



David Hampel, Hana Vránová (eds.)

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## CONTENTS

RAYMOND KOFI ADJEI, LIBOR GREGA: Socio-economic Implications of Trade and Economic Globalization in Ghana: A Preliminary Study . . . . .	11
ERASMUS YAW AFRIYIE, GERMAIN KOFI ACKA AIDOO: Corporate Governance and its Impact on Financial Performance of Commercial Banks in Ghana . . . . .	13
RICHARD SELASE AGBOGA, ANYARS MAHMUD: Internal Control and Crisis Management: Comparative Study of State and Privately Owned Enterprises in Ghana . . . . .	15
PETER ALBRECHT, SVATOPLUK KAPOUNEK, ZUZANA KUČEROVÁ: Fractal Dynamics of Stock Markets and Uncertainty . . . . .	17
DOROTA ANDERLOVÁ: Luxury Skincare Products: Factors of Influence on Consumers and Their Significance . . . . .	19
IRENA ANTOŠOVÁ: The Employee Income Differences by Gender in Relation to the Possibility of Part-Time Work in the EU . . . . .	21
KWAKU BOAFO BAIDOO: Asymmetric Effects of Long and Short Selling Positions: Evidence from New York Stock Exchange . . . . .	23
KLÁRA BAKOVÁ, SVATOPLUK KAPOUNEK: Asymmetric Effects of Firm Investment Determinants: Evidence from Post-transformation Economies . . . . .	25
VIKTORIA JOY BEHRENS, SIMON KRAUSE: Conception of a Model for an Internal and International Project Transfer . . . . .	27
MATTHIAS BENDER, LUBICA BAJZÍKOVÁ: Talent Management in German Small and Medium-Sized Companies (SMEs) . . . . .	29
SEBASTIAN BUNZENDAHL: The Way to Purchasing 4.0 in the Automotive Industry and the Impact on Sustainable Procurement . . . . .	31
ALEXANDER BUSCHE: Willingness to Pay of Audience and Non-audience in Publicly Funded German Music Theater . . . . .	33
PETRA ČISKOVÁ: On Dynamics in a Simple Keynesian Macrodynamical Model of Monetary Policy: The Case of Slovak Republic . . . . .	35
LUCIA DOBROTOVÁ: Increasing Spending on Social Protection and Redistribution Policy in the State . . . . .	37
CHRISTIAN DREYER: Characteristics of Generation X, Y, and Z (Literature Review) . . . . .	39
IRYNA FEDYSHYN: Impact of Globalization Crises on the Tourism and Hospitality Economy . . . . .	41

ADAM FILLA, MICHAL MÁDR, BŘETISLAV ANDRLÍK, LUCIE FORMANOVÁ: Electromobility Development as a Factor Affecting Tax Revenues: Evidence from Norway . . . . .	43
MARTINA FILOVÁ: Development of Electromobility in Relation to COVID-19 in the Czech Republic . . . . .	45
ANTJE CAROLIN FINDEIS, ELENA GROCHOLSKI: Burnout Prevention by Freelance Coaches and the Possible Effect on Productivity: A Literature Review . . . . .	47
BORIS FIŠERA: Income Inequality and the Distributional Effects of Monetary Policy: The Role of Financial Heterogeneity . . . . .	49
JIŘÍ GEORGIEV: Forecasting Czech GDP: Hierarchical Approach . . . . .	51
ELENA GROCHOLSKI, ANTJE CAROLIN FINDEIS: Change Management in a Dynamic Business Environment – A Critical Literature Review . . . . .	53
DOMINIK GŘEŠÁK: Economic and Political Stability of the Eurozone Countries and One of the Most Important Aspects – Eurosepticism . . . . .	55
OLIVER HAAS: COVID-19 Disruption and Delay Implications on Construction Projects . . . . .	57
PETR HABÁNEK: Analysis of the Sponsorship Environment in Slovakia . . . . .	59
CHRISTA HANGL: Digitisation – A Global Examination Based on a Bibliometric Analysis . . . . .	61
NATALIYA HARMATIY: Modeling the Impact of Investment on Population Welfare . . . . .	63
CHRISTINE HINRICHSEN, TINA KRIEGER: The Effects of a Smartphone or Tablet Application on Learning Transfer in Continuing Vocational Training (CVT) When Used in the Training Program . . . . .	65
IVO HORÁK: The Environmental Goods in Agriculture in the Region of South Moravia and their Economic Evaluation . . . . .	67
JENS-MARKUS HORN: Cause-related Nudging – Employing Nudges in Cause-related Marketing Campaigns of German Food Retailers . . . . .	69
ŠTĚPÁN HOŠEK, OLDŘICH FALDÍK, OLDŘICH TRENZ, BARBORA BÜHNOVÁ: Digital Twin Cloud Platforms: An Overview . . . . .	71

JAKUB CHINI, TOMÁŠ DVOŘÁK: Definition of Relevant Market for the New Personal Cars in the Czech Republic: Application of Random Coefficient Model . . . . .	73
PETER CHOCHULA, ANNA DRAGOLOVOVÁ, PAVEL TURČÍNEK, TOMÁŠ FOLTÝNEK: Identification of Academic Integrity Misunderstood Topics and Suitable Time Frames for Promoting Them to the Academic Community Throughout the Year . . . . .	75
ANDREJ ILIČ: Realisation of the Manipulation Task Using Delta Robot . . . . .	77
JAN KARAS: Industry 4.0 and Employment in Agriculture . . . . .	79
ANDREAS KASPER: The Impact of Introducing a Flat Rate Withholding Tax for Capital Gains on Tax Revenue and Tax Relief in Germany . . . . .	81
STEFAN RALF KOPPOLD: Comparative Examination of Quantitative Risk Maps and Simulation-based Scenario Analyses . . . .	83
IVAN KOROLOV, MICHAL MÁDR: Regulatory Changes and Ukrainian Domestic Trade . . . . .	85
BERNHARD ALEXANDER KRAH: Peculiarities and Difficulties in Entering the B2A Market Compared to B2B and B2C, Based on a Case Study from the Philippines . . . . .	87
SIMON KRAUSE, VIKTORIA JOY BEHRENS: The Impact of Trust in the Team at the Difference Between Local and Decentralized Teams . . . . .	89
ANETA KREJČOVÁ: The Barriers in the Female Managers Career . . . . .	91
TINA KRIEGER: An Economic Model of Fair Taxation in the Digital Age . . . . .	93
TINA KRIEGER, CHRISTINE HINRICHSEN: Fair Taxation in the Digital Age: Literature Survey . . . . .	95
SIMON LUCA KROPF: Enhancing Data Quality for Data Analytics Through Machine Learning . . . . .	97
ANDREA KRÁLIKOVÁ: Czech Wine Regions in the Context of Visitors' Happiness . . . . .	99
PATRIK KUBÁT: Cycling Tourism Certification and its Justified Role in Wine Tourism in Znojmo Subregion . . . . .	101
LIBOR KYNCL, MICHELLE JANTULÍKOVÁ, KATARÍNA KOVALČÍKOVÁ, STRATOS ZERDALOGLU, OLDŘICH TRENZ: Personal Data Processing in the Academic Conditions Using the Modern Instruments of Group Electronic Communication . . . . .	103

BENJAMIN LAHMANN:	
Impact of Digital Supported Process Workflow Optimization for Knee Joint Endoprosthesis Implantation on Hospital-Specific Process and Quality Ratios . . . . .	105
MICHAEL LANG:	
A Business Model Innovation Methodology for Established Organizations: Systematic Theory Validation . . . . .	107
MICHAEL LANG:	
Modern Business Model Innovation Methodologies: A Systematic Literature Review (2015–2020) . .	109
BIRGIT LEHNER:	
Introduction of Robotic Care: Risks and Benefits in the Area of Ethics . . . . .	111
JULIA BETTINA LEICHT:	
Descriptive Analysis of German Listed Companies Regarding Climate-Related Reporting . . . . .	113
JANA LEKEŠOVÁ:	
Evaluation of Price Transmission in the Commodity Chain . . . . .	115
ANTJE LÜERSMANN:	
AI as Inventor – A Statistical Analysis of the Current State of Discussion in Patent Law . . . . .	117
ANTJE LÜERSMANN:	
AI as Inventor – A Qualitative Analysis of the Current State of Discussion in Patent Law . . . . .	119
IVANA MALINKOVÁ, PETRA ZERÁKOVÁ, TEREZA LÁZNIČKOVÁ:	
Reporting of Non-Financial Information from the Perspective of Audit Companies . . . . .	121
SAMIRA MEIER:	
The European Corporate Green Bond Market – Quo vadis? . . . . .	123
MAXIMILIAN MEISSNER:	
Offshore Wind Turbine Cost Structure Analysis . . . . .	125
THOMAS MEIXNER:	
Personality, Perceived Leadership and Commitment . . . . .	127
EBENEZER KWABLA MENSAH, CALEB KWADWO OSAFO:	
Factors Accounting for the Default in Repayment of Debt Capital by Small-Scale Businesses: A Case Study of Developed and Developing Countries . . . . .	129
RALF ALEXANDER MICHAEL, DAVID STEIN:	
Systematic Literature Review on the Economy of Fire Protection Measures in Germany . . . . .	131
MARKÉTA MLČÚCHOVÁ:	
Formulary Apportionment of Common Consolidated Corporate Tax Base in the European Union . .	133
HAGEN MÜLLER, MANFRED SCHÖNLEBER:	
Continuous Auditing – The New normal? . . . . .	135

JOHANNES NEUMANN, MILAN FEKETE: The Development and Effects of Digitalization on Stationary Retail Using the Example of Mobile Phone Contracts for Older Consumers . . . . .	137
CHRISTIAN ROLAND NIEMEIER: Online Price Discrimination: Precursors to a quantitative study of different approaches . . . . .	139
RADEK NÁPLAVA: Institutional Quality and Income Inequality: Evidence from Post-Soviet Countries . . . . .	141
ONDŘEJ NOVÁČEK, PAVEL TURČÍNEK, TOMÁŠ FOLTÝNEK: Decision Tree Survey Tool . . . . .	143
DANIEL PASTOREK: Public Perception of the European Integration Process: Evidence from the United Kingdom and Germany . . . . .	145
STEFAN PELZ: Refrain from Redundancies and Permanent Employments in the Public Service in Germany Due to Employment Protection . . . . .	147
JANA PÉTERIOVÁ, BŘETISLAV ANDRLÍK, MARTIN VATRT: Impacts of the Circulation Tax Introduction on the Vehicle Fleet of Slovakia . . . . .	149
ALEŠ PETR: Factors Influencing a Change of Farmers Behaviour in Tractor Acquisition . . . . .	151
PETER PETRAT, GERHARD HANS FISS: Compliance Reporting in the Annual Report of the German DAX30 Companies: Looking for Best Practices . . . . .	153
BEATE MONIKA PHILIPPS: Loan Covenants: Effective Protection for Commercial Real Estate Lenders or Administrative Burden? . . . . .	155
LENKA POMYKALOVÁ: Does European Union Membership Stimulate Economic Growth? The Case of Visegrad Group . . . . .	157
MICHAL PŠURNÝ: Does the Attractiveness of Product Photography Affect Consumer Preferences? . . . . .	159
CHRISTOPH RIEMER: Is Reciprocity Still the Silver Bullet of Trade Policy? . . . . .	161
REMO ROSSI: Estimation of Supplier's Indirect Plant Salary Cost Within the Automotive Industry . . . . .	163
HANA ROZEHNALOVÁ, MICHAL MÁDR, LUCIE FORMANOVÁ, BŘETISLAV ANDRLÍK: Air Pollution from Transport and Human Health in EU Countries . . . . .	165
ALEXANDER SALMEN: Link Between Digitalization and New Product Launch: Lessons Learned from an Empirical Survey . . . . .	167

MARINA SCHLOESSER:	
The Raise of Data Analytics and Data-lead Decision Making in Global Sporting Organizations . . . . .	169
MANFRED SCHÖNLEBEN, HAGEN MÜLLER:	
Smart Dairy Nutrition: How to Harvest the New “Green Gold”? . . . . .	171
OLIVER SCHNEIDER:	
The Historical Beginnings of Quality and Its Transfer to Global Quality Management Systems Nowadays . . . . .	173
LUCIE SEDLÁKOVÁ:	
Average Costs for one Person with Disabilities from the State and Employer Perspective . . . . .	175
MARIANNA SEKEREŠOVÁ, BŘETISLAV ANDRLÍK, LUCIE FORMANOVÁ, MICHAL MÁDR:	
The Impact of the Operation of Passenger Cars Registered in the Slovak Republic on the Environment	177
VERONIKA SPÁČILOVÁ:	
Ageism During the Job Competition of Workers on the Czech Labor Market . . . . .	179
DAVID STEIN:	
Analytical Hierarchy Process on the Impact of Selected Local Environment Factors on Founder’s Decision Making in German Dentistry . . . . .	181
DAVID STEIN, RALF MICHAEL:	
Systematic Literature Review on the Impact of Local Environment Factors on Founder’s Decisions in German Dentistry . . . . .	183
FLORIAN STEINBRENNER:	
An evaluation of identified and unidentified obstacles to an implementation of value-based pricing . . . . .	185
FLORIAN STEINBRENNER:	
Future Disruptive Trends in Value-Based Pricing Methods . . . . .	187
JOLANA STEJSKALOVÁ:	
Forecasting with Google Trends: Evidence from Auto Industry . . . . .	189
BERNHARD STELLNER:	
Effects of Fatherhood onto Behaviour of Managers: A Literature Review . . . . .	191
KRISTÝNA MICHAELA STUHLÍKOVÁ, OLDŘICH FALDÍK, BARBORA BÜHNOVÁ, OLDŘICH TRENZ:	
Evaluation of Smart City Concept Characteristics . . . . .	193
LENKA ŠLEGEROVÁ:	
Using Costs States in a Semi-Markov Model to Estimate Cost-Effectiveness: An Illustration for Metastatic HER2+ Breast Cancer in the Czech Republic . . . . .	195
KARIN TÓTHOVÁ, ALICA KAHÚNOVÁ, MARTINA CHLÁDKOVÁ:	
Zero Waste Evaluation Criteria Identification – Case of Hotel Industry . . . . .	197
ZDRAVKO TRETINJAK:	
The Behaviour of Social Traders . . . . .	199



JIŘÍ VALACH:	
Dimensions and Quality Check Using Image Processing Methods . . . . .	201
ROMAN VALOVIČ:	
Unsupervised Aspect Phrase Extraction in Czech Dataset . . . . .	203
TERÉZIA VANČOVÁ:	
The Role of Economic Sentiment Indicator in the Consumption Functions of the V4 Countries . . . . .	205
NATALIYA VESELA, VOLODYMYR RODCHENKO, DAVID HAMPEL:	
Prospects for Attracting Foreign Investment in the Context of Green Transformation in Ukraine . . . . .	207
ADAM VLČEK, JAKUB DRAJSAJTL:	
People Transit Counter . . . . .	209
JAN VRÁNA, STANISLAV MOKRÝ:	
The “Need for Touch” and Czech Generation Y . . . . .	211
LENKA VYROSTKOVÁ, RAJMUND MIRDALA:	
What We Have Learned from the Literature Review . . . . .	213
MARTIN WALLNER, JONAS PFEFFER:	
The (Sustainable?) Future of the Oil Industry . . . . .	215
JÜRGEN WELTERMANN, SASCHA KLEIN:	
A Critical Analysis of the Current State of Research on Business Succession . . . . .	217
STEFAN WIEKE:	
Decision Making Models in Germany’s Natural Gas Infrastructure: Analysis of Maintenance Costs . . . . .	219
AIK WIRSBINNA:	
The Evaluation of Economic Benefits of Smart City Initiatives . . . . .	221
MANDY WITT:	
The Process of an Employee Performance Appraisal . . . . .	223
VALÉRY WÖLL:	
How Can Accidents at Work be Prevented? State of Research and Outlook . . . . .	225
DRAHOMÍRA ZAJÍČKOVÁ:	
Does Fatherhood Bonus Exist in the Czech Republic? . . . . .	227
SILVIE ZÁMEČNÍK:	
Employee Retention in Selected Spanish Hotels: Quality of Investment in the Motivation Factor . . . . .	229
MARTIN ZEJDA:	
Merging of Virtual and Real Space for Augmented Reality Applications . . . . .	231
MARTINA ZELENÁ, TOMÁŠ FIŠER:	
Banking System in European Union . . . . .	233



# SOCIO-ECONOMIC IMPLICATIONS OF TRADE AND ECONOMIC GLOBALIZATION IN GHANA: A PRELIMINARY STUDY

Raymond Kofi Adjei<sup>1</sup>, Libor Grega<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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economic globalization, Ghana, socio-economic, trade

## JEL CODES

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F02, F16, Q56

## 1 INTRODUCTION

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International trade is said to be the lifeblood of economic globalization. Globalization in and of itself is a welcome concept in many developing countries especially because of the perceived benefits derived from it but also because of trade liberalization policies perpetuated by the World Bank and the International Monetary Fund. With the widespread dissemination of globalization in many of these developing countries, the question remains as to how these countries develop the capacity to utilise the full forms of economic and trade globalization. There is a general consensus among economists that all things being equal, open economies often tend to grow faster

than closed economies. That notwithstanding, this conventional idea is not a one-size-fits-all approach as studies have shown (Musila and Yiheyis, 2015; Ulaşan, 2015). In fact, it has also been proven that the effect that globalization has on economic growth in Sub-Saharan Africa is not exactly linear (Zahongo, 2018). This paper therefore seeks to investigate the socio-economic implications that economic and trade globalization has on specific macroeconomic indicators in Ghana. The macroeconomic indicators considered are GDP per capita, Consumer Price Index (CPI), Unemployment, Inflation, Interest rates, and Government debts.

## 2 MATERIAL AND METHODS

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The primary data sources for this study will be secondary data from the World Bank and International Monetary Fund (IMF) data banks. Trade in Value Added (TiVA) will also be collected as secondary data from the organisation for Economic Cooperation and Development (OECD). The study considers foreign direct investment, degree of openness, and nominal exchange rate as proxies for trade globalization.

The implication analysis will be performed as a time-series analysis for the proxies of trade globalization on GDP per capita, Consumer Price Index (CPI), Unemployment, Inflation, Interest rates, and Government debts. This will be done using multiple regression analysis to test the dependencies. The parameter estimates will be derived using the Ordinary Least Squares (OLS) method. Additionally, Autoregressive-Distributed Lag (ARDL) models will

be adopted to test the presence of long-run relationships between the variables.

### 3 RESULTS

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Based on preliminary assumptions, we expect trade globalization to have a significant positive impact on GDP per capita. We also expect a significant inverse effect on unemployment. The implications of trade

globalization on CPI, inflation, interest rates, and government debts presents a grey area for which the study has to be finalised to get a concrete result.

### 4 CONCLUSIONS

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Reasonable conclusion based on the empirical analysis will be presented and appropriate policy recommendations will be offered.

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ZAHONGO, P. 2018 Globalization and Economic Growth in Developing Countries: Evidence from Sub-Saharan Africa. *International Trade Journal*, 32 (2), 189–208. DOI: 10.1080/08853908.2017.1333933.

