number of the decisions issued by the European Commission in the field of prohibited agreements.⁸⁷

Source: Cartel statistics of European Commission available online:

<http://ec.europa.eu/competition/cartels/statistics/statistics.pdf>.

⁸⁶ Note: In 2017 only decisions issued by 22 November 2017 are included.

⁸⁷ Note: In 2017 only decisions issued by 22 November 2017 are included.

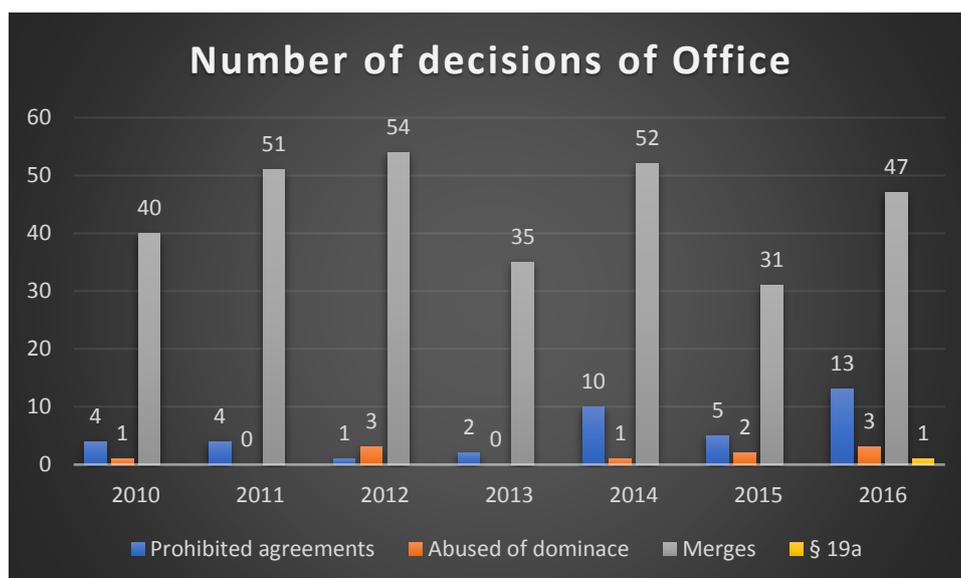


Figure 4: The number of the decisions issued by the Office in the field of prohibited agreements. Source: Annual report of the Office for 2016.

3. Crime and punishment: the costs and benefits of prohibited conduct

Chicago school⁸⁸ that strongly influenced and still influences competition policy is based on the rational choice theory. It presumes a rationally thinking, welfare maximizing businessman.⁸⁹ A central notion of Chicago school is efficiency. Gary S. Becker, one of the representatives of Chicago school, was the first one who dealt with an economic efficiency of criminality.⁹⁰ He presumed a rationally thinking criminals who commit crime not because they are influenced by the environment they were raised in but rather mainly because the crime pays off in economic terms. In other words, criminals commit crime because its expected profits exceed its expected costs. If such conduct becomes non-profitable, for example due to regulation, a rationally thinking profit-maximizer will cease to commit such crime. According to this theory it is unimportant whether optimal deterrence will be achieved by a high probability of detection combined with a lower level of penalties or rather a very high level of penalties and lax investigation. The optimum is, for rationally thinking individual who is counting, always the same.

If we apply Becker's theory to competition policy, the optimal deterrence from anti-competitive conduct will be achieved if all expected sanctions multiplied by the probability of detection exceed the expected gain achieved as a result of such anticompetitive conduct. If a rational competitors expect an imposition of fine higher than their gains achieved exclusively thanks to the cartel's existence, they will simply not engage in such conduct.

⁸⁸ The essential ideas of Chicago school in the field of competition law were formulated by Aaron Director and were based on price theory. He assumed that businessmen are rational profit-maximizers. For deeper discussion of Chicago school of antitrust thinking see Richard A. Posner, "The Chicago School of Antitrust Analysis," 127 *University of Pennsylvania Law Review* 925 (1978).

⁸⁹ Richard A. Posner, "The Chicago School of Antitrust Analysis," 127 *University of Pennsylvania Law Review* 925 (1978), p. 928.

⁹⁰ His seminal paper is *Crime and Punishment: An Economic Approach* 76 *J.POL. ECON.* 169 (1968).

Some theorists claim that optimal punishment (in case of European competition law mainly fines) should relate to the damage caused to the society by an anticompetitive conduct.⁹¹ Given the costly investigation of the cartels, it is socially efficient to investigate and punish less than 100% of existing cartels. According to the second theory it is thus optimal to sanction only conduct the gains of which achieved by the given competitors do not exceed the costs borne by the society as a whole. In other words, only a conduct the total effect of which is negative should be punished. Both approaches are equally legitimate but the first approach is, in my opinion, easier to implement in practice since the gains of the cartels are equal to overcharge above the competitive prices and such prices can be determined by economic models which are used for counting a direct damage claimed by damaged individuals before civil courts. In case of the second theory, however, it would be necessary to examine also further, indirect damages caused to society, such a lowering of consumer surplus which would be problematic.

4. Bounded rationality, heuristics and their influence on prevention of cartels

4.1. Bounded rationality of managers

The assumption of Chicago school that competitors are rational individuals who count the benefits and the costs of every conduct in advance and that they engage only in those conduct that pays off, was disproved by many empirical researches.⁹² Humans, including professional managers⁹³, have bounded rationality⁹⁴, suffer from systematic cognitive biases about the probable results of different conduct⁹⁵ and thus they often act contrary to the principle of maximization of welfare. These systematic mistakes that are in contradiction to rational choice theory are the consequence of so called heuristic that simplify decision making of individuals of complicated and uncertain issues.⁹⁶

An example of such heuristic that can directly influence decisions of managers whether they conclude a prohibited cartel agreement or not, is an availability heuristic. It means that individuals tend to systematically overestimate a probability of such events about which they heard recently or which are often publicly discussed. Individuals consider such events more frequent (statistically more likely to occur) than they are in reality.

⁹¹ Landes, W.M. (1983), 'Optimal Sanctions for Antitrust Violations', University of Chicago Law Review, 50.

⁹² E.g. an experiment in Israel day care centres showed that parents were picking up children on time when there was no fine for late arrival because they felt ashamed in front of the teacher. Once the fine for late arrival was introduced, the number of parents coming late rapidly increased. See Uri Gneezy and Aldo Rustichini, "A Fine Is a Price," The Journal of Legal Studies 29, no. 1 (January 2000): 1-17.

⁹³ Professional managers who have the powers to make decisions and have a position to control, suffer from overconfidence bias which means that they attribute good outcomes to their own success but bad outcomes to bad luck. See Camerer, C., & Malmendier, U. (2012). Behavioral economics of organizations. Behavioral Economics and Its Applications, p. 235.

⁹⁴ The notion of bounded rationality was introduced by Herbert Simon in his Rational Choice and the Structure of the Environment and it expresses the fact that there are limits of our cognitive thinking and available information on the basis of which we make decisions, and also limitations of time. See Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review*, 63(2), 129-138.

⁹⁵ Russell B. Korobkin and Thomas S. Ulen, Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics, 88 Cal. L. Rev. 1051 (2000), p. 1085. Available at: <http://scholarship.law.berkeley.edu/californialawreview/vol88/iss4/1>.

⁹⁶ Kahneman, D., Slovic, P., & Tversky, A. (1982). Judgment under uncertainty: Heuristics and biases. Cambridge: Cambridge University Press.

In the same way people tend to underestimate the occurrence of such events that did not stick in their mind for example because such events never happened among their friends or they are simply not publicly discussed.

4.2. Increasing awareness through medialization

A significant increase in medialization of cartel decisions that would describe concrete negative consequences of cartels for its customers, i.e. concrete overcharge of the goods above competitive level, together with the fines imposed or damage claimed by harmed individuals, could, in my opinion, contribute to enhancement of deterrent effect of competition law. I suggest, however, that the information provided to public are as concrete as possible so that consumers are aware that they were ripped off by the cartel members. This would strengthen prevention for two reasons.

First, because of the availability heuristic as the newly published information about the current cartel decisions would very likely result in the general perception of uncovering the cartels as more likely than it actually is. And second, we could expect the increase of awareness about the harmful effect of cartels in society which would harm cartelists' reputation and would result in loss of customers. The society's demand for efficient sanctioning of such competitors could increase as a result of more information about the consequences of anticompetitive behaviour explained in the concrete cases. Such demand is nowadays missing. It would basically work as a negative advertisement of a brand which is very valuable for companies and its damage could be more painful for the shareholders than monetary fine.

Insufficient awareness of the European⁹⁷ consumers about harmful effects of cartels is confirmed also by the survey⁹⁸ of perception of cartels in society conducted in the UK in 2007. Although most (73%) of the respondents feel that cartels are harmful and they agree that such conduct should be punished, the survey showed that the perception is different for young and older respondents. While in the category of 18-24 years old, only 50% of respondents perceive price-fixing agreements harmful, in the category of 45 years old and older, it is more than 79% of respondents feeling that such agreements are harmful. It is thus obvious that the respondents who have significantly more experience as consumers, i.e. more experience with markets with different levels of competition, perceive the harmfulness of cartel agreements more likely compared to their young counterparts who lack such experience.

However, the survey did not confirm any significant influence of newspaper readership on the perception of harmfulness of anticompetitive conduct. This can be caused by an insufficient attention of media to cartels, their impacts on consumers as well as an insufficient awareness about sanctions to which cartelists face. There was no such survey conducted in the Czech Republic yet but we can assume that the results would not be substantially different.

Apart from the greater attention of media to the cartel agreements and its harmfulness, the prevention of anticompetitive conduct could be enhanced also by involvement

⁹⁷ The situation in the USA is different. Americans have deeply rooted awareness about negative impacts of antitrust, there is a strong public support of criminalization of cartels and also private enforcement is developed and often used.

⁹⁸ Stephan, Andreas, Survey of Public Attitudes to Price-Fixing and Cartel Enforcement in Britain (May 1, 2007). *Comp. Law Review*, Vol. 5, No. 1, pp. 123-145, 2008. Available at SSRN: <https://ssrn.com/abstract=993407>. or <http://dx.doi.org/10.2139/ssrn.993407>.

of detected and punished cartelists (or rather the particular managers or employees responsible for concluding a cartel agreement) in the competition compliance programmes, again thanks to the influence of the availability heuristic.⁹⁹ We can assume that these individuals who have gone through the investigation will perceive a future danger of detection much more likely than cartelists who were not detected yet. Such measure could therefore be of much help for strengthening deterrence.

Both above mentioned measures are cheap, easy to implement (the second one assumes the existence of a motivated competitor to implement a compliance programme in the first place) and they can significantly influence the decisions of managers whether they engage in an anticompetitive conduct or not. These are thus efficient tools which should be complements rather than substitutes to the existing fines or the developing private enforcement of competition law. It is, however clear, that the increase in medialization would require, at least in the beginning, a strong involvement of the Office in contacting media and the provision of the information to media. In the same time it is obvious that the fined firms and their attorneys will put much effort to avoid such negative publicity. It is quite possible that the theme of anticompetitive conduct will start to be medially attractive once first private damages claims appear before the courts.

5. Conclusion

The fines imposed upon competitors who breached competition rules in Europe constantly increase, private enforcement of competition law is developing and in some EU member states cartelists even face criminal proceedings. The expected costs of such prohibited conduct seem thus very high especially where freedom is at stake. Yet, the optimal deterrence of cartels in Europe is not achieved as we can observe a constant or even increasing number of prosecuting cartels in the last years.

One of the reasons why competitors still engage in anticompetitive conduct even though the expected costs of such conduct are very high may be a bounded rationality of such decision makers. They suffer from systematic cognitive biases about the probable results of different conduct and thus they often act contrary to the principle of welfare maximization.

In this paper, I suggested that in the field of competition law, an availability heuristic can be used to stimulate *ex ante* decisions of cartelists not to enter into anticompetitive conduct in the first place even if it paid off in monetary terms, and thus strengthen prevention which is the main goal of competition law. Increase in medialization of recent cartel scandals together with the information about overcharges of goods above competition level would, in my opinion, result in the general perception of uncovering the cartels as more likely than it actually is which would further strengthen deterrence. But also we could expect the increase of awareness about the harmful effect of cartels in society which would harm cartelists' reputation and their brand which is very valuable and its damage could be more painful for the shareholders than even a very high monetary fine. Lastly, involving managers, who have already been prosecuted and punished for anticompetitive conduct, into competition compliance programmes would contribute to more efficient implementation of such programmes and thus prevention, again thanks to the influence of the availability heuristic. The suggestions of this paper, if implemented in practice, could

⁹⁹ Maurice E. Stucke, Am I a Price-Fixer? A Behavioral Economics Analysis of Cartels, in *Criminalising cartels: a critical interdisciplinary study of an international regulatory movement* (Caron Beaton-Wells & Ariel Ezrachi eds., 2011), available at <http://ssrn.com/abstract=1535720>.

complement the existing enforcement mechanism of competition law and help to strengthen the prevention of anticompetitive conduct. At the same time, the suggested measures are cheap and easy to implement and I believe that they may be more efficient than implementation of new sanction mechanisms.

References

- ALDEN F. ABBOT, A brief comparison of European and American Antitrust Law, The University of Oxford Centre for Competition Law and Policy, The Competition Law & Policy, Guest Lecture Programme – Paper (L) 02/05.
- ALLAIN, M.-L. and BOYER, M. and KOTCHONI, R. and PONSSARD, J. P., Are Cartel Fines Optimal? Theory and Evidence from the European Union.
- CAMERER, C., & MALMENDIER, U. (2012). Behavioral economics of organizations. Behavioral Economics and Its Applications.
- COMBE, E. and MONNIER, C. F. Against Hard Core Cartels in Europe: The Myth of Over Enforcement, *The Antitrust Bulletin*: Vol. 56, No. 2/Summer 2011
- CONNOR, J. M., Has the European Commission Become More Severe in Punishing Cartels? Effects of the 2006 Guidelines.
- GNEEZY, U. and RUSTICHINI, A. “A Fine Is a Price,” *The Journal of Legal Studies* 29, no. 1 (January 2000).
- KAHNEMAN, D., SLOVIC, P., & TVERSKY, A. (1982). Judgment under uncertainty: Heuristics and biases. Cambridge: Cambridge University Press.
- KOROBKIN, R. B. and ULEN, T. S. Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics, 88 *Cal. L. Rev.* 1051 (2000).
- KOVACIC, W. E. (1992), The influence of economics on antitrust law. *Economic Inquiry*.
- LANDES, W.M. (1983), ‘Optimal Sanctions for Antitrust Violations’, *University of Chicago Law Review*, 50.
- MCCARTHY, E., MALTAS, A., BAY, M. and RUIZ-CALZADO, J. Litigation culture versus enforcement culture A comparison of US and EU plaintiff recovery actions in antitrust cases, *The Antitrust Review of the Americas* 2007, a *Global Competition Review*.
- NOVÁKOVÁ, T., Plní pokuty ukládané účastníkům kartelové dohody preventivní funkci? *Antitrust*. 2017. no. 2.
- PEITZ, M. & SPIEGEL, Y. (2014). The analysis of competition policy and sectoral regulation. Singapore : Hanover, Md: World Scientific; Now Publishers Inc, ISBN: 9789814616355.
- POSNER, R. A. “The Chicago School of Antitrust Analysis,” 127 *University of Pennsylvania Law Review* 925 (1978).
- SIMON, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review*, 63(2), 129–138.
- STEPHAN, A. Survey of Public Attitudes to Price-Fixing and Cartel Enforcement in Britain (May 1, 2007). *Comp. Law Review*, Vol. 5, No. 1.

STIGLER G., Crime and Punishment: An Economic Approach 76 J.POL. ECON. 169 (1968).

STUCKE, M. E. Am I a Price-Fixer? A Behavioral Economics Analysis of Cartels, in *Criminalising cartels: a critical interdisciplinary study of an international regulatory movement*.

Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union Text with EEA relevance

Act no. 273/1996 Coll., on Office for the Protection of Competition.

Act no. 262/2017 Coll, on Damages in the Field of Competition, as amended.

Cartel statistics of European Commission

Annual report of the Office for the Protection of Competition of 2016

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Making decision makers’ thinking processes transparent

Jolan Velencei¹

*¹Keleti Faculty of Business and Management, Óbuda University, Tavaszmező 15, 1083
Budapest, Hungary, e-mail: velencei.jolan@kgk.uni-obuda.hu*

Abstract

Decision makers are always concerned about the idea of transparency, making the assumption that transparent processes are easier to control. The essence of having transparent thinking processes is the ability to check the consistency of decision-making. The validation of consistency happens in the context of mental thinking processes. As a member of the Doctus Knowledge-Based System development team, I apply this shell to get a proposal for a decision from the domain experts’ explicit knowledge. This proposal is explainable, the route leading to this is transparent, and hence it strengthens and builds confidence for the decision makers. By understanding their own reasoning and by being able to hand it down, the acceptance of the decision makers grows. On the one hand, the purpose of this paper is show how decision makers can hold conversations with the computer as it uses concepts defined by them and domain experts. During this process, previously undefined concepts that possibly had a strong effect on the outcome may surface. Furthermore, conversations with the computer constrain these participants to clarify the different meanings and connotations of the used concepts. On the other hand, the purpose of this paper is to investigate this idea through a case study about an Information and Communication Technology tender process.

Keywords: Decision Making, Knowledge Representation, Rule-maker ability

JEL Code: D81, D91

1. Introduction

I am exploring the digital age in order to discover the developing behavior patterns of people, because artificial intelligence and stories of its applications, experiencing a resurgence since the 80’s, once again pose new challenges and spur me to action. The essence of these stories is that people are replaceable by AI in the workplace thanks to the algorithmization of processes. This is at once scary, inspiring and a challenge. The problem at hand: what will a replaceable person do and how will they behave? The desire for error-free work creates a huge market. It is thus self-evident that contemporary organizations are competing with each other to quickly algorithmize processes and purchase AI-based

data analysis tools. This makes the need for these tools even more urgent. A few influential economists and psychologists are already pointing out, that these tools actually shape human behavior, and the digital age sees new behavior patterns emerge.

It is the legacy of our industrial culture that we believe in traceable, transparent work. It means that we will want to apply more work to areas where, in fact, data analysis tools will soon take care of the activities that were once designated as work. This leaves a lot of time at the workplace that we have to spend without being bored. The fifteen-hour workweek and other such scenarios are mere illusions without new behavior patterns. The lack of 'classical' work also rewrites the definition of leisure time.

The world of digital natives has come. Digital natives learn and think differently, and have a hard time identifying with the values of digital immigrants, if at all they do. Well-known thinkers Don Tapscott (1997) and Marc Prensky (2001) introduced these terms at the turn of the millennium. Howard Gardner and Katie Davis are already talking about the App Generation (Gardner, Davis, 2013), and Nicholas Carr is also asking interesting questions (2011, 2014).

2. The Age of Rule-Followers

It was not his customers who told Picasso to invent Cubism, and yet he still did it. There are phenomena that cannot be explained even in hindsight. Many try to explain them through evolution, simply because it is harder to admit that we do not know, more so that we might not be able to know, the causes and reasons, and even if we did, the world would not be a better place for it. You can choose to explain the success of the industrial age as the consequence of standardization. And maybe it is. If something cannot be proven, it cannot be disproven, either. Well, the last great onslaught of the industrial age, a final blow, if you will, is the standardization of loosely structured or unstructured processes. It is safe to declare at this point that the work-flow movement is trying to keep the industrial ideal on the throne. The aforementioned onslaught consists of describing even things like human learning and RDI (research, development and innovation) as well-structured and traceable processes. This hints at the idea that all work has definable rules, and that those rules should be followed.

During the 80's and 90's, the idea of rule-following behavior as defined by James G. March (1994) emerged as the realization of identity. Even back then, many already concerned themselves with how humans will behave and what they will do, when algorithmic activities will be taken over by machines. It would eventually come as no surprise that non-rule-following behavior will become the focus of scrutiny, but back then we could not have known that Richard H. Thaler (2015) will give it the label of 'misbehaving'. The misbehaving of digital natives is almost palpable. The recent years in behavioral economics has seen the emergence of new concepts, such as 'predictably irrational', 'misbehaving' and 'mental accounting'.

Reality will not do us the favor of creating problems that will fit snugly into the subspecializations of certain disciplines. This means reality is never mono-disciplinary. Multidisciplinarity, where the lenses of several disciplines are used together, does not help in this case, because if there are two or more diverse solutions, we do not have any solutions for the real problem. The interdisciplinary examination of a real-world problem alludes to the idea that we combine the conceptual framework of one subspecialization with the methods of another, which eventually also evades understanding the real problem.

Stepping outside the subspecialization of certain disciplines, I examine the phenomena that give a completely different overall picture than when viewed through those disciplines. “It is impossible to support decisions; we can only support decision makers. To portray decision making as we see it, we use a transdisciplinary lens, so that we can observe the decision makers as birds are flying freely between the cages. At the core of decision-making we focus on meta-knowledge, which we argue is necessarily tacit. And we bring in the soft approach, as the antithesis of the hard, to achieve a synthesis in order to move between the realities, that is, levels of reality that thus becomes more nuanced. Therefore, for the sake of our exploratory thinking presented here, we describe decision making with the following three levels of reality: (1) Model of the decision maker’s behavior. (2) Method used to support the decision maker. (3) Tool we use to implement the support of the decision maker” (Baracscai, Dörfler, 2017, p.73). In my research, I present a solution to the problem through a transdisciplinary approach beyond individual disciplines.

3. The Method: Rule-Based Reasoning

Knowledge-based systems utilizing AI can accurately represent the rules of decision makers. The steps of building knowledge base looks like this: (1) The decision maker and the area experts of the company define the decision dilemma. (2) All the expectations (attributes) and their values must be collected. (3) Define the input and dependent attributes and organize them in a graph. (4) Describe the cases with the values of the independent attributes. (5) Articulate the logical if-then rules of the dependent attributes. (6) Evaluate the cases by deductive reasoning. In this paper an illustrative decision dilemma will be presented, namely a knowledge base which was built during the preparation of the Information and Communication Technology tender. To decide which tenderer will be evaluate as “that’s the one” the domain experts defined 32 input and 17 dependent attributes as well as 1175 if-then rules. The process of building knowledge base illustrates the consistency check of the rules and their purification. This is a point of departure for the creation of rules that can be followed, utilizing the rule-maker ability of the knowledge-based system.

What does consistency mean? Attributes, which make sense of validity, allow us to compare two rules based on the validity of their domain and output. Assuming that a rule with a better domain cannot have a worse output, consistency can be defined. A rule is inconsistent with a rule set, if it has a better domain and worse output, or a rule with a worse domain and a better output. A rule may be too good or too bad for this set respectively and if it is too good and too bad at the same time, meaning it can lead to both ‘good’ and ‘bad’ outputs, it is called a rule in crossfire. Figure 1 depicts suggested rules, which have not been expressed, but follow from those that have already been expressed, in other words, made explicit.

| | Expenses | unacceptable | to be considered | acceptable |
|------------|-------------|---------------------|---------------------|---------------------|
| Features | Trust | | | |
| poor | none | OUT OF QUESTION | OUT OF QUESTION | OUT OF QUESTION |
| poor | suspicious | OUT OF QUESTION | OUT OF QUESTION | OUT OF QUESTION |
| poor | maybe | OUT OF QUESTION | OUT OF QUESTION | OUT OF QUESTION |
| poor | trustworthy | .. AS A LAST RESORT | .. GOOD | .. GOOD |
| thin | none | OUT OF QUESTION | .. AS A LAST RESORT | .. AS A LAST RESORT |
| thin | suspicious | .. AS A LAST RESORT | .. MAYBE | .. MAYBE |
| thin | maybe | .. AS A LAST RESORT | .. GOOD | .. GOOD |
| thin | trustworthy | .. AS A LAST RESORT | .. GOOD | .. GOOD |
| acceptable | none | OUT OF QUESTION | .. AS A LAST RESORT | .. AS A LAST RESORT |
| acceptable | suspicious | .. AS A LAST RESORT | .. MAYBE | .. MAYBE |
| acceptable | maybe | AS A LAST RESORT | GOOD | GOOD |
| acceptable | trustworthy | AS A LAST RESORT | GOOD | GOOD |
| excellent | none | OUT OF QUESTION | AS A LAST RESORT | AS A LAST RESORT |
| excellent | suspicious | AS A LAST RESORT | MAYBE | MAYBE |
| excellent | maybe | AS A LAST RESORT | GOOD | THAT'S THE ONE |
| excellent | trustworthy | AS A LAST RESORT | THAT'S THE ONE | THAT'S THE ONE |

Figure 1: Consistent rule-set
Source: screenshot by author

As soon as the knowledge-based system recognizes the mindset of the decision maker, it tries to provide consistent recommendations. If we do not accept the recommended domain, then it gives a warning, as the smiling icons in Figure 2 show. We can then choose between returning to the recommended domain, saying that we were too loose compared to our standard mindset or we have to rethink whether we were too strict in creating the explicit rules.

| | Expenses | unacceptable | to be considered | acceptable |
|-------------|--------------------|---------------------|-------------------------|---------------------|
| Features | Trust | | | |
| poor | none | OUT OF QUESTION | OUT OF QUESTION | OUT OF QUESTION |
| poor | suspicious | OUT OF QUESTION | OUT OF QUESTION | OUT OF QUESTION |
| poor | maybe | OUT OF QUESTION | OUT OF QUESTION | OUT OF QUESTION |
| poor | trustworthy | .. AS A LAST RESORT | THAT'S THE ONE 😊 | ? |
| thin | none | OUT OF QUESTION | .. AS A LAST RESORT | .. AS A LAST RESORT |
| thin | suspicious | .. AS A LAST RESORT | .. MAYBE | .. MAYBE |
| thin | maybe | .. AS A LAST RESORT | .. GOOD | .. GOOD |
| thin | trustworthy | .. AS A LAST RESORT | ? | ? |
| acceptable | none | OUT OF QUESTION | .. AS A LAST RESORT | .. AS A LAST RESORT |
| acceptable | suspicious | .. AS A LAST RESORT | .. MAYBE | .. MAYBE |
| acceptable | maybe | AS A LAST RESORT | GOOD | 😊 GOOD 😊 |
| acceptable | trustworthy | AS A LAST RESORT | GOOD | 😊 GOOD 😊 |
| excellent | none | OUT OF QUESTION | AS A LAST RESORT | AS A LAST RESORT |
| excellent | suspicious | AS A LAST RESORT | MAYBE | MAYBE |
| excellent | maybe | AS A LAST RESORT | GOOD | THAT'S THE ONE |
| excellent | trustworthy | AS A LAST RESORT | THAT'S THE ONE | THAT'S THE ONE |

Figure 2: Inconsistent rule-set
Source: screenshot by author

What does it mean to purify a rule-set? The domains of the rules are divided into elementary rules, hidden rules are deleted, and the rest are assembled and extended. Finally, the resulting complex rules are sorted. Figure 3 depicts the purified rule-set, for example if 'Features' is 'poor', then 'Tender prototype' is 'Out of Question'; the values of 'Trust' and 'Expenses' do not matter.

| Features | Trust | Expenses | TENDER PROTOTYPE |
|---------------|---------------|---------------------|------------------|
| * | none | unacceptable | OUT OF QUESTION |
| .. acceptable | .. suspicious | unacceptable | OUT OF QUESTION |
| .. thin | none | * | OUT OF QUESTION |
| poor | * | * | OUT OF QUESTION |
| thin .. | maybe .. | unacceptable | AS A LAST RESORT |
| excellent | suspicious .. | unacceptable | AS A LAST RESORT |
| thin | suspicious | to be considered | AS A LAST RESORT |
| acceptable .. | none | to be considered .. | AS A LAST RESORT |
| thin | suspicious .. | acceptable | MAYBE |
| thin | maybe .. | to be considered .. | MAYBE |
| acceptable .. | suspicious | to be considered .. | MAYBE |
| acceptable | maybe .. | to be considered .. | GOOD |
| acceptable .. | maybe | to be considered | GOOD |
| excellent | trustworthy | to be considered .. | THAT'S THE ONE |
| excellent | maybe .. | acceptable | THAT'S THE ONE |

Figure 3: Purified rule-set
Source: screenshot by author

There are always less purified rules than there are total number of rules originally entered into the database, and that is enormous help. The knowledge-based system uses the principle of Occam's razor to offer easier-to-define rules. This has proved to be very helpful in our coaching work. "Contextualization is impossible to teach, since we are able to both accept and not accept new knowledge and we cannot even be sure that this is a contradiction. The situation is similar in coaching. Learning coaching is not the same as learning to be a coach. It cannot be the same, as the former is a cognition, but the latter is a craft or metacognition. This is not a bad rule, except when it is. This exception is most commonly made when the content is not well-thought about" (Baracscai, 2017, p.76).

