



Petr David, Hana Vránová (eds.)

# **ECONOMIC COMPETITIVENESS AND SUSTAINABILITY**

**25<sup>th</sup> International Conference**

**March 23<sup>rd</sup>-24<sup>th</sup>, 2023**

**Abstracts**

- MENDELU
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- of Business
- and Economics

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

**Petr David  
Hana Vránová (eds.)**

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Mendel University in Brno  
Czech Republic**

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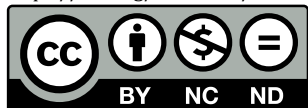
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# Time taken to process a road tax return: an experiment

Břetislav Andrlík<sup>a</sup>, Stanislav Mokrý<sup>b</sup> and Petr David<sup>c</sup>

## Abstract

This paper investigates the input variables of induced administrative costs related to a general road tax through a series of experiments using eye-tracking technology. The aim of the research is to synergistically use a neuromarketing tool and a questionnaire survey to identify time variable parameters and factors related to the completion of a model road tax return in the Czech Republic and to verify the relevance of using eye-tracking to identify time variable parameters for the purpose of determining the induced administrative costs. In addition to the identification of basic time variable characteristics, it can be concluded from the results of the eye-tracking experiment and the related questionnaire survey that the use of a neuromarketing tool is relevant for the purpose of identifying time variable parameters in the process of determining the induced administrative costs of taxes. In addition, the use of a combination of a standard questionnaire survey method and a neuromarketing experiment provides a synergistic effect through the ability to examine cross-linkages between socio-demographic variables and data collected in a time study.

This article is financed from the state budget by the Technology agency of the Czech Republic and the Ministry of the Environment of the Czech Republic under the Prostředí pro život Programme, project SS03010156 Prediction of emission savings in road transport achieved by application of the selected tax and fee instruments by 2030.

## Keywords

road tax, eye-tracking, time to comply

## JEL Classification

H25, M390

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<sup>a</sup> Mendel University in Brno, e-mail: xandrlik@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: stanislav.mokry@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: petr.david@mendelu.cz

# Structure of Household Disposable Income for Sustainability out of Poverty in the EU

Irena Antošová<sup>a</sup> and Jana Stávková<sup>b</sup>

## Abstract

Identification of the structure of sustainable household disposable income in times of economic uncertainty is the aim of this paper. The research aims to understand the different components of household income and the income-related factors affecting the chances of a sustainable income ensuring a life out of poverty. The analyses were based on the EU-SILC 2020 database of primary data. In total, data from 232,816 European households has been used. Using binary logistic regression, it was verified that households capable of generating savings have the highest chances of achieving a sustainable income. There is also a positive influence of investment income (interests, dividends, profit from capital investments and income from rental), but with a lower impact than expected. On the contrary, the presence of social benefits in income reduces the likelihood of sustainable income. The setting of social policies must be taken into account in this context. According to the robustness analysis, the presented model is most appropriate for the segment of countries characterised by a higher share of social benefits in household income rather than the share of old-age pensions in income. The focus on social benefits seems appropriate with regard to the poverty rate.

## Keywords

household income, Sustainable income, Income poverty, EU-SILC

## JEL Classification

I32, D31

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<sup>a</sup> Mendel University in Brno, e-mail: irena.antosova@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: jana.stavkova@mendelu.cz

# An analysis of password patterns in leaked user accounts

Jiří Balej<sup>a</sup>, Stratos Zerdaloglu<sup>b</sup> and Andrej Juríčka<sup>c</sup>

## Abstract

Every user tends to ease the work with own passwords, especially to make them fulfill requested condition along with being memorable. Thinking of many people is similar, they use existing words joined with number and special character rather than randomly generated string of characters. Our question was how common are the individual patterns and whether the password strength could be lowered because of this. To analyze the behavior, we used one of publicly leaked databases containing user accounts. The databases leaked from various sources including large and respected Internet services. These in some cases contained also plain text passwords. We used one of these databases to investigate the patterns in user passwords.

## Keywords

password, pattern, behavior, brute force, vocabulary, hacking, leaked, social engineering

## JEL Classification

L86, K24

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<sup>a</sup> Mendel University in Brno, e-mail: balej@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: stratos.zerdaloglu@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: andrej.juricka@mendelu.cz

# Estimating the Relative Risk of Accidents for Drunk Driving and Age

Peter Bolcha<sup>a</sup> and Josef Montag<sup>b</sup>

## Abstract

This article focuses on the role of driver heterogeneity in relation to risk of causing a road traffic accident (RTA). Our main objective is to estimate the related relative risks (RR) across selected driver characteristics (age, alcohol consumption). We overcome a challenge of unknown driving exposure (i.e. relating the risk to mileage or time spent on the road) by adopting a quasi-induced exposure approach.

## Keywords

accidents, induced exposure, drunk driving

## JEL Classification

R41

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<sup>a</sup> Anglo-American University, e-mail: peter.bolcha@gmail.com

<sup>b</sup> Charles University, e-mail: josef.montag@gmail.com

# Occupational pension provision in Germany

Robert Dombek<sup>a</sup>

## Abstract

Section 1 (1) of the Act on the Improvement of Occupational Retirement Provision (Betriebsrentengesetz – BetrAVG) of 19 December 1974 defines the term occupational pension. According to this, an occupational pension exists if an employer promises his employee benefits for old age, invalidity or survivors' pensions on the occasion of his employment. Employees within the meaning of section 17(1) of the Occupational Pensions Act are blue-collar workers, white-collar workers and trainees who are compulsorily insured under the statutory pension insurance scheme.

Employer and employee already agree on the commitment in the employment contract or in an addendum to the employment contract, which can then no longer be succinctly changed to the disadvantage of the employee.

Likewise, according to §1 para. 2 BetrAVG, an occupational pension scheme exists if certain contributions are converted into an entitlement to an old-age, invalidity or survivors' pension through a commitment by the employer and these are paid to a pension fund or a direct insurance.

The basis of the legal entitlement to occupational pension provision for employees has been in § 1a para. 1 of the Act on the Improvement of Occupational Pension Provision since 1 January 2002. In addition to this general legal requirement, occupational pension provision is also regulated by the legal bases of labour, tax and social insurance.

## Keywords

company pension scheme, labour law, social security

## JEL Classification

G52, I32, J10, J53, K00

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<sup>a</sup> Mendel University in Brno, e-mail: robert.dombek@web.de

# Investment activity of zero-debt firms in times of economic policy uncertainty

Pavel Dorňák<sup>a</sup> and Daniel Pastorek<sup>b</sup>

## Abstract

The paper examines the asymmetric effects of macroeconomic uncertainty on firm investment activities, which is critically important in the post-pandemic period. The growing trend of conservative zero-debt policy provides firms with higher financial flexibility and enhances their investment abilities. We draw on literature that analyses the problem of underinvestment caused by debt burden, and we argue that a zero-debt policy mitigates the number of channels through which uncertainty affects firms. Our results show a significantly weaker impact of macroeconomic uncertainty on zero-debt firms.

## Keywords

uncertainty, economic policy uncertainty, corporate investment, debt

## JEL Classification

D25, D80, G31

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<sup>a</sup> Mendel University in Brno, e-mail: pavel.dornak97@gmail.com

<sup>b</sup> Mendel University in Brno, e-mail: daniel.pastorek@mendelu.cz

# Deep Attention Reinforcement Learning for Stochastic Optimal Control in Asset Pricing

Michal Dufek<sup>a</sup> and Jiří Štastný<sup>b</sup>

## Abstract

In this study, we propose a graph attention reinforcement learning (GARL) approach for the stochastic optimal control problem in asset pricing. Our approach is based on a classical factor model that is redesigned as a multi-class classification problem. We employ graph neural networks (GNNs) with attention mechanisms and a deep reinforcement learning (DRL) framework, specifically the proximal policy optimization (PPO) algorithm. Our GARL approach is evaluated using synthetic simulated data as a benchmark. Results indicate that our proposed method outperforms existing methods in terms of accuracy and efficiency. Furthermore, we demonstrate that the use of GNNs with attention mechanisms and DRL in the context of stochastic optimal control in asset pricing is an effective approach, particularly when the problem is redesigned as a multi-class classification problem and evaluated with synthetic simulated data.