# CORPORATE GOVERNANCE AND ITS IMPACT ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN GHANA

Erasmus Yaw Afriyie<sup>1</sup>, Germain Kofi Acka Aidoo<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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corporate governance, financial performance, commercial banks, Ghana

## JEL CODES

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G21, G30, G34, G38

## 1 INTRODUCTION

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Banks play a significant role in achieving economic development (Serwadda, 2018; Ongole and Kusa, 2013). Banks help in the mobilization and distribution of financial resources hence the need for corporate governance to guide in the management of financial resource entrusted to management, thus guaranteeing efficiency, sustainability, competitiveness, safety, and profitability (Alkhazaleh and Almsafir, 2014; Managi and Matousek, 2014; Du and Sim, 2016; Bopkin, 2013). Corporate governance in banks has assumed heightened importance and has become an issue of global concern after the collapse of some high profile institutions such as Enron and WorldCom in the early 2000s. Indeed, in the aftermath of the crises, tighter regulations such as the Sarbanes Oxley

Act 2002, Basel frameworks, and other laws were enacted to reinforce corporate governance practice worldwide (Appiah et al., 2017). The government, to promote good corporate governance in Ghana, enacted the following Acts; Banking Act 2004, Audit Agency Act 658, the Financial Administration Act 654, the Depository Protection Act, 2016 (Act 931), Companies Code 1963 (Act 179), and the Bank of Ghana Corporate Governance Code (2018), these Acts establishes corporate governance and financial management process (Appiah et al., 2017). Notwithstanding these measures, the commercial banks, especially the indigenous commercial banks, continue to record poor financial performance.

## 2 MATERIAL AND METHODS

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The paper evaluates corporate governance and its impact on the financial performance of commercial banks in Ghana. Data was extracted from Orbis and annual reports of commercial banks from 2011 to 2017. Although 25 commercial banks exist during the period, the study was limited to 20 commercial banks due to data unavailability. The study used the purposive and convenience sampling method

to identify and select commercial banks with data proximity. The study adopted Return on Asset as the performance indicator and Board Composition, Board Size, Cost to income, Net Interest Margin, Bank Size, and Bank Age as the independent variables. A random-effects GLS regression model was used to analyze the impact.

### 3 RESULTS

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The study recorded a significant positive relationship of 0.019% between Board Composition and Return on Asset. Furthermore, the study recorded a significant positive relationship of 0.00% between Net Interest Margin and Return on Assets. The study recorded a significant positive relationship of 0.00% between Bank Size (represented by the total log of assets) and Return on Assets. Besides, the study recorded a significant negative relationship of 0.031%

between Bank Age and Return on Asset. This implies that age has some effect on banks' profitability. The outcome of the study shows a significant negative relationship between Cost-to-Income and Return on Assets. The study recorded a significant negative  $p$ -value of 0.00%. These imply that when a bank's operating cost increases, its Return on Assets is likely to decrease. Board Size showed no significant relationship between Return on Assets at 70.3%.

### 4 CONCLUSIONS

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The paper assesses the impact of corporate governance on commercial banks' financial performance in Ghana. Board Composition, Net Interest Margin, and Bank Size showed a significant positive impact on the banks' profitability. In contrast, Bank Age and

Cost to Income revealed a significant negative impact on banks' profitability, meaning that one's presence affects the other as cost and bank age increase profitability is likely to be affected. However, Board Size exhibited no impact on banks' profitability.

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# INTERNAL CONTROL AND CRISIS MANAGEMENT: COMPARATIVE STUDY OF STATE AND PRIVATELY OWNED ENTERPRISES IN GHANA

Richard Selase Agboga<sup>1</sup>, Anyars Mahmud<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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crisis management, internal control

## JEL CODES

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L33

## 1 INTRODUCTION

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State and Privately Owned Enterprises in Ghana face various crises due to weak Internal Control mechanisms. Even though the situation is diverse, power/electricity, human resource, and finance/capital are common. This an unprecedented or extraordinary event or situation threatens these organisations and requires a strategic, adaptive, and timely response to preserve its viability and integrity. Therefore, dynamism is needed to build, integrate, and reconfigure external and internal competencies to ensure enterprise continuity. Also, Ghana enterprises cannot identify suitable management practices due to weak Internal Control systems that have contributed significantly to these crises. Many of the State and Privately Owned Enterprises have

performed poorly over the years due to weak internal controls as enshrined in the 2013 Committee of Sponsoring Organizations of the Treadway Commission's (COSO) model. This challenge has led to a shutdown of some enterprises in Ghana while others run into crisis. The enterprises' poor performance has led to the non-regular payment of salaries, laying-off workers, mergers, and total shutdowns in some cases.

In this light, the paper discusses the relevant Internal Control measures in place as a means of crisis management in both State and Privately Owned Enterprises in Ghana, emphasizing how the internal controls prevent, detect, and control these crises.

## 2 MATERIAL AND METHODS

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The author employed a survey and cumulative percentage research approach based on a five-point Likert scale for the study using a sample of 20 enterprises from five sectors, namely: transport, service, energy, financial, and manufacturing, with 120

respondents from both State and Privately Owned Enterprises in Ghana. The study also used the Pearson correlation matrix in revealing the strength of association and relationship among the variables. Chi-Square analyses were further used in calculating

the critical value based on 0.05 and 3 as the level of

significance and degree of freedom, respectively, in testing the hypotheses.

### 3 RESULTS

The results indicate that less than a quarter of the respondents agree that both State and Privately Owned Enterprises perform excellently in adhering to the 2013 COSO Internal Control Model. However,

the performance of Privately Owned Enterprises is better than that of State-Owned Enterprises.

The study also finds a weak positive correlation between Internal controls and Crisis management in both State and privately owned enterprises in Ghana.

### 4 CONCLUSIONS

Following the complexities surrounding enterprises and their exposure to crisis, it is very important for the management of the various enterprises to prioritise strict measures and internal controls to deal with crisis. Issues of electricity/power, human

resource, and finance/capital must be well addressed through regular reviews to ensure efficiency. Institutions should also partner with one another to enjoy economies of scale to reduce the cost of production.

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# FRACTAL DYNAMICS OF STOCK MARKETS AND UNCERTAINTY

Peter Albrecht<sup>1</sup>, Svatopluk Kapounek<sup>1</sup>, Zuzana Kučerová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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fractal market hypothesis, market fractions, economic-policy uncertainty, wavelet analysis

## JEL CODES

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G01, G41

## 1 INTRODUCTION

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The uncertainty is generally measured using the Economic Policy Uncertainty (EPU) index published by Baker et al. (2013). Increasing uncertainty in markets is related to higher exchange rate risk (Abid, 2019). Firms are not sure what impact it may have on demand, so they are more risk-averse and so they prefer to own fewer assets in foreign currencies during times of higher uncertainty (Huang et al., 2019). It is strongly related to decreasing stock prices (e.g. Luo and Zhang, 2020) however, a specification for each investor according to her preferred investment horizon should be more analyzed (e.g. Baker et al., 2013). Investors invest in different investment horizons and consider specific fundamentals to start trading. Each investor type looks at uncertainty in a different way and not every type of investor delays its investment to stock markets when uncertainty appears (Peters, 1994).

We make three main contributions to the growing stream of the empirical literature on the fractal dynamics of stock returns and uncertainty. First, we examine time-varying relationship of stock returns and uncertainty and find the existence of the cyclicity in all market fractions but only to a small extent. Our results only partly confirm the results of Křištofek (2012) as we observe a much longer period. Second, we find that the uncertainty increases are related to the stock market drops as already proved by other authors (e.g. Luo and Zhang, 2020). However, we identify the existence of the mutual coherence between the uncertainty and stock market returns for each time period and for each market fraction separately which is quite innovative. Third, based on our results, we offer concrete investment recommendations for all investors actively watching their portfolios, particularly for institutional investors.

## 2 MATERIAL AND METHODS

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Once the CWT is used and detects cyclical movements and market fractions, we apply the Wavelet Coherence to identify uncertainty as a leading or lagging indicator of future stock market returns for each market fraction separately. The coherence of un-

certainty and stock market returns is observed for the following countries: the USA, the UK, Japan, and the EU. Data for all stock indices are downloaded from the Yahoo Finance database. Uncertainty indices data are downloaded from their producers' databases

(www.policyuncertainty.com); the downloaded data include monthly uncertainty data for the USA, the UK, Japan, and the EU. The data are transformed by a logarithmic difference of the time series. EPU is the index calculated from the headlines of newspaper articles from chosen newspapers for each country. We examine the transformed time series employing wavelet analysis and we chose the Morlet wavelet.

### 3 RESULTS

The results among the analyzed countries are very similar. Most of the time, the effective market hypothesis was valid and the fractal market hypothesis was valid only in few periods in time, mostly when the market volatility was large and was caused by the occurrence of crises or by other economic shocks. This is valid especially for shorter terms up to 16 months. For higher horizons, there is no significant cyclicity.

Analyzing mutual coherence between uncertainty and stock returns has shown a few interesting findings. There is no observable relationship between

This Morlet wavelet analyses time series using time-frequency domain by the Continuous Wavelet Transform (CWT). Once the CWT is used and detects cyclical movements and market fractions, we apply the Wavelet Coherence to identify uncertainty as a leading or lagging indicator of future stock market returns for each market fraction separately.

### 4 CONCLUSIONS

We show significant cycles in times of higher uncertainty especially for short market fractions between 4 and 16 months. We define the relationship between uncertainty and stock market returns for each market fraction and time period separately. We point out

two variables for market fractions between 0 to 4 months. For the fractions between 4 to 16 months is uncertainty a leading indicator of future stock returns in times of economic-policy shocks. We identify that the relationship (32 months market fractions and higher) could be also reversed, i.e. that the stock prices drop stimulates uncertainty increases. We also identify that there are peak seasons (2003–2007) when it is significant to look at the decreasing uncertainty values. Such findings have not been defined as significant yet.

trading opportunities employing the uncertainty as a leading indicator for stock market returns especially for investors investing in horizons between 4 and 16 months.

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# LUXURY SKINCARE PRODUCTS: FACTORS OF INFLUENCE ON CONSUMERS AND THEIR SIGNIFICANCE

Dorota Anderlová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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consumer behaviour, conjoint analysis, influencing factors, skincare products, luxury goods

## JEL CODES

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D12, D91, M31, L66

## 1 INTRODUCTION

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The objective of the article is to discover consumer preferences in the luxury skincare products segment with the application of the multivariate statistical method, a conjoint analysis. The main source of primary data is questionnaire surveys and in-depth interviews with representatives of companies operating in this sector. According to the initial analysis, four of the most significant attributes were determined applying to consumer behaviour within this sector and the product in question: the possibility of sampling products, point of sale advice, price of the product and level of the special

offer. These attributes, with the aid of the conjoint analysis, were incorporated into individual model cards and subsequently offered to consumers for rating. The final sample of 1,080 respondents rated the offered product variants of skin creams and the results showed that the most preferred factor is the attribute of price and level of special offer as opposed to less preferred products with the possibility of sampling and point of sale advice. Simultaneously, the data showed that consumers gave most preference to the lowest price and the highest special offer.

## 2 MATERIAL AND METHODS

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Based on the literature review and qualitative research (in-depth interviews), the most important factors were listed applying to luxury skincare products on the Czech market. The influencing factors were determined as follows: product ingredients (efficacy), product brand, product price, special price offer, possibility of sampling, possibility of point of sale advice, product design, recommended by friends/family – social status. These factors were incorporated into a questionnaire survey and presented for completion to consumers of FAnn parfumerie. The resulting sample

contained a total of 892 completed questionnaires. According to the frequency of answers in the survey results, four of the most significant attributes were determined. The last step to confirm the relevant choice of significant factors again was in-depth interviews with representatives of the cosmetic sector when individual levels of selected attributes were simultaneously consulted and finally supplemented. Based on the above steps, the following four most significant attributes and their levels were selected: possibility of sampling, possibility of point of sale ad-

vice, product price (product value) and special offer (amount of the offered product discount). Afterwards conjoint analysis was used as the statistical method. This special technique is used to determine which variables characterising the products and services most influence the choice of product and which combination of categories of these variables are most

preferred by consumers. Hypothetical products called profiles were displayed to consumers. Consumers were asked to rate profiles according to preference on a scale of 1 to 10, where value 1 indicates the least preferred product and value 10 the most preferred product.

### 3 RESULTS

The total sample contained 1,080 responses of consumers and was characterised by a significantly higher number of women ( $n = 1056$ , 97.8%) and a smaller part were men ( $n = 24$ , 2.2%). The predominant age category of the sample was defined by the age category of 35–44 years ( $n = 344$ , 31.9%) and 25–34 years ( $n = 324$ , 30%). The most listed education was secondary education ( $n = 526$ , 48.7%) and the average monthly income in a range of CZK 20,001–30,000 stated more than a third of consumers ( $n = 388$ , 35.9%). Almost half of consumers ( $n = 521$ , 48.2%) define the current marital status as married

and the predominant part ( $n = 742$ , 68.7%) of the collected sample identified as being employees as the predominant economic activity. A total of 294 consumers (27.2%) live in cities with a population of over 100,000. Based on the estimated preference coefficients of the given attributes the preferences were then calculated for each profile. The results show that the most preferred profile is Card ID 7, which is the product with the lowest price, the highest special offer and simultaneously for this product there is no possibility of product sampling or point of sale advice.

### 4 CONCLUSIONS

The results of this study carried out on the Czech market differ in some findings from previous claims of other studies. Different results may be explained by several effects. The level of income significantly influenced the perception and consumption of luxury goods when the factor of wealth is traditionally accepted as a key determinant of luxury consumption (Dubois and Duquesne, 1993). Therefore the level of income of the resulting study sample also needs to be considered. The perception of luxury may also differ culturally, individually or at national level: what is “luxury” for one person or culture may not be the

case for another (Park and Reisinger, 2009). This study is drawn up in the Czech Republic, a relatively new market economy in Central and Eastern Europe (CEE). The perception of luxury and brands belonging to the luxury segment may therefore be different “lower” compared to the established western economies in which most consumer surveys and models of consumer behaviour are carried out. A further reason of the above results of the study of Czech consumer behaviour is the higher sensitivity to discounts which is confirmed by further studies and surveys (Starzyczna et al., 2015; Klapilová Krbová, 2016).

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# THE EMPLOYEE INCOME DIFFERENCES BY GENDER IN RELATION TO THE POSSIBILITY OF PART-TIME WORK IN THE EU

Irena Antořová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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income differences, gender, employee, parental leave

## JEL CODES

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D31, O15, P46

## 1 INTRODUCTION

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In all countries of the European Union gender differences in the remuneration of employees are registered and greatly discussed. On average women receive a 15% lower wage than men (Boll, Lagemann, 2019). Given that there is a persisting gender pay gap and average lower remuneration of women, this means that women do not have equal initial conditions to reach the same living standard as men (Kramer et al., 2016). Landmesser (2019) verified the occurrence of a gender pay gap in all EU countries and states that most gender differences in remuneration are in countries of the former Eastern bloc of the Soviet

Union. Demographic factors preference of jobs or sectors influence the income differences (Corsi et al., 2016). The income differences do not always point at the discrimination. Another problem is that women are without contact with the employment for a long time during parental leave whereas men gain work experiences during that time and grow. The aim of this paper is to identify differences in income from employment between men and women in the EU and reveal segments of EU countries according to income differences and their approach to part-time jobs and parental leave.

## 2 MATERIAL AND METHODS

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The primary data source for this study is the survey of the EU-SILC (European Union – Statistics on Income and Living Conditions) from 2018. The EU-SILC survey provides detailed data on the income situation of households and individuals and contains also data related to the employment such as a type of contract or a job sector. In 2018 the EU-SILC survey took place in a total of 260,876 European households and altogether 521,391 individuals took part in it. This study works with individuals who

stated “employee” in the survey as their economic status, in a total of 179,714 respondents.

Cluster analysis is applied to determine segments of EU countries. The aim of cluster analysis is to classify objects into a certain number of clusters. Objects within a cluster are as similar as possible and an object within a cluster is the least possibly similar with objects from other clusters. K-means algorithm is used.

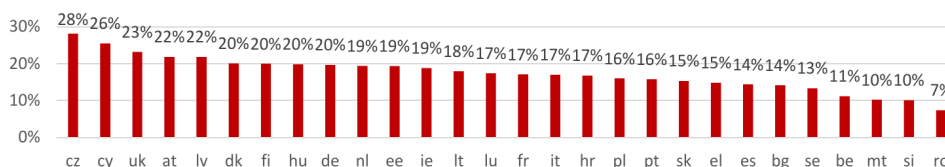


Fig. 1: The employee income differences by gender in the EU

Hebák et al. (2015) explicate that the K-means algorithm is an iterative procedure that minimises function

$$f_{KP} = \sum_{h=1}^k \sum_{i=1}^n u_{ih} \|x_i - \bar{x}_h\|^2,$$

where elements  $u_{ih} \in \{0, 1\}$  indicate whether the  $i$ -th object is (value 1) or not (value 0) assigned to the

$h$ -th cluster, and  $\bar{x}_h$  is a vector of mean values of the  $h$ -th cluster. The following must be fulfilled:

$$\sum_{h=1}^k u_{ih} = 1 \text{ for } i = 1, 2, \dots, n$$

$$\text{and } \sum_{i=1}^n u_{ih} > 0 \text{ for } h = 1, 2, \dots, k.$$

### 3 RESULTS

The first results show that the biggest difference between men's and women's income (Fig. 1) is in the Czech Republic and in turn, the weakest dependence is in Romania and Slovenia.

The share of part-time women employee is assessed in the context of the possibility of engaging in employment during parental leave. The highest share of women working part-time is found out in the Netherlands (72% of women employee) and then in

Austria (48%). The lowest share is revealed in east or central EU countries such as Poland, Hungary, Czechia, Lithuania, Bulgaria or Slovakia (up to 8%).

The next step of the research for this paper is the cluster analysis that will reveal segments of EU countries according to employee income differences, share of full-time and part-time jobs by gender and the average length of parental leave in the EU countries.

### 4 CONCLUSIONS

Social policy should create conditions for women that will motivate them and, above all, enable women who want to work not to lose their expertise during

parental leave but enable them to work part-time, work from home, ensure that there are enough child-care facilities etc.

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# ASYMMETRIC EFFECTS OF LONG AND SHORT SELLING POSITIONS: EVIDENCE FROM NEW YORK STOCK EXCHANGE

Kwaku Boafo Baidoo<sup>1</sup>

<sup>1</sup>Mendel University in Brno, Czech Republic

## KEY WORDS

long/short positions, EGARCH, return volatility

## JEL CODES

C58, G12, G15

## 1 INTRODUCTION

The aftermath of the financial crises in 2007/2008 resulted in close monitoring of short selling activities and enactment of strict regulations (Beber and Pagano, 2013). Short selling is an important mechanism in determining the prices of stocks and the short selling ban and restrictions have been concluded to affects the performance of the market by many researchers. Diamond and Verrecchia (1987) argue short selling restrictions hinders price discovery while Sigurdsson and Saffi (2011) conclude of a low efficiency in stocks. On the market returns, Bris et al.

(2007) also argues short selling leads to negative skewness. The restrictions on short selling led to price inflation (Boehmer et al., 2010) and stocks with high stock interest achieved negatively abnormal returns (Boehmer et al., 2010). The short selling restrictions also related to higher market volatility (Bris et al., 2007). This paper follows the works of Bohl et al. (2016) and Kao et al. (2020) and investigate the relationship between return volatility and short selling trading volumes.