4. Results

The rule-maker ability of the knowledge-based system results in a transparent mindset. We have the ability to create consistent rules through rule-based reasoning. The domain validity of the rule-maker ability of the knowledge-based system is a very delicate question. This method is only applicable if there are domain experts and knowledge engineers on hand who are able to express a few hundred rules for the decision there and then. „When examining relevance, we may achieve a clearer sense-making of the meta-knowledge, and thus may need to go back to examining consistency. When validating applicability we may need to go back to relevance or even consistency. However, if the meta-knowledge is consistent, there will be some phenomena to which it is relevant, and it will certainly be applicable to some particular instances" (Dörfler, Baracscai, 2017, p. 341).

5. Discussion

The desire and drive for reliability has fallen into the misconception that algorithmized processes will automatically be reliable. In the meantime, evangelists of the technology have forgotten that not all processes can be algorithmized. Of course, the vast majority of production processes can be well-structured, and the algorithmization of such processes is indeed indispensable. However, having done that, many then attempted to algorithmize semi-structured processes using the previously successful algorithms from production. They believed that people would only have one function: work according to the algorithms. As it turns out, they have other functions as well, like finding the necessary behavior rules for loosely structured processes.

Today, many have an innate fear of the word ‘transparency’. They expect their decisions to be transparent, while the rules of their decision-making should remain hidden. The rule-maker ability of the knowledge-based system makes a new approach to reliability possible. This new approach defines reliability as the production of consistent and purified rules. This might make decision makers understand that transparency is not a curse but a blessing when it comes to semi-structured processes.

References

- BARACSKAI, Z. 2017. Shouts from the Sidelines: Can Coaching Be Taught? *Transylvanian Journal of Psychology*. 2017(1): 65-79.
- BARACSKAI, Z. and DÖRFLER, V. 2017. An essay concerning human decisions. *The Transdisciplinary Journal of Engineering & Science* 2017(8): 69–80.
- CARR, N. 2011. *The Shallows: What the Internet Is Doing to Our Brains*. New York: W. W. Norton Company.
- CARR, N. 2014. *The Glass Cage: How our Computers are changing us*. New York: W. W. Norton Company.
- DÖRFLER, V. and BARACSKAI, Z. 2017. Fishing for meta-knowledge: a case for transdisciplinary validation. In: *Proceedings IFKAD, St. Petersburg, Russia, 7–9 June 2017*, pp. 337–348.
- GARDNER, H. and DAVIS, K. 2013. *The App Generation: How Today’s Youth Navigate Identity, Intimacy, and Imagination in a Digital World*. New Haven, CT: Yale University Press.
- MARCH, J. G. 1994. *A Primer on Decision Making: How Decisions Happen*. New York, NY: Free Press.
- PRENSKY, M. 2001. Digital Natives, Digital Immigrants. *On the Horizon*, 9(5): 1-6.
- TAPSCOTT, D. 1997. *Growing Up Digital. The Rise of the Net Generation*. Boston: Harvard Business Press.
- THALER, R. H. 2015. *Misbehaving: The Making of Behavioral Economics*. New York: W.W. Norton.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

A note on the impact of financial development on economic growth

Lukáš Vodička¹

¹Department of Finance, Faculty of Economics and Administration, Masaryk University in Brno, Žerotínovo nám. 617/9, 601 77, Brno, Czech Republic, e-mail: 421426@mail.muni.cz

Abstract

This paper evaluates the relationship between financial development and economic growth using data from 141 countries over the 1992–2015 period. The set of explaining determinants describes not only different sectors of the financial system (banking, insurance, securities market) but also their characteristics (depth, access, efficiency, and stability). The data is collected from following databases: World Development Indicators, Global Financial Development, KOF Index of Globalization and Financial Access Survey. Two-step system GMM estimator is used to address the issue of endogeneity. Using this method we find that quantity and quality of the financial system are conceptually different in regard to economic growth; bigger financial system per se does not foster economic output, however, its quality does. This result is robust to the inclusion of different independent variables.

Keywords: financial development, GMM, economic growth

JEL Code: O47, E44, G20

1. Introduction

The earliest work examining the influence of the financial system on the economic growth can be seen in the publication of Walter Bagehot (1873). Further on Levine (1997) describes the theoretical aspects of the impact of finance on the economy using the work of Bagehot and others.

Levine (1997) states that the financial markets and institutions may appear to diminish the problem arising from the information and transaction frictions. The primary function of the financial systems is then to mediate the flow of money and to reduce the impact of information frictions.

However, with an improved financial system, the households can diversify, insure themselves while the loans become cheaper; in the case of insurance markets, the households can be insured, which means that insurance markets will influence the households to save less for the case of unexpected events. Cheaper loans then allow to shift budget limitations and increase the consumption over a given period. In endogenous growth

models, this reduction in savings causes a lower economic growth over a longer period of time. Rajan (2005), as a reason for the possible negative impact of the finance on the economic growth, indicates the increase of the volatility and poor allocation of the capital, especially the human one, where the financial sector attracts educated specialists who would otherwise work in the productive sectors of the real economy. The impact of the financial system on the economic growth according to the existing theoretical framework does not necessarily have to be positive.

The work of Levine and King (1993) can be viewed as a breakthrough in the empirical verification of these theoretical propositions. They have improved the system of *proxy* variables describing the financial market. Thus, the ratios were used as the volume of bank loans to GDP. This work can be considered as the beginning of modern empirical literature on the given topic, and it was absolutely essential for further research, especially by creating a *proxy* variables set-up.

Exploring whether the impact of finance on the economic activity is really positive has been studied by many academics as a follow-up to Levine. Christopoulos and Tsionas (2004), using the OLS panel model, observed that this relationship was positive. In their work, they used the variables of the banking sector size as the standard proxy. Different approaches have been made to similar conclusions, for example by Durusu-Ciftci et al. (2017). The studies examining the impact of the insurance market usually also come to the similar conclusions, such as in the work of Curak et al. (2009) and Lee et al. (2013).

Especially in the course of years after 2008, studies questioning the positive impact of the financial development on the economic growth emerged. Berkes et al. (2012) state that the marginal effect of the financial system on the economic growth becomes negative if the ratio of loans to the private sector reaches 80–100 % to the GDP. Cecchetti and Kharroubi (2012) also came to similar conclusions, claiming that large, fast-growing financial sectors can be very costly for the rest of the economy as they attract scarce resources in a way that is detrimental at the aggregate level. By using estimators that do not create a priori limitation of the function Law and Singh (2014) conclude the same way. The above-mentioned works are complemented by Prochniak and Wasiak (2017) and Arcand et al. (2015). These studies use the GMM model as the main estimator (using other estimators to validate the robustness of the results), and both of the studies come to the same conclusions using a different dataset, namely that the excess in the financial system has a negative effect on GDP growth.

Apart from the studies with the contradictory conclusions, there is a number of studies that track the negligible or unclear influence of the financial sector on the economic growth, e.g. the work of Hasan et al. (2016) who, based on the application of the BMA (Bayesian Model Averaging) model on the created dataset, state that the financial depth does not have any significant impact on the economic growth, on the contrary to the effectiveness associated with a long-term economic growth. A similar conclusion is made by Koetter and Wedow (2010).

The aim of this paper is to contribute to the evolving discussion on the topic and to assess the impact of the overall development of the financial system and its components (banking system, insurance, and securities markets) on the economic growth of selected countries. The rest of the paper is organized as follows. Section 2 describes the methodology and dataset. Section 3 presents the results. To obtain the estimations of the effects of selected determinants on the economic growth, the GMM (Generalized Method of Moments) system estimator is used. The last section discusses the results and compares them with the results of other works.

2. Methodology and Data

2.1. System GMM two-step estimator

Barro (1991) has suggested a simple equation to determine the growth determinants:

$$Y_{i,t} = \alpha_0 + \alpha F_{i,t} + \beta X_{i,t} + \varepsilon_{i,t} \quad (1)$$

where α_0 , α and β are the coefficients, $F_{i,t}$ indicates a given indicator of the financial development of a country i in the course of time t , $X_{i,t}$ is the matrix of the control variables for a country i in the course of time t , $\varepsilon_{i,t}$ is the regression error.

To estimate the parameters, the GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998) is used. Seven and Yetkiner (2016) report the following three advantages of the GMM (namely the system GMM):

- consistent and effective estimates of regression parameters when the regressors are not strictly exogenous and there are the heteroskedasticity and autocorrelation within the units,
- overcoming the problem of endogeneity,
- the estimator is suitable for studies with short periods of time, but numerous units (small t and large n).

For these reasons, the GMM estimator, namely the GMM two-step estimator, is selected for this study.

As stated by Bun and Windmeijer (2010), this estimator using the appropriate moment conditions has the following form:

$$\widehat{\alpha}_s = \frac{q'_{-1} Z_s W_n^{-1} Z'_s q}{q'_{-1} Z_s W_n^{-1} Z'_s q_{-1}} \quad (2)$$

where $q_i = (\Delta y_i', y_i')$. For a detailed description of the estimator, see Bun and Windmeijer.

The Windmeijer (2005) correction is used to reduce the negative bias of the estimates of this estimator. The accuracy of the model specification is verified by Arellano-Bond autocorrelation tests where the zero hypothesis is the absence of autocorrelation. According to Mileva (2007), it is important not to reject this hypothesis in the case of AR (2), as it reveals the autocorrelation at levels. Hansen's test then verifies whether the instruments applied are exogenous, the zero hypothesis is the suitability of the instruments. Both these statistics together with the number of instruments are reported along with the estimation of the coefficients in *Tables 2 to 4*. The square of the correlation coefficient between the actual and of expected values is also reported.¹⁰⁰

2.2. Data

An empirical study in this work is based on data for 141 countries in the course of 1992–2015. The overall database consists of 92 variables, which can be categorized into the explained variables, explanatory, and controlling variables. This chapter only describes the variables that enter the final models. For modeling, the data is averaged over the three-year, non-overlapping periods due to the specification of the estimator. The database was

¹⁰⁰ This procedure is proposed by Bontempi and Golinelli (2006), as the standard coefficient of determination cannot be obtained when generating the GMM models; it is a quasi-coefficient of determination, in the result tables it is reported as R^2 .

compiled on the basis of the existing World Development Indicator database of the World Bank, and databases of the International Financial Statistics (IFS) – IMF, KOF Globalization Index ETH Zürich and GFDD compiled by Čihák et al. (2012).

2.2.1. Dependent and Control Variables

As an indicator of the economic growth, the GDP growth per capita, expressed in constant prices in USD in 2010 and purchasing power parities, was chosen. As other determinants of the economic growth and the control variables, the following standard variables are used: the gross fixed capital formation to GDP following the growth of physical capital, trade to GDP representing the openness of the economy, school enrollment as a *proxy* for the human capital growth, public expenditures to GDP representing the level of public spending to GDP, the overall globalization index as an indicator of the processes involving a country into the world economy and the CPI, where the hyperbolic sine transformation $\ln(x + \sqrt{x^2 + 1})$ is used to adjust the indicator. This transformation enables obtaining logarithms of the negative values and zeros. This procedure was used by Ductor and Grechyna (2015). The final control variable is the initial GDP per capita to control the convergence effect.

2.2.2. Indicators of the Financial Development

Čihák et al. (2012) have created a 4×2 matrix of *proxy* indicators for each category of the financial system for banking and securities markets. The used system of variables for the empirical modeling is based on the same logic, which is expanded for the insurance market for the purpose of this work. *Table 1* introduces a summary of the variables used.

Table 1: List of variables

| Variable source | | Definition type/category |
|--|----|---|
| GDP per capita (constant 2010 US\$) growth World Bank, WDI | o | $\ln (O_{t+1}/O_t)$ dependent |
| Gross capital formation (% of GDP) World Bank, WDI | y | Consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. control |
| Trade (% of GDP) World Bank, WDI | ac | Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. control |
| School enrollment, secondary (% gross) World Bank, WDI | ad | Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. control |
| Expense (% of GDP) World Bank, WDI | af | Expense is cash payments for operating activities of the government in providing goods and services. control |
| Overall globalization index KOF | ag | The KOF Globalization Index measures the three main dimensions of globalization: economic, social and political. control |
| CPI World Bank, WDI | ah | CPI (Consumer Price Index) after hyperbolic sine transformation control |
| Initial GDP per capita World Bank, WDI | ai | Controlling for convergence effect. control |

| | | |
|---|-------------|--|
| Liquid liabilities to GDP (%) Cihak et al., GFD | ak | Ratio of liquid liabilities to GDP. Liquid liabilities are also known as broad money, or M3. banking/depth |
| Deposit money bank assets to GDP (%) Cihak et al., GFD | am | Total assets held by deposit money banks as a share of GDP. banking/depth |
| Private credit by deposit money banks to GDP (%) Cihak et al., GFD | an | The financial resources provided to the private sector by domestic money banks as a share of GDP. banking/depth |
| Bank deposits to GDP (%) Cihak et al., GFD | ap | The total value of demand, time and saving deposits at domestic deposit money banks as a share of GDP. banking/depth |
| Financial system deposits to GDP (%) Cihak et al., GFD | cp | Demand, time and saving deposits in deposit money banks and other financial institutions as a share of GDP. banking/depth |
| BD (index for the depth of the banking system) Authors' calculations | au (av) | First component obtained via Principal Component Analysis (ak, am, an, ap, cp). (av – quadratic form) banking/depth |
| Life insurance premium volume to GDP (%) Cihak et al., GFD | bv | Ratio of life insurance premium volume to GDP. insurance/depth |
| Non-life insurance premium volume to GDP (%) Cihak et al., GFD | bw | Ratio of non-life insurance premium volume to GDP. insurance/depth |
| ID (index for the depth of the insurance markets) Authors' calculations | bx (by) | First component obtained via Principal Component Analysis (bv, bw) (by – quadratic form) insurance/depth |
| Stock market capitalization to GDP (%) Cihak et al., GFD | ce (ceq) | Total value of all listed shares in a stock market as a percentage of GDP. (ceq – quadratic form) securities market/depth |
| Stock market total value traded to GDP (%) Cihak et al., GFD | cf | Total value of all traded shares in a stock market exchange as a percentage of GDP. securities market/depth |
| Commercial bank branches (per 100,000 adults) World Bank, WDI | aw | Commercial bank branches per 100,000 adults. banking/access |
| Account at a financial institution (% age 15+) World Bank, WDI | ax | Account at a financial institution denotes the percentage of respondents who report having an account (by themselves or together with someone else) at a bank or another type of financial institution. banking/access |
| Institutions of insurance corporations (per 100,000 citizens) International Financial Statistics (IFS), IMF | cb | Institutions of insurance corporations per 100,000 citizens. insurance/access |
| Market capitalization excluding top 10 companies to total market capitalization (%) Cihak et al., GFD | cl | Value of listed shares outside of the largest ten largest companies to total value of all listed shares. securities market/access |
| Bank ROA Cihak et al., GFD | bg | Commercial banks' after-tax net income to yearly averaged total assets after hyperbolic sine transformation. banking/efficiency |
| Bank ROE Cihak et al., GFD | bh | Commercial banks' after-tax net income to yearly averaged equity after hyperbolic sine transformation. banking/efficiency |
| Bank concentration (%) Cihak et al., GFD | bd | Assets of three largest commercial banks as a share of total commercial banking assets. banking/efficiency |
| Premiums to insurance companies assets | cd | Ratio of premiums to insurance companies assets. |

| | | |
|---|----|--|
| Cihak et al., GFD | | insurance/efficiency |
| Stock market turnover ratio | cm | Total value of shares traded during the period divided by the average market capitalization for the period. |
| Cihak et al., GFD | | securities market/efficiency |
| Bank Z-score | bp | Z-score captures the probability of default of a country's commercial banking system. |
| Cihak et al., GFD | | banking/stability |
| Bank credit to bank deposits (%) | bo | The financial resources provided to the private sector by domestic money banks as a share of total deposits. |
| Cihak et al., GFD | | banking/stability |
| Bank capital to total assets (%) | bq | Ratio of bank capital and reserves to total assets. |
| Cihak et al., GFD | | banking/stability |
| Banking crisis dummy | bu | Dummy variable for the presence of banking crisis (1=banking crisis, 0=none). |
| Cihak et al., GFD | | banking/stability |
| Stock price volatility | cn | Stock price volatility is the average of the 360-day volatility of the national stock market index. |
| Cihak et al., GFD | | securities market/stability |

Source: Own data processing

The reasons for the use of these *proxy* indicators of the financial system are not provided due to limited space. For the reasoning, see the publications in the introductory section. The descriptive statistics are available on request.

3. Results

The financial development variables are studied across the single characteristics (depth, access, efficiency, and stability) as well as across single fields (banking, insurance and securities markets) of the financial system. Only the coefficients of the regressors representing the financial system will be reported for clarity of results and limited space. The impacts of these variables are shown in the following tables. The regressors have not been included in a single model because of the limitation of the number of instruments. Each table presents an overview of several models with the statistics of the respective tests (the indicators of the financial system used in the given model are presented in the *Variables* column, the control variables are always used).¹⁰¹

Table 2: Financial Depth – estimated models. Based on the analysis performed in STATA on data collected.

| Sector | Variable | RESULTS | | MODEL SPECIFICATIONS | | | | | |
|--------|----------|-------------|-------|----------------------|-------|--------|-------------|--------|----------------|
| | | Coefficient | p | Variables | AR(2) | Hansen | Instruments | Groups | R ² |
| BAN | au | -0.015 | 0.001 | au | 0.88 | 0.044 | 91 | 124 | 0.33 |
| | an | -0.0274 | 0 | an | 0.99 | 0.053 | 91 | 125 | 0.25 |
| | av | -0.0003 | 0.9 | av | 0.69 | 0.041 | 91 | 124 | 0.47 |
| INS | bx | 0.00385 | 0.221 | au, bx | 0.96 | 0.222 | 103 | 118 | 0.1 |
| | bv | 0.00024 | 0.925 | au, bv | 0.93 | 0.254 | 103 | 118 | 0.1 |
| | by | 0.00077 | 0.674 | au, by | 0.88 | 0.206 | 103 | 118 | 0.08 |
| | ce | 0.00148 | 0.683 | au, ce | 0.12 | 0.625 | 103 | 95 | 0.08 |

¹⁰¹ Abbreviations BAN, INS, and FIMA refer to a specific segment of the financial system (banking, insurance or securities markets).

| | | | | | | | | | |
|------|-----|--------|-------|---------|------|-------|-----|----|------|
| SEMA | cf | -0.001 | 0.464 | au, cf | 0.03 | 0.593 | 103 | 94 | 0.07 |
| | ceq | 0.0002 | 0.709 | au, ceq | 0.13 | 0.663 | 103 | 95 | 0.08 |

Source: Own data processing

The statistically significant negative impact of the size of the banking market on the dependent variable can be observed. The coefficients associated with the indicators of the size of the insurance market are positive but statistically insignificant. High p-values can also be seen at the financial market indicators. The coefficients associated with the quadratic regressors at the banking market are negative (i.e. concave function and declining yields) and positive in the case of the insurance and financial markets. However, these relationships are also not significant. The size of the financial system does not affect the rate of growth of the economy, and in the case of the banking sector, it may even have a negative impact.

The results obtained for assessing the impact of the variables representing the access to the financial system are acceptable neither from the point of view of interpretation nor from the point of view of the model specification, therefore they are not stated. This is due to the lack of data and non-perfection of these *proxy* variables. Čihák et al. mention this problem and comment that, for example, the number of branches may be confusing in the case of the banking markets not operating on a branch system basis. The results obtained are available on request.

On the other hand, the existing database offers plenty of fairly representing *proxy* indicators of the effectiveness of financial systems. The effect of these indicators is illustrated in *Table 3*.

Table 3: Financial Efficiency – estimated models. Based on the analysis performed in STATA on data collected.

| Sector | RESULTS | | | MODEL SPECIFICATIONS | | | | | |
|--------|----------|-------------|-------|----------------------|-------|--------|-------------|--------|----------------|
| | Variable | Coefficient | p | Variables | AR(2) | Hansen | Instruments | Groups | R ² |
| BAN | bg | 0.015709 | 0 | bg | 0.77 | 0.059 | 89 | 125 | 0.44 |
| | bh | 0.104636 | 0 | bh | 0.83 | 0.084 | 89 | 125 | 0.35 |
| | bd | 0.008942 | 0.279 | bd | 0.9 | 0.045 | 89 | 123 | 0.4 |
| INS | cd | 0.008387 | 0.041 | cd | 0.61 | 0.15 | 91 | 107 | 0.35 |
| SEMA | cm | -0.00112 | 0.504 | cm | 0.12 | 0.383 | 91 | 94 | 0.09 |

Source: Own data processing

The coefficients obtained show that, apart from the financial markets, the effectiveness of the financial system is statistically significant with a positive impact on the economic growth. The *bd* variable (bank concentration) representing the competition at the banking market is statistically insignificant.

The final monitored feature of the financial systems is their stability. *Table 4* shows the coefficient estimates obtained.

Table 4: Financial Stability – estimated models. Based on the analysis performed in STATA on data collected.

| Sector | RESULTS | | | MODEL SPECIFICATIONS | | | | | |
|--------|----------|-------------|-------|----------------------|-------|--------|-------------|--------|----------------|
| | Variable | Coefficient | p | Variables | AR(2) | Hansen | Instruments | Groups | R ² |
| BAN | bp | 0.005164 | 0.147 | bp | 0.78 | 0.055 | 89 | 125 | 0.45 |
| | bo | -0.01519 | 0.03 | bo | 0.67 | 0.07 | 91 | 124 | 0.35 |
| | bq | 0.012119 | 0.135 | bq | 0.52 | 0.105 | 80 | 98 | 0.07 |

| | | | | | | | | |
|---------|----------|-------|----|------|-------|----|-----|------|
| bu | -0.02477 | 0 | bu | 0.07 | 0.009 | 76 | 125 | 0.42 |
| SEMA cn | -0.00499 | 0.306 | cn | 0.98 | 0.788 | 91 | 76 | 0.04 |

Source: Own data processing

Besides the model built for the *bu* variable (bank crisis dummy variable), all the models are well-specified according to the observed tests. The *bp* variable (bank Z-score) and *bq* variable (bank capital to total assets) are according to the expectations related to the positive coefficients, however, these variables are statistically insignificant (although at the assumed significance level of $p = 0.1$, the zero hypotheses are not rejected by a narrow margin). The *bo* regressor (loans to bank deposits) is statistically significant with a negative impact on the economic growth, which is also in line with the expectations. Due to the lack of data and the expected low impact of the instability of the insurance market on the economic growth, this sector is not considered here. The stability of the securities markets does not have a statistically significant effect on the regressand, according to the obtained results.

4. Discussion and conclusion

This work contributes to the existing literature on the finance and economic growth by analyzing the main sectors of the financial system and their characteristics. It differs from a large number of previous studies that examined either only one of the sectors or only one characteristic of the financial system – its depth. Using a wide-ranging spectrum of variables it enables to gain a new insight into the issue and contribute to an evolving discussion on this subject. The data processing uses a two-step estimator GMM system that addresses the endogeneity problem of the variables used – for this reason, it is a popular estimator for a given topic, e.g. works of Prochniak and Wasiak (2017) and Arcand et al. (2015).

Using this method, estimates of the coefficients of individual indicators are obtained, which show that the quality and quantity from the point of view of the financial development represent two conceptually different areas with different effects on the economic growth. While a larger financial system may even have a negative impact on the growth, the stability and above all the effectiveness of the financial systems (in particular banking and insurance sectors) are crucial to the growth of the economy. The negative impact of the size of the banking system on the economic growth may, for example, be the result of the "too big to fail" policy, where the banks are motivated to take a higher risk and commit moral hazard. This behavior may result in an increased volatility in the financial markets or even in the financial crisis. Another possible reason for the negative impact is the reduction of the household savings, as discussed earlier. The results obtained do not indicate the existence of a concave relationship between the size of the monitored sectors and the performance of the economy, although this function is observed but not statistically significant. This result contradicts the work of Berkes et al. (2012). The impact of the access to the finance on the performance of the economy due to the imperfection of existing *proxy* variables cannot be satisfactorily explained, and its exploration is left to future studies. The efficiency then, according to the obtained coefficients estimates, contributes to the economic growth in the case of the banking and insurance markets, where in the case of banking the same can be said about the stability of the given sector. The impact of the stability of the insurance market on the assumed small impact on the economic growth and the absence of suitable *proxy* variables was not investigated.

The results obtained are robust using various indicators of the financial system and in accordance with the conclusions of Koetter (2010) and Hasan et al. (2016). Based on this empirical study, it can be said that not the size, but the quality of the financial system is an important determinant of the GDP growth. These results contradict the works that claim that too much finance is damaging the growth – it is necessary to distinguish between the size of the financial system and its effectiveness and stability.

Acknowledgements

The author wishes to thank Mr. Oleg Deev for his helpful comments and remarks. This research is supported by the Masaryk University grant financing in the Programme of the Rector.

References

- ARCAND, J.-L., BERKES, E. and PANIZZA, U. 2015. Too much finance? *Journal of Economic Growth*, 20, issue 2, p. 105–148.
- ARELLANO, M. and BOVER, O. 1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68, 29–52.
- BAGEHOT, W. 1979. *Lombard Street: a description of the money market*. Westport, Conn.: Hyperion Press. ISBN 08-835-5677-4.
- BARRO, R. J. 1991. Economic Growth in Cross Section of Countries. *Quarterly Journal of Economics*, Vol. 106 (2), 407–443.
- BERKES, E., PANIZZA, U. and ARCAND, J.-L. 2012. Too Much Finance? No 12/161, IMF Working Papers, International Monetary Fund
- BLUNDELL R. and BOND S. 1998. Initial conditions and moment restrictions in dynamic panel data models. *J Econom* 87:115–143. doi:10.1016/S0304-4076(98)00009-8
- BONTEMPI, E. M. and GOLINELLI, R. 2006. *Dynamic models for panel data: Application in STATA*.
- BUN, M. and WINDMEIJER, F. 2010. The weak instrument problem of the system GMM estimator in dynamic panel data models. *Econometrics Journal*, 13, issue 1, p. 95–126
- CECCHETTI, S. and KHARROUBI, E. 2012. Reassessing the impact of finance on growth. No 381, BIS Working Papers, Bank for International Settlements
- CHRISTOPOULOS, D. and TSIONAS, M. 2004. Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of Development Economics*, 73 (1) 55–74.
- ČIHÁK, M., DEMIRGUC-KUNT, A., FEYEN, E. and LEVINE, R. 2012. Benchmarking financial systems around the world, No 6175, Policy Research Working Paper Series, The World Bank.
- ĆURAK, M., LONČAR, S. and POPOSKI, K. 2009. Insurance sector development and economic growth in transition countries. *International Research Journal of Finance and Economics*, 34(3), 29–41.