## Keywords

stochastic optimal control, asset pricing, reinforcement learning

## JEL Classification

C630

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<sup>a</sup> Mendel University in Brno, e-mail: [michal.dufek105@gmail.com](mailto:michal.dufek105@gmail.com)

<sup>b</sup> Mendel University in Brno, e-mail: [jiri.stastny@mendelu.cz](mailto:jiri.stastny@mendelu.cz)

# Too far to work? Examining the effect of changes in commute time on unemployment

Aleš Franc<sup>a</sup>, Soňa Kukučková<sup>b</sup> and Marek Litzman<sup>c</sup>

## Abstract

The time spent commuting plays a significant role in labour market decision-making, especially for job seekers. Investments in road infrastructure have a direct effect on commuting times and thus may also affect the situation in labour markets in the regions. In this paper, we use a unique database comprised of commuting times from all the Czech Republic municipalities ( $n = 6237$ ) to its regional centres for every month between March 2014 and September 2022 (101 periods). The aim of the article is to test the effect of the improvement in infrastructure on regional unemployment. Based on significant changes in traveling time, 1445 changes meeting the criteria were identified. Our results suggest that one-minute drop in commuting time to the regional centre is associated with a 0.103 percentage point drop in the unemployment rate in the respective municipality after one year, compared to the control group. The ratio rises with time, after five years, the same one-minute drop in commuting time is related to a 0.301 percentage point drop in unemployment. The results suggest that investments in road infrastructure may be an important driver in equalizing the development of regions and reducing their relative poverty via labor market forces.

## Keywords

commuting, unemployment, road infrastructure, OSRM

## JEL Classification

H54, R41, J61

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<sup>a</sup> Mendel University in Brno, e-mail: ales.franc@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: sona.kukuckova@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: marek.litzman@mendelu.cz



# Trustworthy data storage based on blockchain

Andrej Gono<sup>a</sup> and David Procházka<sup>b</sup>

## Abstract

Trustworthy long-term document storage and verification in an enterprise environment and public institutions is a well-known issue. Examples include official documents such as educational and professional certificates, contracts and legal documents, and other important records. Blockchain technology brings obvious benefits for such data storage such as decentralization, immutability, and transparency. However, there are many challenges that must be considered when implementing any blockchain-based document verification solution. One of the key issues of direct blockchain storage is the necessity to deal with digital wallets and accounts. Such an obstacle is not suitable for common users. Therefore, we propose an architecture of a service for storing and verifying data files and documents that eliminates the need to deal with blockchain accounts directly. This can be easily implemented into any enterprise information system or similar environment. Such an approach has the potential to substantially simplify document management and verification in various industries.

## Keywords

blockchain, data storage, document verification, decentralisation

## JEL Classification

C88, L86

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<sup>a</sup> Mendel university in Brno, e-mail: xgono@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: david.prochazka@mendelu.cz

# Investigation in relation and influence between macroeconomic factors, financial performance and firm value

Gernot Gruber<sup>a</sup>

## Abstract

Changing macroeconomic parameters and their impact are the scope of the investigation in this paper. The main objective of the paper is to analyze influence and relation between macroeconomic factors, financial performance and firm value. Data in this paper are used from a selected industrial sector of Germany within the period of 2005–2014.

The investigation was done in two several steps using a multiple linear regression. Firstly, financial ratios (independent variables) which have a relevant impact on firm value were determined. These relevant financial ratios were used for further investigations in the next step. Secondly, the impact of macroeconomic factors on this financial ratio as well as the impact on firm value were analyzed. In this step the macroeconomic factors were used as moderator of the financial performance in the regression model.

The findings show that profit margin and return on asset are the relevant financial ratios on firm value. Interest rate is the only relevant macroeconomic factor on firm value. The impact of interest rate is identified as indirect effect via moderation on profit margin.

## Keywords

macroeconomic factors, firm value, financial performance, regression analysis

## JEL Classification

C390, F620, G320

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<sup>a</sup> Mendel University in Brno, e-mail: gernot.gruber@sbg.at

# Generation Y's Decision Making on Financial Products

Petra Holendová<sup>a</sup>

## Abstract

Generation Y's decision-making about financial products is different from that of previous generations. Generation Y, also known as "millennials", were born between 1981 and 1996 and are characterised as digitally savvy and seeking greater flexibility and control over their finances. When making decisions about financial products, Generation Y often rely on online sources of information and social media to learn more about different options. Gen Y is also looking for products that allow them to easily track and manage their finances online. Generation Y is also known to avoid traditional banking products, preferring to use various forms of financing such as peer-to-peer lending or crowdfunding. Generation Y is also often looking for products that allow them to combine financial goals with environmental or social goals. To succeed in offering financial products to Generation Y, financial institutions should focus on providing simple, transparent and digitally accessible products. It is also important that they are able to provide Generation Y with relevant and useful information through online channels.

## Keywords

finance, financial products, generation Y, investment

## JEL Classification

G1, G4

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<sup>a</sup> Brno University of Technology, e-mail: xpholen01@vutbr.cz

# **Global geopolitical and economic problem situations as factors influencing decisions in a future economic policy Economic policy from a free supply-oriented market economy to more demand-oriented Keynesianism**

Stephan Hoose<sup>a</sup>

## **Abstract**

Economic disputes between major economies, disrupted supply chains and failures in many industries, the pandemic and its effects, and currently the war in Ukraine as a geopolitical disruption with global implications. Business, politics, and society are progressively experiencing new events that challenge them. At present, economic policy is busy stabilizing the status quo with regulatory interventions. In doing so, it intervenes both on the supply side and the demand side with emergency measures. Companies are supported financially because they have to accept losses in turnover but are too important for the national economy as a factor for GDP and employers to subject them to the forces of the market. Private households are supported to cover upcoming emergent additional expenditures and to prevent over-indebtedness and achieve political stability. However, the majority of measures taken so far are situational and serve the short term. The fundamental question here is whether to continue with dominant supply-side economic measures or to return to more Keynesian instruments due to the acute situation of recent years and the apparent lack of a quick solution. For this purpose, individual problem factors of the measures taken are to be presented and compiled in an overall view.

## **Keywords**

Keynesianism, economic policy, Alfred Marshall, supply chain disruptions, European Commission

## **JEL Classification**

F62

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<sup>a</sup> Mendel University in Brno, e-mail: s.hoose@josera.de

# Don't miss out on NFTs?! – A sentiment-based Analysis of the early NFT Market

Florian Horky<sup>a</sup>, Jarko Fidrmuc<sup>b</sup>, Lilli Dubbick<sup>c</sup>  
and Franziska Rhein<sup>d</sup>

## Abstract

This paper aims to investigate the impact of Twitter sentiments on the development of the Non-Fungible Token (NFT) market. Utilizing a dataset of over 5 million English language tweets on NFTs, we calculate a daily sentiment index and link it to NFT sales and trading volume. By applying wavelet analysis and DCC-GJR-GARCH models, we analyze the market which is characterized by multiple bubbles and high volatility. Our findings show that Twitter serves as a primary point of contact for a broad audience. Additionally, our study contributes to existing literature by offering an initial examination of the role of twitter sentiments in the NFT market development. Further, we can show, that established cryptocurrencies are only weakly linked to the NFT market development. Based on our results we suggest traders and policy makers to use social media activity for tracking new (digital) markets.

## Keywords

NFTs, digital finance, crypto markets, sentiments, social media activity

## JEL Classification

C58, G15, G41

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<sup>a</sup> Zeppelin University Friedrichshafen, e-mail: f.horky@zeppelin-university.net

<sup>b</sup> Zeppelin University Friedrichshafen, e-mail: jarko.fidrmuc@zu.de

<sup>c</sup> Zeppelin University Friedrichshafen, e-mail: l.dubbick@zeppelin-university.net

<sup>d</sup> Zeppelin University Friedrichshafen, e-mail: f.rhein@zeppelin-university.net

# Systems Engineering Approach in Project Management to Project Success

Simona Huguet<sup>a</sup> and Helena Brožová<sup>b</sup>

## Abstract

There is an increasing complexity of modern projects, and lifecycle-focused project management displays the inability to manage the risks associated with increased project complexity. The application of systems engineering concepts can improve the management of complex projects and the mitigation of risks. Since systems engineering processes are adaptable, they are suited to manage complex problems. The systems engineering is an interdisciplinary approach that uses systems, scientific approach to develop and manage complex systems. It is a holistic approach which considers the entire system from the start to the end as well as relationship between all of the parts of a whole. The main idea behind systems engineering is to consider the full scope of a project, from the initial planning stages to the end of the product lifecycle. Systems engineering focuses on breaking down a project into smaller components, analysing the components and their interactions, and integrating them into a working system. This approach helps to identify potential risks and their sources before they can cause problems.