## 2 MATERIAL AND METHODS

The study employs the asymmetric Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model to investigate the impact of long-short selling positions on the market price volatility for the period between 2009 and 2020. The Autoregressive Conditional Heteroskedasticity (ARCH) proposed by Engle (1982) and its extension of GARCH by Bollerslev (1986) has been widely used in the modelling and forecasting of volatility. This paper uses the exponential GARCH (EGARCH) proposed by Nelson (1991).

The conditional variance of EGARCH (1,1) is specified as follows:

$$\ln(\delta_t^2) = \omega + \alpha \left[ \frac{|\epsilon_{t-1}|}{\delta_{t-1}} - \sqrt{\frac{2}{\pi}} \right] + \gamma \frac{\epsilon_{t-1}}{\delta_{t-1}} + \beta \ln(\delta_{t-1}^2), \quad (1)$$

where  $\delta_{t-1}^2$  is the variance estimation of the previous period,  $\frac{\epsilon_{t-1}}{\delta_{t-1}}$  is the effect of leverage and asymmetry and

$\gamma$  the leverage parameter. If  $\gamma \neq 0$ , the impact of news is asymmetric while  $\gamma < 0$ , indicates leverage effect. The impact of shocks on the conditional variance is measured by  $\alpha$  and  $\beta$  measure the persistence.

We follow a similar approach of Chen et al. (2011) and modify the conditional volatility of both GARCH and EGARCH models to including the trading volumes of short position ( $V_t^{SP}$ ) and long position ( $V_t^{LP}$ ) used as the explanatory variables.

The variables  $V_t^{SP}$  and  $V_t^{LP}$  are defined as follows:

$$V_t^{SP} = \frac{SV_t}{SV_{t-1}} \quad \text{and} \quad V_t^{LP} = \frac{LV_t}{LV_{t-1}}, \quad (2)$$

where  $SV_t$  and  $LV_t$  are the trading volumes for the short and long positions respectively. This give the significance of the impact of short/long positions on the conditional variance of the returns of the NYSE Composite Index.

The variance equations of the models are given below:

$$\delta_t^2 = \omega + \alpha_1 \epsilon_{t-1}^2 + \beta_1 \delta_{t-1}^2 + \lambda_1 V_t^{LP} + \lambda_2 V_t^{SP}, \quad (3)$$

$$\begin{aligned} \ln(\delta_t^2) = & \omega + \alpha \left[ \frac{|\epsilon_{t-1}|}{\delta_{t-1}} - \sqrt{\frac{2}{\pi}} \right] + \gamma \frac{\epsilon_{t-1}}{\delta_{t-1}} + \\ & + \beta \ln(\delta_{t-1}^2) + \lambda_1 V_t^{LP} + \lambda_2 V_t^{SP}, \end{aligned} \quad (4)$$

where  $\lambda_1$  and  $\lambda_2$  are the estimated parameters for long and short positions respectively.

### 3 RESULTS

The EGARCH (1,1) estimates shows the weak arch and strong garch effects on the return volatility during short selling activities. There is the presence of high volatility persistence in the returns during short selling activities. The high persistence parameter indicates volatility shocks takes a longer time to dissipates and implies a destabilizing effect of short selling on the market volatility (Bohl et al., 2016). The coefficient of the asymmetric effect (0.2809) significant at 1% implies leverage effect in the market returns during short selling and the positive coefficient shows positive shocks prove to increase the

market volatility less than negative stocks (Fakhfekh et al., 2016; Jeribi et al., 2015). The positive asymmetric effect also indicates short selling is dominated by informed traders, investors and asset managers. The coefficient of short position is 2.5158 and significant at 1%. This implies short selling activities on the market increases the return volatility. The traditional buy-and-hold strategy used by traders reduces the return volatility as indicated by the coefficient of the long position (-1.1378). The results are consistent with higher orders of the EGARCH model estimates.

### 4 CONCLUSIONS

The results of the studies show high volatility persistence in the return volatility during short selling activities. This implies a destabilizing effect of short selling on financial market which is consistent with the work of Bohl et al. (2016). We also discovered positive shocks prove to increase the market volatility less than negative stocks (Fakhfekh et al., 2016; Jeribi et al., 2015) which reflect the asymmetric effect observed in stock markets. Our findings strongly support our hypothesis that short sale increase market volatility but may be dependent on the

market condition which is consistent with Bohl et al. (2012). The results show the impact of the pandemic on return volatility is asymmetric in nature and significantly decrease the return volatility of the stock market. The results indicate short positions during the pandemic uncertainties reduce the return volatility in the bearish market which implies investors and fund managers can increase their short positions to hedge against the falling prices in the market.

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# ASYMMETRIC EFFECTS OF FIRM INVESTMENT DETERMINANTS: EVIDENCE FROM POST-TRANSFORMATION ECONOMIES

Klára Baková<sup>1</sup>, Svatopluk Kapounek<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

financial leverage, cash flow, profitability, post-transformation economies

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## JEL CODES

D21, G30, C23

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## 1 INTRODUCTION

Firm investment behavior is traditionally affected by macroeconomic fundamentals (Vermeulen, 2002) and firm specific conditions (Fazzari et al., 1988; Aivazian et al., 2005). There are numerous determinants of firm investment behavior at a firm level but certain financial indicators prevail. The recent literature emphasizes the effects of cash flow (Fazzari et al., 1988; Lewellen and Lewellen, 2016), profitability (Martínez-Carrascal and Ferrando, 2008) and leverage (Lang et al., 1996; Aivazian et al., 2005).

We contribute to this stream of literature in several ways. First, we provide empirical analysis of firm investment behavior in post-transformation economies where capital markets are still not well developed and publicly traded firms are assumed to face more restrictive access to external sources of funds.

Second, we use rich microeconomic data and focus on asymmetric effects of firm investment determinants. We show positive effects of increasing cash flow on investment behavior due to the wedge between the cost of internal and external funds or overspending internally available funds. However, these effects are not significant when cash flow is decreased. On the contrary, firm profitability affects investment behavior in both situations.

Third, our results confirm that firm investment behavior of companies is significantly affected by financial leverage. We show that both groups of low-debt firms and most indebted companies are affected mostly by macroeconomic fundamentals, especially economic activity, instead of firm specific financial constraints.

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## 2 MATERIAL AND METHODS

We use annual microeconomic data of publicly traded firms in the all Visegrad Countries in the period 2009–2018 (provided by Bureau van Dijk, Orbis database).

We employ OLS fixed effects estimator and identify determinants of investment behavior. In the next step we analyze asymmetric effects of cash flow and ROA changes. We decompose effects of positive and negative changes of cash flow and ROA.

Finally, we investigate asymmetric impact of financial leverage in our robustness check. Financial leverage is measured as a ratio of long-term debt to total assets. Robustness of our results is also

supported by additional analysis of lagged cash flow and ROA (Martínez-Carrascal and Ferrando, 2008; Gebauer et al., 2017).

### 3 RESULTS

Our first results confirm recent empirical studies, especially positive effects of liquidity represented by cash flow on firm investment behavior. We show that firm managers in post-transformation economies use free cash to increase investments. Our results also confirm positive and significant impact of profitability on investments. As the robustness check we include lagged cash flow and ROA. We identify stable liquidity creation forms positive expectations of firm management and increase investment activity.

In the next step we provide detailed analysis of asymmetric effects of liquidity and profitability on the firm investment behavior. Our results confirm significant positive effects of increasing cash flow.

These results confirm tendency of firm management using free cash flow for their investment activities. We also confirm positive effects of increasing profitability and negative effects of decreasing profitability on the firm investment behavior.

Finally, we focus on differences between low and highly indebted firms. We show that liquidity and profitability affect firm investment behavior only in case of firms with optimal financial leverage. However, our results are robust only for the firms which report financial leverage between 1% and 50%. Investment behavior of over indebted firms and low indebted firms is affected only by aggregate economic activity.

### 4 CONCLUSIONS

The paper investigates asymmetric effects of liquidity and profitability on the investment behavior of publicly traded firms in post-transformation economies. We argue that firms in post-transformation economies face more restrictive access to external sources of funds stemming from underdeveloped capital markets.

We confirm that management of firms uses free cash flow to increase firm investment activities.

On the contrary, liquidity decreases do not affect investment decision making processes of firms. We also confirm positive effects of increasing profitability and negative effects of decreasing profitability on the firm investment behavior. However, our results are robust only for the firms with financial leverage reported between 1% and 50%. Investment behavior of over indebted firms and low indebted firms is affected mostly by aggregate economic activity.

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# CONCEPTION OF A MODEL FOR AN INTERNAL AND INTERNATIONAL PROJECT TRANSFER

Viktorija Joy Behrens<sup>1</sup>, Simon Krause<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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digital transformation, globalisation, innovation, digital projects

## JEL CODES

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F63, O33, P00

## 1 INTRODUCTION

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“We live in a time of perfect means and confused goals.” (Einstein, n.d.). This quote underlines the luxurious life of all people, who live in abundance due to the times of globalization and digitization and can freely choose products and brands. These two factors affect not only private individuals and companies, but also the state. Digitization brings enormous economic and social benefits. For example, digitization can be used to create a continuous digital chain with customer data, order processes and deliveries. This can reduce error rates as well as personnel costs and accelerate the ordering and delivery. At the same time, digitization also brings new problems with it, as security and data protection are now playing an increasingly important role (Organization

for Economic Co-operation and Development, 2017). Globalization also has an impact on companies. On the one hand, they can sell products and services worldwide and, on the other hand, they get a quick insight into who their competitors are on the market. As a result, companies have to become more and more innovative in order to stand out from their competitors (Stark, 2016). In addition, not only the rapid change and the various influences should be considered, but also the different cultures and the associated corporate structures. This paper deals with projects from the IT industry and, due to the problem presented, is particularly focused on digital projects.

## 2 MATERIAL AND METHODS

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The qualitative research method according to Mayring is used in this paper (Leonhart, 2008). In this paper, problem-centered expert interviews were used, which were carried out with the help of an interview guide. The data obtained in the interview was literally transcribed in a typewritten form in Microsoft Word. The lines of the interviews were numbered in order to be able to name precise sources for the evaluation and presentation. The content

structure was used in this paper. The material on certain topics and content areas is extracted and summarized with the program MaxQDA (Mayring, 2010). The relevant content was filtered out using the theory-led, developed categories (deductive). Finally, the semantic validity according to Krippendorff was applied. This deals with the correct interpretation of the material and is reflected in the appropriateness of the category definitions.

### 3 RESULTS

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In particular, it should be mentioned that, according to current research, the subject area “Patterns for digital projects” has not yet been analyzed or researched. It should also be noted that the framework is just a beginning. This construct can be further refined, improved and expanded. It should be made clear that the new digital unit has so far only been set up in theory and therefore the functionality of the new unit still has to be critically checked. The importance of the IT sector as well as future trends and changes were primarily created on the basis of studies and evaluations by Gartner and Capgemini. Due to the large number of market research companies, different results could have been achieved. In

addition, it should be critically examined that the countries Japan and Germany were primarily focused in the concept. The Hofstede model was also used to assess the cultures. Hofstede only carried out his original study on the basis of IBM employees. The one-sidedness of the company selection is therefore to be assessed critically. Furthermore, the interview subjects should be viewed critically. Although experts from different departments and areas as well as countries (Japan, Germany) were interviewed, the selection was purely subjective. This construct is currently structured according to wishes and needs. However, it was never checked whether this construct could be successfully implemented in reality.

### 4 CONCLUSIONS

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The analysis carried out as part of this paper serves to realign the international project transfer of digital projects. An efficient project transfer with a valid business case could essentially help save time and money. In addition, employee satisfaction could increase as transparency was created for the employee. The processes of the digital unit as well as the process and the success of a project transfer would be implemented in a comprehensible manner. Due to the prevailing digitization and globalization, companies are forced to think about digital projects and find a way to implement them. Another valid aspect that must be taken into account when implementing the digital unit is the technical consideration of the transfer of digital solutions. Technical development differences or the availability of the latest technologies could influence a project transfer, as these are necessary for the complete

transfer of the digital projects. For this reason, the development center was taken into account in the framework, which could theoretically absorb these barriers. Furthermore, due to the centralization of development departments, the digital topics are not developed or programmed in Europe. Therefore a project transfer is necessary for almost every new digital solution. Japan’s predominant culture was highlighted. This can have a huge impact on the entire process. Therefore, among other things, the aspect of cultural influences on the project transfer should be examined in more detail in the further procedure. In conclusion, it should be noted that with the help of the problem-centered expert interviews within the framework of the paper, very important aspects have emerged which should be taken into account in future for a digital project transfer.

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# TALENT MANAGEMENT IN GERMAN SMALL AND MEDIUM-SIZED COMPANIES (SMES)

Matthias Bender<sup>1</sup>, Lubica Bajžíková<sup>1</sup>

<sup>1</sup>*Comenius University in Bratislava, Slovakia*

## KEY WORDS

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talent, talent management, human resources management, key function

## JEL CODES

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M12, M50

## 1 INTRODUCTION

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On March 1, 2020, the so-called “Facharbeiter – Einwanderungsgesetz” came into force. This law aimed to lay down the conditions under which qualified personnel from third countries can immigrate to Germany. But what forced the federal government to introduce such a law? The demand for skilled workers in Germany has steadily increased over the last years. Similar to this development, there is an increasing search for executives who can take over company management. In addition to the quantitative and qualitative needs, companies still need to develop approaches to cope with other framework conditions, e.g., Demographic change, more possibilities for employees on the labor market because of the internet, change from industry to knowledge work,

inadequate German educational system and a change in communication behavior are sustainable framework conditions, and this is not possible to ignore (Trost, 2012). These framework conditions mean that companies must fight for workers in general and especially for qualified staff (talents) in the labor market. It is precisely the availability of talent that makes the difference between how a company can or cannot prevail on the market. And this fight will be won by these companies that are best prepared for these challenges. Therefore the objective of this study is to determine how this exceptionally high-performing personnel (talents) can be made available to a company. Answer: Talent Management.

## 2 MATERIAL AND METHODS

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A qualitative literature analysis (Mayring, 2015) should answer the following question: Which pillars are there on which effective and efficient talent management is based? The necessary literature

research was carried out with the help of the Econbiz database. The selected literature, 34 sources, was evaluated deductive using 4 codes and 14 subcodes by the MAXQDA software.

## 3 RESULTS

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The analysis shows that the topic of talent management in Germany is inadequately researched. The research shows that the smaller a company is, the fewer

staff is available for personnel management tasks. The degree of specialization of human resources personnel also decreases as the size of the company

drops (Gonon et al., 2005). A similar correlation can be seen concerning the institutionalization of talent management in companies. The smaller the company, the less likely it is that there will be established talent management. Talent management is still considered important, as can be seen from the fact that in SMEs in particular, the entrepreneurs take responsibility for this process in the companies. And if the implementation of talent management in the company is to succeed, the clear commitment of the company management to talent management is indispensable. But what talents need to be managed? There are different approaches to how companies can determine the value of an individual employee. This assessment is necessary to be able to use the available resources for employee recruitment, development, and retention efficiently. It must also

be clear which positions in the company are key functions that must be filled by exceptionally qualified employees (talents). Nathan Myhrvold, former Chief Technology Officer at Microsoft, made the following statement: “The top software developers are more productive than average software developers not by a factor of 10 or 100, or even 1000, but 10000” (Trost, 2012). And this group of employees must be supported by a holistic talent management system, which is characterized by four functions: “identify and win”, “assessment and insertion”, “development” and “motivation and binding”. Under the current framework conditions on the labor market, it is not a challenge for high-performing employees to find a new employer. And if you want to be an attractive employer, which is the requirement for attracting talent, you have to be perceived as such.

## 4 CONCLUSIONS

The following pillars have been identified – if one wants to conduct talent management successfully, formal structures should be in place for this purpose. This process should not become the task of a sub-department without the necessary support of the management and the interim supervisors. Without their commitment, the concepts and implementations developed by the HR department will remain only ideas. The company must be aware of which positions are essential for its success, and the appropriate staff must be available. Every employee contributes his or her part to the company’s success. But this particularly high-performance and capable staff is to be promoted and challenged preferentially. Equal treatment of the workforce should be avoided to make the best use of existing resources. Even if

many reduce talent management to the main task of personnel development, talent management can only be successful if the process is implemented holistically. The higher-skilled staff could look for another employer in the event of a lack of perspective, under the given conditions. And this can only be avoided if personnel development and succession planning are coordinated. To be able to use talent management at all, a company must be attractive to potential talents. Entrepreneurial attractiveness is not part of talent management, but it still plays its role in attracting staff in the first place. An authentic and attractive corporate appearance is indispensable. Finally, it should be noted that the question for SMEs is not whether they are managing talent. The only question is how they operate it (Trost, 2014).

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# THE WAY TO PURCHASING 4.0 IN THE AUTOMOTIVE INDUSTRY AND THE IMPACT ON SUSTAINABLE PROCUREMENT

Sebastian Bunzendahl<sup>1</sup>

<sup>1</sup>*Comenius University in Bratislava, Slovakia*

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## KEY WORDS

purchasing 4.0, procurement 4.0, automotive industry, sustainable procurement

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## JEL CODES

H57, Q01

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## 1 INTRODUCTION

The evolution of purchasing goes ahead with the development of trading. Already in antiquity, knowledge about purchasing was taught at commercial schools (Hillberg, 2017).

Reflecting industrialization, purchasing is assigned a strategic function in the newer science. By using the different views (organization, supplier-customer relationship, information system), the orientation of purchasing should help to achieve the strategic goals of the company (Hamm, 1997). How can the necessary cost reduction programs be implemented to achieve the strategic purchasing goals? The former Board Member for Purchasing at Volkswagen AG José Ignacio López showed in the 1990s how to increase the transparencies. The vertical range of manufacture was reduced by outsourcing and forward, global and single sourcing were integrated. In pre-meetings and sourcing committees, the procurement costs are decided in detail by the committee. This ensures internal transparency. However, the good supplier-customer relationship and quality suffered (Meissener, 2012).

In 2013, the Verband der Automobilindustrie (VDA) together with Oliver Wyman conducted the FAST 2025 study “Future Automotive Industry Structure” with the result that the value chain of automobile manufacturers (OEMs) and suppliers is changing significantly. It is expected that the value-added share of OEMs will decline to 29% by 2025. Supplier integration will be focused, so that development and production (trend towards modules) will increase strongly (VDA, 2012). The technology trends in the automotive industry is still ongoing. For OEMs and suppliers, the change means that significant investments will have to be made to implement the restructuring of their business models in the context of increasing cost pressure. The first game changer is the trend towards electromobility, which is already in the implementation phase. The VDA expects the share of electricmobility to change from 3% in 2020 to over 25% as early as 2030 (VDA, 2018).

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## 2 MATERIAL AND METHODS

Several quantitative and conceptual studies and also interviews with experts have been conducted. One of the most important considered success factor is the cooperation with suppliers. The optimal cooperation is controversially discussed in science (Lange, 2010). Supplier integration

follows the industrial revolution and has now reached the 4th revolution. Industry 4.0 includes value creation, production and logistics, which are transferred to the suppliers. What role purchasing will take over is to

be answered by purchasing 4.0. Purchasing 4.0 has no empirical basis.

It is now state of the art in the automotive industry for order processes to be digitized and for orders to be scheduled to a large extent automatically into the suppliers' production. However, due to the changes in the automotive industry, the significant investments are not subject to standard order processes. Different information have to be available to do strategic decisions.