- DUCTOR, L. and GRECHYNA, D. .2015. Financial development, real sector, and economic growth. *Int. Review of Economics & Finance*, 37, issue C, p. 393–405.
- DURUSU-CIFTCI, D., ISPIR, M. S. and YETKINER, H. 2017. Financial development and economic growth: Some theory and more evidence. *Journal of Policy Modeling*, 39, issue 2, p. 290–306.
- HASAN, I., HORVATH, R. and MAREŠ, J. 2016. What type of finance matters for growth? Bayesian model averaging evidence. *The World Bank Economic Review*
- INTERNATIONAL MONETARY FUND. 2017. Financial access survey. [Accessed: 15 September 2017].
- KING, R. G. and LEVINE, R. 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108, 717–738.
- KOETTER, M. and WEDOW, M. 2010. Finance and growth in a bank-based economy: Is it quantity or quality that matters? *Journal of International Money and Finance*, 29, issue 8, p. 1529–1545.
- KOF [Konjunkturforschungsstelle or Economic Research Centre of ETH Zurich]. 2017. 2017 Index of globalization. [Accessed: 15 September 2017].
- LAW, S. H. and SINGH, N. 2014. Does too much finance harm economic growth? *Journal of Banking & Finance*, 41, issue C, p. 36–44.
- LEE, C.-Chuan, LEE, C.-Chiang and CHIU Y.-B. 2013. The link between life insurance activities and economic growth: Some new evidence. *Journal of International Money and Finance*, 32(3), 405–427.
- LEVINE, R. 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature* 35: 688–726.
- MILEVA, E. 2007. Using Arellano – Bond Dynamic Panel GMM Estimators in Stata.
- PROCHNIAK, M. and WASIAK, K. 2017. The impact of the financial system on economic growth in the context of the global crisis: empirical evidence for the EU and OECD countries. *Empirica*, 44: 295–337.
- RAJAN, R. G. 2005. Has financial development made the world riskier? Proceedings of the 2005 Jackson Hole Conference organized by the Kansas City Fed.
- SEVEN, Ü. and YETKINER, I. 2016. Financial intermediation and economic growth: Does income matter? *Economic Systems*, 40, issue 1, p. 39–58.
- WINDMEIJER, F. 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics* 126: 25–51.
- The WORLD BANK. *World Development Indicators*. Washington, D.C.: The World Bank (producer and distributor). [Accessed: 15 September 2017].
- The WORLD BANK. *Global Financial Development Database (GFDD)*, The World Bank. Martin Čihák, Asli Demirgüç-Kunt, Erik Feyen, and Ross Levine, 2012. [Accessed: 15 September 2017].

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Sustainable Development Small and Medium-Sized Enterprises Innovation Activities Potential in the Czech Republic

Lucie Vokáčová¹, Klára Margarisová¹, Jan Huml¹ and Jiří Čerkasov¹

¹Department of Management, Faculty of Economics and Management, Czech University of Life Sciences, Kamýcká 129, 165 21 Prague, Czech Republic, e-mail: vokacova@pef.czu.cz, margarisova@pef.czu.cz, huml@pef.czu.cz, cerkasov@pef.czu.cz

Abstract

The issue of sustainability was gradually integrated into individual national strategies and it is also gaining in importance at the corporate level across sectors. In relation to the changing role of business in society, wherein both spheres are linked through prioritization of stakeholder interests, they acquire ‘new’ dimensions and innovation – sustainable innovation. The aim of the paper is to define the innovation environment in the Czech Republic and the impact of sustainable development on the changes in small and medium-sized enterprises. The article used secondary data from the Czech Statistical Office (CZSO) survey according to Eurostat methodology, from the national strategic framework “Czech Republic 2030” etc. Sustainable innovations still do not have a firm place among other innovation activities. In their development, small and medium-sized enterprises rely heavily on subsidies from the EU, but the future of this funding source remains in question. One possible solution is greater interdependence between SMEs and scientific institutions. Sustainable innovations offer low-cost solutions, and ultimately, end users themselves can be part of the innovation process and not just the consumer of its outcome.

Keywords: Innovations, Sustainable Development, Corporate Social Responsibility, Sustainable Innovation, Small and Medium-Sized Enterprises, Czech Republic, End-user

JEL Code: M14, O35, R58

1. Introduction

Sustainable development, defined as ‘development meeting the needs of the present without compromising the ability of future generations to meet their own needs’, has been the subject of international negotiations and the resulting conventions (UN-DESA, 1987;

OECD, 2006–2011; Kates, Parris, Leiserowitz, 2005) for thirty years. One of the most important environmental documents in the world is “Agenda 21”, where the principles of sustainable development are formulated in a comprehensive manner and an environmental care program for the 21st century is set out. The area of agriculture and rural development is covered by the concept of sustainable agriculture, i.e. the long-term improvement of the quality of the environment and the resource base on which agriculture is dependent and economically viable, and improving the quality of the lives of farmers and society as a whole (Ikerd, 1995). This consists of the protection of the natural ecosystem and non-renewable resources, and food and agricultural systems must also be economically viable so that they can be sustainable over time, and last but not least, sustainability concerns social justice involving equality in employment for farmers, farm workers and other workers in the system, ensuring food sufficiency and preserving traditional culture and relationships in the relevant region.

The issue of sustainability was gradually integrated into individual national strategies (Leukhardt, Allen, 2013; Steurer, Hametner, 2013; Office of the Government of the Czech Republic, 2017) and it is also gaining in importance at the corporate level across sectors (Johnson, 2015; Lee, Herold, Yu, 2016; Hodinková, Sadovský, 2016; Kubíčková, Morávková, Tuzová, Nečas, 2017).

The three pillars of sustainability are derived from the definition of sustainable development – environmental, social and economic – the so-called ‘3Ps’ or ‘triple-bottom-line’¹⁰², i.e. planet (environmental area), people (social area) and profit (economic area). In the business sector, the concept of Corporate Social Responsibility (CSR) was implemented for these facts, and this concept strives to find a balance between the three areas. The European Union has more strongly supported the development of CSR by publishing the “Green Book”, defining it as the voluntary integration of social and ecological considerations into day-to-day corporate operations and interactions with corporate stakeholders. A number of authors (Frederic, 1987; Drucker, 2003; Crane et al., 2008 in Kuldová, 2010 and others) present similar concepts, such as Corporate Citizenship, Corporate Social Responsiveness, Stakeholders Theory and others.

In relation to the changing role of business in society, wherein both spheres are linked through prioritization of stakeholder interests, they acquire ‘new’ dimensions and innovation – sustainable innovation (Halme, Korpela, 2014; Langendahl, Cook, Potter, 2016; Barth, Ulvenblad, Ulvenblad, 2017), social innovation (Phillips et al., 2015), Eco-innovation (Adamec, 2010; Hörte, Halila, 2008), frugal innovation (Radjou, Prabhu, 2015; Khan, 2016; Kaplan, 2017) and inclusive innovation (more for less for more, MLM), etc. Professional literature also talks about so-called Sustainable End-user Innovation – SEI (Nielsen, Reisch, Thøgersen, 2016; Goodman, Korsunova, Halme, 2016). SEI refers to the finding that consumers (end-users) often play a significant role in innovation not only from the point of view of company and project initiatives, but also from the point of view of end-users who are increasingly innovating independently.

The aim of the paper is to define the innovation environment in the Czech Republic and the impact of sustainable development on the changes in small and medium-sized enterprises. In the conclusion, the main directions of further investigation are outlined.

¹⁰² “The Economist” has done another piece on the triple bottom line, which is nice, but they invert the 3Ps. Having come up with the TBL concept in 1994, I launched the 3Ps in 1995 as ‘People, Planet, Profit’. “The Economist”, by contrast, goes for ‘profit, people and planet’ – which makes sense, if you are them (Elkington, 1997).

2. Methodology and Data

The current state of knowledge of the problem is elaborated on the basis of Czech and foreign scientific literature focused on sustainable development, sustainable agriculture, corporate social responsibility, innovation and sustainable innovation. Data are obtained from electronic databases Web of Science, SCOPUS, EBSCOhost, Emerald Insight, the Wiley Online Library, from freely available sources in the form of official web presentations of the Czech Statistical Office, the Office of the Government of the Czech Republic, the Ministry of Industry and Trade of the Czech Republic, the Association of Small and Medium-Sized Enterprises and Crafts of the Czech Republic, and others.

The issue of sustainable development is represented by the national strategic framework “Czech Republic 2030” (Office of the Government of the Czech Republic, 2017) and project “CSR & Reputation Research¹⁰³” (Ipsos, 2017). The definition of innovative activities results from the survey of the Czech Statistical Office “Innovation Activities of Enterprises in the Czech Republic – 2012 to 2014¹⁰⁴” according to the methodological principles of Eurostat contained in the Oslo Manual (CZSO, 2016).

3. Results

These results relate to two key areas, namely sustainable development/CSR and innovation entrepreneurship in the Czech Republic.

3.1. Sustainable development and social responsibility

The “Czech Republic 2030” Strategic Framework is the overarching government document for the national, regional and local level, and it also serves as a mechanism for transferring Czech commitments to the European Union and the global community in the field of sustainable development.

In the Czech Republic, the state does not significantly regulate CSR, but rather maintains it at the level of voluntary activity. Since 2013, the national CSR coordinator has been the Ministry of Industry and Trade (MIT), whose task is to draw up the strategic document “National Action Plan for Corporate Social Responsibility in the Czech Republic” (NAP CSR). In cooperation with the BusinessInfo.cz portal, the Ministry prepared a public online consultation – Social Responsibility of Organizations “National Action Plan for Social Responsibility of Organizations in the Czech Republic”, which aims to obtain suggestions and proposals from all stakeholders intensively involved with the issue of CSR. The Ministry of Industry and Trade is also entrusted with the management of the Quality Council of the Czech Republic and organizational provision of its activities. The Council is

¹⁰³ Data collection was conducted in November and December 2016 via online polling on a representative sample of the adult Internet population [n = 1018]. The research was also carried out with a group of 40 experts – the media [N=8], CSR experts [N=8], communication and PR agencies [N=8], non-profit organizations [N=8], influencers and representatives of unions, associations and institutions [N=8].

¹⁰⁴ The reporting units are enterprises with 10 or more employees registered or not registered in the commercial register in the selected business sector [n = 6 577], for which basic economic data are ascertained, as well as data on the carried out product, procedural, marketing, organizational innovations and eco-innovations, data on financing innovation activities, innovation cooperation, factors inhibiting innovation, innovation in public contracts etc.

the main entity that ensures the promotion and coordination of CSR activities at the national level. A specialized section was set up for this purpose, which, since 2015, has been called the Social Responsibility of Organizations and Sustainable Development. The mission of the section is to support and coordinate the concept of social responsibility (CSR) and sustainable development in the Czech Republic (MIT, 2016). In addition to the Quality Council of the Czech Republic, non-governmental organizations such as the Association of Social Responsibility, the Business Leaders Forum, Business for Society, the Czech Business Council for Sustainable Development and National Network Global Compact Czech Republic (NAP CSR, 2017) also took part in the development and promotion of CSR.

According to the SDG¹⁰⁵ Index global study (Sachs et al., 2017), which assesses the progress of individual countries with regard to achieving Sustainable Development Goals, the Czech Republic is ranked 5th from 157 countries right behind the Scandinavian countries. The Czech Republic achieved an index of 81.9, which is above the average both globally and within the region, where the average is 77.7. The study appraised Czech advances in terms of poverty, health and quality of life, access to drinking water, economic growth and land life, whilst identifying a need for improvement in the partnership between sectors and innovations.

A total of 83% of experts believe that corporate CSR is becoming a bigger topic in the Czech Republic. Today, companies do not see only charity in CSR, but they strive to achieve the closest possible interconnection of social responsibility with their field, thereby fulfilling the expectations of the population, which presumes that companies will primarily focus on what they are closest to, what they most influence and what they understand. In the opinions of the respondents, companies should primarily focus the impact of their CSR projects on the Czech Republic rather than deal with global problems (Ipsos, 2017). Companies mainly focus on environmental protection, education, charity or support for disadvantaged people, but also on transparent communication and support for financial literacy; for example, many companies provide their services and expertise to non-profit organizations and projects that have a limited budget for their activities. The Ipsos study shows that large companies should mainly behave fairly to their employees and protect the environment – these are the most widely cited expectations of people from corporate activities as part of CSR. From the point of view of Czechs, the behaviour of companies toward their own employees has long been first and foremost, followed by environmental protection. Last year, true communication with customers came in third place, but this year it was surpassed by education support (only in 8th place last year). Therefore, education has significantly increased in importance for the Czech population (education was mentioned significantly more by young people under the age of 35–37%). One quarter of Czechs perceive the development of modern technologies as a good way to help society.

Social responsibility is not only about large companies and multinational corporations, but rather it is a natural concern for a number of small and medium-sized businesses or local family-run businesses. Owners or founders of smaller companies often do not even know the meaning of the CSR abbreviation, but they nevertheless focus on socially responsible activities because personal values force them to do so, and it is also an issue of good reputation, as a good reputation is essential for companies operating locally and known by the people around them.

The growing interest in CSR amongst the general public is also related to the media coverage of this topic. Media content from 2010–2015 (Newton Media, 2016) has shown

¹⁰⁵ So-called SDGs = Sustainable Development Goals – these are 17 goals that were adopted by all UN members states as a development program over the next 15 years (2015–2030)

a significantly higher interest of media in traditional philanthropy. For the entire period from January 2010 to December 2015, the media published 7.5 times more articles on the theme of 'traditional philanthropy' than on 'sustainable business' (180 thousand vs. 24 thousand). While traditional philanthropy experienced a modest decline in 2015, interest in sustainable business grew from 2013 onwards. The most frequent presentation of charity was on online websites. In the media coverage of sustainable business, economic titles were significantly more represented thanks to the establishment and development of the Business for Society platform, which significantly contributed to the media coverage of the topic.

It was demonstrated over the past six monitored years that the modern conception of CSR – the concept of sustainable entrepreneurship – is presented very broadly in the media. Different entities such as technology of production, investing, architecture, advertising method, diversity and equal opportunities, approach toward employees (even those with disabilities) or to local communities were called 'responsible' and 'sustainable'. Other entities such as large breweries were added to banks and financial institutions that accentuated employee volunteering, financial literacy of the population and others.

3.2. Small and Medium-Sized Enterprises Innovation Activities

The share of small and medium-sized enterprises in the total number of active business entities in 2016 was 99.8%. The share of small and medium-sized enterprise employees in the total number of employees in the business sector in 2016 was 58.4% (CZSO, 2017).

From 2012 to 2014, 42% of companies in the Czech Republic innovated their products, processes, marketing or organizational methods, but overall innovation activity decreased, and from the international point of view, enterprises in the Czech Republic innovate less than the EU28 average. Businesses with more than 250 employees (77.2%) innovate the most, whilst the share of innovating medium-sized enterprises was 18 percentage points lower (59.1%) than large enterprises. The same distance of 18 percentage points was found between medium and small enterprises (35.2%). In terms of enterprise ownership, foreign-controlled enterprises (53.7%) innovate more than domestic enterprises (39%). The same applies to large and small foreign affiliates. There is an interesting situation with regard to medium-sized enterprises under foreign control, which innovate less (58.4%) than medium-sized domestic enterprises (59.2%).

As part of their innovation activities, enterprises devote their time more intensively to technical innovations, i.e. product and process innovations (share of 35.7% of all enterprises, 84.8% of innovating enterprises) than non-technical innovations, i.e. marketing and organizational innovations (27.3% and 64.9%). The largest share (20.9% of all enterprises, 58% of innovating enterprises) of enterprises was involved in both technical and non-technical innovations. 14.8% of enterprises (35.1% innovating) were involved in technical innovations only. Enterprises involved in information and communication activities innovate the most (61.7%), while another sector with a high share of innovating enterprises is the finance and insurance sector (53.7%). 47% of enterprises innovated in the manufacturing industry as the most important section of the economy.

When implementing innovations, enterprises can take advantage of any of the forms of offered public support. From 2012 to 2014, 33.6% of technically innovating enterprises used public support for technical innovation activities. A total of 23.5% of technically innovating enterprises received state support, of which 18.5% utilized direct public support, and 9.3% utilized indirect tax aid for R&D. A total of 19.3% of technically innovating enterprises received European funds for their innovation activities. Support from local

and regional authorities is much lower. Only 6.2% of technically innovating enterprises received support from this source. Medium-sized enterprises (45.5%) received the highest support for technical innovation, and the number was almost the same for large enterprises (45%). The share of small enterprises is lower by a half (25.8%). Public support is used more by large domestic enterprises (55%) than those under foreign control (37.9%). According to the Ipsos survey (AMSP, 2017), subsidies are becoming an essential tool for the development of more than a quarter of small and medium-sized businesses – half of supported company investments would otherwise not have occurred. Most companies are satisfied with drawing subsidies, but small businesses are complaining about administrative demands and entrepreneurs about that fact that they are unable to draw small amounts.

As part of marketing innovations, enterprises most often focused on new media or promotion techniques (70% of enterprises with marketing innovations). Significant changes in design or packaging were made by 53% of enterprises innovating marketing, and 40.9% of them implemented new methods for product placement. Methods for valuation of products and services (21.4%) were innovated least by enterprises. Large and medium-sized enterprises put more emphasis on changes in design or packaging than small enterprises. The share of this type of innovation in large enterprises innovating marketing reached 60.4%, for medium enterprises 59.8%, and small enterprises only 49.3%. Foreign-controlled enterprises used more innovated selling methods or product/service placement on the market (59.1%) than domestic enterprises (37.1%).

Eco-innovation¹⁰⁶ is broken down according to the type (subject) of innovation into environmental benefits associated with the production of the products/services provided by the enterprise and the environmental benefits associated with the use of the products/services by the customer. Eco-innovations implemented by enterprises in the Czech Republic from 2012 to 2014 are shown in the figure (Fig. 1 and Fig. 2).

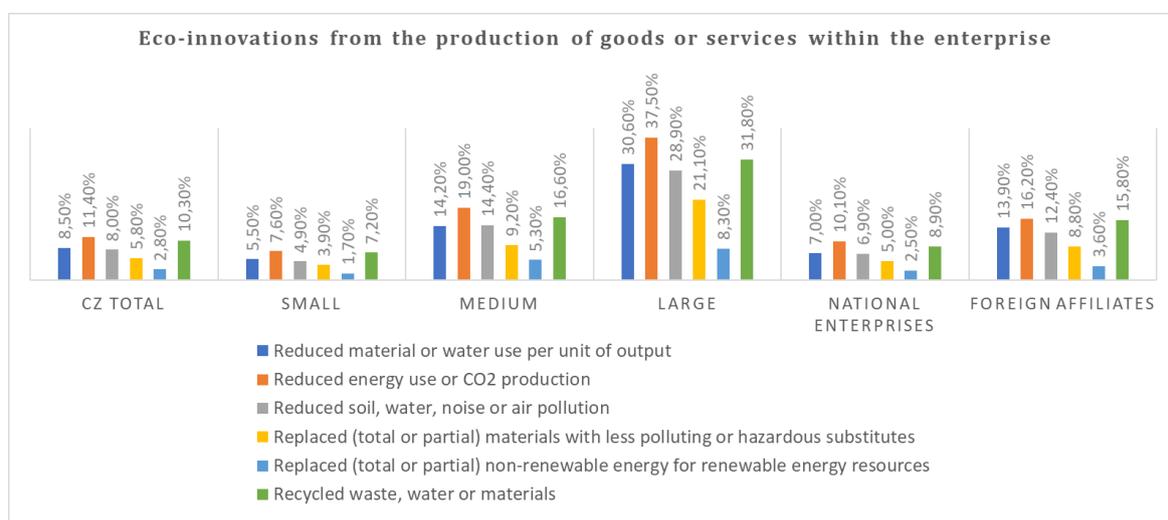


Figure 1: Eco-innovation associated with the production of goods or services within enterprise by type, size-class and ownership (as a percentage of innovative enterprises); 2012–2014

¹⁰⁶ Eco-innovation is not defined in the Oslo Manual. It was defined by Eurostat in 2008, when it first appeared in a model questionnaire of Eurostat for the research of the innovation activities of enterprises. Eco-innovation is not defined as an independent innovation according to the Eurostat methodology, but rather consists of a group of environmental benefits of innovation that are considered as by-products of other named innovation groups (in particular product and process innovation groups).

Source: Authors analysis based on CZSO, 2016

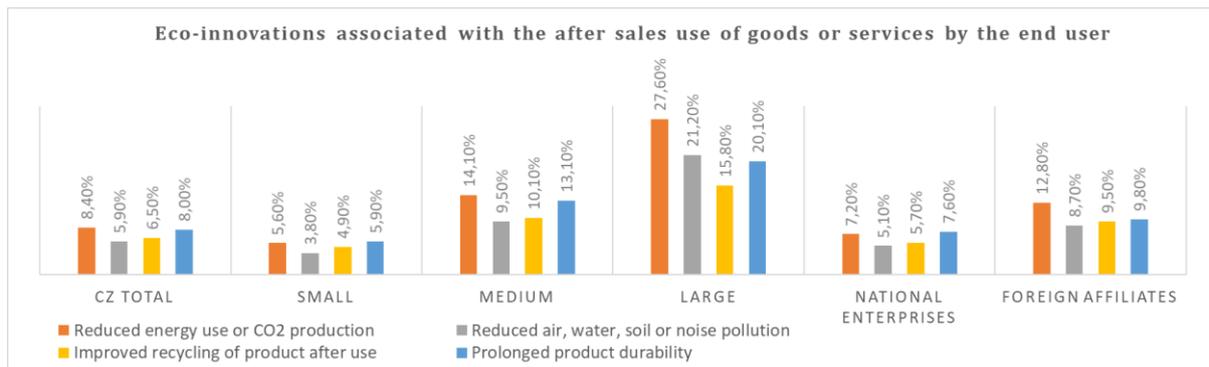


Figure 2: Eco-innovation associated with the after sales use of goods or services by the end user – by type, size-class and ownership (as a percentage of innovative enterprises); 2012–2014

Source: Authors analysis based on CZSO, 2016

In the period of 2006–2008, innovative enterprises in the Czech Republic identified as the main reason for the introduction of eco-innovations the need to comply with existing environmental regulations on pollution (the proportion of 41.8% of innovative enterprises), 27.5% of innovative enterprises cited the need to comply with environmental regulations that are expected to be introduced in the future as the main reason for introducing ecoinnovations. The smallest number of innovative enterprise (10.7%) identified as the main reason for the introduction of eco-innovations the availability of government grants, subsidies or other financial incentives.

4. Discussion and Conclusions

The link between the social, environmental and economic spheres is quite obvious – human society is a subsystem of a larger natural ecosystem, whilst economy is again a subsystem of society. Despite the economists, the succession of planet-people-profit given by Elkington (1997) is therefore not accidental. Nevertheless, any development is impossible without economic stability. When applying the principles of sustainable development, it is also necessary to realize that these are issues that concern various stakeholders (Freeman had already mentioned the approach to stakeholders in 1984). However, principles that are set out once are not fixed and unchanging, but rather evolve as conditions change and are the result of a debate into which actors enter often with opposing goals and views. This inconsistency requires coordination leading to agreement on sustainability values. The sustainability of society may depend on the strong relationships between its members even more so than on strong individuals. Even in this case, it applies that cooperation which means synergy is desirable, which is evidenced by countless discussions and documents backed by transnational groupings, national governments and other legitimate bodies (UN, OECD, Office of the Government of the Czech Republic, Ministry of Industry and Trade of the Czech Republic, etc.).

Enterprises representing the core of every economic system obviously have a major impact on the sustainability of development of a state or a region. Acceptance of sustainable development in the business sphere is obvious, but it is characterized by profound disproportions. A voluntary commitment in the form of a comprehensive Corporate Social

Responsibility concept still tends to be associated with large companies, often with foreign participation. However, the criticism thereof (vague definitions, complexity of monitoring, impacts that cannot be measured precisely, exaggeration and distortion of activities to public manipulation and others) brings with it a number of alternative approaches (e.g. Kuldová, 2010), thereby opening a significant amount of space for applying similar principles within small and medium-sized businesses (Johnson, 2015; Lee, Herold, Yu, 2016; El Baz, Laguir, Marais, et al., 2016; Hodinková, Sadvský, 2016) with a sustainable performance assessment using an expert system based on fuzzy rules.

Sustainable innovations, and innovation in general, are primarily a business phenomenon, but they still do not have a firm place among other innovation activities. In Czech life and institutions, the main data base for monitoring company innovations is the research of the Czech Statistical Office, which is based on the Eurostat methodology (Oslo Manual). No form of sustainable innovation appears in the used classification of innovations; the closest innovation is ecological, which is, however, not considered an independent innovation.

Investment into research and development is another pitfall of innovative entrepreneurship. In spite of the constant effort to increase R&D expenditures, innovation activity in the Czech Republic is still inadequate. The overall small output is also a reflection of the low innovation activity of the small and medium-sized enterprises that make up the vast majority of companies. The OECD assessment (2016) clearly shows that additional money will not help innovations in the Czech Republic, but rather a better innovation system is needed. In their development, small and medium-sized enterprises rely heavily on subsidies from the EU, but the future of this funding source remains in question. One possible solution is greater interdependence between SMEs and scientific institutions. Sustainable innovations offer low-cost solutions, and ultimately, end users themselves can be part of the innovation process and not just the consumer of its outcome.

The existing efforts associated with sustainable development, i.e. state support, corporate social responsibility (although in a number of cases these may be accidental and more intuitive activities), or the growing interest in these activities among the public, clearly predetermine the further direction. The 'patriotism' of Czech consumers or the local influence of smaller companies also plays a role here.

Possible issues for further research into the sustainable innovative business activities of small and medium-sized enterprises include cooperation with key stakeholders; the creation of platforms that enable effective end-user involvement in the innovation process; cooperation with scientific institutions; sustainable innovations in relation to specific sectors; assessing the effect of implementing sustainable innovations, and others.

Acknowledgements

This paper was supported by Internal Grant Agency (IGA) FEM, CULS Prague [nr. 20181004 – Innovative activities in the context of sustainable development: the potential of regional labeling].

References

- ADAMEC, V. a kol. 2010. *Environmentální technologie a ekoinovace v České republice II*. Praha: CENIA, česká informační agentura životního prostředí – in The European Environment Agency (EEA).
- AMSP ČR. 2017. Vliv dotací na rozvoj malých a středních firem. Asociace malých a středních podniků a živnostníků České republiky [Association of Small and Medium-Sized Enterprises and Crafts of the Czech Republic]. [Online]. Available at: <http://amsp.cz/male-a-stredni-firmy-se-stavaji-zavisle-na-dotacich/>. [Accessed 2018, January 10].
- BARTH, H., ULVENBLAD, P., ULVENBLAD, P. 2017. Towards a Conceptual Framework of Sustainable Business Model Innovation in the Agri-Food Sector: A Systematic Literature Review. *Sustainability*, 9(9): 1–15. DOI:10.3390/su9091620.
- CZSO. 2016. Innovation Activities of Enterprises in the Czech Republic in 2012–2014. [Online]. Available at: www.czso.cz/csu/czso/inovacni-aktivity-podniku-v-cr-2012-az-2014. [Accessed 2018, January 10].
- GOODMAN, J., KORSUNOVA, A., HALME, M. 2016. *Stakeholders and End User Innovation*. Aalto Global Impact, Sustainability in Business Research, November 1, 2016. Dostupné z: <http://sub.aalto.fi/2016/11/01/stakeholders-and-end-user-innovation/>
- HALME, M., KORPELA, M. 2014. Responsible Innovation Toward Sustainable Development in Small and Medium-Sized Enterprises: a Resource Perspective. *Business Strategy and the Environment*, 23(8): 547–566, December 2014. DOI: 10.1002/bse.1801.
- HODINKOVÁ, M., SADOVSKÝ, Z. 2016. The benefits of corporate social responsibility introduction in small and medium-sized enterprises: a systematic review of the literature. *Business: Theory & Practice*, 17(4): 345–352, Dec. 2016. ISSN: 1648-0627. DOI: 10.3846/btp.17.11130.
- HÖRTE, S. Å., HALILA, F. 2008. Success factors for eco-innovations and other innovations. *International Journal of Innovation and Sustainable Development*, 3(3/4). [Online]. Available at: DOI: 10.1504/IJISD.2008.022231. [Accessed 2017, December 29].
- IKERD, J. 1995. *On defining sustainable agriculture for national training program*. University of Missouri. [Online]. Available at: <https://agronomy.unl.edu/FarmingSystems/organic/resourcevolumes/volume04.pdf>. [Accessed 2017, December 29].
- IPSOS, 2017. CSR & REPUTATION RESEARCH 2016. [Online]. [Accessed 2017, December 29]. Available at: https://www.ipsos.com/sites/default/files/2017-12/ipsos_csr_reputation_research_2016_vybrane_vysledky_z_verejne_casti_vyzkumu.pdf
- JOHNSON, M. P. 2015. Sustainability Management and Small and Medium-Sized Enterprises: Managers' Awareness and Implementation of Innovative Tools. *Corporate Social Responsibility & Environmental Management*, 22(5): 271–285. [Online]. Available at: DOI: 10.1002/csr.1343. [Accessed 2017, December 19].
- KAPLAN, M. 2017. *Lze na boji s chudobou vydělat?* [Online]. Available at: <http://www.czechaid.cz/lze-na-boji-s-chudobou-vydelat/>. [Accessed 2017, December 12].
- KATES, W. Robert, PARRIS M. Thomas, LEISEROWITZ, A. Anthony. 2005. What is Sustainable Development? Goals, Indicators, Values, and Practice. *Environment: Science and Policy for Sustainable Development*, 47(3): 9–21. [Online]. [Accessed 2017, November 17]. Available at: <https://doi.org/10.1080/00139157.2005.10524444>.