## Keywords

project management, project manager, project success, systems approach, systems engineer

## JEL Classification

M19

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<sup>a</sup> Czech University of Life Sciences Prague, e-mail: huguet@pef.czu.cz

<sup>b</sup> Czech University of Life Sciences Prague, e-mail: brozova@pef.czu.cz

# **Risk Management in the non-profit Public Sector – Hazards of a Lack of Reflection within the Police Force**

Torsten Huschbeck<sup>a</sup> and Oliver Haas<sup>b</sup>

## **Abstract**

This article deals with the existence or, in some places, the non-existence of risk management in the non-profit sector of public administration. This article focuses on the police and in particular their use of force and their use of police resources. Of particular research interest is the consideration of escalating deployments of operational police forces and their evaluation by police officers themselves and other people outside the police force. There is always a chance that a particular police officer may act inappropriately, even in cases where threats are averted or criminal offenses are reported. Public and viral cases of inappropriate use of force by police officers lead to blanket criticism of the police and damage of their reputation. These risks for the non-profit sector of public administration, especially the police, are first subjected to a systematic literature review. Equipped with the necessary tools, the authors turn to their own quantitative-empirical study. The valid study is aimed at a broad cross-section of the population in an online survey and tries to get to the bottom of the question of how the police handle possible risks to life and limb of those affected by an escalating operation through their operational forces and the associated reputational damage. The subject of the scientific analysis is also the extent to which risk management has been developed and anchored in the police force in order to successfully counteract these risks.

## **Keywords**

risk management, crisis management, scenario technique, police force

## **JEL Classification**

L20, L89, M19

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<sup>a</sup> Comenius University in Bratislava, e-mail: huschbeck1@uniba.sk

<sup>b</sup> Comenius University in Bratislava, e-mail: haas9@uniba.sk

# Conversational Agent with Emotional Intelligence

Petra Javorková<sup>a</sup>, David Procházka<sup>b</sup> and František Dařena<sup>c</sup>

## Abstract

Understanding other people's emotions and ability to express emotions is inevitable part of human interaction. Common chatbots and digital assistants however lacks the ability to deal with user's feelings. That's the reason why day-to-day conversation with emotional support on a family or friends level (ESC) has become a scientifically interesting area of affective programming for conversational agents. The goal of this paper is to propose an architecture of a chatbot with the ability to detect user's emotions and react to them appropriately. We use COMET empathetic model to understand the social and physical relations of human world (common-sense). Other state-of-the-art ESC models were used to implement strategies to alleviate stress or generate responses outside of the training data. An experimental chatbot has been implemented in the RASA tool and is capable of detecting emotions and reacting to them relevantly to reduce emotional distress if a user has experienced one.

## Keywords

chatbot, affective computing, natural language processing, RASA, empathy-driven dialogue, COMET

## JEL Classification

C88

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<sup>a</sup> Mendel University in Brno, e-mail: [petra@javorkova.sk](mailto:petra@javorkova.sk)

<sup>b</sup> Mendel University in Brno, e-mail: [david.prochazka@mendelu.cz](mailto:david.prochazka@mendelu.cz)

<sup>c</sup> Mendel University in Brno, e-mail: [frantisek.darena@mendelu.cz](mailto:frantisek.darena@mendelu.cz)



# Key Factors of Blockchain Sustainability

Tomáš Ječmínek<sup>a</sup>

## Abstract

The paper examines the sustainability of blockchain technology by analyzing three key factors: ecology, governance, and technology. It identifies challenges within each factor such as high energy consumption, volatility in cryptocurrency markets, a lack of regulations, scalability limitations, security concerns, and difficulties with blockchain interoperability. Real-world examples are used to demonstrate these challenges. The contribution then aims to propose possible ways to address these challenges to ensure the long-term usability of blockchain technology.

## Keywords

blockchain, sustainability, factors, challenges

## JEL Classification

C80

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<sup>a</sup> Mendel University in Brno, e-mail: jecmto@gmail.com

# Assessing Regional Competitiveness in Indonesia From Food Security Perspective

Indri Arrafi Juliannisa<sup>a</sup>, Hania Rahma<sup>b</sup> and Akhmad Fauzi<sup>c</sup>

## Abstract

Food Security plays an important role for regional competitiveness by promoting a healthy population, wellbeing of individuals, and for economic growth. Food security is also corresponding to regional competitiveness through job creation, reduce poverty, and trade opportunities. Nevertheless, attaining regional competitiveness through food security is challenged by the threat from climate change which affects inflation, reduces income, and job opportunities. This paper attempts to address these issues by analyzing regional competitiveness from the perspective of food security and climate change. The Promethee method was used to assess 34 provinces in Indonesia. The result shows that regions with high economic growth are not always resilient to threat from food security. Other factors might affect the competitiveness of the regions. This study could be useful input and to provide some insights on regional competitiveness viewed from food security and climate change.

## Keywords

regional competitiveness, economic development, climate change, food security, Promethee

## JEL Classification

Q18, R11, Q54

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<sup>a</sup> Universitas Pembangunan Nasional Veteran Jakarta, e-mail: indri.arrafi@upnvj.ac.id

<sup>b</sup> IPB University, Bogor Indonesia, e-mail: hania.rhm@gmail.com

<sup>c</sup> IPB University, Bogor Indonesia, e-mail: akhmadfauzi@apps.ipb.ac.id

# Compatibility of transfer pricing laws and case-law of Czech Republic and Slovakia – comparative study

Matej Kačaljak<sup>a</sup>

## Abstract

Due to several decades of coexistence in one state and to linguistic proximity the case-law of Czech Supreme Administrative Court is often being accepted in Slovak tax practice. However, in transfer pricing agenda there has no comparative study been performed to date to assess the mutual compatibility of laws and constitutional principles of both countries. The presented paper attempts to fill in this gap using standard methods of legal research comprising doctrinal methods of synthesis and analysis of both written law and case-law. The findings show that though the arm's length principle is recognised in both jurisdictions, there are fundamental differences in, inter alia, legal relevance of OECD TP Guidelines and process of auditing the adherence to the arm's length principle. Overall, this results in the general acceptability of decisions of Czech Supreme Administrative Court in Slovakia and vice versa being severely limited. Thus, a case-by-case assessment is required not only with respect to the factual background but also with respect to legal compatibility.

## Keywords

corporate income tax, international taxation, transfer pricing, arm's length principle, OECD Transfer Pricing Guidelines

## JEL Classification

K100, K340, K410

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<sup>a</sup> Comenius University in Bratislava, e-mail: matej.kacaljak@flaw.uniba.sk

# **Environment, Social and Governance factor materiality for illiquid private Real Estate portfolios**

Marty-Jörn Klein<sup>a</sup>

## **Abstract**

This paper deals with the financial materiality of Energy Performance Certificates (EPCs) as an element of Environmental, Social and Governance (ESG) factors for illiquid Private Real Estate as an asset class. This paper focuses on a critical review of 15 previous studies that have been conducted on the use and materiality of EPCs on residential as well as office buildings around the world. These studies have a sample of more than 6.1 million objectives in different regions and measurements for “green financial benefits”, i.e., sales and rental premia, from 2011 until 2021. There is evidence of an in general positive cost premia which seems to be proportional to the certification level. However, some studies report an almost zero or even negative cost premia. There is also evidence that operational cost savings exceed any cost premia associated with green building design and construction, and an in general positive but volatile rental premia for green-labelled buildings. However, the shift of regional focus in these studies is important to note.