In order to generate such data quality, information must be available in real time. Starting with a cockpit chart, the buyer has access to all information about suppliers including possible updates for indexed goods. Based on the real-time data, further factors from the supplier evaluation, the classification of the strategic status of the

supplier are significant for which supplier is integrated into Global Sourcing. The power tool Cost Break Down can be used for worldwide requests and the goods can be compared digitally. All resources that are used can be analyzed and optimized in dialog with the supplier to save resources.

Especially the early supplier integration influences the development speed and sensitizes for cost efficiency in the product development process. This is where major decisions are made for sustainable procurement, which has a direct impact on resources. Based on the global goals for sustainable development, suppliers are obliged to operate sustainably and respect human rights (Global Citizen, 2020).

### 3 RESULTS

Digitalization in purchasing is necessary to channel the large quantity of information and pass through the decision-making process. Early supplier integration is a key to influencing sustainable procurement during the product development process. The change in the automotive industry shifts the development of new technologies to the suppliers and challenges a permanently

increasing speed. Waste of resources and the sustainable procurement is significantly influenced by the Power Tool Cost Break Down. The created transparency can be used to make worldwide comparisons in the production of goods. Purchasing 4.0 will lead to a significant increase in the speed of development, resource-efficient production and competitive advantages for companies.

### 4 CONCLUSIONS

In order to master the challenge of the transformation in the automotive industry, it is important for OEMs and suppliers to work closely and transparently together. The high transparency of information and cross-linking of partners will have the following effect: Development

speeds will decrease, costs will decrease and resources will be saved. Purchasing 4.0 is a future element to be able to compete and will have a significant influence on sustainable procurement.

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# WILLINGNESS TO PAY OF AUDIENCE AND NON-AUDIENCE IN PUBLICLY FUNDED GERMAN MUSIC THEATER

Alexander Busche<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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performing arts, German public music theater, cultural economics, willingness to pay, live entertainment

## JEL CODES

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Z110

## 1 INTRODUCTION

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Baumol and Bowen described as early as 1967, that the service sector in culture is faced with an ever-widening gap between the limited increase in productivity and the unstoppable rise in wage costs (Baumol and Bowen, 1967). While this theory mainly refers to the private theater sector, the publicly funded German theater system is facing an even more complex situation: high subsidies by the government intended to keep ticket prices low lead to few interest in economic thinking of theater management,

although fixed costs raise continuously due to law based dynamics in collective agreements. As costs increase and subsidies do not, the only way to keep a balanced budget in a fixed price system must be seen in decreasing flexible costs (Schmidt, 2017). One interesting question at this point is, if the price system needs to stay on the given level or if audiences and non-audiences maybe are willing to pay more for a theater experience?

## 2 MATERIAL AND METHODS

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An online survey was designed to reach out to a focus group of people with classical music affinity and thus the highest possibility of becoming a theatergoer. The population of the survey was 24- to 65-year-old inhabitants of Germany, including three target groups of frequent theatergoers (more than 4 music theater visits per year), regular theatergoers (2 to 4 music theater visits per year) and non-theatergoers (1 or less music theater visits per year; Renz, 2016). The first two ones in the end form the group of the audience, the latter one those of the non-audience. The limitation of the age included people with the ability to access an online survey easily. The survey was designed to ask for the respondents' behavior and preferences in terms of live entertainment and music theater. By contrasting

average ticket levels of live entertainment (EUR 44; Graefe, 2018), private financed Broadway musical shows in Germany (EUR 90; Miserre, 2016) and publicly funded German music theater (PGMT) performances (EUR 35, result of own data analysis), the willingness to pay (WTP) for music theater in different constellations could be assessed. Therefore, the acceptance of the average ticket price for music theater – and live entertainment/Broadway musical show business in comparison – in Germany is queried as well as the WTP more (in case of acceptance) or less (in case of non-acceptance) with a certain combination of closed-ended and open-ended questions. The closed-ended questions scrutinize the respondents' acceptance or rejection of a suggested price for live entertainment, Broadway musical shows

and music theater performances. The open-ended questions ask for the circumstances under which the

respondents were willing to pay more. From this a general price acceptance could be derived and defined (Fleischmann and Foreit, 2001).

### 3 RESULTS

The total of 875 accepted data sets (out of 1,000) could be distinguished into 589 participants defining the audience and 286 the non-audience. A high acceptance could be described for the mid-price section of live entertainment with 90% of the audience and 80% of the non-audience stating that the average price level of EUR 44 was appropriate. 50% of both groups was willing to pay that price, nearly the same were willing to pay even more. The high-price level of EUR 90 (Broadway shows) proved a lower acceptance of the price. Only 25% of those who stated to be willing to pay that price could imagine paying more in case of the right conditions. These were for the non-audience social aspects of the performance visit like weekend trips or going with friends, the high quality of the performance in general, the knowledge of the title or the piece as well as the production and finally the recommendation of family and friends. The audience focused on quality aspects like good cast, renowned orchestras, or good seating in general. Both groups stated to see a motivation for paying more in incentives coming along with the ticket price. A planned and predictable satisfaction is the

most important basis to pay the price. 82% of the audience and 67% of the non-audience declared that the price of EUR 35 for a music theater performance in PGMTs is appropriate but seen in the total results that refers to the idea that this price is inappropriate low, which a lot of participants also mentioned in the open question part. In the end, the group of those who were willing to pay more was obviously high with 73% in the audience and even 59% in the non-audience. Arguments for the audience to pay the price or even more was the title and the high quality in terms of detailed production circumstances. The non-audience sets a focus on the personal interest in a production and thus in the style and appearance of it. The latter group is not as familiar with the product in PGMTs as in the other entertainment offers assessed and thus, in the survey, the personal financial situation is stated to be of greater importance here than in the two sections before. In total, 74% of the audience and 59% of the non-audience would buy a ticket for the given price of EUR 35. But there is a high tendency to be willing to spend even more money.

### 4 CONCLUSIONS

The results of the survey show that there is a WTP even more if the quality is high and the consumers' expectations have a greater chance to be fulfilled. This means in general, that PGMTs should think about raising their average price level to one between EUR 35 and EUR 90, keeping in mind that the average live entertainment ticket price

in Germany with EUR 44 is highly accepted within the assessed population. PGMTs should think about offering more incentives with the ticket price and maybe form product segments with which already established productions can be branded to give a better orientation for the audience in their decision making.

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# ON DYNAMICS IN A SIMPLE KEYNESIAN MACRODYNAMIC MODEL OF MONETARY POLICY: THE CASE OF SLOVAK REPUBLIC

Petra Cisková<sup>1</sup>

<sup>1</sup>Matej Bel University, Banská Bystrica, Slovakia

## KEY WORDS

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macroeconomic dynamic model, equilibrium, stability, business cycles

## JEL CODES

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C62, E32, E52

## 1 INTRODUCTION

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According to the financial instability hypothesis developed by Minsky (1982, 1986), a financially-dominated capitalist economy is inherently unstable. It seems that the validity of this hypothesis has been proven in practice several times. For example, we can mention the economy of Japan which faced the long term deflationary depression in the 1990s and the 2000s or the mortgage crisis which started in the USA in 2008 and rapidly spread to other parts of the world. But Minsky did not think that such inherent instability is uncontrollable. He pointed out that it is important to "stabilize an unstable economy" by using an appropriate mixture of macroeconomic stabilization policy tools.

As a reaction especially to the above mentioned crises, Asada (2011) set up a simple Keynesian macrodynamic model of monetary policy describing the development of nominal rate of interest, expected rate of inflation, and nominal money supply. Asada investigated in this paper the existence of normal equilibrium point and its stability/instability. A rigorous analysis of the model also with respect to the existence of limit cycles was presented in Asada et al. (2016).

In the present paper, the Asada model is adapted to conditions of Slovak economy. Our main interest is aimed especially on the stability/instability of normal equilibrium point and a possible arising of business cycles.

## 2 THE MODEL

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The adapted model has the form

$$\dot{r} = \alpha [\epsilon(y - \bar{y}) + \pi^e - \bar{\pi}] + \beta(y - \bar{y}),$$

$$\dot{\pi}^e = \gamma [\theta(\bar{\pi} - \pi^e) + (1 - \theta)\epsilon(y - \bar{y})],$$

where  $r$  – the nominal rate of interest,  $\pi^e$  – the expected rate of price inflation,  $y$  – real output,  $\bar{y}$

– ‘natural’ output level corresponding to the natural rate of unemployment (fixed),  $\pi$  – the nominal rate of inflation,  $\bar{\pi}$  – the target rate of inflation that is set by the central bank,  $\alpha, \beta, \gamma, \theta, \epsilon$  – positive parameters.

On the base of quarterly macroeconomic data of Slovak economy from the years 1997–2008 gained from the database of National bank of Slovakia and

Eurostat, we constructed and also estimated the parameters of the functions of private consumption, private firms' investment, government expenditure and net real export which form the function of real output.

Among parameters of the model which have influence on the stability/instability of normal equilibrium point the credibility parameter  $\theta$  which expresses the public confidence in the central bank's

performance is very significant. In the paper Cisková and Zimka (2020) we provide considerations on the existence of normal equilibrium point, its stability/instability and the existence of limit cycles. It is shown that business cycles around the normal equilibrium point  $E = (r^* = \bar{r}, \pi^{e*} = \bar{\pi})$ , arise for the values of credibility parameter  $\theta$  on the left side of its bifurcation value.

### 3 RESULTS

Main findings of our research are summarized in the next two theorems:

**Theorem 1.** Let  $(\theta_0, \beta_0)$  be a critical pair of the model and  $0 < \alpha < \gamma$ . If  $\beta_0$  is fixed, then the equilibrium  $E = (r^*, \pi^{e*})$  is locally unstable for  $\theta < \theta_0$ , and locally stable for  $\theta > \theta_0$ . If  $\theta_0$  is fixed, then the equilibrium  $E = (r^*, \pi^{e*})$  is locally unstable for  $\beta < \beta_0$ , and locally stable for  $\beta > \beta_0$ .

**Theorem 2.** Let the coefficients  $a, b$  in the bifurcation equation of the model exist. If  $a < 0$ , then there exists a stable limit cycle for every  $\theta > \theta_0$ , if  $b$  is positive and for every  $\theta < \theta_0$ , if  $b$  is negative. If  $a > 0$ , then there exists an unstable limit cycle for every small enough  $\theta < \theta_0$ , if  $b$  is positive and for every small enough  $\theta > \theta_0$ , if  $b$  is negative.

### 4 CONCLUSIONS

In presented paper, we applied a two-dimensional Asada's model of monetary policy describing the development of nominal rate of interest and expected rate of inflation to the condition of Slovak economy. Achieved results provide qualitative picture of the behavior of nominal rate of interest and expected

rate of inflation in a small neighborhood of the normal equilibrium of Slovak economy. They also can serve as possible recommendations for central banks on how to "stabilize an unstable economy" through monetary policy.

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# INCREASING SPENDING ON SOCIAL PROTECTION AND REDISTRIBUTION POLICY IN THE STATE

Lucia Dobrotová<sup>1</sup>

<sup>1</sup>University of Matej Bel, Banská Bystrica, Slovakia

## KEY WORDS

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social solidarity, redistribution, social policy, social protection

## JEL CODES

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H55

## 1 INTRODUCTION

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Through a number of redistributive activities, each state engages in the social field, on the basis of which it guarantees a minimum standard of living and other social areas. The role of the state and thus its economy is to create resources for the provision of social services and the payment of social benefits. The economic system creates the conditions for part of the funds to be shifted from richer individuals to the poor. We call this transfer redistribution in

the professional literature and it is realized through transfer payments. In our paper we deal with redistribution from the point of view of social responsibility in the conditions of the Slovak Republic. Our goal is to compare social protection expenditures in the Slovak Republic with EU countries and to find out to what extent social protection expenditures are spent depending on the amount of GDP.

## 2 MATERIAL AND METHODS

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The aim of the paper is to compare social protection expenditures in the Slovak Republic with EU countries and to find out to what extent social protection expenditures are spent depending on the amount of GDP. The subject of the analysis is expenditures on social protection in the Slovak Republic and the countries of the European Union.

The key methods of scientific research are the methods of classification analysis, comparison and

abstraction in the creation of a theoretical and methodological framework for solving the problem, methods of information evaluation and methods of synthesis and partial induction in drawing research conclusions.

In accordance with the aim of the study, the subject of research is defined, which is the total expenditure on social protection in the Slovak Republic and in the EU.

### 3 RESULTS

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Total expenditures on social protection in the Slovak Republic in the observed period increased. In our opinion, this is caused by the aging of the population, and thus a higher amount of paid old-age pensions. But, we can not ignore the impact of inflation, when there is very little assumption that these expenditures will fall year on year.

The largest share of social protection expenditures is old age, and thus old-age pensions paid. Consequently, health care costs are also highly represented here. Surprisingly, over the entire period under review, unemployment benefits account for an average of only 3% of total expenditure. At the same time, the question will be how the total social

protection expenditure will be affected in the coming years by the fact that the parental allowance will be increased by EUR 150 from January 2020, as so far these allowances have accounted for an average of 9% of total expenditure.

Quality social services in the form of health care, education, long-term care services for the elderly and childcare make a significant contribution to a fairer distribution of welfare and have long been particularly characteristic of the Nordic and Western European social security systems. Such support in the EU averages around 9.5% of GDP. The highest is in Sweden – 13.5% and the lowest in Cyprus – 3.7%. In most countries, this expenditure has increased.

### 4 CONCLUSIONS

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Every state needs resources to function. These funds will later be divided into various areas of the national economy, such as education, government, the social sphere and the like. It is in the social field that most funds flow from the state budget of the Slovak Republic. On the one hand, the state's influence on social policy should be reduced, as there are no resources that have been associated in the past, especially with the privatization of state-owned enterprises and domestic economic growth. On the other hand, it is necessary to realize the need for social policy in terms of its function of cultivating human capital, which can be one of the important sources of economic growth. So the problem is not whether the state should intervene in the social sphere or not, but in what way it should do.

An increase in consumption cannot occur if we redistribute the goods given by the economy and do not add any added value to them (we do not increase wealth). By redistributing, we only reduce the consumption of one in order to increase the

consumption of the other (for simplicity, we do not consider the possibility of savings, which will be partly converted into investments and ultimately again into consumption). In addition, no one guarantees that the dose will be used effectively, that the recipient will not use it to consume narcotics, and will thus lead to “desired” effects. We do not claim that the socially weak cannot increase consumption and thus contribute to economic performance, but we think that the path does not lead through redistribution, but rather by reducing the tax and levy burden on the socially weak. That is, in reducing the role of the state – both in the economy but also in social policy.

In our study, we found that spending on social protection is increasing every year and will not be different in the following period. At present, the so-called “Pro-family policy”, under which it was decided to increase the parental allowance by EUR 150 from 01.01.2020, which is an increase of almost 70% compared to today's parental allowance.

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# CHARACTERISTICS OF GENERATION X, Y, AND Z (LITERATURE REVIEW)

Christian Dreyer<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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generation Z, iGen, millennials, generation Y, digital native

## JEL CODES

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J11, L26

## 1 INTRODUCTION

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This paper will go back historically to the 19th century and examine the characteristics of successive generations coined “Great Generation”, “Silent” or

“Lost Generation”, “Baby Boomers”, Generation X”, “Generation Y”, and Generation Z”.

## 2 MATERIAL AND METHODS

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The literature review uses printed works (books, magazines), as well as sources accessible only through the internet. Several free and subscription based

access paths were used, mainly via Google scholar, web of knowledge (WOK), partly through Mendel University of Brno.

## 3 RESULTS

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While there is mostly academic consensus for the names of the different cohorts, the years of birth

vary widely. The results can be best described by the following table:

## 4 CONCLUSIONS

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The characterisation of each cohort is very diverse; each source emphasises aspects which are relevant to his or her objective. As a result, no coherent set of properties can be deducted.

The author himself is specifically interested in the entrepreneurial ambitions and attitudes of Genera-

tion Z in Germany. On the basis of this literature review, the topic can be considered an academic „white space“, which the author intends to explore further in a doctoral thesis titled *How Will “Generation Z” Impact Entrepreneurship in Germany?*

Tab. 1: Results

Cohort Name	Birth Years	Sources	Main Characteristics
Great Generation	1900/01–24 1900–1946	Enam, 2018 Suderman, 2016	strong work ethic; personal responsibility and taking action for a “better” life
Lost Generation, Silent Generation	1925–1964	Enam, 2018	discipline and work ethic; gratitude for what they have due to the high degree of uncertainty; upholding their values
Baby Boomers	1944–1964 1944–1964 1946–1964 1955–1970	Enam, 2018 Stewart, 2017 Suderman, 2016 Deloitte, 2017	materialistic; thriving for freedom; ambitious at work; creative; goal-oriented; competitive
Generation X, GenX (Generation Golf)	1961–1970 1965–1980 1965–1981 1965–1984 1970–1985	Pitta, 2012 Stewart, 2017 Enam, 2018 Suderman, 2016 Deloitte, 2017	grew up partially scared and depressed in terms of their personal life (grunge/punk) era; value work-life balance; focused
Generation Y, GenY (Millennials)	1981–1995 1981–1996 1982–2000 1982–2004	Stewart, 2017 Dimock, 2019 Enam, 2018 Suderman, 2016	first tech-savvy generation from childhood onwards (internet emergence); flexible at work; curious; value work-life balance; social awareness; global
Generation Z, GenZ (Post-Millennials)	1995 and after early 1990s–2004 early 1990s–2004 1995–2010 1995–2012 2000 and after 1997–2012	Stewart, 2017 Bejtkovský, 2016 Enam, 2018 Suderman, 2016 Deloitte, 2019 Deloitte, 2017 Dimock, 2019	digitally born; social networks through media; family-oriented; thriving for value and security; partially cynical
Generation Alpha	2010–2025 2010–2030	Jha, 2020 Suderman, 2016	most likely digital experts; agile; most likely shorter attention span

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# IMPACT OF GLOBALIZATION CRISES ON THE TOURISM AND HOSPITALITY ECONOMY

Iryna Fedyshyn<sup>1</sup>

<sup>1</sup>*Ternopil Ivan Puluj National Technical University, Ukraine*

## KEY WORDS

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crises, economy of tourism, welfare, financial losses

## JEL CODES

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E44, F6, H12

## 1 INTRODUCTION

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Today, globalization of the modern world has covered almost all spheres of human existence: economics, politics, culture, social relations. The development of the tourism industry, as a consequence and cause of globalization, and in a sense also its implementation, is significantly affected by such processes as enlargement of information technology, social differentiation of society, climate change. It is also

worth noting that European and Ukrainian investors have faced an unprecedented situation – the threat of pandemics, which complicate and sometimes make it impossible to operate not only small but also medium and large businesses because of market positions weakening, losing consumers, and as a consequence – declining profits, reduction or even complete closure of enterprises.

## 2 MATERIAL AND METHODS

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The purpose of this investigation is to analyze the impact of world crises, specifically coronavirus pandemic COVID-19, on the functioning of tourism and hospitality agencies and firms. The materials of official statistical data of Eurostat, OECD countries, UNWTO, reports of the Tourism and Resorts State Agency of Ukraine and State Border Guard Service of Ukraine were used in the work.