- KHAN, R. 2016. How Frugal Innovation Promotes Social Sustainability. *Sustainability*, 8(10): 1–29. [Online]. Available at: DOI: 10.3390/su8101034. [Accessed 2017, December 17].
- KUBÍČKOVÁ, L., MORÁVKOVÁ, M., TUZOVÁ, M. and NEČAS, I. 2017. The Role of Small and Medium-Sized Enterprises in the Development of Rural Areas. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 65(6): 1987–1996. [Online]. Available at: <https://doi.org/10.11118/actaun201765061987>. [Accessed 2018, January 10].
- KULDOVÁ, L. 2010. *Společenská odpovědnost firem: Etické podnikání a sociální odpovědnost v praxi*. Kanina – Plzeň: OPS.
- LANGENDAHL, P., COOK, M., POTTER, S. 2016. Sustainable innovation journeys: exploring the dynamics of firm practices as part of transitions to more sustainable food and farming. *Local Environment*, 21 (1): 105–123. [Online]. [Accessed 2017, December 17]. Available at: <http://dx.doi.org/10.1080/13549839.2014.926869>.
- LEE, K.; HEROLD, D. M.; YU, A. 2016. Small and Medium Enterprises and Corporate Social Responsibility Practice: A Swedish Perspective. *Corporate Social Responsibility & Environmental Management*, 23(2): 88–99. [Online]. Available at: DOI: 10.1002/csr.1366.
- LEUKHARDT, F., ALLEN, S. 2013. How environmentally focused is the German sustainability strategy? A critical discussion of the indicators used to measure sustainable development in Germany. *Environment, Development and Sustainability*, 15(1): 149–166. [Online]. Available at: DOI: 10.1007/s10668-012-9380-6. [Accessed 2017, December 17]
- MIT. 2016. Národní akční plán společenské odpovědnosti organizací v České republice. Ministry of Industry and Trade. [Online]. Available at: <https://www.mpo.cz/cz/podnikani/spolecenska-odpovednost-organizaci/schvaleni-aktualizovaneho-materialu-narodni-akcni-plan-spolecenske-odpovednosti-organizaci-v-ceske-republice--169121/>
- NAP CSR. 2017. CSR v ČR. National Action Plan for Corporate Social Responsibility in the Czech Republic. [Online]. Available at: <http://narodniportal.cz/csr-v-cr/>.
- NEWTON MEDIA. 2016. *Jak se píše o aktivitách CSR v médiích?* [Online]. Available at: <https://www.mediaguru.cz/clanky/2016/04/jak-se-pise-o-aktivitach-csr-v-mediich/>
- NIELSEN, K. R., REISCH, L. A., THØGERSEN, J. 2016. Sustainable user innovation from a policy perspective: a systematic literature review. *Journal of Cleaner Production*, 133(1): 65–77. [Online]. Available at: <https://doi.org/10.1016/j.jclepro.2016.05.092>.
- OFFICE OF THE GOVERNMENT OF THE CZECH REPUBLIC. 2017. Strategic Framework Czech Republic 2030. Government of the Czech Republic, 19. 4. 2017. 115 p. [Online]. Available at: <https://www.cr2030.cz/>. [Accessed 2017, December 12].
- OECD. 2006–2011. *Sustainable development key reports*. Organisation for Economic Cooperation and Development. [Online]. Available at: <http://www.oecd.org/green-growth/sustainabledevelopmentkeyreports.htm>. [Accessed 2017, December 10].
- PHILLIPS, W., LEE, H., GHOBADIAN, A., O'REGAN, N., JAMES, P. 2015. Social Innovation and Social Entrepreneurship: A Systematic Review. *Group & Organization Management*, 40(3): 428–461. [Online]. Available at: doi.org/10.1177/1059601114560063.
- RADJOU, N., PRABHU, J. 2015. *Frugal Innovation: How to do more with less*. London: The Economist.
- SACHS, J., SCHMIDT-TRAUB, G., KROLL, C., DURAND-DELACRE, D. and TEKSOZ, K. 2017. SDG Index and Dashboards Report 2017. [Online]. Available at: <http://www.sdgindex.org/assets/files/2017/2017-SDG-Index-and-Dashboards-Report--full.pdf>.

STEURER, R., HAMETNER, M. 2013. Objectives and Indicators in Sustainable Development Strategies: Similarities and Variances across Europe. *Sustainable Development*, 21(4): 224-241. [Online]. Available at: DOI: 10.1002/sd.501. [Accessed 2017, December 10].

UN-DESA. 1987. World Commission on Environment and Development – Our Common Future. United nations, Division for Sustainable Development. [Online]. [Accessed 2017, December 10]. Available at: <https://sustainabledevelopment.un.org/milestones/wced>.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Living on the edge: over-indebted households in Poland

Agnieszka Wałęga¹ and Grzegorz Wałęga²

¹*Department of Statistics, Faculty of Management, Cracow University of Economics, Rakowicka 27, 31-510 Kraków, Poland, e-mail: agnieszka.walega@uek.krakow.pl*

²*Department of Microeconomics, Faculty of Economics and International Relations, Cracow University of Economics, Rakowicka 27, 31-510 Kraków, Poland, e-mail: grzegorz.walega@uek.krakow.pl*

Abstract

The paper is a preliminary attempt to assess the phenomenon of over-indebtedness of households in Poland. After accession to the EU, an increase in household debt has been observed. This fact affects quality of life and is associated, in general, with an increase in over-indebtedness risks. The research presents a review of measures of over-indebtedness. In order to estimate the scale of the problem of indebtedness, financial margins have been calculated based on microeconomic data from a survey on household budgets in Poland. Results of the analysis indicate that the economic situation of households in Poland is good, and a percentage of those over-indebted is not high. Using a logit model, we have also proven the existence of a relationship between the probability of excessive household debt and its socio-economic characteristics.

Keywords: over-indebtedness, household, financial margin, logit model

JEL Code: D12, D14; D31

1. Introduction

Living on credit belongs to typical features of modern market economies. Technological development, an easy access to low-interest loans and a change in social perception have resulted in a rapid increase in household debt. Repeated global consumption patterns and a desire to quick fulfilment of consumer aspirations entail the need to reach for loans and credit facilities. However, an increased level of the debt is reflected in growing burdens of loan repayments (Keese, 2012; Wałęga, 2013). Frequently, problems with debt repayment are structural. Although they do not lead to household insolvency, they force households to live on the edge and hinder their normal functioning from the long-term perspective.

The aim of this study is to assess the problem of household over-indebtedness in Poland. In the course of the research, an econometric model has been developed to identify

socio-economic characteristics of households conducive to the emergence of the problem of over-indebtedness. The study uses microeconomic data from a survey on household budgets. In view of a limited number of scientific studies devoted to this issue, the article will shed light on the economic situation of indebted households in Poland. The obtained results can be used to compare the debt situation of households in other countries.

2. Over-indebtedness

Household debt is the subject matter of numerous studies which analyse reasons for taking loans, debt determinants and the impact of loans on the economic situation of households (Kirchler, Hoelzl, Kamleitner, 2008; Wałęga, Wałęga, 2015; Pastrapa, Apostolopoulos, 2015).

As emphasized by Bertola, Disney and Grant (2006, p. 17), an analysis of consumer loans would be incomplete without understanding what happens in case of problems with loan repayment.

Overindebtedness can be described as a situation when debt repayment becomes the main burden on a household budget, which, over a longer period, objectively prevents timely repayment of obligations in full, even in spite of a deterioration in living conditions of household members (Haas, 2006, p. 4; Russell, Maître, Donnelly, 2011, p. 71).

In the long-term perspective, the phenomenon of overindebtedness can lead to poverty and social and financial exclusion of the household (Reifner *et al.* 2003, p. 18). Household overindebtedness occurs when a household consumption plan financed with a loan is inconsistent with its potential income flow (Disney, Bridges, Gathergood, 2008, p. 13).

In the case of households, excessive debt has not only an economic (financial) and legal aspect, but also emotional, psychological and sociological ones (Świecka, 2009, p. 106; Hojman, Miranda, Ruiz-Tagle, 2016, p. 54–55). An overly indebted household cannot function normally. In economic terms, such a situation of a household can cause difficulties with the payment of liabilities and may be associated with insufficient assets that can be allocated to settle all debts.

The importance of these issues is also evidenced by the fact that in 2008, the Council of the European Union indicated consumer overindebtedness as one of the main problems to be solved (Davydoff *et al.*, 2008; see also: European Economic and Social Committee, 2014).

3. Measurement of Over-indebtedness

There is no general agreement as to how to measure consumer over-indebtedness and what kind of ratios to use (Frade, Lopes, 2003, p. 253). Despite an increase in household indebtedness in the EU states and increased interest in issues of excessive debt, no uniform methodology for research in this area has been developed to this day (Betti *et al.* 2007, p. 137; Russell, Maître, Donnelly 2011, p. 72).

When it comes to measures used in studies, there are those that identify overly indebted households and those that identify households at risk of insolvency. It is a broad range of statistical indicators, often created on an *ad hoc* basis. The following measures are most commonly used (Betti *et al.*, 2007, p. 137 and 138; Vadone, 2009, p. 71–73; Falanga, 2015; Hojman, Miranda, Ruiz-Tagle, 2016., p. 54–55): total household debt; debt

per capita; percentage of households that are net debtors; number of consumer bankruptcy proceedings; number of non-performing loans (that are not repaid on time); average amount of debt subject to bankruptcy proceedings; number of households that believe that they are over-indebted, as well as the consumption-income, debt-income and debt-assets ratios.

An analysis of household overindebtedness and of insolvency risk based on the total household debt (or repayments on account of liabilities) belongs to the simplest approaches to research. However, it does not allow one to identify potential financial problems. This approach ignores the consumer's capacity for loan repayment as high income can compensate for a nominally high level of total debt and related repayments. For this reason, ratios that demonstrate a debt-to-income relationship are preferred (Betti *et al.*, 2007, p. 138).

The majority of indicators are based on objective categories (such as, for example, the amount of debt), yet subjective assessments of their financial situation by consumers are also taken into account. Four basic ratios can be distinguished here (Disney, Bridges, Gathergood, 2008; d'Alessio, Iezzi, 2013):

- arrears:
 - households more than 3 months in arrears on a credit commitment or household bill ;
- a ratio of debt repayment burden:
 - households spending more than 25% of their gross monthly income on unsecured repayments
 - households spending more than 30% (or 50%) of their gross monthly income on total borrowing repayments (secured and unsecured);
- a number of loans:
 - households with 4 or more credit commitments.

The first of the said ratios identifies objectively the occurrence of financial problems of households. The other three measures can be used to determine the level of household debt. They indicate a potential risk of household insolvency, but they do not allow one to determine whether it is likely to take place.

Generally, three approaches (models) are used to analyse over-indebtedness and insolvency of households (Betti *et al.*, 2007, p. 138; Russell, Maître, Donnelly, 2011, p. 71 and 72). The first one – an objective model – analyses the economic situation of household based on, among other things, debt-to-income and/or debt-to-assets ratios. The degree of balancing consumer plans and loan repayment plans in relation to income is evaluated. The value of the indicator of the debt burden on the budget in relation to household income (wealth) is a measure of the household's ability to pay its debt. This is one of the most important determinants used to predict insolvency of households (Sullivan, Fisher, 1988, p. 60; Zajączkowski, Żochowski, 2007, p. 23). However, there is one problem with this approach: critical values of the ratios which, when exceeded, determine that a household is considered over-indebted need to be estimated arbitrarily. Moreover, it should be noted that values of these ratios may fluctuate during a family life cycle, which further hampers the measurement. A lack of complete information on the assets of individual households is another limitation of this model.

In research on a risk of over-indebtedness at the microeconomic level, a household financial margin is also used (Zajączkowski, Żochowski, 2007, p. 10). It is calculated as a difference between current income and fixed expenses (housing and food expenses) and expenses on debt repayment. A negative financial margin indicates that the timely repayment of loans by the household is at risk. A negative financial margin may be an early

signal of possible future problems with repayment, and loans granted to such households are considered to be higher-risk loans (Zajączkowski, Żochowski, 2007, p. 25). Furthermore, it is proposed to analyse changes in the financial margin in the circumstances of adverse market changes (stress tests) that cause an increase in costs of debt service (increase in interest rates, increase in foreign exchange rates).

To sum up, one should agree with Betti *et al.* (2007, p. 138) that in practice, it is extremely difficult to measure insolvency and distinguish indebted households from those over-indebted. Each of the methods discussed above has certain limitations, and this is the reason why, as far as the data are available, they should rather be applied jointly (on a complementary basis).

4. Methodology and Data

This study uses non-identifiable individual data from the household budget survey conducted in the years 2005–2015, made available by the Central Statistical Office of Poland. The object of the study includes households, and the subject of the study covers the amount of loan repayments.

In accordance with the procedure proposed by B.H. Vatne (2006, p. 44), a household financial margin is calculated as a difference between the current household income and its expenditure on elementary (vital) goods, plus expenditure on repayments of loans. In order to estimate the income buffer, the category of disposable income has been used (disposable income reduced by other expenses). Elementary consumption expenses include expenditure on food and housing as well as on health and transport. The said types of expenses are rather fixed and inflexible when compared to changes in household income. In the case of a decrease in income, it is difficult to limit those expenses. On the other hand, expenditure on repayments includes the following types of loans: mortgages, credit cards, other loans taken out in a bank, loans taken out in other institutions and with private individuals.

Factors affecting the probability of a negative financial margin have been identified using econometric modelling. In view of the fact that the response variable – the occurrence or non-occurrence of a negative income buffer – is dichotomous (it assumes two values: $Y = 1$ (identifies households with a negative income buffer) or $Y = 0$ (households with a positive income buffer)), a logit model has been used. Depending on certain factors (x_j), in this model, probability can be interpreted as a value of the distribution function described with the following formula (Maddala, 2006, s. 371–375; Vadone, 2008, p. 774–775;

$$P(Y = 1) = \frac{\exp(\alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_k X_k)}{1 + \exp(\alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \dots + \alpha_k X_k)} \quad (1)$$

where: Y is a dummy dependent variable, X_1, \dots, X_k are explanatory variables, while $\alpha_0, \dots, \alpha_k$ are model parameters.

The parameters of the above model are most often obtained using maximum likelihood estimation (MLE), by maximizing the logarithm of the probability function relative to the model parameters by means of iterative numerical procedures.

Characteristics of the household and the household head have been used as explanatory variables:

- quintile group of income *per capita*,

- gender (1 – male, 0 – female),
- married (dummy variable: 1 – married, 0 – single)
- education level of a reference person¹⁰⁷ (five dummy variables – reference level: lower secondary or lower),
- age of a reference person (four dummy variables – people of up to 34 years of age were adopted as a reference group),
- class of the place of residence (four dummy variables – reference group: households located in the countryside),
- full working time (dummy variable: 1 – full-time job, 0 – part-time job),
- employment contract for an indefinite period (dummy variable: 1 – employment contract for an indefinite period, 0 – part-time job).

5. Results

The financial margin was calculated for households that had showed expenditure on debt repayment in an analysed month. In a sample surveyed in the years 2005–2015, such households ranged from 30% in 2005 to 26% in 2015 (which is approximately 10,000 households per year).

An estimation of a percentage of households with a negative financial margin in the years 2005–2015 is presented in Table 1. Among households in total, the percentage fluctuated from 9.18% (2015) to 14.69% (2000).

Most households with a negative financial margin belong to households in the first quintile group of income *per capita*, and the least of them are among households in the last – fifth group. Apart from low income, another reason for a negative financial margin of a household may also be a high burden of debt repayments. Considering the economic situation, this group of households has limited possibilities of substituting intertemporal consumption without using loans. It is characteristic that over the analysed decade, there has been a decrease in the percentage of such households among the poorest by nearly 4 percentage points, and in the second quintile income group – by almost 6 percentage points. This can be interpreted as a relative decrease in borrowers of higher risk in this group of borrowers.

The analysis indicates a negative relationship between the percentage of households with a negative financial margin and the education level of a reference person. It should be associated with a generally higher level of knowledge about finance and budget planning among households run by people with secondary and higher education than with vocational and lower education.

On the other hand, as regards the age of the household head, there is a tendency for a negative financial margin to occur more frequently in households run by older people (over the age of 55). It can be assumed that young people understand mechanisms of a modern complex financial market better than older people. Moreover, households whose reference person is under the age of 34 are more flexible on the labour market; therefore, it is easier for them to earn income. The group of households aged 55+ also includes a significant percentage of single-person households (of widows or widowers), which are more exposed to the risk of financial problems.

¹⁰⁷ A reference person is a person who is at least 16 years of age and earns, in a long term, the highest fixed income from among all household members, intended for the needs of those household members (Central Statistical Office, 2011, p. 38).

Table 1: Proportion of households (as a percentage) with a negative income buffer among households repaying loans in selected socio-economic cross-sections in the years 2005–2015

| Specification | 2005 | 2008 | 2010 | 2012 | 2015 |
|---------------------------------------|-------|-------|-------|-------|-------|
| quintile group of income per person | | | | | |
| I | 39.02 | 36.20 | 32.54 | 38.24 | 35.04 |
| II | 16.62 | 15.20 | 13.13 | 14.13 | 10.75 |
| III | 12.90 | 12.85 | 10.92 | 9.64 | 7.64 |
| IV | 12.11 | 10.58 | 8.54 | 9.22 | 6.56 |
| V | 8.91 | 8.26 | 7.48 | 7.24 | 4.92 |
| education level of a reference person | | | | | |
| Lower secondary or lower | 21.16 | 19.79 | 16.84 | 16.47 | 13.92 |
| Basic vocational | 15.05 | 14.62 | 12.55 | 12.89 | 9.67 |
| Upper secondary general | 14.29 | 12.74 | 9.88 | 10.85 | 11.29 |
| Upper secondary vocational | 12.72 | 11.93 | 11.50 | 12.35 | 8.61 |
| Tertiary | 11.09 | 10.83 | 9.08 | 9.20 | 7.35 |
| age of a reference person | | | | | |
| Up to 34 years old | 11.38 | 11.40 | 9.22 | 9.74 | 7.86 |
| 35–44 | 12.91 | 11.66 | 9.58 | 10.13 | 8.53 |
| 45–54 | 15.33 | 13.83 | 10.98 | 11.50 | 8.74 |
| 55 and more | 17.35 | 16.40 | 16.10 | 15.12 | 10.71 |
| class of the place of residence | | | | | |
| Countryside | 20.51 | 18.42 | 15.68 | 15.87 | 12.01 |
| Towns below 100 thous. | 12.20 | 10.18 | 9.38 | 9.66 | 7.93 |
| Cities 100–499 thous. | 10.47 | 11.09 | 9.03 | 9.12 | 6.29 |
| Cities 500 thous. and over | 11.32 | 11.62 | 8.99 | 9.44 | 8.11 |
| Total | 14.69 | 13.76 | 11.77 | 11.94 | 9.18 |

Source: own calculations based on unidentified data from the household budget survey in the years 2005–2015

Furthermore, the conducted research indicates that the highest percentage of households with a negative financial margin is located in the countryside. It seems that this is largely associated with the nature of income of families living off agriculture, which is subject to greater fluctuations during a year than, for example, income of households of individuals in employment. An additional factor resulting in a higher risk of a negative income buffer may be a lower average level of education of people living in the countryside and their income.

Table 2: Share of indebted households (as a percentage) by value of debt to income burden in the years 2005–2015

| Debt to income burden | 2005 | 2008 | 2010 | 2012 | 2015 |
|-----------------------|-------|-------|-------|-------|-------|
| Up to 20% | 74.25 | 76.01 | 72.01 | 69.41 | 70.36 |
| 20–39.9% | 20.39 | 19.11 | 21.89 | 24.13 | 23.96 |
| 40–59.9% | 3.76 | 3.41 | 4.56 | 4.73 | 4.21 |
| 60% and more | 1.61 | 1.47 | 1.54 | 1.72 | 1.47 |

Source: own calculations based on individual data from the household budget survey in the years 2005–2015

Information on the distribution of debt to income burden in Polish households is presented in Table 2. Analyses show that about 70% of family budgets are slightly burdened with loan repayments (debt to income burden of up to 20%). For every fifth household, repayment of loans constitutes approximately 20–40% of disposable income. As regards

the years 2005–2015, over-indebtedness applies to 5–6% of all households repaying loans. It is worth noting that signs of crisis of 2010 and 2012 are reflected in the presented statistics; during that period, there was an increase in a number of households that were moderately and heavily burdened with repayments. In order to identify factors that determine the existence of a negative financial margin in a household, parameters of a logit model have been estimated. A data set for 2015 included 9530 observations from households that paid their debts in the analysed month.

Table 3: Estimation results of the logit model parameters

| Specification | Parameter | Standard error | Wald statistics | p-value |
|----------------------------|-----------|----------------|-----------------|---------|
| Constant | 0.422 | 0.131 | 10.368 | 0.001 |
| Quantile II | -1.555 | 0.117 | 177.474 | 0.000 |
| Quantile III | -2.020 | 0.121 | 278.727 | 0.000 |
| Quantile IV | -2.253 | 0.123 | 337.869 | 0.000 |
| Quantile V | -2.672 | 0.127 | 443.501 | 0.000 |
| Towns below 100 thous. | -0.254 | 0.088 | 8.381 | 0.004 |
| Cities 100–499 thous. | -0.394 | 0.116 | 11.611 | 0.001 |
| Upper secondary general | 0.537 | 0.137 | 15.301 | 0.000 |
| Upper secondary vocational | 0.271 | 0.101 | 7.150 | 0.007 |
| Tertiary | 0.481 | 0.112 | 18.470 | 0.000 |
| Indefinite period | 0.353 | 0.119 | 8.786 | 0.003 |
| Full working time | -0.358 | 0.135 | 7.044 | 0.008 |
| >55 years old | 0.492 | 0.100 | 24.413 | 0.000 |
| Married | -0.273 | 0.092 | 8.815 | 0.003 |
| Gender | -0.174 | 0.087 | 3.974 | 0.046 |
| AIC | | | 5240.82 | |
| R ² Nagelkerk | | | 0.14 | |
| Log(likelihood ratio) | | | -2605.41 | |

Source: own calculations based on individual data from the household budget survey in the year 2015

Estimation results of the model parameters (Table 3) indicate that the probability of a negative financial margin is lower in the case of households run by a married man with a full-time job. This probability also decreases with an increase in income and with an increase in the size of the locality of the household. The income level has the greatest impact on the probability of a negative financial margin. Other variables taken into account result in a higher likelihood of a negative financial margin in a household. In general, the results obtained using an econometric model confirm the observations from the analysis of information contained in Table 1.

6. Discussion and Conclusions

The conducted research indicates that households in Poland are burdened with repayments of loans to a small extent. Nearly 3/4 of the surveyed households had the debt burden ratio of up to 20%. Over-indebtedness applies to approximately 6% of households. A relatively good financial situation of households in Poland is a result of a prosperous economy and a situation on the labour market in the second decade of the 21st century. However, it is worth pointing at a gradual increase in the loan burden on household budgets.

This phenomenon concerns individuals who can be considered moderately indebted (debt burden ratio of 20 to 60%). In this group of households, a percentage increased by over 4 percentage points during the period from 2005 to 2015.

The analyses show that such features as being a member of the first quintile group (the lowest income), age over 55, low level of education and location in the countryside increase the risk of a negative financial margin in indebted households. In addition, as a result of using econometric modelling, an increase in the probability of a negative financial margin in a household is affected by such features as an employment contract for an indefinite period and the level of education, which has produced results contrary to expectations. Therefore, it is reasonable to conduct further research in this area using, for example, other indicators or methods of analysis.

The conducted research is important from the point of view of the stage following over-indebtedness – declaration of household bankruptcy. Familiarity with determinants of over-indebtedness can be helpful in developing support plans for this group of households at the national level. Moreover, the conducted research can be used as a guide for determining new areas and target groups in social policy

Acknowledgements

This paper was supported by funds from the National Science Centre (NCN. Poland) through grant No. UMO-2015/19/D/HS4/02569.

References

- BERTOLA, G., DISNEY, R. and GRANT, C. 2006. The economics of consumer credit demand and supply. In: *The Economics of Consumer Credit*. Eds. G. Bertola, R. Disney, C. Grant. Cambridge-London: MIT Press.
- BETTI, G., DOURMASHKIN, N., ROSSI, M., et al. 2007. Consumer over-indebtedness in the EU: measurement and characteristics. *Journal of Economic Studies* 34(2): 136–156.
- CENTRAL STATISTICAL OFFICE 2011. *Metodologia badania budżetów gospodarstw domowych*. Warszawa: Główny Urząd Statystyczny. Departament Warunków Życia.
- D’ALESSIO, G. and IEZZI, S. 2013. Household over-indebtedness: definition and measurement with Italian data. *Bank of Italy Occasional Paper No. 149*.
- DAVYDOFF, D. et al. 2008. *Towards a common operational European definition of over-indebtedness*. European Communities: Directorate-General for Employment, Social Affairs and Equal Opportunities. Brussels: European Commission.
- DISNEY, R., BRIDGES, S. and GATHERGOOD, J. 2008. *Drivers of Overindebtedness*. Report to the Department for Business, Enterprise and Regulatory Reform. Centre for Policy Evaluation. University of Nottingham.
- EUROPEAN ECONOMIC AND SOCIAL COMMITTEE 2014. *Opinion of the Risk of over-indebtedness and behavioral factors EESC on Consumer protection and appropriate treatment of overindebtedness to prevent social exclusion [online]*. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014AE0791>. [Accessed: 22 February 2018].

- FALANGA, M. A. 2015. Over-indebtedness in the EU: from figures to expert opinions. Réseau Financité & EFIN [Online]. Available at: <http://www.ecosocdoc.be/static/module/bibliographyDocument/document/004/3123.pdf>. [Accessed: 18 February 2018].
- GREENE, W. H. 2008. *Econometric Analysis*. 6th Edition. New Jersey: Pearson Education. Inc.
- HAAS, O. J. 2006. Overindebtedness in Germany. Working Paper N° 44. Geneva: International Labour Office.
- HOJMAN, D. A., MIRANDA, Á. and RUIZ-TAGLE, J. 2016. Debt trajectories and mental health. *Social Science & Medicine* 167: 54–62.
- KEESE, M. 2012. Who feels constrained by high debt burdens? Subjective vs. objective measures of household debt. *Journal of Economic Psychology* 33(1): 125–141.
- KIRCHLER, E., HOELZL, E. and KAMLEITNER, B. 2008. Spending and credit use in the private household. *The Journal of Socio-Economics* 37(2): 519–532.
- MADDALA, G. S. 2013. *Ekonometria*. Warszawa: Wydawnictwo Naukowe PWN.
- PASTRAPA, E. and APOSTOLOPOULOS, C. 2015. Estimating Determinants of Borrowing: Evidence from Greece. *Journal of Family and Economic Issues* 36(2): 210–223.
- REIFNER, U., KIESILAINEN, J., HULS, N., et al. 2003. Consumer overindebtedness and consumer law in the European Union. Final Report presented to the Commission of the European Communities. Health and Consumer Protection Directorate-General. September [Online]. Available at: http://www.knl.lv/raksti_data/1147/parskats_ES_2003.pdf. [Accessed: 20 February 2018].
- RUSSELL, H., MAÎTRE, B. and DONNELLY, N. 2011. Financial Exclusion and Over-indebtedness in Irish Households. Department of Community, Equality & Gaeltacht Affairs and Economic and Social Research Institute [Online]. Available at: http://www.socialinclusion.ie/publications/documents/2011_03_07_FinancialExclusionPublication.pdf. [Accessed: 20 February 2018].
- SULLIVAN, A. C. and FISHER, R. M. 1988. Consumer credit delinquency risk: Characteristics of consumers who fall behind. *Journal of Retail Banking* 10(3): 53–64.
- ŚWIECKA, B. 2008. Niewypłacalność gospodarstw domowych. Przyczyny – skutki – przeciwdziałanie. Warszawa: Wydawnictwo Difin.
- ŚWIECKA, B. 2009. Bankructwa gospodarstw domowych. Perspektywa ekonomiczna i społeczna. Warszawa: Wydawnictwo Difin.
- VANDONE, D. 2009. *Consumer credit in Europe: Risks and opportunities of a dynamic industry*. Heidelberg: Physica-Verlag.
- VATNE, B. H. 2006. How large are the financial margins of Norwegian households? An analysis of micro data for the period 1987–2004. Norges Bank. *Economic Bulletin* 77(4): 173–180.
- WAŁĘGA, G. 2013. Convergence Processes in Central and Eastern European Household Credit Market. In: *Proceedings of 7th International Days of Statistics and Economics*. Eds. T. Löster. T. Pavelka. Prague: MELANDRIUM.