## **Keywords**

ESG, real estate, EPC, green financial benefits, cost premia, green building

## **JEL Classification**

F64, P18, P48, R32

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<sup>a</sup> Mendel University in Brno, e-mail: [marty-joern.klein@allianzgi.com](mailto:marty-joern.klein@allianzgi.com)

# The role and distribution of creative industries in the national economy

Pavĺína Komosna<sup>a</sup> and Marek Litzman<sup>b</sup>

## Abstract

Creative industries became an important sector of modern economies in the 21st century. Many recent studies emphasize the role of the creative industries in achieving economic growth and sustainable competitiveness in developed as well as developing countries. Creative industries are based on creative people. Creativity is assumed as a new factor of production, which is unbounded unlike the traditional factors and thus achieves key position among others. All developed economies started to pay the attention to the creative industries gradually and various definitions of creative industries were introduced. In the contribution the creative industries are defined as a set of sectors including arts, publishing activities, music, video, architecture, programming, advertising as well as research and development. To approximate the size of the creative industries in a region we use the share of value added and turnover in creative industries. We aim to verify, how equally are the creative industries spread in the NUTS 3 regions in Austria, Czech Republic, Germany, Poland, and Slovakia. It was confirmed that higher concentration of creative industries is around big cities than in rural areas. The biggest differences among NUTS 3 regions were detected in Germany.

## Keywords

creativity, creative industries, NUTS 3 regions, Central Europe, value added, turnover, urban area

## JEL Classification

R12, O18

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<sup>a</sup> Mendel University in Brno, e-mail: balcarov@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: marek.litzman@mendelu.cz

# Improving automated systems for customer requests categorization

Filip Koukal<sup>a</sup>, František Dařena<sup>b</sup> and Roman Ježdík<sup>c</sup>

## Abstract

In this paper, we focus on the categorization of tickets in service desk systems. We explore modern neural network-based artificial intelligence methods to find the potential for improvement and to address typical problems in the domain. Special attention is paid to balancing the ticket categories, selecting a suitable representation of text data, and choosing a classification model to achieve satisfactory performance. Based on experiments with two real-world datasets, we conclude that text preprocessing, balancing the ticket categories, and using the representations of texts based on fine-tuned transformers are crucial for building successful classifiers.

## Keywords

service desk systems, customer requests classification, transformer models, machine learning

## JEL Classification

C69

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<sup>a</sup> Mendel University in Brno, e-mail: filip.koukal@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: frantisek.darena@mendelu.cz

<sup>c</sup> ALVAO, s. r. o., e-mail: roman.jezdik@alvao.com

# Integration of integrated management systems in case of minimization of waste in processes

Katarína Kovalčíková<sup>a</sup>

## Abstract

The intention of some project management methodologies such as the Lean methodology Manufacturing is the elimination of waste in processes by continuous improvement of the business process. In production processes, waste from overproduction, defects, inventory, unnecessary movement and transport, waiting, excessive processing and unused time and creativity of employees. (Soliman, 2017) Currently, however, the literature does not provide a complete overview of the integration of ISO certification with project methodologies management in the industrial sector in Europe. Currently, there are still companies that do not use integrated management systems together with project management. While according to the current state of the issue, this integration brings the company results in a similar minimization of waste in company processes.

## Keywords

Lean Six Sigma, ISO standards, integrated management system, waste minimization, Europe, industry, project management

## JEL Classification

O32, Q55

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<sup>a</sup> Mendel University in Brno, e-mail: xkovalc2@mendelu.cz

# Participatory Budgets in the Czech municipalities during the COVID pandemic

Soňa Kukučková<sup>a</sup>, Eduard Bakoš<sup>b</sup> and Gabriela Samsonová<sup>c</sup>

## Abstract

Participatory budgeting is promoted as a relatively new tool to involve citizens in public decision-making. In the Czech Republic, a project-oriented type of participatory budgeting has been organized since the beginning of its introduction (since 2014). The COVID-19 pandemic caused a change in the thinking of local government leaders and a reassessment of public spending priorities. The aim of the paper is to demonstrate the impact of the pandemic on the intensity of the process and the impact on the stakeholder groups – political representatives and citizens. Concerning the intensity of participatory budgeting, the development shows two trends reflecting the activity of stakeholders. First, we can observe inertia in the absolute amount of money spent on projects of PB and the decrease in the amount for PB as % of total expenses which could be more influenced by the growth of other municipal expenditures than by the decisions of the officials and politicians. Second, there is only a slight decrease in the number of submitted projects accompanied by the increase in the number of inhabitants participating in the voting phase of PB. Even in the time of the crisis, both groups of stakeholders did not significantly reduce their interest in the process.

## Keywords

participatory budgeting, barriers, pandemic

## JEL Classification

H11, H76, H77

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<sup>a</sup> Mendel University in Brno, e-mail: sona.kukuckova@mendelu.cz

<sup>b</sup> Masaryk University, e-mail: bakos@econ.muni.cz

<sup>c</sup> Mendel University in Brno, e-mail: gabriela.samsonova@mendelu.cz



# Analyzing Facial Emotional Expressions while Reading Managerial Ethical Dilemma: Where Psychology Meets New Technologies

Šimon Kvíčala<sup>a</sup> and Pavel Žiaran<sup>b</sup>

## Abstract

Questionnaires or interviews may not reveal genuine and authentic ethical predispositions of employees. Objective of this work is to search for implicit tools, using new technologies, that allow to analyze spontaneous and subconscious emotional reactions to ethical stimuli. The paper presents two studies of computer-aided analysis of facial emotional expressions using machine learning and artificial intelligence. The first study ( $n = 16$ ) uses the commercially available emotional expression analysis system Affdex from iMotions. The second study ( $n = 18$ ) presents analysis by our own software application using a combination of three convolutional neural networks (1 bitmap and 2 vector). Facial emotional expressions are recorded while reading the ethical management dilemma (both studies). In the 2nd study, additionally, emotional expressions are also analyzed while considering different solutions to the dilemma: 1. Report to the police, 2. Rejection of the task, 3. Leaving the company, 4. Compliance with unethical behavior. Results indicate that individual perception of the ethical dilemma and preferred solutions of the dilemma might correspond to a specific combination of emotional states: sadness and fear (1st study) and eventually anger, fear and surprise (2nd study).

## Keywords

psychology, ethical decision-making, facial emotional expressions, neural networks, machine learning

## JEL Classification

M1

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<sup>a</sup> Mendel University in Brno, e-mail: simon.kvicala@gmail.com

<sup>b</sup> Mendel University in Brno, e-mail: pziaran@gmail.com

# Small-Scale Farming in Zambia: a Swot Analysis

Maureen Lupunga Malesu<sup>a</sup>

## Abstract

Agriculture remains one of the key priority sectors in Zambia. The sector employs the majority of the Zambian labor force and thus contributes to job creation and poverty reduction and ultimately to economic growth. The agricultural sector in Zambia is dominated by small scale farmers who are mostly located in the rural parts of the country. The small-scale farmers play an important role of improving the livelihood of the rural population and ensuring the food security of the country at large. The important role that the agriculture sector plays in Zambia cannot be overemphasized, however, it can be noted that in the recent past, the agricultural sector's contribution to the country's GDP has been declining. Numerous studies have highlighted the challenges that the sector faces. Owing to the importance of the agricultural sector and specifically the important role of the small-scale farmers in Zambia this paper presents a SWOT analysis that will highlight the strengths, weaknesses, opportunities and threats of the sector. The SWOT analysis is done in the context of small-scale farming with reference to the crops sub sector which is the largest sub sector in the agricultural sector. The analysis was informed by Secondary data sources from several peer reviewed journal articles and reports from professional bodies. The paper ends by proposing some recommendations that can help with the development of the small-scale farming in Zambia.

## Keywords

agriculture, small scale farmers, SWOT analysis, Zambia

## JEL Classification

M10, M100, Q100, Q120

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<sup>a</sup> Mendel University in Brno, e-mail: maureenmalesu@gmail.com

# Prescriptions for Monetary Policy when Inflation Is High

Aleš Maršál<sup>a</sup>

## Abstract

Inflation in most western advanced economies has been rising at a fast pace since the middle of 2021. The necessary condition for central banks to maintain price stability is to prevent temporary shocks to inflation from feeding into the mechanisms of wage and price formation (Bernanke 2007, Draghi 2014). The monetary theory prescription to avoid these self-fulfilling inflation expectations and prevent long-term inflation expectations from de-anchoring is to follow the Taylor principle, according to which the nominal interest rate should rise more than proportionally with inflation. We show that once inflation is high, the distribution of prices across products widens and inflation uncertainty rises, the Taylor principle is no longer sufficient for inflation stability. Anchoring of inflation expectations then requires a considerably more aggressive monetary stance, focusing strictly on targeting inflation and abstaining from virtually any aim to stabilize the real side of the economy.