The analysis of the literature has shown that there are different approaches to the implementation of crisis management in the activity of enterprises under such conditions. Wenqin Fan, Weixian Dong Jie Luo (Wenqin and Weixian, 2018) and Malewska K. (2003) studied the impact of crises on the

activities of international enterprises and focused on the development of the concept of crisis management.

Central and Eastern Europe has become an attractive market for the development of the hotel business. It was found that the growth of travel to Central and Eastern Europe has increased hotel profitability and made the region a hot spot for investment. During the five-year period from 2013 to 2017, hotel transactions in the Czech Republic alone were estimated at more than a billion euros. Problems concerning internal tourism development of Ukraine in 2020 were detected, suggestions for the application of crisis management were submitted.

### 3 RESULTS

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The global hotel and restaurant industry is influenced by the travel and tourism industry, that contributed \$8.81 trillion to the global economy in 2018. But today these spheres already indicate significant financial losses due to the coronavirus pandemic (COVID-19) in the first quarter of 2020 to a fraction of what they were in 2019. Available data points to a double-digit decrease of 22% in Q1 2020, with arrivals in March down by 57%. This led into a loss of 67 million international arrivals and about \$80 billion in receipts. The impact of coronavirus on world tourism and the predictions of scientists and pro-government structures are based on previous experience of such crises, such as the spread of SARS or H1N1 viruses. It is forecasted that global travel and tourism revenue due to COVID-19 in 2020 will be \$447.4 billion, global employment loss in the sphere – 100.8 million, region with the largest loss in travel and tourism is Europe.

The ukrainian tourism and hospitality industry was also hit by the pandemia crisis, because of reduction in incoming tourist flows. Losses from quarantine and pandemics for the tourism industry

of Ukraine were estimated at \$3–5 billion. Approximately 80% of hospitality establishments in Ukraine were small businesses, sole proprietors, that didn't survive the quarantine. It was revealed that internal tourism in Ukraine experienced a surge, which, however, can not fully replace foreign because of the average higher prices and often worse service than in popular tourist countries.

Representatives of the global tourism and hospitality industry expect that due to the coronavirus and the introduction of quarantine restrictions, the decline in the industry in 2020 will be 80% compared to 2019.

Different market segments require different models and approaches to meet consumer needs. The tourism, hotel and restaurant spheres have already proved the need of building their business on the basis of information and communication technologies. In order to survive the time of the crisis firms of service industry need to optimize their costs, conduct strategic control, form an insurance funds and receive subsidized state support.

### 4 CONCLUSIONS

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The tourism industry has faced an unprecedented conflict of threats: on the one hand – fear for human health and life, and on the other – economic losses from quarantine measures, which lead to the impoverishment not only of individuals but also of entire nations. The situation is complicated by the

fact that investment problems of leading industries have to be solved in a crisis conditions, when the freezing of funds for specific projects has a very negative impact on the efficiency of the entire economic system and, consequently, nation's welfare.

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# ELECTROMOBILITY DEVELOPMENT AS A FACTOR AFFECTING TAX REVENUES: EVIDENCE FROM NORWAY

Adam Filla<sup>1</sup>, Michal Mádr<sup>1</sup>, Břetislav Andrlík<sup>1</sup>, Lucie Formanová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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electric car, Norway, road tax, registration tax, vehicle fleet

## JEL CODES

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H23, L62, R48

## 1 INTRODUCTION

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The paper deals with development of electromobility in Norway and its impact on the tax revenues. The focus of the paper is on registration and road tax that are directly related to the acquisition and operation of a road motor vehicle. The aim of the paper is to verify whether there is an impact of growing share of electric cars (BEVs) in Norway's fleet on the decrease in tax collection. For this

purpose, Norwegian legislation framework supporting sales of BEV with focus on registration and road tax is analysed. In addition to that regression models are used to provide information on change of tax collection. However, the results provided by the regressions models did not confirm effect of the increase of BEVs on the decline of tax revenues.

## 2 MATERIAL AND METHODS

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The researched topic is the development of electric cars and its connection to the amount of tax collection of road and registration tax in Norway. Data used in regression models are numbers of registered vehicles in Norway with focus on period from 1998 to 2018, issued by the Norwegian Statistical Office (Statistisk Sentralbyrå). The use of the number of registered vehicles instead of data on vehicles sold is also empirically justified, for more details see Clinton and Steinberg (2016). Based on these data two regression models are compiled, where each of them is focused on the tax revenue from one of the mentioned taxes. In both of the models dependent variable is tax revenue of particular tax.

Model for annual road tax revenue consists of two independent and two control variables. Since tax collection size depends on the number of cars that are taxable and the number of cars that are exempted, independent variables were choose to represent these two groups. Specifically, the share of vehicles with internal combustion engine (ICEV) and BEVs is monitored. In addition, two control variables were included in the model. The control variable representing data on the number of newly issued driving licenses and the control variable expressing the growth of GDP per capita.

Model describing registration tax revenue is based on number of newly registered cars, which is the main

factor affecting the size of registration tax revenue. The first independent variable represents number of newly registered ICEVs (including hybrids), which are subject to registration tax. Second independent variable represents number of newly registered BEVs.

### 3 RESULTS

As the results of the road tax model show, the independent variables growth of ICEV share and growth of GDP per capita were statistically significant, meanwhile growth of BEV and variable representing issued driving licenses were not. Therefore the originally expected negative effect of BEVs on the amount of road tax collection cannot be confirmed. This could be caused by the fact, that BEVs are in up to 90% of cases owned by households that own more than one vehicle (Figenbaum and Kolbenstvedt, 2013). For this reason, ICEVs are not replaced by electric cars, but electric cars are just another household car. Outputs of the registration tax model identify as statistically significant only

For the purpose of registration tax BEVs fulfills the condition for tax exemption. Moreover two control variables also enter the model. It is a variable representing newly registered vehicles and a variable representing the growth in GDP per capita.

### 4 CONCLUSIONS

According to the outputs of the road tax and registration tax models, it has not been confirmed that the current increase in the number of electric vehicles in the case of Norway will be reflected in a reduction in the collection of these taxes. Short time line can be considered the main limitation of this paper. Changes in the vehicle fleet took place only in recent years (after 2011), which had an impact on the limited amount of input data. Therefore, the topicality of the topic currently does not allow a full assessment of the impacts of the introduction of electric cars, which, however, offers opportunities

one variable (newly registered cars). In the case of the insignificant variables BEV and ICEV, the two reform measures regulating the registration tax may have been reflected. Those reforms are from years 2007 and 2012. According to the examined data, the number of registered BEVs, which are exempt from registration tax, increased after 2011. At the same time, the mentioned reforms of the registration tax caused a higher financial cost of registration of a vehicle with an internal combustion engine (Cicccone, 2014). With this said, the registration tax model did not confirm the assumption of growing number of newly registered BEVs would cause the decrease of registration tax revenues.

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# DEVELOPMENT OF ELECTROMOBILITY IN RELATION TO COVID-19 IN THE CZECH REPUBLIC

Martina Filová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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passenger cars, electric car, environment

## JEL CODES

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H30, Q50

## 1 INTRODUCTION

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The paper deals with the issue of the development of electromobility, the current pandemic crisis of COVID-19 and the real impacts on electromobility in the Czech Republic. The objective of this paper is to confirm or refuse a growing trend in the number of personal electric cars in observed timeline.

For this purpose, the quantity of these cars in the Czech vehicle fleet is stated and evaluated. Based on the achieved results, it is clear, that the general development trends in the growth of the number of passenger cars can be confirmed.

## 2 MATERIAL AND METHODS

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The aim of the article is to confirm the growing trend in the number of electric cars based on an analysis of the development of the number of passenger electric cars in the Czech Republic. The paper will identify the number of passenger cars registered in the Czech Republic and determine their shares in the total vehicle fleet. The conclusion will be devoted to the analysis of the coronavirus crisis and the effects of the

pandemic on the development of electromobility in the Czech Republic. Subsequently, for the purposes of the diploma thesis, a questionnaire survey will be conducted in the Czech Republic for municipalities and the business sector. The content of the research will identify readiness, preferences and interest in cars that are powered only by electricity. The questionnaire will contain 23 questions.

## 3 RESULTS

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The primary aim of the European Commission is to achieve Europe's carbon neutrality by the end of 2050. According to the European Commission, one way to achieve this aim could be to significantly expand electromobility (European Commission, 2018). The development of the quantity of registered electric

passenger cars ("BEV") in the Czech Republic is shown in the table below.

The table summarizes the development of passenger cars registered in the Czech Republic in 2012–2019. Therefore, it can be stated that, except years 2013 and 2016, the development of the number of registered passenger cars was rising. The growing

Tab. 1: A summary of passenger electric cars registered in the Czech Republic

	2012	2013	2014	2015	2016	2017	2018	2019
Total number of BEVs	152	237	417	1018	1090	1118	2030	2837
New BEV registrations	92	39	187	331	233	389	699	780
Total share of BEV in passenger cars (%)	0.003	0.01	0.01	0.02	0.02	0.02	0.04	0.05
Share of new BEVs in new passenger cars (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3

Source: EFAO (2020)

trend is mainly due to the increasing supply of these cars on the market. Car manufactures are forced to include low-emission cars in their portfolios. However, the question is whether the current development of electromobility will lead to carbon neutrality. According to the latest data from the European Environment Agency (EEA), the Czech Republic produced 128.7 g CO<sub>2</sub>/km in 2019 (ACEA, 2020). From the information obtained, it can be assumed that the current development of electromobility will not be enough to meet the set target. The EEA shares this view, according to which the electrification of the vehicle fleet started late (European Commission, 2019).

The coronavirus that hit the world in 2020 shook Europe and the world. So, the world is facing a challenging restart of the economy. The question is, what is the likely impact of the COVID-19 pandemic

on the development of electromobility in the Czech Republic?

According to the Ministry of Industry and Trade, the coronavirus crisis caused the exhaustion of funds earmarked for the given period for other planned calls. Those funds were meant to support the development of electromobility. For this reason, the previously announced call “Low Carbon Technology – Electromobility” will no longer be announced this year (MPO, 2020). However, in view of the current COVID-19 pandemic, the Czech Republic has extended the deadline for submitting grant applications under the current program “Low Carbon Technologies – Electromobility - Call V.” to July 2020 and in February 2020 the Czech Republic increased the Call V. budget from 50 to CZK 150 million (API, 2014).

## 4 CONCLUSIONS

The goal of the article was to use the development analysis of the number of electric cars in vehicle fleets in the Czech Republic to confirm the declared

trend of their growing number. Furthermore, the paper evaluated the actual impact of the COVID-19 pandemic on electromobility in the Czech Republic.

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# BURNOUT PREVENTION BY FREELANCE COACHES AND THE POSSIBLE EFFECT ON PRODUCTIVITY: A LITERATURE REVIEW

Antje Carolin Findeis<sup>1</sup>, Elena Grocholski<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

burnout prevention, coach, productivity, freelance coaching, sick day costs

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## JEL CODES

I12, I15

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## 1 INTRODUCTION

Burnout and depression are a worldwide problem and they are also reasons for increasing sick day costs in SMEs in Germany. Higher time pressure and often repeated workflow interruptions can increase the risk of mental disorders (Rau et al., 2010). These aspects seem to play a role for health problems more and more workers have to face. Chronic stress and psychic strain can lead to mental disorders as depression and burnout (Seidler et al., 2014). Both disorders together cause rising sick day and rehabilitation costs. In Germany the costs for the treatment of depression amounted to 5,2 billion Euro according to data collection of the Federal Statistical Office in 2010. Already in 2004 the annual treatment costs were estimated about 2.524 Euro per person according to Salize et al. (Salize et al., 2004).

In the DEGS1 study of the Robert-Koch-Institute in 2013 in Germany only 16.6% of the 7807 participants in DEGS1 reported having taken part in at least one

behavioral prevention measure in the 12 months preceding the survey (Gößwald et al., 2012). The vast majority did not join any stress or burnout prevention measure offered by their health insurance during this time period.

Beside the officially offered prevention programs of the public health insurances round about 8,000 freelance coaches are working in Germany according to the 3. Marburger Coaching Study (Gross and Stephan, 2015) and the majority of them is offering burnout prevention measures and stress reduction methods for employees as well. The research question is to examine how the freelance coaches are involved in burnout prevention programs and if they can help increase the productivity of the workers and lower the costs of work incapability.

A systematic literature analysis was conducted to show the current situation of the burnout prevention programs by freelance coaches and the possible positive effect on productivity in SMEs in Germany.

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## 2 MATERIAL AND METHODS

To find out more about the described possible cooperation and effect on productivity the research tries to find answers to the following research question: What possible cooperation model between freelance coaches and SMEs in Germany for burnout prevention is examined so far and can it have a positive effect on productivity?

A systematic literature research was performed using the following databases: Google Scholar, Springer Link and Science Direct. This literature research covered the period from January 2010 to September 2020 and the languages were limited to English and German. The search terms used were “burnout prevention” combined with “coach” AND “productivity”

Included were peer-reviewed research articles. Excluded were letters, homepages, blogs dictionaries, books, congress reports/papers, theses and reviews. Articles about burnout prevention programs that were organized by federal institutions or by public health insurances were excluded because of the special focus of this review on the freelance coaches in Germany.

### 3 RESULTS

In the systematic literature review only very few articles were found with the described key word combination. In the databases 23 relevant articles were found. Burnout prevention seems to get rising attention but there is no focus on the possible help of freelance coaches for SMEs in Germany in general. In the structural content analysis 6 categories were build to characterize the research on the topic. The first was prevention of burnout and only 9 articles were focusing on the prevention. The rest was describing the management of burnout or the current burnout situation. The methods used for prevention

For being able to answer the research question a structural content analysis according to Mayring (2015) was conducted. After sorting the articles they were systematically coded and clustered to find out more about the current situation.

### 4 CONCLUSIONS

The problem of burnout is still rising although there are some offerings for prevention. It is not enough done yet to successfully prevent workers in SMEs in Germany from burnout and the costs of sick days are rising (Marschall and Hildebrandt, 2019). There is so far nearly no research information available for possible cooperation projects of freelance coaches and SMEs in Germany and the possible positive effects on reduction of sick days, cost

were very variant and the most often mentioned one is “mindfulness”. Nearly half of the articles were describing help by coaches with several methods but there was no focus on freelancers. The costs of burnout were not considered at all. Only one article described increased job turnover by the reason of burnout. The productivity increase by preventing burnout and supporting employees with burnout was mentioned by about 50% of the authors. The most focused target group of employees were health professionals, employees in general and teachers.

reduction and a possible increasing productivity of the workers in general. The group of health professionals was mentioned the most but in the DAK-Gesundheitsreport 2019 (Marschall and Hildebrandt, 2019) employees in jobs like public administration and logistics are specially affected by burnout as well and also deserve more attention in research.

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# INCOME INEQUALITY AND THE DISTRIBUTIONAL EFFECTS OF MONETARY POLICY: THE ROLE OF FINANCIAL HETEROGENEITY

Boris Fišera<sup>1</sup>

<sup>1</sup>*University of Economics in Bratislava, Slovakia*

## KEY WORDS

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income inequality, standard monetary policy, unconventional monetary policy (UMP), distributional effects, financial heterogeneity

## JEL CODES

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D31, E52, E58

## 1 INTRODUCTION

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The Global Financial Crisis of 2008–2009 (GFC) and slow post-crisis recovery have resulted in an unprecedented monetary expansion in many advanced economies. The slow and uneven recovery, coupled with perceived income disparities has intensified the debate about the causes and consequences of income inequality and about the effect of monetary policy on income inequality. The understanding of the distributional effects of different monetary policies is indeed highly relevant, as the resulting income inequality may have significant consequences. For example, higher income inequality has been found to reduce the public support for the central bank,

hinder the transmission of monetary policy, slow down economic growth or limit the provision of credit to poorer households (Guerello, 2018; Madsen et al., 2018; Coibion et al., 2014). While a number of studies have recently investigated the distributional effects of monetary policy across numerous countries, they often come to conflicting conclusions, with studies finding both positive and negative effects of monetary policy on inequality. As a result, we hypothesize that the characteristics of a country's financial system may influence the overall effect of monetary policy on inequality.

## 2 MATERIAL AND METHODS

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In this paper we first separately study the effects of both standard and unconventional monetary policies (UMPs) of the European Central Bank (ECB) on income inequality in 19 Euro Area (EA) member states over the years 2008–2018. We distinguish two main groups of UMPs: quantitative easing (QE) and credit easing (CE) policies. To estimate our regressions, we use the pooled mean group (PMG) estimator of Pesaran et al. (1999) to estimate an ARDL

model. This approach enables us to study both short-term and long-term distributional effects of monetary policy. Second, by introducing interaction terms in our regressions, we study the conditionality of the distributional effects of monetary policy on the financial heterogeneity across the EA member states. We distinguish three main measures of financial heterogeneity: financial development, financial cycle and financial market integration. In our baseline

regressions, we use the Gini coefficient as our main measure of income inequality. Moreover, we also create an alternative measure of income inequality, which is based on the approach of Domonkos et al. (2020) and which is defined as the ratio of the population share of poorest individuals earning a

portion of overall disposable income to the population share of richest individuals earning a portion of overall disposable income. That is, unlike the Gini coefficient, the alternative measure of inequality focuses only on the tails of the income distribution.

### 3 RESULTS

We find that restrictive standard monetary policy and expansionary QE and CE policies contribute to higher income inequality in the EA. Our results also indicate that these monetary policies affect the income inequality over the long-term, while we fail to find evidence of any short-term distributional effects. Using the alternative measure of income inequality, we once again find that restrictive standard monetary policy increases income inequality. Nonetheless, we fail to find evidence that UMPs affected the alternative measure of inequality, indicating that the UMPs may have affected the income distribution within the middle of the distribution (which is captured by the Gini coefficient but not by the alternative measure of inequality), but not the relative position of lowest

and highest earners. We also find that financial heterogeneity across the EA countries affects the distributional effects of monetary policy. Namely, higher financial development augments the distributional effects of both standard and non-standard monetary policies. Furthermore, we distinguish three distinct features of financial cycle: credit cycle, real estate prices cycle and stock prices cycle. We find that while expansionary stage of the credit cycle enhances the distributional effects of UMPs, our results for real estate and stock prices cycles are inconclusive. Finally, we find that higher financial integration among the EA countries slightly enhances the distributional effects of standard monetary policy, but it also limits the distributional effects of QE policies.

### 4 CONCLUSIONS

While bulk of the previous studies have concentrated on studying the short-term distributional effects of monetary policy, we distinguish short-term and long-term distributional effects. Our results indicate that monetary policies may exhibit a long-term impact on inequality and thus distributional effects of monetary

policy may no be a temporary phenomenon. We also find that different types of monetary policy affect income inequality differently and that the transmission of monetary policy to income inequality depends on financial heterogeneity across countries.

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# FORECASTING CZECH GDP: HIERARCHICAL APPROACH

Jiří Georgiev<sup>1</sup>

<sup>1</sup>Prague University of Economics and Business, Czech Republic

## KEY WORDS

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forecasting, GDP, hierarchical time series

## JEL CODES

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C53

## 1 INTRODUCTION

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Forecasting precision is crucial in order to create usable forecasts for decision-makers, policymakers and other economic agents. Many macroeconomic time series are aggregates of other series, which creates an aggregational hierarchical structure that can be utilized in improving forecast accuracy (Athanasopoulos et al., 2020; Dias et al., 2018; Heinisch et al., 2018). Often these structures are based on attributes of interest, geographical location or industry sectors. This contribution focuses on GDP calculated with the income approach. The income approach is mea-

sured as an aggregate of multiple series representing income generated by the production of all economic goods and services in different parts of the economy, such as agriculture, forestry, manufacturing, mining and other industries. Each of these series can be split even further into series reflecting different areas. The goal of this contribution is a comparison of two common approaches, bottom-up and reconciliation, for forecasting hierarchical time series representing income approach on data for the Czech Republic.