- WAŁĘGA, A. and WAŁĘGA, G. 2015. Determinants of loan repayments: evidence from household budget survey in Poland. In: Proceedings of 9th International Days of Statistics and Economics. Eds. T. Löster. T. Pavelka. Prague: MELANDRIUM.
- ZAJĄCZKOWSKI, S. and ŻOCHOWSKI, D. 2007. Obciążenia gospodarstw domowych spłatami długu: rozkłady i stress testy: na podstawie badań budżetów gospodarstw domowych GUS. Materiały i Studia. Narodowy Bank Polski. Zeszyt nr 221.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The influence of SI on the flexibility of relationships with suppliers – research framework

Grażyna Wieteska¹

¹Department of Logistics, Faculty of Management, University of Łódź, Matejki 22/26, 90-237 Łódź, Poland, e-mail: gwieteska@uni.lodz.pl

Abstract

The increase in business uncertainty and environmental turbulence has become a key management challenge today. More and more companies are building flexibility into their supply chains to ensure a smooth response to changes in supply, demand, product as well as to crisis situations. Since flexibility is seen as the key element of resilient supply chains, it is important to design a resilient supplier base as early as during the NPD process.

The paper presents the research framework developed in the project “Flexibility in relationships with suppliers in terms of supplier-purchaser models of cooperation on product development in the B2B market”, no. 2016/21/B/HS4/00665, financed by the National Science Centre (NCN) in Poland. The main scientific objective of this project is to identify the dependencies between sourcing, supplier flexibility and involving suppliers in product development.

The article consists of different sections, in which author presents a literature review, conceptual model, hypotheses, research constructs, theoretical and managerial implications.

Keywords: supplier involvement, uncertainty, supplier flexibility, product development

JEL Code: M10, M11, M19

1. Introduction

When configuring supply chains, managers assess the legitimacy of implementing a lean or agile strategy. There are several determinants influencing their decisions, e.g. degree of product variability, length of product life cycle, production environment (e.g. make to stock, make to order) or type of demand (Ma-son-Jones, Naylor and Towill, 2000). Some companies opt for a leagile strategy, guided by long lead time and high uncertainty of demand (Christopher, Peck and Towill, 2006). M. Christopher (2000) explains that the key characteristic of an agile organization is flexibility. A. de Toni and S. Tonchia (2005) identi-

fied that the concept of flexibility was described, for the first time in the economic literature, by G. Stigler, who used an economic and organizational approach (Carlson 1989). With regard to the economic approach, G. Stigler defined flexibility as the ability to produce different lot sizes. This approach is more popular among companies incurring lower marginal costs related to the changes in production volume. In turn, he linked the organizational approach with companies that respond to the uncertainty resulting from fluctuations in demand. Over time, organizational flexibility has begun to refer to each type of change in the internal and external environment of companies (Osbert-Pociecha, 2008, p.13). Fayezi, Zutshi and O’Loughlin point out that environmental changes are a source of uncertainty for enterprises (2014). Uncertainty refers to the situation when the company has insufficient knowledge to predict all potential scenarios resulting from its decisions or operations (Svensson, 2002). According to the Enterprise Risk Management Standard, uncertainty is the inability to accurately predict the likelihood or outcomes of future events (COSO 2004, pp. 15, 117). These events may adversely affect the efficiency and effectiveness of processes carried out by enterprises (Koh and Saad, 2002).

G. Osbert-Pociecha (2004, p. 51) suggests that “in the face of deepening environmental turbulence and increasing dynamics of changes within the organization, flexibility has become a desirable attribute that determines business continuity and development of the organization”. Christopher and Holweg (2011) also underline, that the high level of environmental variability necessitates building supply chain flexibility.

The main aim of the paper is to present the assumptions of the theoretical model on the influence of supplier involvement (SI) on the flexibility of relationships with suppliers. The paper consists of different sections, in which author presents both a theory background and a conceptual model, hypotheses, studied constructs, theoretical and managerial implications.

2. Literature review

2.1. The flexibility of relationships with suppliers

Following a literature analysis, Fayezi, Zutshi and O’Loughlin (2014) define supply chain flexibility as “the ability of an organization to manage the internal (e.g. manufacturing) and interfacing (e.g. procurement and distribution) processes, as well as its key suppliers/customers to respond to expected changes in supply, product and demand in an efficient manner enabled by both technological and social platforms”. Fantazy et al (2009) concluded that the literature covers twelve supply chain flexibility dimensions, between which dependences have not yet been sufficiently studied.

An analysis of literature (Vickery, Calantone and Droge, 1999, Duclos, Vokurka and Lummus, 2003, Pujawan, 2004, Slack, 2005, Sanchez and Perez, 2005, Kumar et al, 2006, Fantazy et al, 2009, Chu Po-Young et al, 2012, Fayezi, Zutshi and O’Loughlin, 2014) highlighted that one of the main supply chain flexibility dimension is the flexibility in relationships with suppliers, which consists of:

- sourcing flexibility (procurement flexibility),
- supplier flexibility (vendor/supplier flexibility).

Sourcing flexibility is primarily the ability to reconfigure the supply base and/or shift orders between suppliers rapidly (Duclos, Vokurka and Lummus, 2003, Pujawan, 2004). Among other things, it involves double and multi sourcing.

Supplier flexibility is the ability of suppliers to effectively respond to changes occurring to orders received from clients (Fantazy et al, 2009). It is divided into:

- supplier volume flexibility – supplier’s ability to respond to volume changes,
- supplier mix flexibility – supplier’s ability to respond to alterations to the type of ordered items,
- supplier delivery flexibility – supplier’s ability to respond to delivery time changes,
- supplier product flexibility – supplier’s ability to make changes in the offered goods.

Supplier flexibility is described quite similarly across the literature (Zhang et al, 2003, Sanchez and Perez, 2005, Kumar et al, 2006, Tachizawa and Giménez, 2009). Its particular types have been described in detail by Pujawan (2004), Chu Po-Young et al (2012).

2.2. Joint product development in supply chain

Companies are increasingly willing to cooperate in the area of research and development as well as in production (Harary and Pulizzi, 2014). The key reason for cooperating in joint ventures, strategic alliances or in-formal collaborations is access to new or emerging technologies. Primarily, companies cooperate in this regard with suppliers (PricewaterhouseCoopers, 2015, pp. 25, 26).

Joint product development (JPD) is the situation in which more than one organization performs in the product development process. It is mainly related to the collaboration between different supply chain links (Andersen and Munksgaard, 2009). In addition, it is a leading interaction performed in relationship with suppliers (PricewaterhouseCoopers, 2013, p. 14). JPD is a practice of agile supply chains (Christopher, 2000). It is a way of dealing with shortening product life cycle times and the increasing rate of technological changes. This approach is associated with such benefits as: shortened the time of new product development (NPD) processes, cost reduction (of design, purchasing, manufacturing) and improved product quality. Recently, the most popular concept in the area of JPD is Early Supplier Involvement (ESI). Supplier involvement is possible on each stage of a new product development (NPD) process (Handfield and Lawson, 2007). However, the timing of supplier integration is crucial for project performance (Hauser, Tellis and Griffin, 2006). It is therefore recommended to involve suppliers as early as at the stage of idea generation (Wagner, 2012).

The literature (Trent and Monczka 1999, Christopher 2000, Nellore and Söderquist 2000, Lee 2002, Handfield and Lawson 2007, Wagner 2012) is a source of different types of supplier-purchaser cooperation on product development in the B2B market. The criteria of their classification include mainly the stage at which the supplier is involved in the product development process and the size of their responsibility for the creation of product specification (Wieteska, 2017a).

3. Research hypotheses

3.1. Supplier involvement and supplier flexibility

JPD requires a close cooperation between supplier and purchaser. Supplier involvement means “supplier participation in the integrated product development process” (Birou and Fawcett, 1994). It has been revealed that different departments (e.g. sales, engineering,

manufacturing) of both partners take part in the NPD process (Birou and Fawcett, 1994, Takeishi 2001, McIvor and Humphreys, 2004, Parker, Zsidisin and Ragatz, 2008). However, researchers underline the key role of the procurement function for product development performance (Wynstra, Weggemann and Van Weele, 2003, Shiele, 2010). One of the main tasks of purchasing managers is the selection of reliable partners for NPD (Sjödin and Eriksson, 2010). The initial assessment of potential suppliers consists of various criteria (Büyüközkan and Görener, 2015), including flexibility (Handfield et al, 1999). The importance of supplier capabilities for the success of NPD projects is confirmed (LaBahn and Krapfel, 1994, Wasti and Liker, 1997, Liker, Kamath and Wasti, 1998). Companies primarily search for responsive suppliers with high technical capabilities. It is interesting that manufacturers are liable to support partners through supplier development programs. Some studies revealed that business clients are willing to perform activities aimed at improving the manufacturing systems of suppliers (Bozdogan et al, 1998, Saeed, Hossein and Hossam, 2013). An example is the initial supplier audit and its support in the scope of improvement activities necessary before the final acceptance of supplier as a business partner (Wieteska 2017c). Supplier flexibility (volume, mix, delivery, product) is the result of the supplier's flexible manufacturing system (Wieteska 2016). It is therefore expected that:

H1: Supplier involvement increases supplier flexibility.

3.2. Supplier involvement and sourcing flexibility

Sourcing flexibility requires more than one source of supply (Pujawan 2004). However, the first stage of JPD implementation is the reduction of supplier base. This enhances single sourcing (Asmus and Griffin, 1993). Supplier involvement mainly concerns suppliers of strategic and critical components (Wynstra and Pierick 2000, Cantarello et al 2011, Luzzini et al, 2015), whose number on the market is usually limited. Furthermore, the main principle, especially for ESI, is a partnership (Asmus and Griffin, 1993) based on mutual trust, communication, transparency and adherence to long-term agreements (LaBahn and Krapfel, 2000, Wagner, 2012, Parker, Zsidisin and Ragatz, 2008, Sjoerdsma and Weele, 2015). This increases the probability of single sourcing implementation.

First of all, NPD success depends on the frequency of communication and mutual visits (Takeishi, 2001). Therefore it seems appropriate when involved suppliers are located close to the client's production site. While co-location assists engineers of suppliers when visiting the client's plant (Ragatz, Handfield and Petersen, 2002, Parker, Zsidisin and Ragatz, 2008), this does not necessarily require a short distance between partners. Furthermore, the proximity of involved suppliers is not that important in the face of communication methods used in JPD except meetings: Internet, EDI (McIvor and Humphreys, 2004). Additionally, globalization increases geographical extension of supply chains, which can slow down the supplier's response to sudden orders. It is hypothesised that:

H2: Supplier involvement decreases sourcing flexibility.

3.3. Supplier involvement and supply uncertainty

The papers on supplier involvement usually refer to uncertainty brought about by the novelty and complexity of technology (Ragatz, Handfield and Petersen, 2002, Petersen, Handfield and Ragatz 2003). It is proven that supplier involvement eliminates uncertainties related to quality and time in NPD projects (Handfield et al, 1999, Jayaram, 2008). Furthermore, ESI reduces the risk of technical problems, loss of suppliers and supplier capacity constraints (Zsidisin and Smith, 2005).

Product development processes do not end when the prototype is finished. Some authors also include the production phase into NPD (Mikkola and Skjoett-Larsen, 2003, Danilovic 2006). Takeishi (2001), among JPD tasks, lists assessment and improvements to mass production during which manufacturers conduct supplier improvement activities (Bozdogan et al, 1998) and various co-investments (Saeed, Hossein and Hossam, 2013). This ensures the reliability of suppliers, especially in the context of agreed quality and punctuality of ordered deliveries. Moreover, the decision on supplier involvement is based on a detailed assessment (Handfield et al 1999) which allows the efficient mitigation of supply uncertainty. Khan, Christopher and Burnes (2008) suggest managing supply chain risk in the product design stage. It is expected that:

H3: Supplier involvement decreases supply uncertainty.

3.4. The effect of flexibility on a client's KPIs

In the face of global purchases and growing turbulence in the international business environment, an increase in supply chain flexibility is recommended (Fayezi, Zutshi and O'Loughlin 2014). This can be achieved by selecting flexible suppliers that are able to quickly respond to demand changes in terms of product, delivery time, volume and product mix (Tachizawa and Giménez, 2009). Cooperation with a reliable supplier base ensures the quality, time, flexibility and cost objectives of the supply chain.

Supplier assessment plays an important role in supply chain risk management (Torres-Ruiz and Ravindran 2018). However, sometimes it is impossible to prevent all external risks (e.g. eruption of Eyjafjallajökull in 2010, Japan's 2011 earthquake) that may directly influence first or second tier suppliers. Benyoucef and Forzley (2007) stated that "supply chain disruptions can directly affect corporate stock prices by nearly 9%, and revenue losses by 20%". Surprisingly, Wieland and Wallenburg (2012), revealed that there is no relation between a company's agility and business performance. This requires further studies, especially in terms of relationships with suppliers. Without a doubt, companies need to have contingency plans that maintain a required level of customer service during crisis situations (Forbes 2009). One of the elements of supply chain resilience is multi sourcing (Hohenstein 2015). Multi sourcing determines sourcing flexibility (Tachizawa and Giménez, 2009). According to the research results, supply flexibility and supply continuity are built using similar practices (Wieteska 2017b). It is hypothesised that:

H4: Supplier flexibility has a positive influence on purchaser's KPIs.

H5: Sourcing flexibility has a positive influence on purchaser's KPIs.

4. Discussion on variables and research sample

The project base is a conceptual model of product development in flexible relationships with suppliers (Figure 1). It is defined by five hypothesis, whose verification requires quantitative data. The theoretical model consists of several constructs, all of which the research questionnaire must be able to measure. Each construct will be described with several observable indicators. Based on the in-depth literature review and case studies (Wieteska, 2017a, 2017b, 2017c), the variables and research sample can be defined as follows.

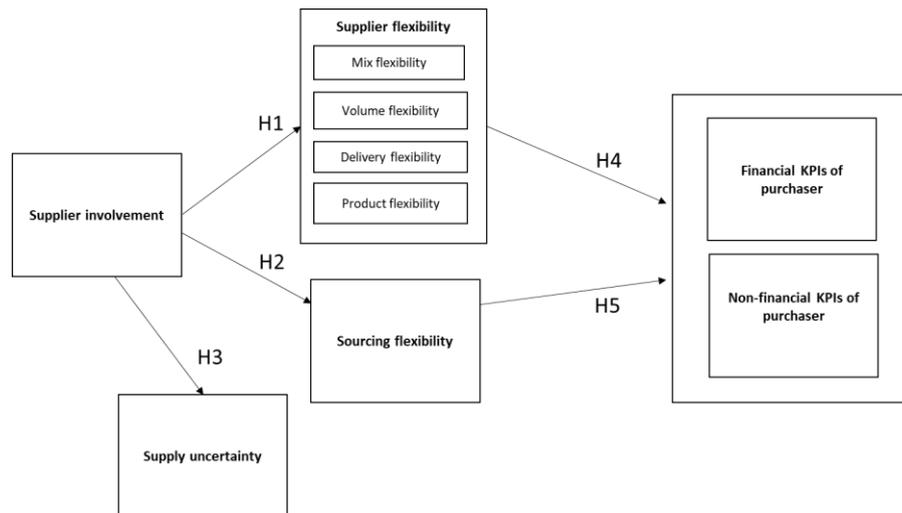


Figure 1: The theoretical model of the product development in flexible relationships with suppliers.
Source: own study

The literature provides many different studies on *supplier involvement*. With regard to these studies, this construct will be measured using the following variables:

- Timing (Hartley, Zirger and Kamath 1997, Handfield and Lawson 2007, Parker, Zsidisin and Ragatz 2008).
- Type of involved suppliers (Birou and Fawcett 1994).
- Supplier-buyer relationship, especially: supplier's dependence (Kähkönen, Lintukangas and Hallikas 2015), buyer's dependence (essentiality or substitutability of supplier's resource), trust (goodwill trust and competence trust), commitment (affective or calculative) (Jong and Nooteboom 2000).

As some researchers consider supplier assessment a valuable tool (Handfield et al 1999, Büyüközkan and Görener, 2015), the questionnaire should also identify criteria that are crucial for the decision on including suppliers in product development.

Based on the case studies (Wieteska 2017b), it is noted that the main external factors influencing product development today are: the sustainability concept and increased interest of consumers in healthy lifestyles, which results in the introduction of eco-product (e.g. eco-designed cars, organic food or natural and organic cosmetics). The next strongest factor influencing product development is mobile technologies. Therefore, it would be interesting to identify in the research the types of product innovations that require supplier involvement. Following on from these considerations, company innovativeness should also be included in the research. The measurement of which can be adopted from Golgeci

and Ponomarov (2015). When it comes to eco-products, the environmental sourcing construct may be included to the proposed model, following the measurement proposed by Brewer and Arnette (2017).

Supplier flexibility measurement will be adopted from Chu Po-Young et al (2012), their approach being adequately detailed.

Sourcing flexibility can be measured using items presented by Pujawan (2004) and Tachizawa and Giménez (2009). It is also worth supplementing these with descriptions of other sourcing strategies, e.g. domestic and offshoring strategy (Wu and Zhang 2014) or single and multi-sourcing (Costantino and Pellegrino 2010). It is interesting to know whether the supplier selection criteria and sourcing strategies formulated in NPD support the building of resilient supply chains. Following these considerations, the research should also identify respondents' opinions on the impact of supplier involvement on the mitigation of various risks. Zsidisin and Smith (2005) made an interesting attempt in this regard.

Supply uncertainty should be measured through the most frequent supply risks. According to the research results, these risks are primarily: untimely deliveries and inadequate quality of deliveries (Wieteska 2010).

Finally, *purchaser's key performance indicators* should be taken from a standard that is willingly implemented by companies. It is therefore proposed to use the basic measures that are in the SCOR model: reliability, responsiveness, agility, cost, assets (Supply Chain Council 2012 p. 8).

The study should also take into account control variables: including company size, industry and origin of capital.

The interviewed companies will be production companies. The CATI (Computer-Assisted Telephone Interviewing) method will be used to ensure a high response rate. The survey will gather the opinion of respondents, who will be asked to indicate answers using the seven-point Likert scale. Due to the wide scope, it is suggested that those questions regarding product development will be answered by (new) product managers whereas the questions about suppliers will be answered by purchasing managers or supply chain managers employed in the same organization.

An important question arises; should only one or several industries be examined? In the literature on supplier involvement there are many articles studying only one industry, e.g. automotive (Kamath and Liker 1994, Takeishi 2001, Zirpoli and Caputo 2002), but also research on various industries, e.g. chemical, medical, electronic, pharmaceuticals, packaging, textiles (Petersen, Handfield and Ragatz 2003, Jayaram 2008, Parker, Zsidisin and Ragatz 2008). It is proven that the decision on supplier involvement, especially at a very early stage of NPD, depends on the product's characteristics. For example, the greater the complexity of the product the greater the willingness of companies' ESI (Handfield et al 1999). This prompts the author to focus on one industry or even on similar groups of products.

It was therefore decided to examine an industry which has not been sufficiently researched yet. Certainly, the cosmetics industry is such an industry. The literature on the subject contains only individual articles presenting case studies of developments in the cosmetics industry (Laursen et al. 2016). Due to the shortening life cycle of cosmetic product, the growing number of cosmetic innovations, as well as the strong eco-trend (Czeraniak and Sipiński 2017, p. 22), the cosmetics industry seems to be an interesting avenue to investigate. In addition, the first scientific considerations show that the supply chains of natural and organic cosmetics may have increased vulnerability to disruptions (Wieteska 2018).

5. Conclusions

At a time when business uncertainty is growing, the issue of building the resilience of supply chains is particularly important. NPD is strongly associated with the configuration of a new product supply chain, understood, among others, as the selection of suppliers and sourcing strategies as well as designing of adding value processes. It is suggested that risk management should be considered as early as during the product development process (Khan, Christopher and Burnes 2008). At the same time, continuity plans should be prepared to ensure business continuity.

The proposed research framework concerns the practise of supplier involvement, which is undoubtedly implemented by manufacturing companies more and more often. In general, the theoretical model aims to examine the impact of this practice on supplier base flexibility. A relation which has not been investigated so far.

Flexibility is the key element of a resilient supply chain (Hohenstein et al 2015). The conceptual model can also be supplemented with other constructs that define resiliency in relationships with suppliers, e.g. redundancy or visibility (Kamalahmadi and Parast 2016). However, it requires extra considerations and an in-depth literature review.

From the perspective of future research, it may be worthwhile investigating the impact of the implementation of various innovations (product, process, marketing, organizational) on supply chain resiliency. In this case, the resiliency of the supply chain can be measured by the realization of strategies and practices that were identified by Tukamuhabwa et al (2015). An interesting study in this area was conducted by Golgeci and Ponomarov (2015), who investigated the influence of company innovativeness on supply chain resilience.

Conceptual model verification will also provide important managerial implications for business practice. The results will determine the directions of improvement of the NPD process in relationships with suppliers, as well as the role of purchasing decisions in designing flexible and resilient supply chains for new products.

Acknowledgements

This paper is a result of a scientific project (no. 2016/21/B/HS4/00665) financed by the National Science Centre, Poland.

References

- ANDERSEN, P.H. and MUNKSGAARD, K.B. 2009. Collaborative product development and situated knowledge contexts: The case of non-durable food products. *European Journal of Innovation Management* 1(2): 200–222.
- ASMUS, D. and GRIFFIN, J. 1993. Harnessing the power of your suppliers, *The Mckinsey Quarterly* 3: 63–78.
- BENYOUCEF, M. and FORZLEY, S. 2007. Business Continuity Planning and Supply Chain Management. *Supply Chain Forum: An International Journal* 8(2): 14–22.

- BIROU, L. M. and FAWCETT, S. E. 1994. Supplier Involvement in Integrated Product Development: A Comparison of US and European Practices. *International Journal of Physical Distribution & Logistics Management* 2(5): 4–14.
- BOZDOGAN, K., DEYST, J., HOULT, D. and LUCAS, M. 1998. Architectural innovation in product development through early supplier integration. *R&D Management* 28: 163–173.
- BREWER, B., and ARNETTE, A. N. 2017. Design for procurement: What procurement driven design initiatives result in environmental and economic performance improvement? . *Journal of Purchasing and Supply Management* 23(1): 28–39.
- BÜYÜKÖZKAN, G. and GÖRENER, A. 2015. Evaluation of product development partners using an integrated AHP-VIKOR model. *Kybernetes* 44(2): 220–237.
- CANTARELLO, S., NOSELLA, A., PETRONI, G. and VENTURINI, K. 2011. External technology sourcing: evidence from design-driven innovation. *Management Decision* 4(6): 962–983.
- CARLSON, B. 1989. Flexibility and the Theory of the Firm. *International Journal of Industrial Organization* 7(1): 179–203.
- CHRISTOPHER, M. 2000. The agile supply chain: competing in volatile markets. *Industrial Marketing Management* 29(1): 37–44.
- CHRISTOPHER, M. and HOLWEG M. 2011. Supply Chain 2.0: managing supply chains in the era of turbulence. *International Journal of Physical Distribution & Logistics Management* 41(1): 64–65.
- CHRISTOPHER, M., PECK, H. and TOWILL, D. 2006. A taxonomy for selecting global supply chain strategies. *The International Journal of Logistics Management* 17(2): 277–287.
- CHU, PO-YOUNG, CHANG, KUO-HSIUNG and HUANG, HSU-FENG. 2012. How to increase supplier flexibility through social mechanisms and influence strategies? . *Journal of Business & Industrial Marketing* 27(2): 115–131.
- COSTANTINO, N. and PELLEGRINO, R. 2010. Choosing between single and multiple sourcing based on supplier default risk: A real options approach. *Journal of Purchasing and Supply Management* 16(1): 27–40.
- COSO. 2004. *Enterprise Risk Management – Integrated Framework*. Committee of Sponsoring Organizations of the Treadway Commission, New York: AICPA.
- CZERNIAK, A. and SAPIŃSKI, D. 2017. *Cosmetic Industry*. Santander Group, BZWBK Report.
- DANILOVIC, M. 2006. Bring your suppliers into your projects – Managing the design of work packages in product development. *Journal of Purchasing & Supply Management* 12: 246–257.
- DUCLOS, L. K., VOKURKA, R. J., LUMMUS, R. R. 2003. A conceptual model of supply chain flexibility. *Industrial Management & Data Systems* 103(6): 446–456.
- FAYEZI, S., ZUTSHI, A. and O'LOUGHLIN, A. 2014. Developing an analytical framework to assess the uncertainty and flexibility mismatches across the supply chain. *Business Process Management Journal* 20(3): 362–391.

- FANTAZY, K.A, KUMAR, V. and KUMAR, U. 2009. An empirical study of the relationships among strategy, flexibility, and performance in the supply chain context. *Supply Chain Management: An International Journal* 14(3): 177–188.
- FORBES, N. 2009. Contingency planning for earthquakes in Asia. *Journal of Business Continuity & Emergency Planning* 3(4): 356–367.
- GOLGECI, I. and PONOMAROV, S. Y. 2015. How does firm innovativeness enable supply chain resilience? The moderating role of supply uncertainty and interdependence. *Technology Analysis & Strategic Management* 27(3): 267–282.
- HANDFIELD, R. B. and LAWSON, B. 2007. Integrating Suppliers Into New Product Development. *Research-Technology Management* 50(5): 44–51.
- HANDFIELD, R. B., RAGATZ, G. L. PETERSEN, K. J. and MONCZKA, R.M. 1999. Involving Suppliers in New Product Development. *California Management Review* 42(1): 59–82.
- HARARY, A. and PULIZZI, U. 2015. Global Innovation Barometer 2014 – Insight on Disruption, Collaboration and the Future of Work, General Electric. <http://www.gereports.com/innovation-barometer-2014/> (Accessed 15.01.2015).
- HARTLEY, J. L., ZIRGER, B. J. and KAMATH, R. R. 1997. Managing the buyer-supplier interface for on-time performance in product development. *Journal of Operations Management* 15: 57–70.
- HAUSER, J., TELLIS, G. J. and GRIFIN, A. 2006. Research on Innovation: A Review and Agenda for Marketing Science. *Marketing Science* 25(6): 687–717.
- HOHENSTEIN, NILS-OLE, FEISEL, E., HARTMANN, E. and GIUNIPERO, L. 2015. Research on the phenomenon of supply chain resilience: A systematic review and paths for further investigation. *International Journal of Physical Distribution & Logistics Management* 45(1/2): 90–117.
- JAYARAM, J. 2008. Supplier involvement in new product development projects: dimensionality and contingency effects. *International Journal of Production Research* 46(13): 3717–3735.
- JONG, G. and NOOTEBOOM, B. 2000. *The Causal Structure of Long-Term Supply Relationships*. Springer.
- KÄHKÖNEN, A.K., LINTUKANGAS, K. and HALLIKAS, J. 2015. Buyer's dependence in value creating supplier relationships. *Supply Chain Management: An International Journal* 20(2): 151–162.
- KAMALAHMADI, M. and PARAST, M. M. 2016. Review of the literature on the principles of enterprise and supply chain resilience: major findings and directions for future research. *International Journal of Production Economics* 71: 116–133.
- KAMATH, R. R. and LIKER, J. K. 1994. A Second Look at Japanese Product Development. *Harvard Business Review*, November-December, 154–170.
- KHAN, O., CHRISTOPHER, M. and BURNES, B. 2008. The impact of product design on supply chain risk: a case study. *International Journal of Physical Distribution & Logistics Management* 38(5): 412–432.