## Keywords

inflation, monetary policy, Calvo pricing, inflation spiral

## JEL Classification

E13, E31, E43, E44

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<sup>a</sup> Mendel University in Brno, e-mail: ales.marsal@gmail.com

# Regional Security and Regional Competitiveness: The Case of Indonesia

Arif Maulana<sup>a</sup>, Hania Rahma<sup>b</sup> and Akhmad Fauzi<sup>c</sup>

## Abstract

Regional security is an important aspect for regional competitiveness, by supporting economic growth, increasing investment, and reducing poverty and inequality. The Indonesia National Police (INP), as a stakeholder in domestic security, has a vital role in developing regional security to ensure that economic development can be carried out with minimal disturbances. This study aims to determine the regional security performance ratings of 34 regional police in Indonesia in relation to regional competitiveness and identify to dominant variable in determining this performance by using a multi-criteria decision-making (MCDM) tool, which is the preference ranking organization method for enrichment evaluation (PROMETHEE-GAIA). The data used in this study is from Indonesia Criminal Statistics 2021. The results of this study indicate that PROMETHEE-GAIA can be used as an effective method for evaluating regional security performance, where this performance is influenced by 13 indicators. This study can be used as input for improving regional security performance by the INP.

## Keywords

regional security, regional competitiveness, economic development, Promethee

## JEL Classification

O18, O29, R58

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<sup>a</sup> IPB University, Bogor Indonesia, e-mail: arif.maulana@apps.ipb.ac.id

<sup>b</sup> IPB University, Bogor Indonesia, e-mail: haniarhm.pwd@gmail.com

<sup>c</sup> IPB University, Bogor Indonesia, e-mail: akhmadfauzi@apps.ipb.ac.id

# Bank management in the view of ESG criteria

Keanu Niclas Moseler<sup>a</sup>

## Abstract

The aim of this paper was to examine whether compliance with ESG criteria not only meets society's demands for greater sustainability, but also supports the banks themselves in their transparency and thus in their risk management. The hypothesis that banks with greater ESG implementation are simultaneously less vulnerable to credit risks and crises was tested with the support of several studies.

The research proves that in the respective focus of the study, it could be determined time and again that compliance with ESG criteria or individual ESG pillars lead to banks becoming less risk-averse or generally having a stronger resistance to crises. Reasons given for this included the greater transparency that comes with the implementation of ESG criteria: ESG reporting and different internal and external reporting mean that risk sensitivity is higher, and, at the same time, information asymmetry is lower. In the future, regular studies should continue to be conducted to verify whether the correlation of banking risks and crisis safety with ESG management also exists in the future. If it becomes clear that the dependencies are decreasing, it may be up to policy to take regulatory action to ensure that ESG management continues to strengthen the crisis safety of banks.

## Keywords

ESG, bank management, bank risks, risk appetite, sustainable banking

## JEL Classification

G10, G15, G18, G20, G21, G28

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<sup>a</sup> VSFS – University of Finance and Administration Prague, e-mail: keanu.moseler@gmx.de

# **Descriptive Analysis of the Consumer Perceptions and Behavior Towards Fast Food Businesses in Zambia**

Bravo Muchuu<sup>a</sup>

## **Abstract**

The study aimed at conducting a descriptive analysis on consumer perceptions and behaviours towards fast foods in Zambia. The fast food business operators had to know how best they would meet the demands of fast food consumers especially after being hit by the Covid 19 pandemic. A cross sectional by survey research design was used to collect data online via Google forms and a total of 126 questionnaires were analysed using Excel and SPSS. The results revealed among other findings that 22% of consumers had not changed their consumption patterns of fast foods post Covid 19 and 66% of the consumers increased their consumption of fast foods after Covid 19 pandemic restrictions were closed in Zambia. It was also found that children at home influenced the purchase of fast foods and therefore, the study recommended that fast food operators ought to make their food premises child friendly because they should expect consumers visiting their businesses with children. It is also highly recommended that fast food businesses in Zambia should increase the supply of fruits and vegetables, and local foods. It is further recommended that fast food businesses should consider increasing home deliveries and provide spacious seating space for consumers.

## **Keywords**

descriptive analysis, cross sectional, fast food businesses, consumer perceptions, consumer behaviour, Covid 19

## **JEL Classification**

D1

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<sup>a</sup> Mendel University in Brno, e-mail: muchuubravo@yahoo.com

# Determinants of Trade Fragmentation within the Global Value Chains

Tomáš Oleš<sup>a</sup>

## Abstract

International trade has been reshaped and structured around global value chains. We investigate a detailed decomposition of global value chain trade linkages between 2000–2014 in order to empirically determine whether determinants of traditional trade also explain various types of trade within global value chains. Using dynamic panel data estimation techniques our findings indicate that the factor endowment hypothesis does not shape a country's engagement in complex value chain trade, however, to a great extent explains why countries participate in simple global value chain trade in volumes. The unexplained variability by the traditional factors is empirically ascribed to the gravity variables such as connectivity, distance, and FDI inflows, as well as to the role of institutions, which underlines the fact that strong complementarities shapes a GVC trade intensities more than the traditional trade of final products.

## Keywords

fragmentation of production, global value chains, dynamic panel estimator

## JEL Classification

F13, F14, F23, O2

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<sup>a</sup> University of Economics in Bratislava, e-mail: tomas.oles@euba.sk

# **The influence of leadership on employer branding focused on medium-sized enterprises in Germany**

Özlem Özdalyan<sup>a</sup>

## **Abstract**

Employer branding is becoming increasingly important as the job market becomes more competitive and companies strive to attract top talent. Especially medium-sized enterprises must be focused on an employee-oriented approach. This paper clarifies existing research on employer branding and leadership and analyzes the impact of using leadership approaches and employer branding focused on medium-sized enterprises in Germany. It aims first to give a deeper current state of research on employer branding and leadership and second to examine the influence of leadership on employer branding. The purpose of this study is to find the connection between leadership and employer branding and examine the research question “Has leadership a strong impact on employer branding on medium-sized enterprises?” by a deep literature review. A qualitative content analysis of relevant studies of the last 10 years according to Mayring was used for the literature review. The results of the literature review show that leadership plays a strong role in communicating the organization’s employer brand and is a close one. The two go hand in hand, and it is vital that employers understand the connection between them.

## **Keywords**

leadership, employer branding, marketing, medium-sized enterprise, Germany

## **JEL Classification**

J21, M12, M14, M51, M54

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<sup>a</sup> Mendel University in Brno, e-mail: oezlem.oezdalyan@gmx.de



# Working from home during the COVID-19 – survey of older workers in Visegrad countries

Ondřej Pavelek<sup>a</sup>, Drahomíra Zajíčková<sup>b</sup> and Martin Lakomý<sup>c</sup>

## Abstract

The COVID-19 pandemic was a significant factor changing the labour market. Transition to work from home was among the basic and abrupt changes affecting a number of employees. The legal analysis and the results of the questionnaire survey of older employees showed satisfaction with working from home and a preference for hybrid working in the future. This is despite the minimal legal regulation of this type of work, the frequent lack of necessary equipment and the non-compensation of the costs working from home. The protection of an employee working remotely is weaker than in the case of work performed physically in the workplace. Work from home is likely to become commonplace, a need arises to regulate remote work so that it only differs by the workplace and not by a lower degree of legal protection of the employee. Working from home would allow older workers to stay longer in the labour market if there is sufficient legal protection for workers.

## Keywords

remote working, legal aspects, Visegrad countries

## JEL Classification

J8, K4

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<sup>a</sup> Mendel University in Brno, e-mail: [ondrej.pavelek@mendelu.cz](mailto:ondrej.pavelek@mendelu.cz)

<sup>b</sup> Mendel University in Brno, e-mail: [drahomira.fischlova@seznam.cz](mailto:drahomira.fischlova@seznam.cz)

<sup>c</sup> Mendel University in Brno, e-mail: [martin.lakomy@mendelu.cz](mailto:martin.lakomy@mendelu.cz)

# Social media impact on food consumption – conspicuous consumption of generation Z

Jana Pavelková<sup>a</sup>, Jana Turčínková<sup>b</sup> and Andrej Grajciar<sup>c</sup>

## Abstract

This paper focuses on investigation of the possible relationship between tendency to conspicuous consumption and nature of usage of social networks as an independent factor in addition to factors influencing consumption already mentioned by the literature. For purposes of this research, Generation Z was chosen, and food and beverages as investigated category of products. Thus, the sample ( $n = 246$ ) consists of respondents of Generation Z. Battery of claims used in this research consists of statements from various fields of literature. For analyzing the data, factor and regression analyses were used. Although the statistically significant relationship between nature of social networks use and the tendency to conspicuous consumption wasn't confirmed, the results show influenceability of respondents by social networks and influencers.