## 2 MATERIAL AND METHODS

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Hierarchical time series consists of one *top-level* series that is the most aggregated series, bottom-level series that are most disaggregated and many other series that are aggregates of *bottom-level* series. This relationship can be written as  $\mathbf{y}_t = \mathbf{S}\mathbf{b}_t$ , where  $\mathbf{y}_t = (y_{\text{Tot},t}, y_{A,t}, y_{B,t}, \dots)'$  is a vector of length  $n$  that is equal to a number of series in the hierarchy,  $\mathbf{b}_t$  contains  $m$  bottom-level series and  $\mathbf{S}$  is summing matrix of size  $n \times m$ , which reflects linear aggregation constraints (Hyndman et al., 2007). The traditional approach for forecasting hierarchical time series is a *bottom-up* approach, where only the most disaggregated bottom-level series are forecasted, and

these forecasts are aggregated to obtain remaining series. An alternative approach is a *reconciliation* (Hyndman et al., 2007), where all forecasts across the hierarchy are obtained by any method, ignoring aggregation constraints and then retroactively adjusted, so the sum of bottom-level forecasts is equal to higher-level forecast. Therefore  $h$ -step-ahead forecast for bottom-up approach would be  $\tilde{\mathbf{y}}_{T+h|T}^{\text{BU}} = \mathbf{S}\hat{\mathbf{b}}_{T+h|T}$ , and for reconciliation  $\tilde{\mathbf{y}}_{T+h|T} = \mathbf{S}\mathbf{P}\hat{\mathbf{y}}_{T+h|T}$ , where  $\hat{\mathbf{b}}_{T+h|T}$  are forecasts only of bottom-level series, whereas  $\hat{\mathbf{y}}_{T+h|T}$  contains forecasts for each of the time series up to time  $T$  and  $\mathbf{P}$  is  $m \times n$

matrix. If  $\mathbf{P}$  is appropriately selected, forecasts will be coherent. Optimal  $\mathbf{P}$  is determined as a solution to the minimization of a trace of the covariance matrix of the  $h$ -step-ahead reconciled forecast errors

$$\text{Var}(\mathbf{y}_{T+h|T} - \tilde{\mathbf{y}}_{T+h|T}) = \mathbf{S}\mathbf{P}\mathbf{W}_h\mathbf{S}^T\mathbf{P}^T,$$

where  $\mathbf{W}_h$  is the covariance of  $h$ -step-ahead base forecast errors. Wickramasuriya (2019) introduces several different estimators for  $\mathbf{W}_h$  and provides a detailed description. This contribution will use so-called OLS estimator, WLS estimator and most complex MinT Shrink estimator. Data used for this contribution were obtained from the Czech Statistical Office and OECD database and spans from 1995 Q1 to 2020 Q1. Data representing the hierarchical structure of income approach contains 14 time series. These series include Gross domestic product,

Gross value-added, Taxes on products, Subsidies on products and series of income generated in different segments of the economy. For the multivariate models Unit labour cost, Unemployment rate, M1 monetary aggregates, Export and Import were used to improve forecasting power. To obtain base forecasts for all series in the hierarchy, ARIMA, VAR model and its extension with regularization (VARr) were used. Appropriate hyperparameters and lag order of the models were selected by a combination of information criterion BIC, cross-validation by rolling forecast origin and unit-root testing. Evaluation of forecast capabilities for different models under the hierarchical approach is carried out by using rolling forecast origin with a forecasting horizon of 4 on 2017 Q4 – 2020 Q1.

### 3 RESULTS AND CONCLUSIONS

This contribution assessed the forecasting ability of two hierarchical approaches on data for Czech GDP measured by the income approach. Both multivariate and univariate models were utilized to estimate the base model. Best performing, in terms of forecasting top-level series, proved to be the bottom-up approach with base ARIMA model, followed by reconciliation (MinT Shrink) with VARr. In the first case, the bottom-up approach managed to improve precision on average by 10.3% and reconciliation by 6.48% of

the base forecast. In the case of VARr, improvement of the base forecast was achieved only by reconciliation by 6.77% on top-level series and 11 lower-level series on average by 7.25% compared to their respective base forecasts. The bottom-up approach is not able to improve the bottom-level series and managed to improve only the forecast obtained from ARIMA, whereas reconciliation managed to improve all used models. Therefore, reconciliation proved to be a viable alternative to the bottom-up approach.

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# CHANGE MANAGEMENT IN A DYNAMIC BUSINESS ENVIRONMENT – A CRITICAL LITERATURE REVIEW

Elena Grocholski<sup>1</sup>, Antje Carolin Findeis<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

changing change management, agile change management, dynamics in the business environment, change in a VUCA-world

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## JEL CODES

M21, M54, M59

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## 1 INTRODUCTION

Under today's circumstances, traditional change management approaches have seemed to reach their limits. Many of the well-known models are based on concepts that rely on stability and controllability. The reality of today, however, is different. Even the near future is quite unpredictable, dynamics in business are high and change cycles are becoming shorter (Jick et al., 2017; Trost, 2019; Worley and Mohrman, 2014). Against this background, a critical literature review on the topic of changing change

management was carried out. As a result, it can be said that change management is growing ever more important. Nevertheless, there is obviously a lack of approaches to how change management can be successful under rapidly changing conditions in the business environment. To solve this problem, it is first of all necessary to answer the question of what the requirements of today's change management are. This issue is the main objective of this paper.

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## 2 MATERIAL AND METHODS

Based on the described initial situation the research intends to answer the following research question: *What are the requirements of change management in a dynamic business environment?*

To work out the current state of research on the topic of changing change management and to answer the proposed research question a scientific literature research was conducted. For this purpose, relevant literature was searched in different scientific databases (Science Direct, Springer, Wiley Online, Taylor & Francis Group, Emerald Insight,

Scopus). Various journals on the subject of change management were also examined (e.g. Research in Organizational Change and Development, OrganisationsEntwicklung, Changement!). As the empirical data and scientific sources dealing with the topic are still limited, the scientific literature research was supplemented with recent publications and studies by economic enterprises or management consulting firms. Overall, great care was taken to ensure that the contributions are up-to-date and deal specifically with change in dynamic times or current changes

in change management. The review produced 590 results. However, after reviewing the title, the abstract, and finally the entire text, many search results proved irrelevant for the rest of the research. To finally answer the research question and identify the requirements for today's change management,

### 3 RESULTS

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The critical literature review has shown that the term “agile change management” is increasingly used (Kohnke et al., 2019; Trost, 2019). However, there is no systematic examination of the topic and there are only a few approaches of agile change management in the scientific literature. Therefore the interaction of agile and change management was examined more closely in the course of the survey of the literature. If one compares the main characteristics of agile change management with those of conventional approaches, it becomes clear that there are fundamental differences in the understanding and handling of change. Traditionally change is often a lengthy, heavily weighted process. Agile change management, however, has a cyclic approach to change and helps to react to changes consistently (Kohnke et al., 2019; Trost, 2019).

### 4 CONCLUSIONS

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In today's business environment many parameters change simultaneously. Change management, as a discipline that normally supports others in their transformation efforts, must itself develop fundamentally to still have a significant impact. Nevertheless, it is still unclear in which direction this development must go and what the current requirements for change management are. This issue was addressed

a structural content analysis according to Mayring (2015) was carried out. For this purpose, the data material collected was examined with specific regard to this question. The material was therefore sorted, systematically coded and clustered accordingly.

Moreover, the qualitative literature analysis after Mayring has revealed eight categories of requirements for today's change management. According to the research, change management should take place in a participatory way for example. In this context, the role of management is an enabling one that ensures the framework conditions and provides guidance. Furthermore, change management should be a continuous process and take place in short, iterative cycles. Also, an experiential, flexible approach is essential. A high level of transparency and the use of digital tools are equally important. Due to increasing insecurity, providing stability and security constitute an important role of change management today, according to the evaluation.

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# ECONOMIC AND POLITICAL STABILITY OF THE EUROZONE COUNTRIES AND ONE OF THE MOST IMPORTANT ASPECTS – EUROSCEPTICISM

Dominik Gřešák<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

EU, Eurozone, sovereignty, euroscepticism, European integration

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## JEL CODES

F2, F50, H70

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## 1 INTRODUCTION

The information presented relates to the discourse addressing the stability of the euro area. I specialize in this issue in the form of a dissertation. The political and economic stability of this monetary integration unit, and therefore of the EU itself, is undoubtedly one of the most resolved issues at the international political level. One of the topics covered by the issue outlined above is Euroscepticism. I focused on this topic in my thesis

The economic crisis has revealed shortcomings in the conception of European economic and political

institutions. Europeans' confidence in the EU does not seem to be stable everywhere, undermining progress towards deeper European integration. This mistrust therefore supports the rise of Eurosceptic ideas (Algan, Guriev, Papaioannou and Passari, 2017). Euroscepticism is a widely known term that can be characterized as an opposition to the process of European integration in the EU. This concept was first characterized in Great Britain – the 1980s (Vasilopoulou, 2018).

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## 2 MATERIAL AND METHODS

Research on political and economic stability will need to focus on the effectiveness of reform in the Member States. In this way, it will be possible to determine what efforts the states are making for political and economic stability in the euro area and, subsequently, how stable they are after the implication of reforms. The findings will then be used to assess whether or not euro area membership is beneficial. The work compares the stability of three segments of countries:

1, Eurozone countries. 2, Countries that are not members of the euro area but are members of the EU. 3 European countries outside these integration units.

The dissertation is related to the findings of my thesis, which relate to Euroscepticism. During the elaboration of the diploma thesis, it was first necessary to criticize Eurosceptic stimuli at the level of political parties and movements across the EU.

This was helped by a broader literature search, which helped to identify the most common Eurosceptic stimuli, but also Eurosceptic topics that are closely related to the issue of European integration. In the analytical part, I specialized in the communication of Czech political parties with a focus on the EU with the help of content analysis.

Content analysis is a research tool that is used to determine the presence of certain words or concepts in given texts or sets of texts. Researchers quantify and analyze this presence, the meanings and relation-

ships of such words and concepts. They then draw conclusions from this finding (University of Missouri – St. Louis, 2004). Political parties that entered the Chamber of Deputies in 2017 were analyzed. Press releases from the official websites of political parties/movements were resolved. After conducting this research, it was possible to characterize not only which parties are most/least characterized by Eurosceptic manifestations, but also which topics are most discussed in the Eurosceptic context. The research focused on all press releases for 2018.

### 3 RESULTS

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Migration was the most frequently negatively addressed topic in connection with the EU at the level of top Czech politics. This result thus confirmed the findings of a wider scientific spectrum that the migration issue is one of the most frequently addressed topics of Eurosceptics. Lack of identification with European identity is one of the other important results of Euroscepticism research. The literature search then supplemented aspects that play an integral role in this topic, such as cultural differences. Another important finding was that the

most powerful political party in the Czech Republic focuses on communicating its information about the EU through other sources of information than their official website, which is what its leading representative does. These results need to be taken into account in the context of the dissertation focusing on Member State stability. Confidence in the EU, the creation of reforms, the ability to form consensual solutions is undoubtedly derived from the impact on Euroscepticism of the Member States.

### 4 CONCLUSIONS

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The results of the diploma thesis open up the possibility for the scientific spectrum to deal more with the communication of political parties – political marketing. In the context of the political and economic stability of the euro area countries, ie the EU, the causes of Euroscepticism can be taken

into account in the design of reforms to help break down barriers between individual Member States. The results, which help to understand the issues addressed in the Eurosceptic context, can be used to strengthen the homogeneity of the member states, or to contribute to their greater convergence.

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# COVID-19 DISRUPTION AND DELAY IMPLICATIONS ON CONSTRUCTION PROJECTS

Oliver Haas<sup>1</sup>

<sup>1</sup>*Comenius University, Bratislava, Slovakia*

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## KEY WORDS

construction, claim, disruption, project management, delay, COVID-19, Force Majeure, extension of time (EOT)

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## JEL CODES

L74, N60, O22

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## 1 INTRODUCTION

The outbreak of COVID-19 disease officially announced by WHO on March 11th 2020 negatively affected engineering and construction projects around the globe as much as it affected the societies in different ways and magnitudes. Labour and skilled worker shortages due to travel bans and temporarily or permanent self-isolations reduces the ability for a return to the engineering and construction projects and therefore created disruptions and delays to deliver the project in time to a certain extent. The same effect happened to the interrupted supply chain for construction materials, plants and equipments relevant for the progress of construction project, which stuck either due to closed country borders or due to a lockdown of established transportation and traffic routes. All of those shortages of labour and goods in general slowed the progress and timely performance of a contractor while the contractor may bar and tight up to a concrete and fixed delivery time for the project and liability for delays associated

with a contractual liquidated damage provision. That creates a problem for contractors, but finally as well for the clients, owners, all other subcontractors and the society involved in the same engineering and construction project. The goal of this extended extract is to assess and verify whether a contractor affected by COVID-19 implications can be relieved of such liquidated damages and can use contractual Force Majeure or other excusable disruption and delay provisions to seek for an extension of time (EOT) and additional compensation for such disruptions and delays. The proof of cause and effect is important and if COVID-19 implications can be distinguished into excusable or inexcusable reasons for disruptions and delays. In addition, if the contractor can not deliver interim or final project milestones the contractor is not able to achieve interim or milestone payments or maintain sufficient cash flow. Ultimately, the contractor's ability to perform and progress will be restricted or even collapse.

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## 2 MATERIAL AND METHODS

This extended extract and its research method is based on the existing and long-time available construction literature and case law before the COVID-19 outbreak officially announced by WHO on March 11th 2020 and the articles and journals published

then in the aftermath of the officially outbreak of the pandemic and the experience of the author of this extended extracted while working in engineering and construction project in the same period.

### 3 RESULTS

On first sight it seems relatively easy for a construction contractor to use COVID-19 implications as an accurate and valid argument to prove disruptions and delays and related costs. Force Majeure, Act of Gods or other extraordinary events including local or national government orders, i.e. lockdown, quarantined areas, self- or instructed isolations etc. for a construction contractor it seems to be tending to further use COVID-19 implications to relief him from contractual obligations, liquidated damages and apply for an extension of time, as well as relief him from delivering the construction project at large to certain and concrete date. But there is risk to do so. COVID-19 in general can not be seen as Force Majeure as such or as an exceptional event or situation which is beyond a or any party's control obligation to perform or deliver a construction project in time and to a certain date. The contractor should instead to carefully examine and assess the contractual provisions linked to the

pandemic disease COVID-19 and act accordingly. This includes the provision of proper notices of impact or notices of disruption respectively delay to the client or subcontractors involved. In the absence of contractual provisions the contractor may have to find statutory or common law equivalent and evaluate further legal options. The contractor has to consider in his overall assessment existing high supreme court decision to assess and prove disruption and delays by accurate records, cause-and-effect considerations based on comparison of as-planned vs as-built construction programmes and not to forget the duty to mitigate. In the absence of recent higher or highest court decision the contractor is well advised not to rely on a general COVID-19 "free of obligation" thinking. The individual and specific effects due to COVID-19 implication on disruption and delays without any proper records and reasonable way of doing might be differently seen by the court and judges at a later stage.

### 4 CONCLUSIONS

COVID-19 related disruption and delay implications may or may not be seen as excusable reason to apply for an extension of time under a construction contract. It depends on the concrete contract provisions, on the specific impacts and situation the construction

project is in. A "one COVID-19" argument fits for an all disruption and delay reason for a contractor to relief from one or more contractual obligations is a critical endeavour and may backfire to the contractor later on.

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# ANALYSIS OF THE SPONSORSHIP ENVIRONMENT IN SLOVAKIA

Petr Habánek<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

sponsorship, sports marketing, brand building, sport in economy, benefits of sport, sport management

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## JEL CODES

M310, Z230, Z200

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## 1 INTRODUCTION

This article examines the development of the sponsorship environment in Slovakia. However, to begin with we must define what type of sponsorship will be discussed, because there can be sponsorship at several levels; whether we talk of sport, culture, non-profit organisations, etc. In a great majority of cases however, when speaking of sponsorship, this usually means sponsorship in sport. Currently sport addresses almost 50% of the world's population. It is universal, in other words, the differences there are not as great as in the cultures of individual nations. It is also for these reasons that over 70% of sponsorship

spending goes to sport. Sport is an integral part of human culture that is why sponsors find it is so attractive (Novotny, 2011). Thus, this article also primarily focuses on the development of sponsorship in Slovakia.

The objective of this article was therefore determined as an analysis of how developed the sponsorship environment is in Slovakia, whereby real sponsorship relationships will be examined within the Slovak Republic as to how effectively the legislative aspect is determined for both parties.

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## 2 MATERIAL AND METHODS

Secondary data was used to achieve the objective of this article. Information from sponsorship agreements concluded between a company and a sport entity were used as a source of secondary data. For the research purposes of this article, 80 agreements between a sport entity and company, i.e. sponsor, were collected and analysed.

In individual agreements basic attributes were determined which were monitored and subsequently removed from the agreements and analysed. It was determined how well the agreements are set, what freedom they give to the individual parties, and

whether the relationships which are contractually secured are effective for both parties. So that both parties know how to exploit as much as possible from this relationship and the activation of sponsorship is as effective as possible. Likewise basic indicators were also monitored such as the sector of the company, company turnover, type of sport, level of performance and duration of the contractual relationship. These indicators are basic filtering indicators.

Also examined were the rights of the actual sponsor associated with the sponsored party's brand. Given that the actual sponsorship in marketing terms

presents an opportunity for brand awareness through its own sponsorship communication channels. Therefore the use of sponsorship was also examined as a tool for brand building. It is standardly used by companies abroad under the name “sponsorship-linked marketing”. In other words, the implementation of sponsorship in marketing activities for the purpose of creating and communicating associations with sport

### 3 RESULTS

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80 sponsorship agreements were examined and analysed. In particular, in the agreements the subject matter and annexes were analysed which determine the marketing performance by the sport entity with regard to the sponsor.

The basic variables we determined were company turnover, level of financial performance received from the sponsor and the duration of the agreement. The geographical area of the company was also determined from the individual agreements. We took as areas to be individual regions of Slovakia and also the area of business of the company which sponsored sport.

### 4 CONCLUSIONS

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From the findings presented in the results it can be seen that the sponsorship segment in Slovakia has not yet been fully grasped and in the agreements there were very many inconsistencies which show a certain lack of maturity of Slovakia concerning the success of sponsorship activation, especially between smaller companies and smaller sports clubs.

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and brand building (Cornwell and Kwak, 2015). So this is made possible it must also be embedded in the given contractual relationship.

All collected data were analysed in Statistica 12 SW and descriptive statistics, contingency tables and individual dependent variable tests that were relevant were used.

Main finding was, that the sponsor, in most cases, cannot use association with the sponsored sport subject in its own communication because of missing statement in sponsorship contract and all associations will be communicated only through the sponsored sport.