- KOH, S. C. L. and SAAD, S. M. 2002. Development of a business model for diagnosing uncertainty in ERP environments. *International Journal of Production Research* 40(13): 3015–3039.
- KUMAR, V., FANTAZY, K.A., KUMAR, U. and BOYLE, T.A. 2006. Implementation and management framework for supply chain flexibility. *Journal of Enterprise Information Management* 19(3): 303–319.
- LABAHN, D. W. and KRAPFEL, R. 1994. Early Supplier Involvement in New Product Development: A Model of the Suppliers' Perspective. ISBM Report 12-1994: 1–34.
- LABAHN, D. W. and KRAPFEL, R. 2000. Early Supplier Involvement in Customer New Product Development: A Contingency Model of Component Supplier Intentions. *Journal of Business Research* 47(3): 173–190.
- LAURSEN, L. N. and ANDERSEN P. H. 2016. Supplier involvement in NPD: A quasi-experiment at Unilever. *Industrial Marketing Management* 58: 162–171.
- LEE, H.L. 2002. Aligning supply chain strategies with product uncertainties. *California Management Review* 44(3): 105–119.
- LIKER, J. K., KAMATH, R. R. and WASTI, S. N. 1998. Supplier involvement in design: a comparative survey of automotive suppliers in the USA, UK and Japan. *International Journal of Quality Science* 3(3): 214–238.
- LUZZINI, D., AMANN, M., CANIATO, F., ESSIG, M. and RONCHI, S. 2015. The path of innovation: purchasing and supplier involvement into new product development. *Industrial Marketing Management* 47: 109–120.
- MASON-JONES, R., NAYLOR B., and TOWILL, D.R. 2000. Engineering the leagile supply chain. *International Journal of Agile Management Systems* 2(1): 54–61.
- MCIVOR, R. and HUMPHREYS, P. 2004. Early supplier involvement in the design process: lessons from the electronics industry. *Omega* 32: 179–199.
- MIKKOLA, J. H. and SKJOETT-LARSEN, T. 2003. Early Supplier Involvement: Implications for New Product Development Outsourcing and Supplier-Buyer Interdependence. *Global Journal of Flexible Systems Management* 4(4): 31–41.
- NELLORE, R. and SÖDERQUIST, K. 2000. Portfolio approaches to procurement: analyzing the missing link to specifications. *Long Range Planning*. 33(2): 245–267.
- OSBERT-POCIECHA, G. 2008. Określenia, definicje, problemy. In: Krupski R. (ed.), *Elastyczność organizacji*. Wydawnictwo Uniwersytetu Ekonomicznego, Wrocław.
- OSBERT-POCIECHA, G. 2004. Elastyczność organizacji – atrybut pożądaný a niezidentyfikowany. *Organizacja i Kierowanie* 116(2): 51–62.
- PARKER, D. B., ZSIDISIN, G. A. and RAGATZ, G. L. 2008. Timing and extent of supplier integration in new product development: a contingency approach. *Journal of Supply Chain Management* 44(1): 71–83.
- PETERSEN, K. J., HANDFIELD, R. B. and RAGATZ, G. L. 2003. A Model of Supplier Integration into New Product Development Product, *Journal of Product Innovation Management* 20: 284–299.
- PRICEWATERHOUSECOOPERS. 2015. 18th Annual Global CEO Survey.

- PRICEWATERHOUSECOOPERS. 2013. Supplier Relationship Management. How key suppliers drive your company's competitive advantage?
- PUJAWAN, I. N. 2004. Assessing supply chain flexibility: a conceptual framework and case study. *International Journal of Integrated Supply Management* 1(1): 79–97.
- RAGATZ, G. L., HANDFIELD, R. B. and PETERSEN, K. J. 2002. Benefits associated with supplier integration into new product development under conditions of technology uncertainty, *Journal of Business Research* 55: 389–400.
- SAEED N.T., HOSSEIN S. and HOSSAM S. I. 2013. A study of contingency relationships between supplier involvement, absorptive capacity and agile product innovation, *International Journal of Operations & Production Management* 34(1): 65–92.
- SANCHEZ, A. and PEREZ, M. 2005. Supply chain flexibility and firm performance: a conceptual model and empirical study in the automotive industry. *International Journal of Operations & Production Management* 25(7): 681–700.
- SCHIELE, H. 2010. Early supplier integration: the dual role of purchasing in new product development. *R&D Management* 40(2): 138–153.
- SJÖDIN, D. R. and ERIKSSON, P. E. 2010. Procurement procedures for supplier integration and open innovation in mature industries. *International Journal of Innovation Management* 14 (4): 655–682.
- SLACK, N. 2005. The flexibility of manufacturing systems. *International Journal of Operations & Production Management* 2(12): 1190–1200.
- SUPPLY CHAIN COUNCIL. 2012. Supply Chain Operations Reference Model.
- SVENSSON, G. 2002. A conceptual framework of vulnerability in firms' inbound and outbound logistics flows. *International Journal of Physical Distribution & Logistics Management* 32(2): 110–113.
- TACHIZAWA, E.M. and GIMÉNEZ, T.C. 2009. Assessing the effectiveness of supply flexibility sources: an empirical research. *International Journal of Production Research* 47(20): 5791–5809.
- TAKEISHI, A. 2001. Bridging Inter- And Intra-Firm Boundaries: Management of Supplier Involvement in Automobile Product Development. *Strategic Management Journal* 22: 403–433.
- TONI DE, A. and TONCHIA, S. 2005. Definitions and linkages between operational and strategic flexibilities. *The International Journal of management Science* 33(6): 525–540.
- TORRES-RUIZ, A. and RAVINDRAN, A. R. 2018. Multiple criteria framework for the sustainability risk assessment of a supplier portfolio. *Journal of Cleaner Production* 172: 4478–4493.
- TRENT, R. J. and MONCZKA, R. M. 1999. Achieving world-class supplier quality. *Total Quality Management* 10(6): 927–938.
- TUKAMUHABWA, B. R., STEVENSON, M., BUSBY, J. and ZORZINI, M. 2015. Supply chain resilience: definition, review and theoretical foundations for further study. *International Journal of Production Research* 53(18): 5592–5623.

- VICKERY, S., CALANTONE, R. and DROGE, C. 1999. Supply chain flexibility: an empirical study. *Journal of Supply Chain Management* 35(3): 16–24.
- WAGNER, S. M. 2012. Tapping Supplier Innovation. *Journal of Supply Chain Management* 48(2): 37–52.
- WASTI, S. N. and LIKER, J. K. 1997. Risky business or competitive power? . *Journal of Product Innovation Management* 14(5): 337–355.
- WIELAND, A. and WALLENBURG, C. M. 2012. Dealing with supply chain risks: Linking risk management practices and strategies to performance. *International Journal of Physical Distribution & Logistics Management* 42(10): 887–905.
- WIETESKA, G. 2010. The need to identify threats in supplier–purchaser relationships on the B2B market. *Gospodarka Materialowa & Logistyka* 12: 7–13.
- WIETESKA, G. 2016. Flexibility in relationships with suppliers in an era of turbulence. *Gospodarka Materialowa & Logistyka* 3: pp. 9–15.
- WIETESKA, G. 2017a. ESI in supply chains of modular products. *Problemy Transportu i Logistyki*. No. 3 (in publishing process).
- WIETESKA G. 2017b. Ensuring the flexibility and continuity of supplies in the B2B market. *Journal of Economics and Management* 29(3): 118–138.
- WIETESKA, G. 2017c. Practical considerations on JPD – developing products with suppliers. *Supply Chain Management Conference*. 23–24.11.2017. SGH Warsaw School of Economics (in publishing process in: *Ekonomika i Organizacja Przedsiębiorstwa*).
- WIETESKA, G. 2018. The impact of natural and organic cosmetics development on supply chain processes and supplier base architecture. 8th International Conference on Management 2018 "Leadership, Innovativeness and Entrepreneurship in a Sustainable Economy", 7–8 June, Częstochowa, Poland.
- WU, X. and ZHANG, F. 2014. Home or Overseas? An Analysis of Sourcing Strategies Under Competition. *Management Science* 60(5): 1223–1240.
- WYNSTRA, F. and TEN PIERICK, E. 2000. Managing supplier involvement in new product development: a portfolio approach. *European Journal of Purchasing & Supply Management* 6: 49–57.
- WYNSTRA, F., WEGGEMANN, M. and VAN WEELE, A. 2003. Exploring purchasing integration in product development. *Industrial Marketing Management* 32: 69–83.
- ZHANG, Q., VONDEREMBSE, M. A and LIMC, JEEN-SU. 2003. Manufacturing flexibility: defining and analyzing relationships among competence, capability, and customer satisfaction. *Journal of Operations Management* 21: 173–191.
- ZIRPOLI, F. and CAPUTO, M. 2002. The nature of buyer-supplier relationships in co-design activities: The Italian auto industry case. *International Journal of Operations & Production Management* 22(12): 1389–1410.
- ZSIDISIN, G. A. and SMITH, M. E. 2005. Managing Supply Risk with Early Supplier Involvement: A Case Study and Research Propositions. *The Journal of Supply Chain Management* 41(4): 44–57.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The purchasing behaviour and attitudes of students and retirees towards fruit and vegetables as convenience food

Wioletta Wróblewska¹, Dawid Olewnicki² and Joanna Pawlak³

¹*Department of Management and Marketing, Faculty of Agrobioengineering, University of Life Science, B. Dobrzańskiego 37, 20-262 Lublin, Poland, e-mail: wioletta.wroblewska@up.lublin.pl*

²*Section of Horticultural Economic, Faculty of Horticulture, Biotechnology and Landscape Architecture, Warsaw University of Life Science – SGGW, Nowoursynowska 159, 02-776 Warszawa, e-mail: dawid_olewnicki@sggw.pl*

³*Department of Management and Marketing, Faculty of Agrobioengineering, University of Life Science, B. Dobrzańskiego 37, 20-262 Lublin, Poland, e-mail: joanna.pawlak@up.lublin.pl*

Abstract

Macroeconomic changes imply socio-cultural changes, including lifestyle, which increases the interest in convenience food. The consideration of consumer behaviour on the market for convenience food products inadequately covers the fruit and vegetable market. The aim of the study was to compare the attitudes and purchasing behavior of students and retirees from two Polish cities: Warsaw and Lublin in relation to fruit and vegetables purchased in the form of convenience food. The studied group consisted of 300 students and 300 retirees from both cities. The data came from empirical studies conducted using a standardized questionnaire. Most students and retirees declare a lack of knowledge of the term “convenience food”. The highest level of knowledge of this concept was noted among students from both cities. The lack of terminological awareness, however, did not affect the purchasing practice, because most of them purchase fruit and vegetable products from this group. The factors differentiating the choice of this type of food was social status, age and place of residence. A relatively higher level of interest was shown by younger consumers and in general, consumers from Warsaw. The frequency of purchases was also due to different preferences as to the type of product. During the selection the respondents from both cities and age groups paid particular attention to the practical values of the products, i.e. the quick preparation, convenience and the lack of time. The main choice factors were also taste and freshness.

Keywords: consumption, convenient food, fruits, vegetables

JEL Code: D12, M31, Q13

1. Introduction

The consideration of consumer behaviour on the market for convenience food products inadequately covers the fruit and vegetable market. Studies conducted by Kabacińska and Nazarewicz (2005) revealed that young consumers of convenience products most frequently purchased ready-made vegetable dishes. Consumers have become more willing to buy, for instance, vegetable salads and fruit and vegetable juices (Adamczyk 2002). In addition, changes in consumer behaviour as regards food consumption have been observed for many years, with half-products and ready-made dishes being increasingly used in preparing meals, due, for instance, to the lack of time (Adamczyk 2001). For this reason, an attempt was made in this article to assess the students and retirees' behaviour and attitudes towards purchasing fruit and vegetables as convenience food.

2. Methodology and Data

Data included in the analyses were obtained from empirical studies conducted in Warsaw and Lublin between December 2015 and December 2017 using a standardised questionnaire. Questionnaire surveys were conducted among 600 students, comprising 300 academic students from Lublin and 300 academic students from Warsaw, aged between 20 and 29, as well as 300 retirees and pensioners from Warsaw, and another 300 from Lublin, aged above 60. The analyses focused on two groups of potential consumers, as the literature on the subject indicates that convenience food consumption is characteristic mainly of young people displaying new consumption patterns (Jabłońska, Wata, Wróblewska 2017), and running small households (Babicz-Zielińska 2010), and also of elderly people living alone or without cooking skills (Gutkowska, Ozimek 2005; Szymańska 2012; Brunner, Horst, Siegrist 2010; Peltner, Silke 2017). With reference to academic students, as well as retirees and pensioners, the terms "students" and "retirees" are used respectively. As regards students, a purposive sample selection method was employed, given the fact that these people, while pursuing their academic studies, tend to live outside their family homes, running a specific type of independent households. The surveys were conducted using the PAPI method among the full-time students. As regards the retirees, two survey methods were employed. The PAPI method made it possible to complete approx. 60% of the questionnaires in both cities. However, given the limited access to the surveyed people, and their unwillingness to participate in the surveys, the snowball-sampling method was also used in two Lublin and two Warsaw "Senior Clubs." Retiree-respondents were recruited by other survey participants (also retirees) who conducted the surveys on a voluntary basis, having received the appropriate survey methodology training.

The questionnaire contained yes/no questions. Following a preliminary survey regarding the respondents' familiarity with the term "convenience food," the proper definition of this type of food was provided, as it was necessary to ensure that all the surveyed persons understood this notion in the same way while answering the subsequent questions. The subsequent questions concerned, inter alia, consumer attitudes to such food, buying frequency, types of purchased products, and factors significant to buying decisions. Responses provided to the survey questions took the form of a five-level Likert scale. As part of the question on the reasons for buying convenience products, respondents were asked to rank the indicated options using a 1 to 7 assessment scale. While analysing the aforementioned issues, descriptive statistics were used, along with assessment

structures for individual issues, the average rank (\bar{X}), and standard deviation (SD). The average responses obtained in relation to the 1 to 5 scale were interpreted as 1–1.5 – an insignificant factor, >1.5–2.5 – a not very significant factor, >2.5–3.5 – a moderately significant factor, >3.5–4.5 – a significant factor, and >4.5–5 – a very significant factor. Furthermore, certain ranks were assigned the average values obtained in the question regarding the significance of the factors contributing to the purchase of convenience food, thus creating series of determinants of convenience food choices among respondents. The dependency levels between the series of determinants for the choices made by the students and the retirees in both cities were evaluated on the basis of Spearman's rank correlation analysis.

$$r_s = \text{corr}(RX, RY)$$

where corr is the correlation coefficient

RX is the variable X ranks in the sample

RY is the variable Y ranks in the sample

In the event of equal values' being observed for a given rank variable, an identical rank was assigned, corresponding to the average of the subsequent numbers, as a result of which non-absolute values were frequently obtained. The following correlation levels were adopted for the purpose of result interpretations: <0.2 – no linear relationship; 0.2–0.4 – a weak relationship; 0.4–0.7 – a moderate relationship; 0.7–0.9 – a fairly strong relationship; > 0.9 – a very strong relationship.

The aim of the surveys was to conduct a comparative analysis of the attitudes and behaviour of the students and the retirees from Warsaw and Lublin towards fruit and vegetable products in the convenience-food group. Consumer attitudes and behaviour resulted from several variables. The surveys took into account selected socio-economic variables, such as the respondents' age and social status (the students aged 20–25, and the retirees aged >60), and the place of residence which seemed to correspond to the level of income, especially among the retirees. The highest average gross retirement payments and pensions in Poland, according to the Social Insurance Institution, were recorded in the Mazowieckie Voivodeship (PLN 2,213.6), while the corresponding benefits in the Lubelskie Voivodeship (PLN 1,812.1) were among the lowest in the country (Emerytura..., 2017). The respondent-related variables employed in the analyses provided information on, inter alia, the size and structure of the demand for convenience products among various groups of recipients. This information appears significant for producers, as it serves the purpose of determining target consumer groups and identifying their preferences.

3. Results

Based on the survey results, the conclusion can be drawn that the surveyed people were rather unfamiliar with the term convenience food. This expression was accurately defined by nearly every fourth student from Warsaw, by 15% of the Lublin students, and by 17.3% and 10.0% of the retirees from both cities, respectively (Figure 1). The percentage of the students unfamiliar with this term was slightly lower as compared to the retirees, amounting to 34.0% and 59.0% for the Warsaw and Lublin students respectively. Among retired respondents, this term was unfamiliar to as many as 52.3% in Warsaw and 64.6% in Lublin.

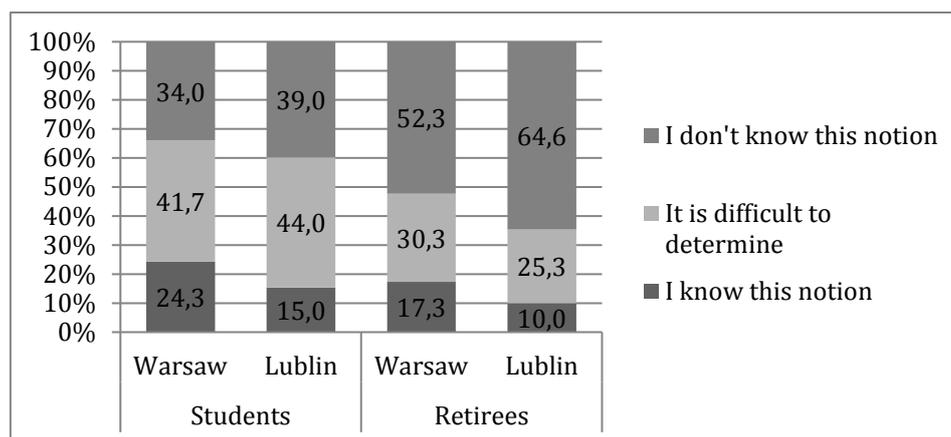


Figure 1: Familiarity with the term convenience food (in % of individual surveyed groups)
Source: Own study

However, the above results don't conclusively indicate that the respondents were unfamiliar with the term convenience food. When expressing their views on the question "How do you understand convenience food?", while being offered a range of responses to choose from, they made more accurate choices. In total, 95.0% and 93.0% of the students from Warsaw and Lublin respectively, and 49.3% and 55.7% of the retirees from both cities, agreed or generally agreed that this kind of food was long-lasting and easy to prepare (Figure 2). The average assessment values regarding this statement were $\bar{X}=4.5$ (SD=0.78) for the Warsaw students, $\bar{X}=4.4$ (SD=0.71) for the Lublin students, $\bar{X}=3.1$ (SD=1.4) for the Warsaw retirees, and $\bar{X}=3.4$ (SD=1.5) for the Lublin retirees.

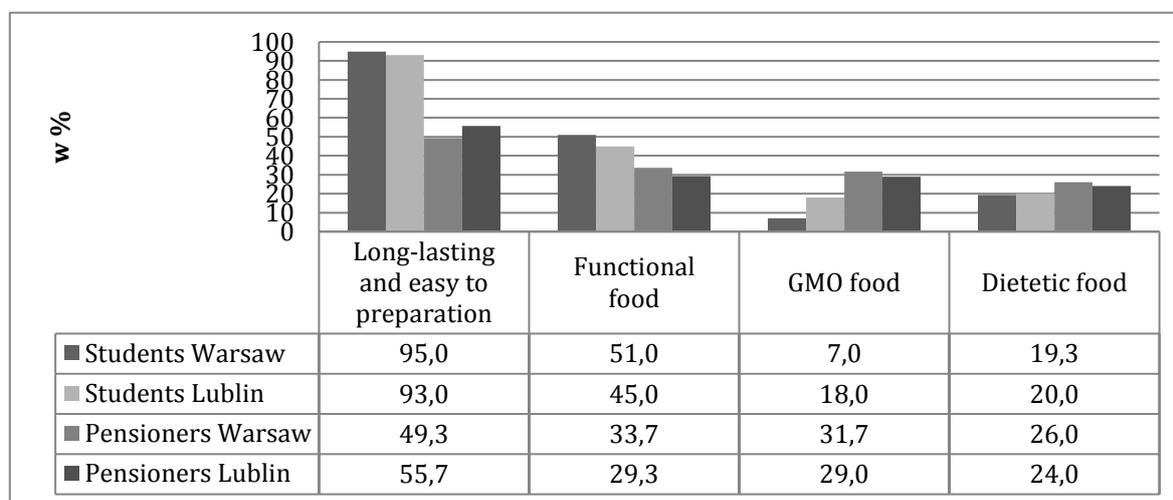


Figure 2: Respondents' views on the question "How do you understand convenience food?" (in % of individual surveyed groups)
Source: Own study

Convenience food and functional food were considered the same thing by a relatively significant percentage of respondents, i.e. by 51.0% and 45.0% of the students from Warsaw and Lublin, and by 33.7% and 29.3% of the retirees from both cities. A higher level of unfamiliarity with the nature of convenience products was observed among the retirees, as, on average, every third respondent from Warsaw and Lublin associated convenience food with genetically modified products. Among the students, these proportions were significantly lower, amounting to 7.0% in Warsaw and 18.0% in Lublin. Similar percentages

of the students and the retirees from the cities under analysis, ranging between 20–25%, viewed convenience food as identical to dietetic food. This perception was not completely wrong, and might have resulted from viewing convenience fruit and vegetable products as low-calorie products based on dietetic ingredients. In addition, on average, 60.0% and 50.0% of the students from Warsaw and Lublin, respectively, as well as around 40.0% and 50.0% of the retirees from both cities, considered this kind of food to be balanced and safe.

The frequency of purchasing various products, including convenience food, was determined by a variety of factors, including purchasers' age, economic status and lifestyle. The analyses indicated that the frequency of purchasing fruit and vegetable products in the convenience category was slightly higher among the students than among the retirees in both cities (Figure 3). Furthermore, respondents from Warsaw declared an increased frequency of buying such products, which might have resulted from their higher level of income. Relatively, the largest differences in purchase frequency were recorded among the retirees from both cities. The retirees from Warsaw were likely to purchase fruit and vegetable products in the convenience category on average several times a month, whereas the Lublin retirees did so less than once a month. The purchase frequency also depended on the type of product. A fairly high correlation between the ranks of the purchase frequencies of individual convenience food products was recorded among the students from both cities ($r_s=0.77$). The students from Warsaw and Lublin made the most frequent purchases, i.e. several times a week, of fruit juices and nectars ($\bar{X}=3.8$; $SD=0.1$; $\bar{X}=3.7$; $SD=0.1$). In addition, the students were inclined to purchase concentrates and purées, pan-fried vegetables, single-ingredient frozen foods, fruit desserts, or salad mixes, several times a month, with the hierarchy of the listed products differing only slightly among the Warsaw and the Lublin students. Snacks (e.g. fruit crisps), pickled vegetables, dried tomatoes and fruit salads were purchased by the students less frequently than once a month. The average assessment value for the listed products ranged from 1.9 to 2.2. Among the retirees from both cities, the correlation between the ranks of the purchase frequencies of individual convenience food products was low ($r_s=0.4$). The retirees from Warsaw most often purchased tomato concentrates and purées ($\bar{X}=3.5$; $SD=1.1$), fruit juices and desserts ($\bar{X}=3.1$; $SD=1.1$ in both cases), jams ($\bar{X}=3.0$; $SD=1.4$), and pickled vegetables ($\bar{X}=3.0$; $SD=1.0$). The least frequent purchases included snacks, frozen fruit, pan-fried vegetables and dried tomatoes, with the average values ranging from 1.9 to 2.3. The retirees from Lublin usually preferred, similarly to their Warsaw counterparts, tomato concentrates and purées ($\bar{X}=2.7$; $SD=0.8$ and $\bar{X}=2.6$; $SD=1.2$, respectively), as well as frozen vegetables for preparing vegetable dishes ($\bar{X}=2.5$, $SD=1.1$). The least popular products included fruit salads, jams, snacks and frozen fruit (with the average assessment values ranging from 1.3 to 1.8).

The frequency of purchasing convenience food can result from a lifestyle which influences the ability to plan and prepare traditional home-made dishes. As shown by the conducted surveys, meal planning was more frequently observed among the retirees than among the students, including especially those who earned lower incomes (i.e. Lublin retirees). In this group, as many as 66.0% often or very often planned their meals. From the point of view of consuming convenience food, including fruit and vegetables, the proportion of people who never or very rarely planned their meals appeared especially significant. Among the Warsaw and Lublin students, this proportion was 21.7% and 14.0%, respectively, and among the retirees – 12.0% and 9.0%, respectively. Although convenience products can be purchased both by people who plan and those who do not plan their

meals, the latter group appears a major target segment for the producers of convenience food, including fruit and vegetables.

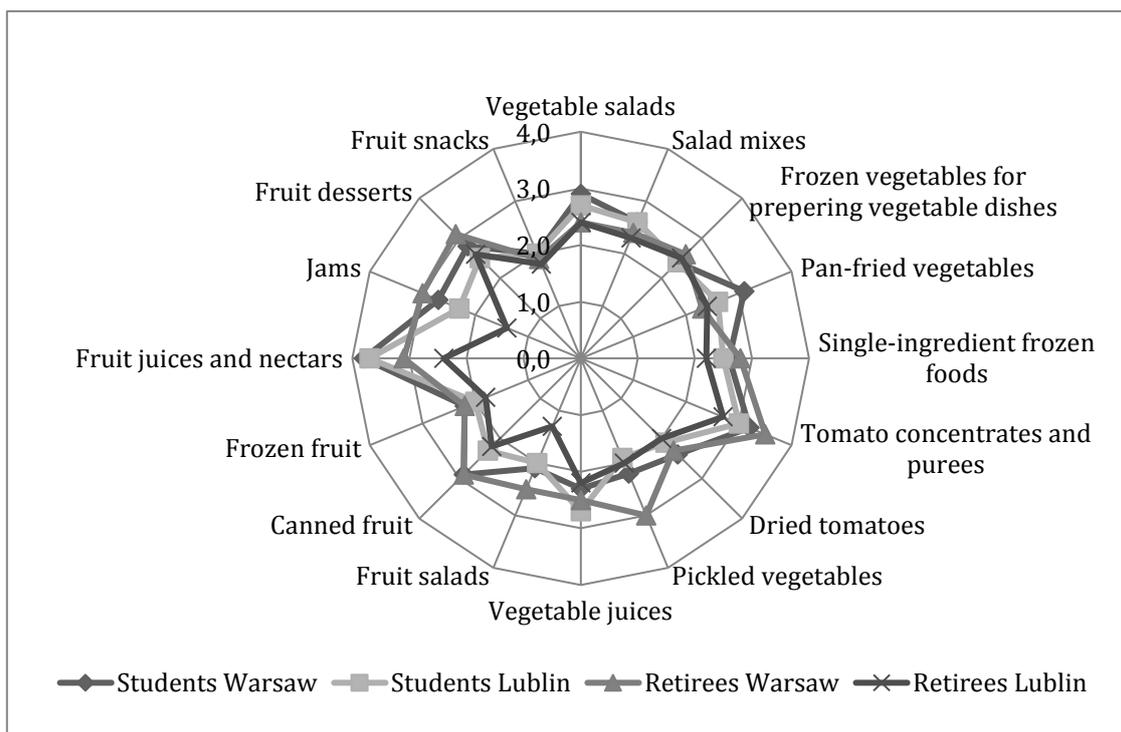


Figure 3: The frequency of purchasing fruit and vegetables as convenience food (average rank, where 1–1.5 – never, >1.5–2.5 – less frequently than once a month, >2.5–3.5 – a few times a month, >3.5–4.5 – a few times a week, and >4.5–5 – every day or almost every day)

Source: Own study

The modern food market is undergoing continual transitions, and is characterised by a relatively high innovativeness level, contributing, inter alia, to the creation of new products. This results, inter alia, from more and more diverse expectations among consumers, who expect that food will not only satisfy their hunger but also meet specific needs, e.g. related to convenience and reduced meal preparation Times (Gawęcki 2002, Olejniczak 2010, Gutkowska 2011). In the surveyed student and retiree groups from both cities, a very high correlation ($r_s=1.0$ and $r_s=0.71$, respectively) was observed between the ranks of reasons for buying fruit and vegetables from the convenience group. The students and the retirees mentioned quick and convenient preparation, as well as the lack of time, as the three main reasons for purchasing such products (Figure 4).