## Keywords

conspicuous consumption, generation Z, influencer marketing, food consumption

## JEL Classification

M3

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<sup>a</sup> Mendel University in Brno, e-mail: jana.pavelkova@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: jana.turcinkova@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: xgrajcia@mendelu.cz

# Effortless interaction with IoT devices in shared spaces

Jan Peřinka<sup>a</sup>, Tomáš Šmerda<sup>b</sup>, David Procházka<sup>c</sup> and Martin Zejda<sup>d</sup>

## Abstract

The goal of this research is to find an effective solution to interact with IoT devices in shared spaces such as hotels and co-working centres. We found that current solutions focus mostly on using platforms like Apple or Google Home which are platform-centric and do not offer integration of devices that outside their ecosystem. Related user access management is also very limited. Certainly, we can use industrial solutions such as Lox-one. However, such a solution leads usually to complete vendor lock-in. Last, but very important related issue is the control itself. Finding the appropriate device in mobile application can be frequently quite a challenge for an ordinary user. We aimed to address these issues by developing an open solution for effortless interaction with IoT devices in shared spaces. Our solution allows integration of devices produced by multiple vendors. Through open-source project Homebridge and a combination of a cloud service, web application, and native mobile application, we have created a comprehensive solution with user interface that allows for easy and direct control of IoT devices, regardless of the manufacturer or communication protocol.

## Keywords

internet of things, user experience, computer vision, mobile devices, web application, cloud service, user interface, home automation, object recognition

## JEL Classification

L63, L86, C88

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<sup>a</sup> Mendel University in Brno, e-mail: xperinka@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: xsmerda@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: david.prochazka@mendelu.cz

<sup>d</sup> Mendel University in Brno, e-mail: xzejda@mendelu.cz

# Does the Purchasing Power Parity hold in the EU-15 countries?

Klára Plecíťá<sup>a</sup>

## Abstract

The aim of this paper is to revisit the validity of the purchasing power parity (PPP) for the EU-15 countries over the time span 1970–2022. The creation of the single market (1993) and the euro introduction (1999) are considered as important milestones in the European integration, thus PPP is also investigated over following shorter periods: 1970–1992, 1993–2022, 1970–1998 and 1999–2002. The validity of PPP is assessed on the basis of various univariate and panel data unit root tests. The results are inconclusive as the first generation panel unit root tests tend to support the PPP whereas the second generation panel unit root tests do not.

## Keywords

PPP, EU, real effective exchange rates, unit roots

## JEL Classification

F310

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<sup>a</sup> Mendel University in Brno, e-mail: klaraplecita82@gmail.com

# NLP Studio

Jan Přichystal<sup>a</sup>, Tomáš Jakúbek<sup>b</sup> and Roman Valovič<sup>c</sup>

## Abstract

This article deals with the description of NLP Studio software. This web application allows users to prepare their own textmining experiments for the natural language analysis without the need to use the programming language. There is a development environment in which the user can work in the form of visual programming. Preprocessing, training or visualization components are available. The software is designed primarily for teaching natural language processing and aims to help students navigate this area even if they do not have a deep knowledge of programming.

## Keywords

natural language processing, web application, textmining, visual programming

## JEL Classification

L86

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<sup>a</sup> Mendel University in Brno, e-mail: jan.prichystal@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: tomas.jakubek@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: roman.valovic@mendelu.cz

# Fair Booths: What is Appealing to Generation Y. An Eye-tracking Experiment

Michal Pšurný<sup>a</sup>, Stanislav Mokry<sup>b</sup>, Jan Vrána<sup>c</sup> and Ondřej Dufek<sup>d</sup>

## Abstract

Attracting the attention of visitors to the fair is important for the exhibitor in terms to achieve the set goals with which they come to the fair. From this point of view, the appearance of the fair booth is essential. An important role is played by the layout of the elements, the design, the placement of the logo, the displayed products, and a lot more. The study aims to identify the importance of the communication elements of the fair booths and their effect on the attention of potential visitors from generation Y. People from this most numerous generation are gradually getting into managerial and business-related positions and for them visiting fairs is typical. Thanks to the eye-tracking measurements, we uncovered elements of the fair booths that attract attention. Subsequent in-depth interviews helped to identify elements that are attractive and pleasant. The results of this study can be used by exhibitors when designing fair booths. In such a way that booth will attract people from Generation Y and feel comfortable at such a booth. The study confirms previous studies about the importance of product demonstrations, color design, and element placement design. According to the data collected, there is a certain inconsistency in respondents' replies and the data obtained via eye-tracking technology. Although the respondents did not put much emphasis on logos in the interviews, they paid close attention to the logos presented in the eye-tracking experiment.

## Keywords

fair booths, generation Y, eye-tracking

## JEL Classification

M310, M370

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<sup>a</sup> Mendel University in Brno, e-mail: psurnymichal@email.cz

<sup>b</sup> Mendel University in Brno, e-mail: stanislav.mokry@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: 53731@mendelu.cz

<sup>d</sup> Mendel University in Brno, e-mail: 2023@node.mendelu.cz

# Are older academicians equipped for digital acceleration? The case of Czechia and Ukraine.

Martina Rašticová<sup>a</sup>, Nataliia Versal<sup>b</sup> and Nataliia Tkalenko<sup>c</sup>

## Abstract

The comparative analysis highlights the need for diversity management in higher education in the Czech Republic and Ukraine to address the issue of older workers. There is a high proportion of older workers in Ukraine's research sector and a growing trend in the Czech Republic. To resolve this paradox, diversity management should aim to create conditions for the integration of young and old workers and provide training and courses for older workers to stay updated. The principle of lifelong learning should be implemented through the periodic assessment of an academic's skills.

## Keywords

digital skills, digitalisation, older workers, academicians, technostress, diversity management, lifelong learning

## JEL Classification

J14, J23, J24

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<sup>a</sup> Mendel University in Brno, e-mail: [martina.rasticova@mendelu.cz](mailto:martina.rasticova@mendelu.cz)

<sup>b</sup> Mendel University in Brno, e-mail: [nataly.versal@gmail.com](mailto:nataly.versal@gmail.com)

<sup>c</sup> Mendel University in Brno, e-mail: [nataly.tkalenko@mendelu.cz](mailto:nataly.tkalenko@mendelu.cz)

# Impact of Social Capital on Loan Behavior in CEECs

Lea Riexinger<sup>a</sup>, Jarko Fidrmuc<sup>b</sup> and Florian Horky<sup>c</sup>

## Abstract

We analyze the influence of social capital on loan behavior in Central Eastern and Southeastern Europe from 2007 to 2020. Social capital indexes are built, measured by the embeddedness in norms, the social trust of individuals and the strength of their networks. The loan behavior differentiates between the access to loans, the holding of a loan, the purpose of the loan, the plan to take out a loan and the adequacy of the loan. The influence of social capital is measured through multiple regressions using a probit model, and controlling for country effects, time effects, income, age, (financial) education, gender, size of the household, marital status and professions. The analysis finds, that social capital has a predominantly positive influence on the plan to take out a loan, access to credit, the likelihood of having a loan, and its adequate amount.

## Keywords

social capital, loans, loan behavior

## JEL Classification

D19, G21, C31

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<sup>a</sup> Zeppelin University Friedrichshafen, e-mail: l.riexinger@zeppelin-university.net

<sup>b</sup> Zeppelin University Friedrichshafen, e-mail: jarko.fidrmuc@zu.de

<sup>c</sup> Zeppelin University Friedrichshafen, e-mail: f.horky@zeppelin-university.net



# Bank deposits of Czech local government

Lucie Sedmihradská<sup>a</sup>

## Abstract

Bank deposits of Czech local governments steadily grow and by the end of September 2022 amounted to 352 billion CZK (i.e., 5.8% of 2021 GDP or 55.2% of 2021 local government expenditure; the share of municipalities is about 82%). Ministry of Finance (2022) claims that local governments are not acting as good managers when they do not invest these savings to care for the general development of their territories and the needs of their citizens. Potential opportunity costs are growing as the inflation rate grows since mid-2021, reaching 16,2% in November 2022. Despite a very good availability of granular budgetary and accounting data for all local governments, there is not available any detailed analysis and evaluation of this situation yet. The only exception is an analysis of the 2021 data by different municipal size groups prepared by the Czech Fiscal Council (2022). The proposed paper will fill in this gap. The objectives of the paper are (1) to analyze the volume and development of bank deposits of Czech local governments in the period 2010 to 2021 and (2) to explore the determinants of municipal per capita bank deposits in 2021. The first objective will be fulfilled using descriptive statistics and appropriate figures, the second using econometric analysis (using OLS).