The second fundamental matter which was found in the agreements was the sponsored party's marketing performance. Results shows in which performance there is the greatest interest with the growing promotional performance and with the increasing duration of the sponsorship relationship.

However, the analysis of sponsorship agreements is not just one of many factors that arise and show the overall development of the sponsorship environment in Slovakia. There is still great room here for further research in the area of the financing of sport which is still not explored and clear answers cannot be found concerning the question of its effectiveness.

CORNWELL, T. BETTINA A DAE HEE KWAK. Sponsorship-Linked Marketing: Introduction to Topics. *Journal of Sport Management* [online]. 2015, 29(2), 133-136 [cit. 2019-08-11]. DOI: 10.1123/JSM.2015-0055. ISSN 0888-4773.

# DIGITISATION – A GLOBAL EXAMINATION BASED ON A BIBLIOMETRIC ANALYSIS

Christa Hangl<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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digitalization, bibliometrics, Scopus

## JEL CODES

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O33, O50, Y30

## 1 INTRODUCTION

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The concept of digitization can be seen as an older phenomenon. Gottfried Wilhelm Leibniz transformed Arabic numbers into binary strings; this can be seen as an impulse for digitization. In 1835, Samuel F. B. Morse invented the Morse code named after him for transmitting binary signals by telegraph. Digitization is discussed in the current debate as a completely new phenomenon, but for companies and organizations it has

been a serious development since the late 1990s due to the development of digital products and infrastructures. The next noteworthy development step with e-commerce and web strategies took place around the year 2000. From the year 2010 onwards, the advancing technical possibilities led to an expansion of this dimension of change, which is characterized by the digital transformation of business models (Becker et al., 2019). This is shown in Figure 1.

## 2 MATERIAL AND METHODS

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The issue of digitization has received increasing attention. In their literature reviews, many scholars have only examined digitization from a general point of view or have focused on a specific topic related to digitization. This paper presents a comprehensive analysis of the impact and productivity of research on digitization for the period 2000 to 2020, reporting on trends among authors, countries and institutions based on a bibliometric approach. To this end, the study analyzes more than 17,000 scientific

publications on the current state of digitization. The study uses the Scopus database to analyze the bibliometric data. Bibliometrics is a discipline that examines bibliographic material from a quantitative perspective (Wildgaard, Schneider and Larsen, 2014). It is very useful for classifying information according to different variables, including journals, institutions and countries. These indicators provide a general picture and some of the most influential research in this area can be identified.

## 3 RESULTS

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Publications on the subject of digitization have increased considerably during the period under study, with an increase of more than 1,000 percent between 2000 and 2020. Several reasons can be given that an increasing number of researchers worldwide are aware of the im-

portance of digitization in companies and for society. Digital technologies are used to change a business model and create new revenue and value creation opportunities. Digitization gives companies a competitive advantage by making things better, faster and cheaper than their

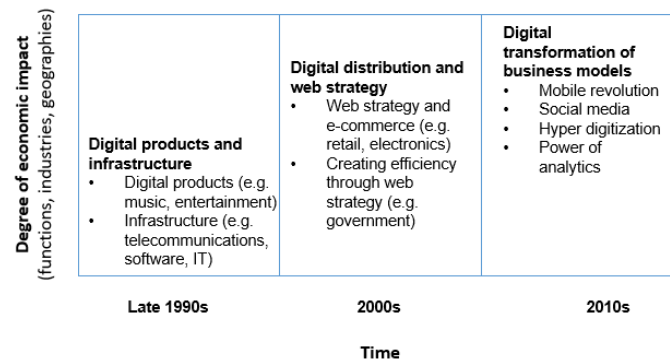


Fig. 1: Evolution of digital transformation - Digital transformation is becoming pervasive across functions, industries and geographies (Berman and Bell, 2011).

competitors make. Digitalization is also changing the manufacturing processes in production. With the use of networked machines and components that communicate with each other via the Internet and form cyber physical systems, production processes can be made more flexible and individualized (Rürup, 2017). The increasing importance of digitization is also expressed in various indices that attempt to capture the digitization in a country. The Digital Economy and Society Index (DESI) and the Network Readiness Index (NRI) attempt to measure the degree of digitization in different countries (Prattipatti, 2019). According to the European Commission, all EU countries improved their digital performance over the past years. Finland, Sweden, Denmark and the Netherlands

scored the highest ratings in DESI 2020 and are among the global leaders in digitalisation. The “Network Readiness Index” (NRI) is an index developed by the World Economic Forum as a composite measure of a country’s information and communication technology (ICT). The Network Readiness Index 2019’s top performer in this year’s index is Sweden, followed by Singapore and the Netherlands . The top of the rankings is dominated by European nations, with the region claiming 8 of the top 10 positions. The United States is ranked 8th globally.

Germany is the most influential country to deal with this topic scientifically. Most of the fundamental research of Digitalization are in engineering and computer Science areas.

## 4 CONCLUSIONS

A general overview of research on digitisation using bibliometric techniques was presented. There is a high degree of dispersion in this research area, with some influential countries. But scholars also warn of the dangers of the digital divide and the manifestation of existing and

new inequalities. Questions are frequently raised about the sovereignty of data interpretation, the “right to forget” and the protection of personal data. Further research activities are needed on these issues.

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# MODELING THE IMPACT OF INVESTMENT ON POPULATION WELFARE

Nataliya Harmatiy<sup>1</sup>

<sup>1</sup>*Ternopil Ivan Puluj National Technical University, Ukraine*

## KEY WORDS

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direct investments, average monthly disposable income, welfare, modelling

## JEL CODES

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A1, E2, E1

## 1 INTRODUCTION

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Improving of investment capital that flows into country's economy is transformed into productive or innovative capital and has a significant impact on improving the purchasing power of the population. Banerjee's research (Banerjee and Duflo, 2011) states the need to invest in the development of education and science to overcome poverty in the world. As a result of these researches, five million Indian children

have benefited from effective corrective educational programs at schools. That is, investments flowing into the economies of countries should be directed in innovative educational programs. However, the search for new ways to support and develop the economy is taking place at a time when many countries are experiencing stagnation, reduction of production and innovation activities financing.

## 2 MATERIAL AND METHODS

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The purpose of this article is to develop a model for investigating the impact of direct investment on the population welfare of Ukraine. The basis for analysis and modeling was the neoclassical model of exogenous economic growth of R. Solow (1956), assessment and consumption, poverty and welfare modeling of A. Deaton (2001), economic research of A. Banerjee, E. Duflo (2019).

The materials of official analytical reports of the State Statistics Service of Ukraine were used in the work. The statistical data of direct foreign investment, average monthly salary of inhabitants of

Ukraine for the period of 2009–2019 were analyzed, the correlation influence of these indicators was investigated. The correlation effect of direct investments on the average monthly disposable income per capita in Ukraine was studied. This indicator was 0.73, which signified a close and direct correlation between the selected factors.

A theoretical economic and mathematical model was developed that gives the ability to investigate the impact of direct investment on the correlation effects of income and consumer purchasing power. This model is dynamic in terms of time.

### 3 RESULTS

Most investments were made in the economy of Ukraine in the period 2009–2013 with a further decline in 2013–2014 and 2017 (Foreign direct investment, 2019), which was obviously due to the unstable social and political situation, the conflict in eastern Ukraine. The average monthly income of the population for the period 2016–2018 had a dynamic growth (State Statistics Service of Ukraine, 2020). However, to a large extent, that was unmotivated, had no background and reason, and ultimately provoked inflation since it created demand in those sectors that could not provide economic growth.

We have developed an improved model of the impact of investment on consumer spending and capital intensity of the country's economy:

$$Y(t) = C_s(t) + A \frac{d(Y)}{d(t)} = C(0) + \frac{dE(t)}{d(t)} = \\ = \left[ y(0) - \frac{C(s)}{1 - In_K} \right] \cdot e^{\frac{1}{B}t} + \left[ \frac{C(s)}{1 - A} \right] \cdot e^{rt},$$

### 4 CONCLUSIONS

This theoretical model allows studying the interdependence and impact of direct investment in the economy, the corresponding impact on the welfare and improvement of macroeconomic indicators of

where  $I_p$  – direct investments;  $C_s$  – consumer purchasing power;  $Y$  – income and well-being of the country's population;  $E$  – the level of goods and services export;  $1/E$  – increase in goods and services exports, including high-tech sectors of the Ukrainian economy; – attractor of a model;  $In_K$  – innovative component in the transformation of investment into capital;  $1/In_K$  – the coefficient of innovation and investment component in production of the Ukrainian economy.

A variable  $A(t) = \left[ 1 - \frac{C}{Y(t)} \right]$  – the rate of accumulation at time  $t$ , and the growth rate of income is proportional to this value, as well as the growth rate of the innovation-investment component in the production of the national economy.

national economy. Of course, this requires adequate policy aimed at expanding the region's ability to effectively absorb investment funds for education and innovation.

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# THE EFFECTS OF A SMARTPHONE OR TABLET APPLICATION ON LEARNING TRANSFER IN CONTINUING VOCATIONAL TRAINING (CVT) WHEN USED IN THE TRAINING PROGRAM

Christine Hinrichsen<sup>1</sup>, Tina Krieger<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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evaluation of training, instruments of evaluation, CVT, HRD, life long learning

## JEL CODES

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I25, M12

## 1 INTRODUCTION

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Successful transfer of learning is becoming increasingly important in the field of continuing vocational training (CVT). Furthermore, the success of a company and individuals will depend on how quickly they learn, develop new, suitable ideas, and put them into practice. Therefore, CVT has to achieve corporate goals. For this reason, evaluation of learning transfer is the central task of education controlling.

The origin of evaluation forms the Four-Level-Evaluation-Model developed by Kirkpatrick in 1959. It is still used in its fundamental features today. Kirkpatrick's model is extended by two more levels, ROI (Return on Investment) and VOI (Value on Investment). These key figures based on algorithms

such as ROI or the descriptive determination of the added value VOI are not sufficient in their meaningfulness to meet the constantly changing requirements in the areas of HRD (Human resource development).

This paper addresses the impact of the use of a smartphone or tablet application on learning transfer. Furthermore, it shows that the use of a smartphone or tablet application underpins a seamless communication process in CVT and increases the learning transfer.

Quantitative studies to increase the effectiveness of the app are currently open.

## 2 MATERIAL AND METHODS

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Based on qualitative literature research the development of instruments for the evaluation of CVT measures is reconstructed. The research findings of Kirkpatrick in 1959 are forming the beginning. The extension of Kirkpatrick's Four-Level-Evaluation-Model by Phillips by a further level is the continua-

tion of the reconstruction. The 5th level, called ROI (Return on Investment) calculates and determines this key figure in CVT. A further extension of evaluation CVT is the determination of the VOI (Value on investment). Kellner developed in 2005 a VOI-Model based on six phases to be processed.

Nonetheless, when calculating ROI in CVT several problems need to be considered. Calculating the ROI becomes more difficult if training that train so-called soft skills are to be evaluated. Only limited instruments are available for this purpose. Employee satisfaction can be measured, for example, by using surveys. But, also, in this case, it is not easy to place increased employee satisfaction in a verifiable and direct context with measurable corporate success.

The above presented key figures ROI and VOI refer to the topic of sustainability and successful learning transfer. In a theoretical way is shown to what extent

the participants can contribute to an increase of ROI or VOI.

The question of a suitable instrument for a successful learning transfer, and thus a suitable instrument to measure the success of further training, is being addressed by a wide variety of institutes and companies.

Furthermore, the training design in the field of CVT is developed under the aspect of the support possibility by an application for a smartphone or tablet. If the application is used stringently and adequately during the training design process, a significant increase in learning transfer is achieved.

### 3 RESULTS

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The success of the learning transfer is increased by the clear formulation of training goals. The goals can be stored in an app. Furthermore, the evaluation options of the app enable individualized training design.

The use of an app increases the key figures ROI and VOI in CVT. From the ROI and VOI it cannot be reliably deduced whether the learning transfer is successful.

The results of empirical studies (expert interviews) are still open.

### 4 CONCLUSIONS

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To achieve a successful learning transfer, a seamless communication process within the training design is necessary. This means that already during the needs analysis and planning of the training program all participants must be involved. It is important to define as precisely as possible how the successful learning transfer can be achieved and how it can be evaluated.

The evaluation of training programmes takes place on several levels. Since Kirkpatrick's research more than 50 years ago, further evaluation instruments have been developed with the ROI of Phillips or the VOI of Kellner. Apart from the problem of the lack of

a clear definition of the variables, the question arises, what is the significance of an ROI of 195%? With regard to the successful learning transfer, this value is only of limited use. The added value of a training program for organizations can only become visible at a later point in time. The structured survey of the VOI achieves good results in this context.

The use of an app supports the communication process in CVT sustainably. The app can be used to store training goals that are individually tailored to the organization and the training program, as well as to the participants. The use of an app further increases the success of the learning transfer.

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# THE ENVIRONMENTAL GOODS IN AGRICULTURE IN THE REGION OF SOUTH MORAVIA AND THEIR ECONOMIC EVALUATION

Ivo Horák<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

environmental economics, agriculture, economic evaluation, biodiversity

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## JEL CODES

Q51, Q56, Q57

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## 1 INTRODUCTION

This paper aims to establish a methodology and quantify the economic value of selected environmental goods in the region of South Moravia – namely the case of the Ekofarma Petra Marady which won this year the Rural Inspirations Awards competition for its approach to battle climate change in the very heart of South Moravia. The work builds upon the method of valuing environmental goods, to which, in modern intensive agriculture, is not given much importance to the appropriate extent. Public environmental goods are essential not only for the development and quality of life in rural areas but also for their own agricultural management in the area, using non – productive functions to ensure

water retention in the region, the protection against subsequent erosion and the increase biodiversity.

The work aims to grasp the idea that environmental goods are crucial for agricultural production itself and calls upon the idea of the EU Green Deal, according to which the future agriculture will play a key role in the sustainable development and management of world biomass reserves. At the end of the work are summarized recommendations for future development and possible solutions to improve the current situation. The work mainly aims to illuminate the professional public signaling the usefulness and the need for the environmental elements in agriculture and taking into account both the needs of farmers and the public interest.

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## 2 MATERIAL AND METHODS

The methods to evaluate the environmental elements created in the region of South Moravia combine direct and indirect methods of market valuation together with expert non – market methods in order to compare these different approaches and draw conclusions about the value of environmental goods. The various methods are available although each

of them has its own limits and none of them is overwhelming the complexity of the given topic, (see de Groot, 2002 and Seják et col., 2010). De Groot (2002, in Seják et. col., p. 31) lists five main methods of indirect market valuation that can lead to the economic analysis: *cost aversion* – ecosystem services makes it possible to avert the costs that

would arise in their absence (eg. flood avoidance and wetland compensation costs), *compensation cost* – ecosystem services can be replaced by an artificial system (eg. water treatment plant instead of wetland; construction costs then represent the value of wetland cleaning function), *income factor* – ecosystem services can increase revenues from some economic activities (eg. fishing, tourism), *associated travel costs* – reflecting the need for recreation and the potential of the area to meet this need and, last but not least, *hedonic valuation* – it derives the economic value of natural parts of the territory according to the difference in property prices adjacent to the site. The methods of direct market valuation

such as Contingent Valuation Method (CVM) are meant to present a value expressed by people's preferences using neatly prepared questionnaires in order to present the issue in full spectre and letting the respondents to give their opinion. Seják, Dejmál et col. (2003) then offer the expert Hessen method which is meant to be free of economic and preferential "bias" and evaluate the quality of eco – systems, this method was then adapted to the Czech environment to BVM method. The data will be drawn from the various sources, however, the most important will be the primary sources obtained from "Ekofarma Petra Marady".

### 3 RESULTS

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The output of the research will be a case study carried out on the Ecofarm example and a selected set of environmental goods in agriculture. These goods will be evaluated using the valuation methods together with expert BVM method and compared together. The expected results may differ, however, it is expected to get a high economic value of these goods for they contribute immensely to biodiversity

and the life in the region on the whole beside their calculable economic value. Evaluating the environmental goods by the individual preferences presented in neo – classical economy, however, found its critics, see Gowdy (1994), when they reached a conclusion that there is a crucial incompatibility of the market economy paradigm with ecological sustainability.

### 4 CONCLUSIONS

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It is challenging to calculate the value and to evaluate the importance of an environmental good for it is well – known that the value of nature has an infinite economic and financial value from many points of view and what is more, for each member of our society. To draw a conclusion from this activity, it is important to note that the environmental goods in agriculture play a vital role not just as positive

externalities but also as means of production for agriculture, for biodiversity and mainly as a tool to battle climate change that is on the rise. If we acknowledge these statements and mainly the importance of the environmental goods on the whole, then we might be on the right track to pursue a better future not only for farmers, but for us all.

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# CAUSE-RELATED NUDGING – EMPLOYING NUDGES IN CAUSE-RELATED MARKETING CAMPAIGNS OF GERMAN FOOD RETAILERS

Jens-Markus Horn<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

corporate social responsibility, cause-related marketing, willingness-to-pay, rounding up, checkout charity, behavioral economics, choice architecture, nudging, retail

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## JEL CODES

D91, L81, M14

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## 1 INTRODUCTION

Cause-related Marketing (CrM) activities, which are one method of companies' Corporate Social Responsibility (CSR) efforts, have been implemented in different industries over the past decades. According to a widely-used definition (Varadarajan and Menon, 1988), CrM links donations with a revenue-generating transaction, such as the purchase of a product.

CrM campaigns can result in a win-win-win outcome (Hawkins, 2012): For the charitable organization that receives financial means, for the company by being perceived as acting socially responsible, and for customers who gain increased utility through doing good, e. g. by feeling a warm glow. Numerous studies have been conducted to research the parameters of a successful CrM implementation. For example, it has been shown that providing customers a choice of which cause to support has a positive impact (Robinson et al., 2012). Another way of choice would

apply to the amount to be donated, which could utilize consumers' willingness-to-pay (or willingness-to-donate, for that matter).

As a special type of CrM, rounding up the shopping bill amount – also referred to as checkout charity (Giebelhausen et al., 2017) – is especially suitable for retail companies. In this scenario, with a free choice of donation (rather than one fixed sum), customers could choose their preferred amount, similar like giving a gratuity in a restaurant.

Whenever there is a choice, choice architecture as a concept of behavioral economics comes in. Thaler and Sunstein have elaborated how nudges could affect decisions in a way that the desired outcome gets more likely (Thaler and Sunstein, 2008). This paper aims to investigate how confronting customers of German food retailers with nudges at the checkout impacts their donations, if customers could freely choose how much they want to give.

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## 2 MATERIAL AND METHODS

Based on the research question (RQ1) “Do nudges have a positive impact on customers' donation amounts?”, the hypothesis (H1) “If a food retail company employs nudges to influence the size of its

customers' voluntary donations, then the collected sum will be larger than without nudging.” has been proposed.

Data collection of quantitative primary data has been carried out through a survey of adult customers of German food retail stores via a structured online questionnaire. In a between-subject design, participants have been randomly assigned to one of three groups with different framings of asking for the donation. First, all subjects have been prompted to state their donations for six shopping bill amounts while having a free choice of how much to donate, or not to donate at all. Subsequently subjects have been randomly assigned to one of four groups, each with a different nudge related to the donation, and have

been asked again for their donations for the same six shopping bill amounts; so in total  $3 \times 4 = 12$  groups exist.