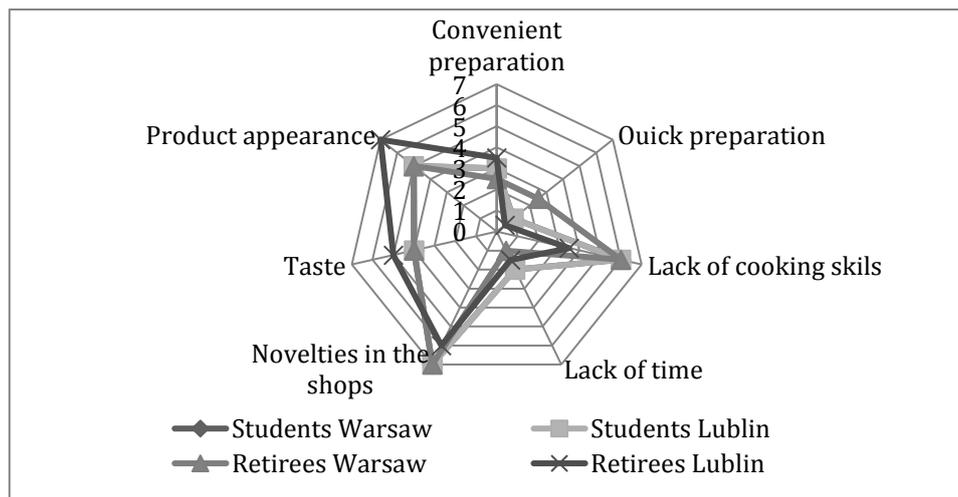


Figure 4: The reasons for buying fruit and vegetable products from the convenience group (average assessment from 1 to 7, where 1 means the most important and 7 the least important reason) Note: r_s students = 1.0 which is why the curves for the Warsaw and Lublin students overlap with each other. Source: Own study

Quick preparation was indicated as one of the three major reasons for purchases by an average of 80% of the students from both cities, and convenience and lack of time by 70% of the students from Warsaw and Lublin. As regards the retirees, among the three major reasons for purchasing convenience food, 54.0% and 42.0% of the retirees from Warsaw and Lublin, respectively, cited quick preparation; 57.0% and 25.0%, respectively, convenient preparation; and 60.0% and 50.0%, respectively, the lack of time. The least important reasons for purchasing this kind of food among both the students and the retirees, were novelties on the market, product appearance, and the lack of cooking skills, although the last reason mentioned was relatively important for the Lublin retirees, 42.0% of whom listed it as one of the major factors in selecting such type of food. While selecting fruit and vegetable products in the convenience category, the students from both cities attached importance to product taste and freshness, and the Warsaw students additionally to product quality. In turn, retirees viewed taste, freshness and colour as very important factors, and the Lublin retirees – also shelf life. The correlation of the ranks of all the convenience food choice factors, both in the student ($r_s = 0.59$) and retiree groups ($r_s = 0.64$), from both cities, exhibited a moderate correlation (Table 1).

The differences in assessing the choice significance factors among the students related mainly to product appearance and easy preparation, with these characteristics being more important to the Warsaw students, as well as vitamin content, which especially attracted the attention of the Lublin students. On the other hand, while assessing the significance of convenience-product characteristics and factors, the retirees seemed to differ especially in their opinions regarding the significance of the price criterion, which, interestingly, proved more important to the retirees from Warsaw ($\bar{X} = 3.54$) than to the Lublin retirees ($\bar{X} = 3.2$).

The differences in assessing the convenience-product choice factors between the analysed groups of the students and the retirees from Warsaw and Lublin also influenced their assessment of the significance of individual pieces of information displayed on product packaging (Table 2). Furthermore, the Spearman's rank correlation coefficient indicated a relatively strong correlation between the significance of product information in the student groups ($r_s = 0.76$) and the retirees ($r_s = 0.79$) in the analysed cities. The compo-

sition and best-before date proved the most important for both the students and the retirees, but the latter group also attached importance to information regarding the preservatives content and the country of product origin.

Table 1: The factors and characteristics of fruit and vegetable products in the convenience category and their importance to the students and the retirees (average assessment from 1 to 5, where 1 – not important and 5 – very important)

| | Students | | | | Retirees | | | |
|-------------------------------|-----------|------|-----------|-----|-----------|------|-----------|------|
| | Warsaw | | Lublin | | Warsaw | | Lublin | |
| | \bar{X} | R | \bar{X} | R | \bar{X} | R | \bar{X} | R |
| Health safety | 3.9 | 8 | 3.9 | 9 | 3.9 | 6 | 3.9 | 11.5 |
| Attractive appearance | 4.2 | 5 | 3.6 | 15 | 3.4 | 10 | 3.9 | 11.5 |
| Accessibility | 3.7 | 9.5 | 3.7 | 13 | 2.7 | 18.5 | 3.5 | 18 |
| Quality | 4.6 | 3 | 4.3 | 3.5 | 3.7 | 8 | 4.2 | 6 |
| Calorific value | 2.8 | 20 | 3.0 | 19 | 2.9 | 16.5 | 3.7 | 13.5 |
| Easy to prepare | 3.7 | 9.5 | 3.0 | 19 | 3.0 | 14.5 | 3.6 | 16 |
| Brand (producer) | 3.5 | 12 | 3.0 | 19 | 3.1 | 13 | 4.2 | 6 |
| Promotion | 3.6 | 11 | 3.6 | 15 | 3.2 | 12 | 3.7 | 13.5 |
| The content of nutrients | 3.2 | 18 | 3.6 | 15 | 2.9 | 16.5 | 4.0 | 10 |
| Novelty on the market | 3.2 | 18 | 2.9 | 20 | 2.5 | 20 | 3.3 | 19 |
| Price | 4.0 | 7 | 3.9 | 9 | 3.5 | 9 | 3.2 | 20 |
| Taste | 4.9 | 1 | 4.7 | 1 | 4.9 | 1 | 4.8 | 1 |
| Colour | 4.2 | 5 | 4.1 | 6 | 4.8 | 2.5 | 4.5 | 3 |
| Freshness | 4.8 | 2 | 4.7 | 1.5 | 4.8 | 2.5 | 4.7 | 2.5 |
| Vitamins content | 3.2 | 18 | 4.2 | 5 | 3.0 | 14.5 | 4.1 | 8.5 |
| Mineral substance content | 3.4 | 13.5 | 4.0 | 7 | 3.8 | 7 | 4.1 | 8.5 |
| The content of preservatives | 3.3 | 15.5 | 3.8 | 11 | 4.3 | 4 | 3.6 | 16 |
| Shelf life | 4.2 | 5 | 4.3 | 3.5 | 4.2 | 5 | 4.7 | 2.5 |
| Wrapping/packaging | 3.4 | 13.5 | 3.4 | 17 | 2.7 | 18.5 | 3.6 | 16 |
| Complete information on label | 3.3 | 15.5 | 3.9 | 9 | 3.3 | 11 | 4.2 | 6 |
| r_s | 0.59 | | | | 0.64 | | | |

\bar{X} – average significance of choice factors, R – rank, r_s = Spearman's rank correlation coefficient

Source: Own study

Table 2: The significance of individual pieces of information displayed on the packaging of fruit and vegetable products in the convenience category (average assessment from 1 to 5, where 1 means not important and 5 – very important)

| | Students | | | | Retirees | | | |
|---------------------------|-----------|-----|-----------|---|-----------|---|-----------|---|
| | Warsaw | | Lublin | | Warsaw | | Lublin | |
| | \bar{X} | R | \bar{X} | R | \bar{X} | R | \bar{X} | R |
| Ingredients | 4.3 | 2 | 4.2 | 2 | 4.0 | 2 | 4.6 | 1 |
| Best-before date | 4.6 | 1 | 4.4 | 1 | 4.3 | 1 | 3.9 | 4 |
| Quality marks | 3.6 | 3 | 3.3 | 5 | 2.6 | 6 | 3.3 | 6 |
| Country of product origin | 3.4 | 5.5 | 2.8 | 6 | 3.5 | 4 | 4.0 | 3 |
| Calorific value | 3.1 | 7 | 2.7 | 7 | 2.2 | 7 | 2.7 | 7 |
| Preparation guide | 3.3 | 6 | 3.6 | 4 | 3.1 | 5 | 3.6 | 5 |
| The preservatives content | 3.4 | 5.5 | 4.0 | 3 | 3.8 | 3 | 4.1 | 2 |
| r_s | 0.76 | | | | 0.79 | | | |

\bar{X} – average significance of choice factors, R – rank, r_s = Spearman's rank correlation coefficient

Source: Own study

The respondents' preferences regarding the product purchase place also proved to differ, with supermarkets being the most popular purchase place for the Warsaw students and the retirees. In Lublin the retirees, in turn, preferred local shops and market places, the latter being the least frequently chosen place among the students from both cities.

4. Discussion and Conclusions

The conducted analyses of the purchase attitudes and behaviour of the Warsaw and Lublin students and retirees revealed some differences and common characteristics for both groups involved. The surveyed were rather unfamiliar with the term “convenience food,” with the familiarity level being slightly higher among the students than among the retirees. The majority of the survey participants purchased fruit and vegetable products in the convenience category, but with differing frequencies, depending on both social status and place of residence, and on the type of purchased products. The frequency of purchasing the said products was slightly higher among the students than among the retirees. The students from both cities most frequently (i.e. few times a week) purchased fruit juices and nectars, and several times a month concentrates and purées, pan-fried vegetables, single-ingredient frozen foods and fruit desserts, to name a few. The place of residence and related income strongly varied the frequency of purchasing this type of food among the retirees. More specifically, the retirees residing in Warsaw were likely to purchase fruit and vegetable products in the convenience category, on average, a few times a month, whereas the Lublin retirees did so less often than once a month. However, the social status, age and place of residence did not differentiate the reasons for purchasing this kind of food. Both surveyed groups cited quick preparation, convenience and the lack of time as the three major purchase reasons. Attention was drawn to these factors, inter alia, in the studies by Krełowska-Kułas (2005). Similar motives for purchasing convenience food have also appeared in other surveys (Gawęcki 2002, Olejniczak 2010, Gutkowska 2011). The growing pace of life (Kabacińska, Nazarewicz 2005; Mojka 2012), and an increased number of single-person and two-person households (Janicki 2006; Shiptsova 2007; Daniels, Glorieux 2015), were other factors contributing to such purchases. The respondents' social status had an insignificant impact on their opinions regarding the product characteristics important to the consumers. The students attached much importance to product taste and freshness, and the retirees additionally to colour. The place of residence had more impact on respondents' opinions regarding the significance of various product characteristics, while, for the students from Warsaw, quality was also important, and for the Lublin retirees, product shelf life seemed to matter.

The conducted surveys provide valuable practical information on the purchase behaviour of two groups of consumers of fruit and vegetable products in the convenience category, at the same time triggering the need to undertake further surveys in this field, taking into account the impact of other factors diversifying consumer purchasing behaviour.

References

- ADAMCZYK, G. 2001. Analiza zachowań konsumpcyjnych gospodarstw domowych i ich implikacje dla producentów żywności. Maszynopis. Kat. Ekonomiki Gospodarki Żywnościowej AR, Poznań.
- ADAMCZYK, G. 2002. Wybrane aspekty zachowań konsumpcyjnych i wzorców spożycia żywności w polskich gospodarstwach domowych w latach dziewięćdziesiątych. Roczniki Akademii Rolniczej w Poznaniu. CCCXLIII: 31–41.
- BABICZ-ZIELIŃSKA, E. 2010. Postawy konsumentów wobec nowej żywności, Zeszyty Naukowe Akademii Morskiej w Gdyni, 65: 16–22.

- BRUNNER, TA., VAD DER HORST, K. and SIEGRIST, M. 2010, Convenience food products. Drivers for consumption. *Appetite* 25, 498–506.
- DANIELS, S., GLORIEUX, I. and MINNEN, J. et al. 2015 Convenience on the menu? A typological conceptualization of family food expenditures and food-related time patterns. *Social Science Research* 51, 205–218.
- GAWĘCKI, J. 2002. Żywność nowej generacji a racjonalne żywienie. *Żywność. Nauka. Technologia. Jakość* 4(33): 6–14.
- Emerytury i renty w 2016 r. 2017. GUS. Warszawa: 72 [Online]. Available at: <http://stat.gov.pl/obszary-tematyczne/roczniki-statystyczne/roczniki-statystyczne/rocznik-demograficzny-2017,3,11.html> [Accessed 2018, January 17].
- GUTKOWSKA and K. OZIMEK, I. 2005. Wybrane aspekty zachowań konsumentów na rynku żywności – kryteria zróżnicowania. Warszawa, Wyd. SGGW.
- GUTKOWSKA, K. 2011. Innowacyjność konsumentów wobec produktów żywnościowych jako warunek rozwoju rynku żywności, *Konsumpcja i Rozwój* 1:108–119.
- HARRIS, J. M., and SHIPTSOVA, R. 2007. Consumer demand for convenience foods: demographics and expenditures. *Journal of Food Distribution Research* 38(3): 22 –36.
- JABŁOŃSKA, L., WATA, I. and WRÓBLEWSKA W. 2017. Wpływ wybranych czynników demograficzno–ekonomicznych na postawy mieszkańców Warszawy dotyczące owoców i warzyw spożywanych w formie żywności wygodnej, *Zagadnienia Ekonomiki Rolnej* 2(351): 108–124.
- JANICKI, A. 2006. Żywność wygodna.[w:] F. Świdorski. (red.), *Żywność wygodna i żywność funkcjonalna*. Warszawa: WNT.
- KABACIŃSKA, A. and NAZAREWICZ, R. 2005. Czynniki wyboru i częstotliwość spożycia żywności wygodnej. *Roczniki Naukowe SERiA*, VII, 8: 93–97.
- KREŁOWSKA-KUŁAS, M. 2005. Badanie preferencji konsumenckich żywności wygodnej. *Zeszyty Naukowe Akademii Ekonomicznej w Krakowie*, 678: 141–148.
- MOJKA, K. (2012). Wybrane produkty żywności wygodnej – ocena preferencji i częstotliwości ich spożycia wśród studentów. *Problemy Higieny i Epidemiologii*, 93(4), 828–833.
- OLEJNICZAK, T. 2010. Determinanty zachowań konsumentów na polskim rynku żywności wygodnej. *ZN Uniwersytetu Szczecińskiego. Problemy Zarządzania, Finansów i Marketingu*, 16: 321–331.
- PELTNER, J. and SILKE, T. 2017. Convenience-based food purchase patterns: identification and associations with dietary quality, sociodemographic factors and attitudes, *Public Health Nutrition* 21(3): 558–570.
- SZYMAŃSKA, A. 2012. Jakość tzw. „żywności wygodnej”, na przykładzie wyników kontroli jakości handlowej koncentratów spożywczych, *Wiedza i jakość*, 3 (26): 7–10.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

The Multi-Dimensionality Of The Safety Of The Production Process

Anna Wronka¹

¹*Faculty of Management, University of Łódź, Matejki 22/26, Łódź, Poland,
e-mail: anna.wronka@uni.lodz.pl*

Abstract

The safety of the production process is a broad term. It can be considered in various aspects, ranging from issues typically related to normative regulations in the field of health and safety and risk management through to the ability to transfer competences. Understanding the conditions for safety in the context of the specificity of a given company is crucial in ensuring the liquidity of production and thus contributes to the competitiveness of the entity. The article presents the multi-dimensional concept of industrial safety together with the results of the research. Conclusions obtained from theoretical and empirical analysis are a significant contribution to further in-depth research on the complexity of the subject matter.

Keywords: safety process, production process

JEL Code: M10, M11, M19

1. Introduction

Without doubt, the world's progressive development generates both many benefits as well as carrying specific risks, which have consequences depending on the scale of their occurrence. At the same time, a growing awareness of the risks in society and fear for their loved ones were a considerable influence on the broad spread of the understanding of safety. When analyzing the meaning of the concept, one can conclude that safety is a very capacious term, which can be interpreted in numerous ways, although most conclude that it is simply an antonym of the word risk (Möller et al., 2006). The generic definition, often referred to in literature, states that safety is the system property or quality that is necessary and sufficient to ensure that the number of events which could be harmful to workers, the public, or the environment is acceptably low (Hollnagel, 2014).

Considering the fact that safety has a number of dimensions, various definitions can be used and each of them would emphasize a different context (aspect) of the concept.

Safety in Latin is *sine cura* (*securitas*) which can be translated as a state without care, worries, anxiety or change (Bailliet, 2009). Although, the World Health Organization (WHO) suggests a definition of safety through the prism of two perspectives: objective

and subjective. The first dimension – behavioral and environmental factors measured against external criteria, and the second one – the subjective dimension, which can be variously defined as the individual's internal feelings or perceptions of being safe (which can be aggregated to the macro-level, to represent the community's perception of subjective safety (Nilsen et al., 2004). Another concept popularized in the literature of this subject assumes that safety can be covered in four basic categories: subjective (eg national security), objective (eg human, economic or ecological safety), spatial (eg local and global safety) and processive (considered as safety of consecutive processes and states) (Zięba, 2008). The aim of this article, however, is not to review the mentioned definitions but the complexity of the concept but to focus on the B2B market, because industrial processes will be the background for the described empirical research. Contemporarily, safety on the corporate market is not only a requirement of the ever more restrictive regulations (mainly including: standards, directives and legal acts), but more and more often the expectation of all interested parties involved both in direct and indirect implementation of industrial processes. Therefore, the phrase industrial safety is often formulated in the context of management of an acceptable level of risk impact factors for People (Occupation, Health, Injury), Environment (Air, Water, Land, Working), Assets (Equipment, Products) and Production (Sporadic – Intermittent and Chronic – Habitual and their containment) (Wilson et al., 2003)

The guidelines for industrial safety refer to the definition of the so-called Safety II, which, unlike Safety I, is oriented towards the ability to succeed under varying conditions. Safety II is achieved by trying to ensure that things go correctly, rather than by preventing them from going poorly. Safety therefore is a condition where the number of successful outcomes is as high as possible (Hollnagel, 2014).

However, the popularization of the industrial safety issue does not imply the correct understanding of the concept and, what follows, its level of optimization. Due to this, the phrase “industrial safety” has a lot of sub conventions created around it, supporting the implementation of the overarching assumptions of the idea. At this point, it is worth mentioning the multiple activities built into safety management systems (Guldenmund and Li, 2017) and the increasingly popular initiatives helping to build a culture of safety, particularly in manufacturing companies (Crutchfield et al., 2013), where the safety of a process has significant importance.

2. Safety in production processes – literature review

Process safety is a relatively new field of knowledge, emerging only in the 1970s. Initially, it was used mainly in the nuclear power industry but currently applies to almost the whole of industry. The importance of the concept is evidenced by a numerous activities conducted in both scientific and technical environments, bringing together practitioners from different sectors (CCPS -Center for Chemical Process Safety, 2016). As an example, one could mention the World Safety Organization and the International Safety Equipment Association, as well as other national organization like the National Labor Inspectorate or the Office of Technical Inspection in Poland. Effective process safety management requires an approach which considers both the state of the internal conditions of the business and the impact of external factors, which often leads to the so-called socialization of risks and threats (Woodhead, 2013). To prevent and/or limit the negative effects of process malfunctions, the literature proposes the so-called process safety paradigms. These are universal principles formulated on the common-sense interpretations of the safety

philosophy (Markowski, 2017) They are presented together with brief characteristics in Table 1.

Table 1: Characteristics of principles

| Principle | Essence/Gist |
|---|---|
| Do not idealize security measures | Regardless of the quality of the owned infrastructure, there is always a so-called residual risk that should be kept in mind. |
| Stay humble | It is necessary to recognize and accept human weaknesses and limitations in the scope of technical and organizational decisions made. |
| Team work | Only the cooperation of various specialists can guarantee a holistic approach to ensuring safety through synergy. |
| Learn from others' mistakes and remember them | The ability to use the experience gained and the use of good practices of other entities in the field of safety management. |
| Continue to gain knowledge and experience | Only the constant updating of interdisciplinary knowledge provides the basis for optimal decisions taken, in particular by management. |
| Take into account all aspects of security | Safety should be considered in its different dimensions. The assessment of ensuring safety requires a holistic approach. |
| Give safety a business value | Giving safety tangible benefits or losses will help to include it in business objectives, thereby increasing interest within top management. |
| Prevent all failures | Take preventive actions and be convinced of their effectiveness. |
| Prioritize security | One cannot allow the dominance of strictly production-orientated aims. It is necessary to maintain a balance and proceed with a so-called safe production, which can bring more benefits than losses. |
| Constant control | Continuous testing of security practices in order to eliminate risk factors, together with the use of reliable, multi-layered safety and security systems |

Source: own work based on: A.S.Markowski, *Bezpieczeństwo procesów przemysłowych*, Politechnika Łódzka, 2017, p.17

Improving managing process safety applies mainly to production activities since these are potentially the most probable sources of industrial threats.

Just like the very concept of safety, the term production process safety can be considered on various levels, even though some researchers identify them only as analysis and

risk management (Silvestri, 2012). However, as economic practices show, it is a too simplistic a perception, preventing optimization of the management process. The B2B research conducted by the author for many years indicates that production safety is largely determined by so-called functional safety, referring to production infrastructure, mainly machines and devices.

Functional safety of devices and production machines is based on three main pillars:

- The machine manufacturer
- The employer for whom the machine is a means of production
- The user (operator) for whom the machine is a tool for performing work

All the above-mentioned parties bear an equal amount of responsibility for the implementation of safety in the immediate vicinity of the used machined. Functional safety is regulated by legal documents, guidelines, legislation, and recommended practices (Mehta, 2015), as well as those directives (including the so-called Machinery Directive 2006/42/EC) pertinent to national legislation and monitored by local and national market auditors and regulatory bodies, whose main task in the field of functional safety is ensuring compliance of manufactured machines and industrial devices with the essential requirements of relevant directives which are oriented to ensuring the health and safety of their users and respecting the natural environment. Assuming that ‘manufacturer’ means any natural or legal person who designs and/or manufactures machinery or partly completed machinery covered by this Directive and is responsible for the conformity of the machinery or the partly completed machinery with this Directive with a view to its being placed on the market, under his own name or trademark or for his own use. In the absence of a manufacturer as defined above, any natural or legal person who places on the market or puts into service machinery or partly completed machinery covered by this Directive shall be considered a manufacturer (Directive 2006/42/EC of The European Parliament and of The Council of 17 May 2006). Good management of functional safety on the level of the production process greatly contributes to the improvement of the following business indicators:

- Certainty of delivery
- High quality of manufactured goods
- Satisfying the safety of employees, understood as a contribution to the company’s business success
- An increase in the company’s productivity, which directly impacts the market position of all stakeholders, including, primarily, customers, employees and suppliers

Another equally important area for safety analysis is production quality assurance, determined primarily by the transparency and reliability of technological (production) procedures. Within this dimension of safety, an important aspect would be involvement of employees in the production process, perceived as a form of an integrated executive chain for tasks. It is important to emphasize the importance of knowing the aim of a company’s activities, consisting mainly of the production of a specific number of units at a fixed quality and price over a given time. This is a production task – whose correct execution is determined by setting specific quantitative and time parameters. A condition for ensuring production safety is to maintain continuity over a period of time. This is because too large and frequent fluctuations in task specificity cause a decrease in the process stability and its degradation in relations to adopted parameters. This dimension of safety is associated integrally with another identified by the author, which is related to the flow of input materials (production means) to the production process and then the reception of finished items. The undeniable fact of the dependence between safety and supply, both

internal and external, has contributed to the creation of the concept of Supply Chain Safety Management (Essig, 2013).

Modern production process safety analysis can not be carried out without taking the aspect of production automation into account, in particular when it comes to productivity growth. A growing number of business entities automate their processes, mainly to eliminate bottlenecks and optimize process beyond the capabilities of the human factor. Typical procedures undergoing the automation process include the most troublesome, repetitive activities that a machine can perform more efficiently.

Automation of production undoubtedly has a significant impact on safety, for example by eliminating the weakest links and thus increasing the productivity of the process. Additionally, the problems of human nature and impairment, such as sick leave, fatigue or tiredness of operators get minimized as well. It should be emphasized that automation is not aimed at reducing the level of employment, because, as shown by observation of practice in a professionally managed, automated enterprise, it is not only possible to maintain a stable employment – it is also possible to increase it by delegating employees to other tasks which are not subject to automation.

The idea of a fourth industrial revolution (Smart industry) shifts the paradigm of manufacturing towards the direction of technology. This could mean making production so flexible that the customers' needs could be satisfied in an even shorter time, assuming it does not limit the specificity of the needs to a pre-defined template (based on the analogy to H. Ford's motto from 1914: you can get a car in any color, on the condition that it is black).

Thanks to automation, production lines are constructed in order to produce different types of the same product, consistent with the client's expectation. However, it should be emphasized that the implementation of the 4.0 industry, apart from investing in modern production lines, requires a change in the system managing the production and distribution of goods, and this bears certain consequences for production safety. However, the opportunities made possible by the 4.0 Industry concept in fact lead to the effective counteracting of all threats, for example due to numerous tools for real-time data collecting and taking preventive actions based thereon (Mintrum, 2017).

Production safety is also a matter of ensuring sales for the current production. This goal is typical for business, however, it is often neglected by manufacturers at the level of maintaining production capacity, thus having an impact on a possible breach of safety level.

The last highlighted security dimension of the production process is related to the staff. Breaking the continuity of competences may result in a decrease in the level of security, which many companies overlook and suffer noticeable losses. That is why it is so important to share knowledge, which should be treated as one of the most important assets and a basis for building a strong competitive advantage (Crhova, 2015).

The featured aspects of production safety in business reality are related and have a significant impact on each other, although they are generally focused on different dimensions. For example, by using sensitivity analysis one can determine the level of any impact and reveal any potential threats (of different importance and severity) to the production process (quantitatively: low, weak, significant, large, critical). It is possible to determine a second descriptive parameter, namely the level or effect (negligible, small, significant, large) of the change in the relation to the state of the production process. Gathered data will undoubtedly be an important source for increasing the safety of the continuous production processes.

3. Methodology, Research Data and Results

The research conducted by the Author concerns those aspects considered as related to the safety of the production process in the B2B market. The study consists of two phases: the pilot and the main one, which is planned to be carried out in May 2018. Each phase is preceded by literary studies and qualitative research in the form of consultations with practitioners from the analysed field. The pilot survey, whose results are partly presented in this article, was performed at the end of 2017 (12th-13th of December) during the cyclical national conference "Safety Automation". The paper-and-pencil option was chosen as the most effective in such research conditions. Due to the specifics of the research area, the focus was only on those production companies operating in Poland. It was assumed that respondents would be aware of the concept of the safety of the production process. Out of the total of 38 distributed questionnaires, 30 were correctly completed. The analysed companies represented different manufacturing sectors, presented in Table 2. Along with its sector, a company's profile contained data related to: spatial range (local; national or international), market in which the products are being offered (domestic; foreign; domestic and foreign), type of the market, on which the offer is addressed (B2B; B2C; B2B and B2C), number of people employed (up to 10; 11–50; 51–250; 251–500; more than 500) and type of capital (national; international; joint-venture). All these data allowed for detailed analyses of the responses given by companies. The structure of the questionnaire consisted of six questions concerning:

- Understanding of the term safety of the production process;
- Tools/means used to ensure the safety of the production process;
- Subjective responsibility for the safety of the production process;
- Influencing factors/determinants of the safety of the production process;
- Measures used for the safety of the production process;
- Identified barriers/difficulties in management of the safety of the production process.

Respondents taking part in survey could mark a free number of answers standardized for each question items. Given answers were not subject to any grade. The percentage of each variable was calculated. The variables used in the survey were developed on the base of the specialist literature in the field of industrial safety and interviews with safety experts.

Due to the subject of the article and limitations in the scope of the extent of the article, the author is only able to approximate the results obtained from the questions on the interpretation of the concept of the safety of the production process (Table 3) and determinants of safety (Table 4). The remaining issues will constitute the content presented in future publications.

Table 2 presents the structure of the research sample in terms of production sectors, assuming that one entity can represent more than one industry.

Table 2: Characteristics of the research sample

| Sector | Number of companies |
|-------------------|---------------------|
| Chemical | 2 |
| Construction | 7 |
| Electromechanical | 13 |
| Food | 5 |
| Metal | 7 |
| Textile | 2 |
| Chemical | 2 |
| Construction | 7 |

Source: own elaboration.

It can be seen that, probably due to the specificity of the conference during which the described study was conducted, the majority of companies are from the electro technical and metal sectors.

In addition, as business practices show, these two industries are the most advanced in the field of security, especially in its technical dimension.

Table 3 presents the quantitative distribution of answers to the question regarding the understanding of the concept of the safety of the production process and Table 4 shows the main factors shaping production safety in surveyed companies.