## Keywords

bank deposits, local government, fiscal reserves

## JEL Classification

H72, H83

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<sup>a</sup> Prague University of Economics and Business, e-mail: sedmih@vse.cz

# Artificial intelligence in the hotel industry: current applications and future prospects

Szilvia Vanessza Schalk-Nador<sup>a</sup>

## Abstract

The foundation of artificial intelligence (AI) was established decades ago, yet it is only in 2023 that non-high-tech industries are gradually becoming susceptible to this technology due to enhanced transparency and user-friendliness. Therefore, the purpose of this study is to discover current applications of AI in the hotel sector and to propose visionary prospects on improving the use of this ground-breaking technology. The analysis of scientific literature aims to improve awareness towards AI as a strategic tool to cut costs, improve hotel operations, enhance productivity, advance efficiency levels and to elevate personalization to a new magnitude without the need for employees to undergo extensive training. This technology also aims to improve perceived guest experience, create unforgettable and innovative memories resulting in a differentiating aspect for hotels. The paper follows an exploratory design and concludes that the use of AI in the hotel industry is rather scarce and thus emphasizes the potential behind the technology. This study provides a solid base for future qualitative studies in the hotel industry to strengthen the use of this intelligent technology and to capture the attention of scholars in the field about the immense potential of AI.

## Keywords

artificial intelligence (AI), hotel industry, information technology, innovation, personalization

## JEL Classification

L83, M10, O33

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<sup>a</sup> Mendel University in Brno, e-mail: xnador@mendelu.cz

# Tools improving Quality of Experience in WWW – a Review

Tomáš Sochor<sup>a</sup> and Jiří Passinger<sup>b</sup>

## Abstract

The speed of web page display after clicking on a link is a crucial factor for user satisfaction (Quality of Experience – QoE). However, it is not easy to guarantee that this time is short enough in any circumstances. The paper reviews the existing and newly developed protocols and other measures on the transport layer (MPTCP) as well as on the application layer (HTTP/2 and HTTP/3) trying to improve web page QoE. It is demonstrated in the review that their efficiency varies heavily and it is highly dependent on other factors like the quality of underlying network connection(s), client implementation, and many others.

## Keywords

MPTCP, HTTP/2, HTTP/3, QUIC, transport layer, application layer, multiplexing, head of line blocking

## JEL Classification

Y

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<sup>a</sup> Mendel University in Brno, e-mail: tomas.sochor@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: jiri.passinger@mendelu.cz

# Adaptive object detection for use in Metaverse Mobile Augmented Reality Application

Jan Strnad<sup>a</sup> and Jaromír Landa<sup>b</sup>

## Abstract

A growing interest in Metaverse and Augmented Reality brings several challenges to mobile applications. One of the most important challenges is the need for effective and robust object detection. With the increasing power of mobile devices, object detection can be performed locally. However, not all users have powerful and new mobile devices. In this paper, we propose an adaptive object detection and Mobile Augmented Reality system which decides if the object detection is performed locally on the device or remotely on the server to offload the processing power requirements. We concentrate on the entire process which can be split into two parts: a) adaptive on-device/remote server object detection and b) visualization of detected object information in augmented reality.

## Keywords

object detection, augmented reality, Metaverse, TensorFlow

## JEL Classification

L63, L86

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<sup>a</sup> Mendel University in Brno, e-mail: xstrnad2@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: jaromir.landa@mendelu.cz

# **Green energy transition in Germany: A bibliometric study**

Adam Sulich<sup>a</sup>

## **Abstract**

Germany is a leader in green energy transition in European Union and world, and this paper is focused on the new electricity generation technologies. The technological change is strongly related to management in the energy sector and country economics. The assessment and understanding of the green energy transition in Germany can be an example for the other governments and current changing political climate. This paper provides the assessment of the different energy sources utilized in Germany and its future directions. This study is based on the secondary data analysis and employs the statistical methods to present the theoretical and practical business implications. This paper presents the analysis results along its limitations and discuss future possible research avenues.

## **Keywords**

renewable energy, energy sector, transformation

## **JEL Classification**

P18, P28, Q4

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<sup>a</sup> Wrocław University of Economics and Business, e-mail: adam.sulich@ue.wroc.pl

# Trends in the funding of foundations from public sources: tax assignation in Slovakia

Mária Murray Svidroňová<sup>a</sup> and Alžbeta Brozmanová Gregorová<sup>b</sup>

## Abstract

Non-governmental, non-profit organisations are established to fulfil socially or generally beneficial purposes, i.e. to realise activities to fulfil their purposes on a non-commercial basis, e.g. environmental protection, social assistance, cultural development, watchdog activities, health protection, and the like. However, they naturally need funding for these activities, which they can obtain from several sources. These are typically divided into public and private. Support from public sources includes appropriating a certain percentage of the income tax paid since the state forgoes part of the tax it would have received from the income of individuals and corporations. In this paper, we focus on financing non-profit organisations in Slovakia. The aim is to analyse the development of tax assignation with an emphasis on foundations. The results show that we can observe a year-on-year increase in the amount of tax appropriated in general, but the amount for foundations has a decreasing character.

## Keywords

tax assignment, foundations, public sources, Slovakia

## JEL Classification

H24, L31

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<sup>a</sup> Matej Bel University in Banská Bystrica, e-mail: maria.murraysvidronova@umb.sk

<sup>b</sup> Matej Bel University in Banská Bystrica, e-mail: alzbeta.gregorova@umb.sk

# **Analysis of gender differences in behavioral factors influencing investment decisions: A literature review**

Jakub Svoboda<sup>a</sup>

## **Abstract**

In this article, we provide a critical review of the views expressed by various authors who have linked their research activities to the topic of gender differences in behavioral finance, an area of research that relates to how psychological biases influence financial decision-making. A review of existing literature indicates that women and men tend to exhibit different patterns of behavior when it comes to making financial decisions, such as women exhibiting higher risk aversion and less susceptibility to overconfidence and overreaction. These differences can be attributed to a variety of factors, including socialization, risk aversion, and financial literacy. The article includes studies from various disciplines, including economics, psychology, and sociology. Additionally, the study examines the potential implications of these gender differences for financial education and investment decision-making.

## **Keywords**

gender, behavioral finance, financial decision-making, investment, risk aversion, financial literacy

## **JEL Classification**

D91, G15, G41, J16

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<sup>a</sup> Brno University of Technology, e-mail: Jakub.Svoboda9@vut.cz

# Asymmetries in the Effects of Exchange Rates on Visegrad's International Trade

Jana Šimáková<sup>a</sup>

## Abstract

Majority of previous studies of the effects of exchange rate changes on trade balance have assumed to have symmetric effects or assumed its linear adjustment. The aim of this paper is to evaluate the asymmetric effects of exchange rate on the most important segment of foreign trade of Visegrad Countries. The results of the study shows, that exchange rate co-movement with partial trade balances is mostly proved by employment both applied approaches. However, the asymmetry cointegration approach, which introduces nonlinearity into the model specification, reveals a more significant impact of the exchange rate on commodity trade than a more standard model that imposes symmetry. Furthermore, by distinguishing between the depreciation and appreciation showed that the effects at the industry level are in fact asymmetrical in most industries.

## Keywords

exchange rate, international trade, asymmetric effects

## JEL Classification

F10, F31

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<sup>a</sup> Silesian University in Opava, e-mail: simakova@opf.slu.cz



# Age-friendly university as helping hands for older workers under digitalisation

Nataliia Tkalenko<sup>a</sup> and Nataliia Versal<sup>b</sup>

## Abstract

European Union is going through a profound transformation associated with socioeconomic and demographic changes. Europe's population is ageing (the proportion of the population 60+ in Europe will reach 35% by 2050) and older workers are increasingly shaping the labour market. As a result, a new type of economy is being formed: 'silver economy'. Such indicators as median age, the proportion of the population in each of the main demographic age groups, and the demographic burden will grow mainly due to dependence on the older population group. Recently, competitiveness in the labour market has been increasingly determined by digital skills. So, there is a need to form new knowledge and skills among older workers, which can be effectively implemented through Age-friendly universities in three areas. The first one is the formation of adaptive educational programs based on the principles of inclusion, considering the peculiarities of study and the skills building. The second area is the design and implementation of short-term training for innovative competencies development. The third area is about the formation of crowd platforms to support the 'olderpreneur'.

## Keywords

age-friendly university, older workers, silver economy, labour market, digital skills

## JEL Classification

J7, M5

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<sup>a</sup> Mendel University in Brno, e-mail: nataly.tkalenko@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: nataly.versal@gmail.com

# A Robustness Analysis of Newspaper-based Indices

Roman Valovič<sup>a</sup> and Daniel Pastorek<sup>b</sup>

## Abstract

In this paper, we subject the methodology for newspaper-based indices to several tests of robustness, to address the potential problems of this proposed approach. Firstly, we examine the strong dependency between the selected keywords and the entered query. We do this using state-of-the-art language models, such as BERT, to automatically select relevant articles to build the index. Secondly, we propose that articles are weighted to partially allow for the context of the articles and potential errors in the incorrect identification of articles. Finally, we track composition change in newspaper articles, these have been evolving over time. The implications of these tests may be of interest to the users of these indices as well as suggesting a future direction for this approach.

## Keywords

newspapers, economic-policy uncertainty, EPU index, NLP, text-mining, similarity search

## JEL Classification

C80, D80, E80, E66

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<sup>a</sup> Mendel University in Brno, e-mail: roman.valovic@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: daniel.pastorek@mendelu.cz

# Growth Effects of EU Expansion: A Penalized Synthetic Control Method

Steven Yamarik<sup>a</sup> and Makram El Shagi<sup>b</sup>

## Abstract

This paper applies the penalized synthetic control method to estimate the growth effects of European Union (EU) enlargement. A penalized synthetic control estimator introduces a penalty term in the synthetic matching algorithm that penalizes discrepancies between the treated economy and its synthetic counterpart. We use this estimator to construct counterfactuals of the growth rate of GDP per capita for the EU accession countries. Like Campos et al. (2019) a country's accession into the EU generates a positive impact on growth. However, once we include a 95-percent confidence interval generated by random donor pool, we find that only Ireland experiences a significant increase in cumulative growth in 2019.

## Keywords

synthetic control matching, treatment effects, European Union expansion, economic growth

## JEL Classification

C33, F15, N14, N44, O52

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<sup>a</sup> California State University at Long Beach, e-mail: Steve.Yamarik@csulb.edu

<sup>b</sup> Henan University, China, e-mail: makram.elshagi@gmail.com

# An overview of blockchain platforms considering options for peer-to-peer energy trading implementation

Martin Zák拉斯ník<sup>a</sup>, Veronika Konečná<sup>b</sup>, Oldřich Faldík<sup>c</sup>  
and Oldřich Trenz<sup>d</sup>

## Abstract

Electricity generation, distribution and retail are usually controlled by a few large businesses in the energy sector. However, the popularity of distributed energy resources (DERs) such as small-scale solar panels and home battery systems has increased as a result of the growing use of renewable energy sources. As opposed to centralized businesses, these DERs can be possessed and operated by individuals or small groups of clients. This resulted in the development of the concept of Peer-to-peer (P2P) energy trading, where individuals and small groups can buy and sell surplus electricity with one another. It investigates Blockchain platforms that enable Peer-to-peer energy trading implementation to support the appropriate usage of this technology. Our main goal is to group various platforms into several categories so that businesses can more easily select the Blockchain for Peer-to-peer energy trading platform that best suits their requirements. The evaluation of available Blockchain platforms to enable decision-making in a business is then led by their description. Furthermore, the paper addresses one of the biggest problems of Peer-to-peer energy trading, i.e. the lack of electricity within the local power system due to buying energy on the spot market.

## Keywords

blockchain, peer-to-peer energy trading, decision making, industry 4.0

## JEL Classification

L8, O3

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<sup>a</sup> Mendel University in Brno, e-mail: xzaklas1@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: xkonecn1@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: oldrich.faldik@mendelu.cz

<sup>d</sup> Mendel University in Brno, e-mail: oldrich.trenz@mendelu.cz

# Using Google Trends to predict economic sentiment indices in the enterprise sphere

Klára Zálešáková<sup>a</sup>

## Abstract

Unemployment is a fundamental economic quantity that determines the economic balance, but time is dynamic and as we can see economic crises affect countries more and more often. As a result of economic imbalances and crises, there is an increase in the unemployment rate all over the world. In this study, we will focus on the interdependence between unemployment and macroeconomic indicators. The unemployment rate will be compiled on the basis of Google Trends, as the abundant use of Internet data is an opportunity to monitor the activity of users on the Internet in searching for a job. Different types of confidence indicators were chosen as macroeconomic indicators. To analyse the relationships, VAR models will be constructed with the subsequent application of Granger causality.

## Keywords

Google trends, granger causality, macroeconomic indicator, unemployment

## JEL Classification

B230, E240, J640

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<sup>a</sup> Mendel University in Brno, e-mail: xzalesa9@mendelu.cz

# Mobile augmented reality design system: Taking actions and visualize data

Martin Zejda<sup>a</sup>, Ivo Pisařovic<sup>b</sup>, David Procházka<sup>c</sup> and František Dařena<sup>d</sup>

## Abstract

The implementation of augmented reality (AR) in applications is becoming more and more common as such apps may leverage the connection of virtual and real environments to make user interactions more natural and effective. A usual obstacle in the implementation is the absence of rules, recommendations and reusable components for the AR user interface (UI) design. This leads to expensive development and inconsistent UI. The problem also applies to mobile augmented reality (MAR) UI. In this paper, we define guidelines for taking actions and visualizing data in MAR. The guidelines are presented clearly and supported with graphic visualization, which is the main contribution of this paper as specific examples are missing in other papers. Two approaches for performing actions and visualizing data in MAR are defined. User testing was performed to compare the approaches and verify their usability. This paper lays the cornerstone for a comprehensive standardization of UI in AR.

## Keywords

mobile augmented reality, user experience, user interface, design patterns, design guidelines, user-centered design, human-computer interaction

## JEL Classification

C88, L86

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<sup>a</sup> Mendel University in Brno, e-mail: xzejda@mendelu.cz

<sup>b</sup> Mendel University in Brno, e-mail: ivo.pisarovic@mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: david.prochazka@mendelu.cz

<sup>d</sup> Mendel University in Brno, e-mail: frantisek.darena@mendelu.cz

# TV commercials for the retirement savings through the prism of theses of behavioral economy

Pavel Žiaran<sup>a</sup>, Adam Slobodník<sup>b</sup> and Eva Čechalová<sup>c</sup>

## Abstract

TV commercials are usually created based on the principles of consumer science and marketing psychology. But when it comes to advertising financial products, it might be advisable to consider psychological concepts related to financial decision-making.

The objective of this paper is to reveal the relevance of the concepts of behavioral economics, as presented by Kahneman and Tversky (narrow vs. broad framework, intuitive vs. analytical thinking, preference for the uncertainty level at gain and loss, etc.), in relation to the impact of TV commercials on retirement savings for potential clients.

A study with 100 participants shows differences in the perception of advertising (humor, nostalgia, form of presentation of older age) in relation to categories defined by behavioral economics. Broad framers are more influenced by humor, narrow framers by nostalgia and the threat of loss. Respondents preferring higher uncertainty of loss are more influenced by a positive presentation of older age and vice versa. Analytical versus intuitive thinking scale correlates with saving/investing behavior.

The results bring important implications in the field of marketing and advertising of financial products and services.

## Keywords

advertising, behavioral economy, psychology

## JEL Classification

M3

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<sup>a</sup> Mendel University in Brno, e-mail: pziaran@gmail.com

<sup>b</sup> Mendel University in Brno, e-mail: xslobod1@node.mendelu.cz

<sup>c</sup> Mendel University in Brno, e-mail: cechalovae@seznam.cz

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