Table 3: Dimensions of safety of production process

| How is the safety of the production process understood in the company? | Number of answers / percentage of all indications |
|--|---|
| Guarantee of the company's existence, stability of employment | 10 (8%) |
| Providing occupational safety | 24 (20%) |
| Quality distinction of manufactured products | 14 (12%) |
| Fulfilling normative requirements, including legal ones | 15 (13%) |
| A key element of the company's strategy | 12 (10%) |
| A means to streamline processes | 3 (3%) |
| Conditioned by the used technology | 5 (4%) |
| Activities aimed at maintaining production capacity while protecting own resources | 10 (8%) |
| Ensuring the reliability of the company's the supply chain | 10 (8%) |
| A kind of corporate image policy | 15 (13%) |
| Others | 3 (3%) |

Source: own elaboration.

Table 4: Determinants of the safety of the production process

| What factors determine the safety of production in a company? | Number of answers / percentage of all indications |
|---|---|
| Image reasons | 6 (5%) |
| Policy of the company | 18 (15%) |
| Legal requirements | 12 (10%) |
| Financial sanctions | 3 (3%) |
| Health and safety regulations | 22 (19%) |
| Concern for human resources | 12 (10%) |
| Used technology | 11 (9%) |
| Pressure of business partners | 6 (5%) |
| Social responsibility | 9 (8%) |
| Employee awareness | 18 (15%) |

Source: own elaboration

4. Discussion of results and conclusions

The main conclusion from the results presented above is that the term safety of the production process does not have a single, explicit definition and can be perceived through the prism of various perspectives. Despite the relatively equal distribution of indications, industrial entities most often identify safety with its occupational dimension and the need to fulfil normative requirements. Such indications are quite obvious but the author's attention is drawn to the relatively high percentage of responses to issues related to linking the safety of the production process and corporate image. Observation of international leaders' activities confirms this dependence in the B2B market. For example, Siemens presents on its own web site safety as a matter of conviction. Safety is defined as a business task, a part of its social responsibility strategy and a factor in its success (www.siemens.com). In line with the biggest companies, more and more other industrial entities are beginning to realize the fact that being safe, beyond its other measurable benefits, is very good publicity and conveys as positive a corporate image as being a part of the community does (Bahr, 2015). As the results from Table 4 indicate, the safety of the production process is mainly determined by different types of occupational health and safety (OHS) regulations, company policy in the area of safety and by employee awareness. Internal training programs, and guidelines for good practices are just examples of different activities that build the culture of security in modern companies (Tsao et al., 2017).

It should be emphasized that both the applied research methodology and the obtained results have some limitations. Mainly due to the narrow research sample it is impossible to formulate detailed conditions and comparative analysis of safety of production process. Therefore, the results from the pilot research and literature studies are the valuable starting point for conducting in-depth studies, both qualitative and quantitative ones.

As some authors have already noticed, due to a number of different factors, among which the following are primarily mentioned: the assumptions of industry 4.0 (even 5.0) concepts, the possibility of doomsday scenarios (e.g. terrorism, cyber-crimes), a philosophy of sustainable development and changing society, companies are forced into a safety paradigm shift. The future of safety in the manufacturing industry will be based on the

holistic inclusion of economic, moral and ethical aspects of safety, multidisciplinary orientations (not only technical), a proactive approach and the integration of five domains: cluster-thinking and cooperation; high transparency and efficient inspection; education, training and learning; security integration; safety innovation and dynamic risk assessments (Reniers, 2017).

Summing up, the article indicates the multidimensionality and importance of the safety of production from both a theoretical and practical analysis and thus confirms the importance of conducting further, in-depth empirical studies. As the German poet Friedrich Hölderlin once said: where there is danger, a rescuing element grows as well (Markowski, 2017)

References

- BAILLIET, C.,A. 2009. Security: A Multidisciplinary Normative Approach. BRILL: 9.
- BAHR, N.,J. 2015. System Safety Engineering and Risk Assessment: A Practical Approach, Second Edition. CRC Press: 89.
- CCPS (Center for Chemical Process Safety). 2016. Introduction to Process Safety for Undergraduates and Engineers. Wiley: 5.
- CRHOVA, Z., KOLMAN, K. and PAVELKOWA, D. 2015. Support of Knowledge Sharing in Manufacturing Companies: A Case Study. World Academy of Science, Engineering and Technology, International Journal of Economics and Management Engineering 9 (5): 1371.
- DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 (<http://eur-lex.europa.eu/legal-content/FRN/TXT/?uri=celex:32006L0042>) Accessed 26.01.2018.
- ESSIG, M., HÜLSMANN, M., KERN, E.,M. and KLEIN-SCHMEINK S. 2013. Supply Chain Safety Man-agreement: Security and Robustness in Logistics. Springer: 5.
- GULDENMUND, F. and YULING, L.2017. Safety management systems: A broad overview of the literature. Safety Science 103:94–123.
- HOLLNAGEL, E. 2014. Safety-I and Safety-II : The Past and Future of Safety Management. Ashgate:183.
- <https://www.siemens.com/global/en/home/company/sustainability/safety.html>. Accessed 26.01.2018.
- MARKOWSKI, A.,S. 2017. Bezpieczeństwo procesów przemysłowych. Politechnika Łódzka: 11.
- MEHTA, B.,R. and AGANMOHAN, Y.,J. 2015. Industrial Process Automation Systems: Design and Implementation. Butterworth-Heinemann: 159.
- MINTURN, A. 2017. Safety first: How Industry 4.0 can optimise safety , <http://www.controlengurope.com/article/133867/Safety-first--How-Industry-4-0-can-optimise-safety.aspx>. Accessed 26.01.2018.
- MÖLLER,N., HANSSON S.O. and PETERSON, M. 2006. Safety is more than the antonym of risk. Journal of Applied Philosophy 23 (4): 419–432.

- NILSEN, P., HUDOSN, D. S., KULLBERG, A., TIMPKA, T., EKMAN, R. and LINDQVIST, K. 2004. Making sense of safety. *Injury Prevention* 10 (2): 71–73.
- RENIERS, G. 2017. On the future of safety in the manufacturing industry. *Procedia Manufacturing* 13: 1292–1296.
- ROUGHTON, J. and CRUTCHFIELD, N. 2014. *Safety Culture: An Innovative Leadership Approach*. Elsevier: 27.
- SILVESTRI, A., DE FELICE, F. and PETRILLO, A. 2012. Multi-criteria risk analysis to improve safety in manufacturing systems. *International Journal of Production Research* 50 (17): 4806–4821.
- TSAO, M.,L., HSIEH, C.,J. and CHEN, L.,Y. 2017. The role of management commitment and employee involvement in safety management. *International Journal of Organizational Innovation* 10 (2): 52–74.
- WILSON, L., MCCUTCHEON D. and BUCHANAN, M. 2003. *Industrial Safety and Risk Management*. The University of Alberta Press: 6.
- ZIĘBA, R. 2008. Pozimnowojenny paradygmat bezpieczeństwa międzynarodowego, in: *Bezpieczeństwo międzynarodowe po zimnej wojnie*. WAIp: 15–39.
- WOODHEAD, A.,D. 2013. *Assessment of risk from low-level exposure to radiation and chemicals. A Critical Overview*. Plenum Press: 70.

21st International Scientific Conference
“Enterprise and Competitive Environment”, March 22–23, 2018,
Brno, Czech Republic

Harmful Tax Competition in the EU and Anti-Tax Avoidance Directive

Pavel Žiaran¹, Eva Ludvíková²

¹*Ing. Bc. Pavel Žiaran, Ph.D., M.A., lecturer and researcher of the Department of Law and Social Sciences and Department of Finance, Faculty of Business Economics, Mendel University in Brno, Czech Republic, email: pavel.ziaran@mendelu.cz.*

²*Mgr. Eva Ludvíková, LL.M., graduated at the School of Advanced Study, University of London in 2017 and Faculty of Law, Masaryk University in Brno in 2006, email: evaludvikova@icloud.com.*

Abstract

Tax competition in the EU creates opportunities for tax avoidance practices and aggressive tax planning. This article considers tax competition in the EU as harmful. The progress of tax harmonisation still has a long way to be developed and needs many efforts from the EU as a whole and each member state. One of the most significant reforms to tackle tax avoidance practices in the EU is the Anti-Tax Avoidance Directive which will come into effect on 1st January 2019. The main part of the article focuses on the contribution of the rules of the recently adopted Anti-Tax Avoidance Directive to prevent tax avoidance in the EU. Overall, it assesses the impact and problems of the directive to approach a fair share of tax.

Keywords: tax competition, tax avoidance practices, aggressive tax planning, corporate taxes, Anti-Tax Avoidance Directive

JEL Code: K15

1. Introduction

Recently the European Commission adopted the Anti-Tax Avoidance Directive. The directive aims for reform to tackle tax avoidance practises that influence economic revenues not only in the EU but also in other countries around the world. The new reforms included in the directive should help to ensure sustainable revenues to provide a higher quality of society through education, health, security or public services and support a better business environment in the internal market.

The global and digital economy has brought new challenges to cross-border companies to increase their profits. These transnational companies (“TNC”) operate in different countries as affiliates, for instance, subsidiaries or branches, which means that they operate in different legal systems as separate entities from the point of view of tax rules. Legal

entities are taxed in different countries, based on their status and residence. Cross-border companies use legal mismatches and loopholes to reduce their tax liabilities. These negative circumstances affect the functioning of the internal market and the tax competition between tax jurisdictions has become harmful. The EU aims to combat tax avoidance and ensure fairer, simpler and more effective corporate taxation and ensure that companies pay tax wherever they make their profit in the EU. One part of the the new reforms is a new Tax-Avoidance Directive ('ATAD').

This paper describes circumstances of harmful tax competition and negative effects in tax avoidance practices and aggressive tax planning. Firstly, harmful tax competition in the EU is described, then there is a short evaluation of the corporate taxation in the EU. The last chapter focuses on new measures adopted by the recent Anti-Tax Avoidance Directive. The critical review analyses if the directive will be effective against tax avoidance practices which results in aggressive tax planning.

2. Harmful Tax Competition in the EU

Taxes, as a part of the fiscal policy, which is an important component of the economic policy can influence many outcomes, for instance consolidation of public finance, stimulation of economic development or achievement of economic balance. On the EU level, the decision about fiscal issues from a member state can affect the national level of economic policy but it will also be on a community level. The settlement of national fiscal policies is essential for the Single Market to function effectively (Pirvu, 2012).

The issue of tax harmonisation within the EU came about because the market ensures the free movement of goods, services, capital and labour. Member states have created convenient conditions for investments and thus they are integral to tax competition but member states have found it difficult to protect their national tax bases because of tax avoidance practices or aggressive tax planning.

Since the beginning of corporate income tax harmonisation there have been some significant achievements, for example, in legal instruments such as directives, in jurisprudence with the new doctrines of European Court of Justice ('ECJ'), in soft law with the Code of Conduct and proposals of the Commission, to make cooperation more effective. However, it is still necessary to make many efforts, for example, coordination of tax policies, harmonisation of tax law or action of the ECJ, on both sides, from the EU as a whole and each member state, to be able to guarantee efficient functioning of the Single Market in the conception of tax harmonisation.

Progress such as corporate income tax rates and differences among the corporate tax bases of member states, still has a long way to be developed. On one hand each member state has full autonomy to set its own system of direct taxation, which includes corporate income taxation, on the other hand the national taxes have to be compatible with EU law, in particular, the fundamental freedoms and fair competition and the establishment or functioning of the internal market laid down in the Treaty ('Treaty of the Functioning of the European Union'). In fact, the full tax autonomy defends the proper functioning of the Single Market (Pirvu, 2012). The solution is regulation of the national taxation system according to economic rules and measures and achieved common objectives stated in the Treaties but with the majority of member states, the area of direct tax keeps the sovereignty of national tax regimes.

Compliance of national taxes in accordance with EU law means in practice that national tax law should not make barriers for cross-border economic transactions. The progress of the single market requires more than ensuring cross-border economic transactions. There are many reasons why income tax harmonisation or income corporate tax coordination is necessary; notably to provide better coordination of corporate tax policies in the EU.

The reasons are: 1) Twenty-eight members of the EU means the same number of national tax systems in the Single Market; 2) Conflict between national tax policies and EU law are often about incompatible national tax rules with EU law; 3) Compliance and administration fees are too expensive for companies operating in more Member States; 4) Differences in the tax systems and their dissimilar burdens distort economic activity in the EU; and, 5) Tax planning strategies of TNCs with their separate accounting methods makes the collection of corporate tax difficult (Devereux & Fuest, 2009).

Harmful tax competition means that there are 28 different corporate taxes with different tax bases and rates in the EU with lack of harmonisation of corporate tax. To avoid harmful tax competition, it is necessary to think about the main obstacles to the harmonisation process. Mainly, the legal basis of the Treaty is not straight for harmonising corporate tax, the principle of subsidiarity – all initiatives should be defined through a consultative process with the member states, and the rule of unanimity – tax provision about harmonisation of corporate income tax is very limited (Soler Roch, 2005).

Fundamental freedoms as a principle of non-discrimination do not allow tax discrimination by any measurements or activities made by member states. In case of lack of income tax measures, incompatible national tax rules with EU law and any conflicts contrary to community law have to be resolved by ECJ. This is also called negative harmonisation.

There have been many important cases about locational efficiencies within groups of companies, cross border tax consolidation and deductibility by the parent company, costs or losses in relation to a subsidiary established in another Member State, or on the contrary. Locational efficiency of capital income is mainly cross-border corporate activities through complex corporate structures concerning the freedom of establishment and can be applied also to the taxation of cross-border dividends and profit shifting by multinational companies (Garbarino, 2016).

Another form of cross-border tax consolidation is under controlled foreign companies. The parent company, within its group of affiliated companies can deduct costs or reflect losses in its tax accounts. Costs and losses can occur at the level of the controlled company.

3. Evolution of corporate taxation in the EU

There are some interesting points in the evolution of corporate tax harmonisation. The international tax system and in parallel the EU tax system was based upon the principle of source and residence. These principles formed rules. Income is taxed where it arises and/or it is taxed where the entity earning the income resides; to identify which country is legitimate to a specific income and the ability to collect the income tax.

When the world became globalised and digitalised and the EU entered into the Single Market, distortions in international trade arose. Both governments and corporations have been demanding the best benefits in tax competition or tax avoidance and on the top of

this, came the economic and budgetary crisis. The reaction to increasing harmful tax competition has introduced measures against tax avoidance to prevent aggressive tax planning and increase tax transparency.

The first relevant initiatives against harmful tax competition were presented in the Code of Conduct for business taxation which was set out in the conclusions of the EU Council of Economics and Finance Ministers ('ECOFIN') in 1997. Even though it was not a legally binding document, the Member States undertook to reduce existing tax measures that constitute harmful tax competition and not to introduce any such measures in the future. In early 2000, a few directives or amendments were approved without essential changes in corporate taxation. For instance, the new legal entities and new types of transactions were amended in amending the Merger Directive. Because of the increasing fiscal problems and discovering that Member States could not fight individually against fiscal fraud, the Commission launched a debate about a strategy to combat fiscal fraud which was undermining the functioning of the Single Market and effected tax competition in a negative way.

In early 2016, the Anti-Tax Avoidance Package ('ATAP') was published to make fairer, simpler and more effective corporate taxation in the EU (European Commission, 2016). It includes measures aimed to tackle tax avoidance and abusive practices in the EU internal market. ATAP proposed a general Anti-Tax Avoidance Directive which includes new rules against tax avoidance and problem solving of aggressive tax planning strategies which have a negative effect on the internal market.

The area of tax transparency resulted from the new proposals to amend obsolete directives such as the Merger Directive and the Parent/Subsidiary Directive. Significant extension of the scope of the automatic information exchange to advance cross border tax rulings was adopted in the amended Directive of the Administrative Cooperation. The new transparency requirements should ensure better cooperation and transparency between tax authorities for protection of tax bases and automatic exchange of information between member states encompassing interest, dividends and gross from the sale or redemption of financial assets. The Parent/Subsidiary Directive was amended several times, however there were many cases where companies avoided paying taxes in any member state and loopholes used for hybrid loan arrangements needed to be closed. The mandatory anti-abuse rule as a minimum was amended in the Parent/Subsidiary Directive in 2015. Member states were obliged to enact measures preventing abusive tax practices.

The new reforms should contribute to better revenue stability, a stronger single market and more efficient conditions of cross-border operations for businesses. The comprehensive proposals included in the Action Plan set out a range of soft law and hard law measures that could enhance the corporate tax environment in the EU and avert significant revenue losses for Member States, a heavier tax burden for citizens and competitive distortions for businesses.

There are also some interesting proposals on how to solve the no longer suitable corporate tax systems. Garbarino suggests on the economical point of view to unite or approximate tax rates and taxable bases in Member States (Garbarino, 2016).

Another proposal is called Destination-Based Corporation Tax where the country of the customers' base would be entitled to tax the company's profits. The last proposal is a Corporate Tax 2.0 which suggests taxing TNCs in the global market, on the concept of equal conditions for taxpayers within each state (Cerioni, 2016). None of these were integrated in the new reforms by the Commission. The Commission's proposal to ensure taxation where the profit is generated remains in the traditional international tax law framework for corporate taxation.

4. Anti-Tax Avoidance Directive

An appeal for reform in corporate tax as the reaction to globalisation and digitalisation of the economy was performed in the new Anti-Tax Avoidance Directive. The ATAD is directly related to the establishment or functioning of the internal market in accordance to Article 115 of the Treaty. The base of the Directive is to provide a minimum level of protection and at the same time it enables national legislations to make provision with a higher level of protection.

The ATAD determines rules against tax avoidance practices which have a negative influence for the functioning of the single market, such as taxpayers' actions against the purpose of the law, taking advantage of disparities between national tax systems and hybrid mismatches. Moreover, it includes cross-border activities involving third countries to preclude reducing tax liability by taxpayers in the EU.

The proposal of ATAD was a part of the Anti-Tax Avoidance Package that includes measures against tax avoidance and abusive practices in the internal market. The approval of the directive did not take a long time and the reason was the necessity to apply BEPS rules among Member States and also provide anti-abuse measures against common forms of aggressive tax planning. The priority of BEPS included in ATAD is to ensure tax payments in the place where profits and value are generated. ATAD should ensure a fairer environment for business with measures against tax avoidance within the EU. Concurrently, ATAD proves that the base of EU tax law is national tax sovereignty and cross-border tax competition. The minimum level of protection against aggressive tax planning and tax avoidance for national corporate tax systems is contained in ATAD which have to be implemented in 28 separate corporate tax systems.

The council adopted ATAD on 20th June 2016 and the Member States should apply the anti-abuse measures from 1st January 2019.

The Anti-Tax Avoidance Directive provides transposition of the BEPS measures within the EU and addresses five main rules to harmonise corporate tax in the EU. The new legally binding rules should combat aggressive tax planning used by TNCs. They are the interest limitation rule, exit taxation, GAAR, Controlled Foreign Companies rules, and rules to tackle hybrid mismatches.

Interest limitation rules limit the amount of interest that a company can deduct which should increase the amount of tax it pays. The tax avoidance rule contains fixed parameters such as 30% EBITDA or EUR 3,000,000 for both, individual or group companies in all business sectors. The fixed parameters provide disproportions of the rule. Furthermore, it does not prevent borrowers to provide loans in low tax jurisdictions but only limits the amount. The rule does not solve the problem when the interest earned is taxable creditor level, the rule may cause double taxation. The interest limitation rule was established at the national level in developed countries before ATAD, such as Germany and Austria and it has shown positive results in decreasing of deduction for group interest payments but there is a question of whether it will be suitable to combat base erosion at the EU level (Dorado, 2017).

The exit tax rule ensures Member States the right to impose exit tax on the value of the unrealised gains before it was transferred cross-border from the Member State. Fundamental freedoms protect the rights of the companies and their cross-border relocations. Exit taxes generally restrict fundamental freedoms, especially the freedom of establishment. Companies are restricted by exit tax rules to tax their latent capital gains at the moment of allocation which could never have happened if they did not relocate their business. On the other hand, in accordance to the principle of territoriality there is the right of

the Member State to effectively tax capital gains and assets during the period when a company established a business on its territory and thereon fell under its taxing power (Peeters, 2017). The normal practise in some industries by companies based in the EU is to develop a new product and move it to the low tax country before it gets finalised. Exit taxation rule treats different transfers intra EU/EEA and to third States. The payment of transfers intra EU/EEA can be deferred by paying the instalments over five years. On the contrary, the payment of the transfers to third countries on unrealised gains has to be recovered immediately. The discrimination of third countries is because of the need to ensure effective fiscal supervision which is higher risk in third states. ATAD established the exit tax rules on the base of these cases with more clarified measures for transfers intra EU/EEA and to third countries.

A General Anti-Abuse Rule gives Member States the power to tackle artificial arrangements instead of applying other specific rules. The calculation of corporate tax liability has to reflect economic reality. The TNCs have to use arrangements with valid commercial reason as a main or one of the main purposes to be able to grant GAAR and obtain a tax advantage. This obligation should fight abusive tax practices and hinder finding ways of circumventing rules and finding loopholes in tax laws. There are many cases of artificial agreements which benefit taxpayers. GAAR allows Member States to refuse those arrangements.

ATAD allows to the Member State to include not-distributed income of Controlled Foreign Companies in the tax base. This provision is to prevent taxpayers from deferring domestic taxation (Schönfeld, 2017). Controlled Foreign Companies Rule still enables companies to shift their profits but it has to be taxable in the EU. The taxpayer is obliged to include the non-distributed income of related entities in its tax base. This rule facilitates Member States to prevent erosion of the domestic tax base. Resident companies are discouraged to shift income to third countries. This rule will affect entities without effective business activity with passive income.

The final measure, Hybrid mismatches are considered as a consequence of a different legal characterisation of payments or entities by two legal systems. Accordingly, the cause of mismatches lies in disparities between national tax systems. Hybrid mismatches rules, including the new amendment with the extended scope to third countries and implementing the defensive rule do not close many of the existing loopholes where hybrid mismatches are used. The reason is that ATAD is not addressing the cause of hybrid mismatches but only a few of the symptoms of hybrid mismatches, especially situations of a double deduction or a deduction without corresponding structures. The right solution to eliminate hybrid mismatches in the internal market should be in uniform classification tax systems between Member States by mutually recognising the tax classification in the third country (Fibbe & Stevens, 2017). The specified rule of ATAD cannot solve the whole problem of mismatches created by tax avoidance.

ATAD aims to close the loopholes and discrepancies of cross-border situations created by the interaction between different tax jurisdictions. Adopted rules affect the main matters created by tax avoidance practices. Without substantial reform in national tax systems and unification of corporate tax and tax rates, there is no certainty of positive results in revenue on national levels.

5. Conclusion

Until now there was not a lot of progress to unify corporate income tax rates which remains in national tax sovereignty. The EU does not have a direct role in setting tax rates, it depends on national tax systems and inherently creates tax competition on internal markets which is considered harmful and is used for aggressive tax planning strategies. The EU corporate tax policy was mainly to reduce the gaps between the taxation of cross-border and internal transactions and eliminate double taxation within the internal market.

The sudden changes in the global and digital economic environment including the global financial crisis forced the EU to reform corporate tax policy. The new reforms have established new rules to tackle practices used by corporate taxpayers to get tax advantages from distinctions between different domestic tax systems in the Member States.

Nowadays the EU corporate tax policy balances between supranational and domestic interests. Corporate income tax in the EU is a conflict between two interests established in the Treaty. On one side is the establishment and the functioning of the Single Market, the fundamental freedoms and their fair competition, on the other side is the protection of domestic tax systems and their revenues (Bizioli, 2017).

The implementation of new rules will complicate the ways of TNCs to reduce their tax liability. However, tax competition between states, which is causing corporate tax avoidance, remains (Mikler & Elbra, 2017). The solution lies with the EU to provide tax reforms that affect tax avoidance or aggressive tax planning used by TNCs and Member States must implement them. Up to now, the power to regulate direct taxation remains largely with the member states. The new rules are considered as an effort by the EU to harmonise standards ensuring the smooth operation of the internal market (De Broe & Beckers, 2017).

The latest evolution of the EU approach in the field of corporate income taxation has been done to diminish existing distortion in assuring that taxes should be paid where the economic activity takes place and in eliminating profit shifting. Inherently, ATAD will contribute to prevent further tax avoidance by corporations, however, it is just the beginning of the long way of how to reach a fair share of taxation from the TNCs.

The problem on the whole Commission's ambitious agenda is that all measures solve consequences of tax competition between Member States but do not solve the cause, being, 28 different corporate taxes with different tax bases and rates in the EU.

Until it is decided to tackle substantial corporate tax reform on a legal basis of the Treaty and system of taxation is integrated and which will correspond to the fundamental freedoms and fair competition and the establishment or functioning of the internal market, the tax competition in the EU will continue to allow tax avoidance by TNCs. Many efforts to harmonise corporate taxation will reduce impacts made by TNCs in the scope of tax avoidance.

Insofar as the directive shows big progress in combatting tax avoidance it does not end tax avoidance practices in the EU and harmful tax competition.

References

- BIZIOLI, G., 2017, 'Taking EU Fundamental Freedoms Seriously: Does the Anti-Tax Avoidance Directive Take Precedence over the Single Market?' *EC Tax Review* 26, 167.

- CERIONI, L., 2016 'The Quest for a New Corporate Taxation Model and for an Effective Fight against International Tax Avoidance within the EU' *INTERTAX* 44, 463.
- Council Directive 90/434/EEC of 23 July 1990 on the common system of taxation applicable to mergers, divisions, transfers of assets and exchanges of shares concerning companies of different Member States (the Merger Directive) [1990] OJ L225.
- Council Directive (EU) 2016/1164 of 12 July 2016 laying down rules against tax avoidance practices that directly affect the functioning of the internal market [2016] OJ L193.
- Council Directive (EU) 2015/2376 of 8 December 2015 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation [2015] OJ L322.
- Council Directive (EU) 2015/121 of 27 January 2015 amending Directive 2011/96/EU on the common system of taxation applicable in the case of parent companies and subsidiaries of different Member States [2015] OJ L121.
- De BROE, L. & BECKERS, D., 2017, 'The General Anti-Abuse Rule of the Anti-Tax Avoidance Directive: An Analysis Against the Wider Perspective of the European court of Justice's Case Law on Abuse of EU Law' *EC Tax Review* 26, 133.
- DEVEREUX, M. P. & FUEST, C., 2009, *Corporate income tax coordination in the European Union*, Oxford University Centre for Business Taxation.
- DOURADO, A. P., 2017, 'The Interest Limitation Rule in the Anti-Tax Avoidance Directive (ADAT) and the Net Taxation Principle' *EC Tax Review* 26, 112.
- European Commission, 2016, *Communication Anti-Tax Avoidance Package: Next steps towards delivering effective taxation and greater tax transparency in the EU*, SWD6.
- European Commission, 2016, *Proposal for a Council Directive amending Directive (EU) 2016/1164 as regards hybrid mismatches with third countries*, COM 687 final.
- FIBBE, G. & STEVENS T., 2017 'Hybrid Mismatches Under the ATAD I and ATAD II' *EC Tax Review* 26, 151.
- GARBARINO, C., 2016, 'Harmonization and Coordination of Corporate Taxes in the European Union' *EC Tax Review* 5–6, 277.
- MIKLER, J. & ELBRA, A., 2017 'Paying a 'Fair Share': Multinational Corporations' Perspectives on Taxation.'. Sheffield Political Economy Research Institute, SPERI Global Political Economy Brief No. 8. [Online] Available at: www.sheffield.ac.uk. [Accessed: 1 February 2018].
- PEETERS, S., 2017, 'Exit Taxation: From an Internal Market Barrier to a Tax Avoidance Prevention Tool' *EC Tax Review* 26, 122.
- PIRVU, D., 2012, *Corporate Income Tax Harmonization in the European Union*, PALGRAVE MACMILLAN.
- SCHÖNFELD, J., 2017 'CFC Rules and Anti-Tax Avoidance Directive' *EC Tax Review* 26, 145.
- SOLER ROCH M. T., 2006, 'Corporate tax in the EU: a never-ending story?' *EC Tax Review* 3, 116.
- The Treaty on the Functioning of the European Union [2007] OJ C326.

**21st Annual International Conference
Enterprise and Competitive Environment
Conference Proceedings**

Responsible editors: Svatopluk Kapounek, Veronika Kočíš Krůtilová
Technical editor: Jan Přichystal

Published by Mendel University in Brno
www.mendelu.cz

First edition
Brno 2018
ISBN 978-80-7509-561-9