Data of 621 customers has been analyzed in IBM SPSS Statistics. A t-test for dependent samples has been employed to check whether the difference between donations without nudging compared to donations with nudging proves statistically significant as to confirm or reject the hypothesis. In addition, analyses of variance (ANOVA) have been conducted to examine the differences between the groups.

### 3 RESULTS

Without a nudge, 94.2% of customers donate an average of 1.99% of the shopping bill amount. Among the three groups, average donations range from 1.37% to 2.67%. An ANOVA proves that differences between the three groups are significant,  $F(2, 530) = 18.142$ ,  $p < 0.001$ . In contrast, donations in a setting with nudging increase to an average of 2.18% with 86.8% of customers donating, ranging from 1.14% to 3.35%. Differences between the twelve groups are significant as well,  $F(11, 512) = 4.338$ ,  $p < 0.001$ , adjusted  $R^2 = 0.066$ .

A t-test (CI 0.95) indicates that nudging significantly influences donations,  $t(488) = 3.107$ ,  $p = 0.002$ ,  $d = 0.14$ . Donations in a setting with nudging ( $M_{\text{nudge}} = 2.17$ ,  $SD_{\text{nudge}} = 2.46$ ) are significantly higher than donations in a setting without nudging ( $M_{\text{base}} = 1.94$ ,  $SD_{\text{base}} = 2.00$ ), so hypothesis (H1) can be confirmed. Hence, if a nudge is employed, customers of German food retail stores donate significantly higher amounts than without the nudge.

### 4 CONCLUSIONS

The study reveals that using nudges proves to be a suitable approach for German food retail companies to increase the donation amounts of their customers. Framing has an impact on the donation size as well, even to a larger extent than nudging. However, certain limitations of an online survey need to be

considered, such as a sampling bias or an attitude-behavior gap.

Further research would be recommended regarding the effect of additional nudges, on different retail formats, and possibly also related to online shopping.

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# DIGITAL TWIN CLOUD PLATFORMS: AN OVERVIEW

Štěpán Hošek<sup>1</sup>, Oldřich Faldík<sup>1</sup>, Oldřich Trenz<sup>1</sup>, Barbora Bůhnová<sup>2</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

<sup>2</sup>*Masaryk University, Brno, Czech Republic*

## KEY WORDS

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Digital Twin, Cloud platform

## JEL CODES

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L8, O3

## 1 INTRODUCTION

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In today's world, more and more facilities are controlled by artificial information systems. Whether it is a significant part of a production plant, whole city, or an equipment of a single flat, the aim is to maximize automation of the control as much as possible.

To be able to control complex environment, it is beneficial to have artificial model of it. The model needs to be detailed and complex enough to get accurate results, while at the same time, it needs to be simple enough so that the computation time is reasonable. One option to create such a model is with the help of the concept called Digital twin. Digital

twin is, as the name suggests, a simplified digital model of a physical entity. It can be created before or after the physical twin creation, or they both can be created simultaneously. It can be used in a multitude of ways, which are being commonly divided into three groups: design, manufacturing, and control. In our work, we focus on the control [1].

Specifically, the goal of this research is to compare existing platforms intended as Digital twin computing systems, with specific attention to cloud platforms, and find their strengths and weaknesses, mostly from the user's perspective.

## 2 MATERIAL AND METHODS

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The first Digital twin cloud platform we have examined is Microsoft Azure developed by Microsoft. It is a cloud platform that also offers the Digital twin feature. The second is the Oracle platform developed by the Oracle company. It offers many integrated cloud applications and invests in Digital twin creation. The third cloud platform included in our study was MindSphere from Siemens. The fourth and last platform was IBM cloud. All cloud platforms are to be evaluated on the basis of availability to users, documentation extensiveness

and comprehensibility, the ease of use and language used for describing their model.

To describe the strong and weak points of the current situation of digital twin platforms, SWOT analysis [2] was chosen. Its purpose is to describe internal strengths and weaknesses as well as external opportunities and threats. Among internal factors, there are capabilities and resources which are capacities or inputs that can potentially be used. Among external factors, there are possible future developments and implications as well as competitor's resources.

Tab. 1: SWOT analysis of the overall current state of Digital twin cloud platforms

	Advantages	Disadvantages
<b>Internal</b>	Strengths: accessible, verstaile, new tutorials are created, free trials exist	Weaknesses: inadequate documentation, too few practical examples, Digital Twin is still not well-known
<b>External</b>	Opportunities: a wide range of applications, expansion of the platforms, speedup of development due to competition	Threats: potentially might not be used, too complicated for a common user, confused documentation

### 3 RESULTS

Microsoft Azure offers a free account and a budget to students to allow its early users to find out what it offers. It is necessary to say that the interface offers many features, but it is very hard to navigate without a guide. The documentation is vast but often offers multiple ways of doing the same things. It is clear that it is still in the early phase of development and, therefore it can sometimes be confusing and misleading. To be able to use the Azure Digital Twin [3], it is necessary to perform a long and tedious setup and also install additional software (Visual Studio in this case).

The Oracle Cloud platform offers Oracle IoT Digital Twin Implementation [4]. There is a possibility of a free account and budget for students. The

documentation is brief and lacks in examples. It is necessary to create the whole structure to run an example.

MindSphere [5] from Siemens does not offer any digital twin implementation. It only gives the user an infrastructure where the digital twin might be constructed.

IBM offers Digital Twin Exchange [6] where it is possible to buy complete digital twins. Other than that, there is no actual documentation of how to create the model.

The SWOT analysis is shown in Table 1. It describes the overall current state of Digital twin cloud platforms.

### 4 CONCLUSIONS

Four cloud platforms were overviewed: Microsoft Azure, Oracle, MindSphere and IBM cloud. Out of these four, it is clear that Microsoft Azure is the most advanced platform towards the digital twin implementation. It offers detailed documentation, and there is a possibility of free account and budget for students. On the other hand, it is still being developed and it can be challenging to use. Oracle

lacks documentation and example cases. MindSphere does not offer any digital twin implementation. IBM is focused on exchange of complete digital twins. The results of our examination indicate that we are exploring a not-yet well matured research field, with substantial potential for future work and interesting research contributions.

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# DEFINITION OF RELEVANT MARKET FOR THE NEW PERSONAL CARS IN THE CZECH REPUBLIC: APPLICATION OF RANDOM COEFFICIENT MODEL

Jakub Chini<sup>1</sup>, Tomáš Dvořák<sup>1</sup>

<sup>1</sup>*Masaryk University, Brno, Czech Republic*

## KEY WORDS

---

relevant market, new passenger cars, random coefficient, aggregated logit model

## JEL CODES

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K21, L40

## 1 INTRODUCTION

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Lately, competition law has been under the influence of so called ‘more economic approach’. Under this approach relevant market should consist of a set of products that are perceived by the consumers as substitutable. To identify which products are perceived as substitutable, a hypothetical monopolist test has been developed. According to this test, a relevant market is constituted by a set of products for which it would be profitable to jointly increase prices by 5% (i.e. a set of products which are worth monopolizing by a hypothetical monopolist). This is usually quantified by a critical loss analysis which compares the critical and actual loss. Critical loss represents the reduction in quantity due to 5% increase under which the hypothetical monopolist would earn zero

profits, whereas the actual loss is the actual reduction in the quantity (Davis, Garcés, 2010). Additionally, since relevant market represents a set of products with high substitutability, it is also worth exploring the cross-price elasticity as it shows the substitution patterns among the investigated set of products (Motta, 2004). Although this approach might seem quite straight forward, it has not been yet established which method is the most useful for the purpose elasticity estimation. This article therefore aims to define the a relevant market or markets for new personal cars in the Czech Republic by using the random coefficient logit model (RCLM) to estimate the own- and cross-price elasticities.

## 2 MATERIAL AND METHODS

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We follow the standard method for relevant market definition which begins with the identification of narrowest possible relevant markets. The subsequent quantitative analysis then examines whether each of these markets actually represents a relevant market based on own- and cross-price elasticities (Motta, 2004). In connection to the new passenger cars, the narrowest possible markets have been already established by European Commission as follows: mini cars; small cars; lower middle cars; middle

cars; upper middle cars; luxury cars; sports cars; MPV’s and SUV’s (see e.g. European Commission, 2009).

After identifying the nine narrowest possible relevant markets, we proceed with quantitative analysis by calculating the elasticities of these markets using the RCLM as suggested by Berry, Levinsohn and Pakes (1995). RCLM calculates the degree of substitution across markets while controlling for endogeneity of prices. RCLM is also able to produce more realistic elasticity estimation as

“cross-price elasticities are larger for products that are closer together in terms of their characteristics” (Nevo, 2004). Additionally, it estimates the elasticities only based on market-level price and quantity data which is quite advantageous as internal data from car manufactures are not easily accessible (Berry, Levinsohn, Pakes 1995). For this purpose we had to construct a dataset containing aggregated market data where the prices are represented by Gross List Prices, including VAT, suggested by the car manufactures as the final catalogue price for the car on their websites. Quantities on the other hand are represented by new car registration per car type collected from the publicly available databases of the Czech Ministry of Transportation and Car Importers Association. The critical and actual loss is then calculated for each of the nine markets as follows:

Critical loss for linear demand:

$$CL = \frac{0.05}{0.05 \cdot \text{margin}}$$

Actual loss:

$$AL = 0.05 \cdot e,$$

where the 0.05 represents the 5% increase in prices suggested by hypothetical monopolist test,  $e$  represents the own-price elasticity of demand in a given market and margin should be ideally represented by margins in a given market, however, since we do not have access to these we have run our analysis for all imaginable margins (0–100%) (Davis, Garcés, 2010). The relevant market is then defined as follows (Davis, Garcés, 2010):

- critical loss > actual loss = the narrowest market is a relevant market;
- critical loss < actual loss = the relevant market is wider than the narrowest market.

### 3 RESULTS

Based on our estimation of own-price elasticities, we calculated the actual loss for the nine markets. Subsequently, we had calculated the critical loss for margins ranging from 0 to 100%. Our results show that the critical loss is usually greater than the actual loss if the margins are lower than 15%. In other words, if the margins in given markets were lower than 15%, each of the nine markets would actually represent a relevant market. This is a strong indication that each of the nine markets

actually represents a separate relevant market as the car manufactures' margins are generally below 10%.

This is supported by our estimation of the cross-price elasticities which take on very low values (the maximum cross-price elasticity was between the SUV and uppermiddle segments in the year 2016 reaching the value of 0.863, however the average values across segments are in general around 0.15) which suggests that the nine markets are not perceived by the customers as substitutable.

### 4 CONCLUSIONS

The aim of this article is to define relevant market or markets for new personal cars in the Czech Republic. After implementing the RCLM we are able to estimate the own-price elasticities and subsequently calculate the actual and critical loss. Our results suggest that there are in fact nine separate relevant markets for new personal cars (mini cars;

small cars; lower middle cars; middle cars; upper middle cars; luxury cars; sports cars; MPV's and SUV's). This is supported by our estimation of cross-price elasticities which show low level of substitutability between these nine markets.

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# IDENTIFICATION OF ACADEMIC INTEGRITY MISUNDERSTOOD TOPICS AND SUITABLE TIME FRAMES FOR PROMOTING THEM TO THE ACADEMIC COMMUNITY THROUGHOUT THE YEAR

Peter Chochula<sup>1</sup>, Anna Dragolovová<sup>1</sup>, Pavel Turčíněk<sup>1</sup>, Tomáš Foltýnek<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

academic integrity, academic misconduct, statistical descriptive analysis

## JEL CODES

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C80, C00

## 1 INTRODUCTION

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Students, teachers, and researchers might find themselves in everyday situations where it can be difficult to decide what acting is morally correct or not. Academic misconduct is perceived differently by students and university staff (Brimble and Stevenson-Clarke, 2005), which complicates its prevention. The situation has become even more confusing due to the Covid-19 outbreak when many universities organize online lectures for the first time and lack of personal contact can lead to more misunderstandings and unnecessary complications.

To prevent unintentional misbehavior or academic misconduct, the university should try to navigate students, teachers, and researchers through confusing situations and help them to understand the essence of academic integrity. There are different ways of approaching such a problem but firstly it is necessary to recognize what situations and topics

are problematic. Then the guidance in a form of a set of rules, code of ethics, or code of conduct or other documents can be provided. It is also necessary to communicate the guidelines to students, teachers, researchers, and other interested parties through an appropriate medium.

In this paper, we want to present the most suitable time frames for discussing specific problems related to academic integrity with students and other academics. For that purpose, we apply statistical descriptive analysis and data mining techniques to data collected from the Academia Stack Exchange forum to identify the academic community's needs throughout the year. The results of the analysis might be used by universities to improve communication in the field of academic integrity and help to better understand the current ethical problems related to academia.

## 2 MATERIAL AND METHODS

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We choose Academia Stack Exchange Forum as a data source. The reasoning behind the choice is the amount of metadata that can be obtained from this source and the structure of the questions

that contains useful metadata such as answer, tags, time of publishing, number of votes and views, etc. We have collected 2748 questions about academic integrity and related metadata from the Stack Ex-

Tab. 1: Indetified topics and time frames

Topic/s	Month/s
Ethics	February, October
Topics related to the publication	June
Exams, Cheating, Teaching	May, October
Teaching	May
Professors, Etiquette	May
Advisor, Ph.D., Thesis	July
PhD	August
Thesis	January, May
Personal-misconduct, Research-misconduct	February, June, November
Research-misconduct, plagiarism	November, December
Abuse, Sexual-misconduct	February, September
Cheating, Plagiarism	May, June, November, December
Plagiarism, Self-plagiarism	June, November, December

change application programming interface in JSON format. Then we have converted the JSON dataset to Pandas Dataframe to easily apply statistical descriptive analysis. We have analyzed dependencies between tags occurring in the dataset related to academic integrity by using heatmaps.

### 3 RESULTS

We were able to identify eleven groups of topics that occurs often together in question and the convenient time frame when academics discussed these topics.

### 4 CONCLUSIONS

This study was conducted because of the lack of similar literature that would determine the appropriate time frames for consulting academic issues related to academic integrity. In our paper, we have analyzed 2748 questions related to ethics in academia by using statistical descriptive analysis and data mining techniques and outlined the groups of closely

Lastly, we have applied cluster analysis using the K-means algorithm (Lloyd, 1982) on preprocessed data to find a typical question for each tag or hidden structure of the questions. Unfortunately, we conclude that questions usually contain more than one topic, which prevents them from clustering.

related topics often discussed side by side and their time frames when they should be optimally promoted or discussed. Our findings may be used by academic institutions to improve the communication of topics related to academic integrity and thus create a better academic environment.

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# REALISATION OF THE MANIPULATION TASK USING DELTA ROBOT

Andrej Ilič<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

automation, delta robot, manipulation, image processing

## JEL CODES

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C88, C89, C69

## 1 INTRODUCTION

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3D Delta manipulator is a robot based on parallel kinematic structure. These manipulator types are nowadays used in many different industries especially for 3D printing by gradually applying various plastics, metals or even liquid concrete. However, Delta manipulators can find application for example in measuring technology, construction, in a production line or in medicine to move various objects from point A to point B along a predetermined trajectory [1]. The solution of this work is a software that can control a robot and solve a given task. The

software connects not only the robot, but also all other peripherals connected to the computer and thus makes the solved task a complex task that combines both image processing and robot control. It is an automated manipulation of objects and therefore the job of the software operator is to ensure the correct communication of HW and SW to load data from the computer's memory to perform the manipulation task and to check, whether a problem has occurred. Everything else is handled by the created software [2].

## 2 MATERIAL AND METHODS

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The goal of the software is to simulate a task that checks the presence of components on a product. If the software finds out that the component is missing, its task is to complete it correctly. All product information is stored in an XML file. A position-controlled object feeder is designed and constructed only for the task. Feeder had to be modified several times to suit the conditions of the manipulation task. Furthermore, a microprocessor-controlled end effector and plastic objects for handling are designed, printed and constructed for the task. The software processes the image transferred from the camera to the computer. According to the processed image

software decides how the manipulation task continues. There were considerable problems with the image processing until constant lighting conditions were ensured. The whole thing is wrapped in a Graphical User Interface, which is easy to use and clear to the user. The GUI has been redesigned to be easy to understand even for inexperienced users. The program is transferable to other types of tasks because the XML file which is loaded by the created program changes the whole principle of the program run. A lot of effort has been put into increasing the accuracy of object manipulation. The motor of the feeder and the entire feeder structure had to be

replaced or redesigned. The hardest part of the work was the implementation of a control program that

connects all peripheral devices and controls the entire run of the task.

### 3 RESULTS

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Four different imitations of PCB boards are used for testing. As a result, the robot repairs these boards according to the template. The system identifies objects in the workspace using QR codes. Robot then decides what to do with the board and which components does the robot need to repair the board. Robot then adds or removes objects from the board. The average time to repair a board is 1.5 minutes. It

depends on the condition of the board. The longest of all repair phases is the physical movement of objects to and from the feeder. It was solved that robot always had the same lighting conditions, therefore the software identified successfully ten out of ten QR codes. The whole manipulation task works as planned.

### 4 CONCLUSIONS

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The desired result has been achieved. The task is complex as it solves the design, construction and testing of own peripheral devices that can be digitally controlled from a PC. It also solves the design,

implementation and testing of the whole software, including the graphical user interface and user experiences of the program. Delta robot works correctly and is currently used in the faculty laboratory.

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# INDUSTRY 4.0 AND EMPLOYMENT IN AGRICULTURE

Jan Karas<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

robotization, labour market, employment, Industry 4.0, Agriculture 4.0

## JEL CODES

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J20, Q10

## 1 INTRODUCTION

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The term “Industry 4.0” (Fourth Industrial Revolution) is more and more mentioned lately – whether in various articles, professional treatises, or political programmes. Industry 4.0 represents the current trend of automation and data exchange in production technologies (Umachandran a.s., 2018). It includes, for example, cyber-physical systems or the Internet of Things. The basic principle of Industry 4.0 is that by joining machines, semi-finished products and systems, businesses create smart grids throughout the value chain that can guide each other. The concept is based on a number of digital technologies, such as the Internet of Things, Big Data, Artificial Intelli-

gence and Digital Practices: Collaboration, Mobility, Innovation (Herman, etc., 2015; Kagermann a.k.a., 2013). However, this transformative power will also affect agriculture – connected farms, new production facilities, smart tractors and machines (Maddox, 2018). It will enable both increased productivity and quality and environmental protection. It also creates changes in the value chain and business models with greater emphasis on knowledge collection, analysis and exchange. This also has potential implications for employment, the labour market or human resources management itself.

## 2 MATERIAL AND METHODS

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Primary data collection was based on semi-structured interviews. A total of 29 interviews were conducted, including 9 with farm representatives, 7 with agricultural advisers and 13 with secondary school heads. The main criterion for selecting respondents was to select respondents with experience in agriculture –

that is why, in addition to business representatives, agricultural advisers and secondary school principals were selected. This also gives an insight into the problem from more sides than just from the side of farm representatives.

## 3 RESULTS

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From the point of view of Industry 4.0 and human resources, the vast majority of the companies surveyed agreed that there is currently a shortage of

workers and that they are forced to use elements of Industry 4.0 (to automate, digitise or robotise production) because of this problem. Most of the

other respondents (i.e. advisers and representatives of secondary agricultural schools) agreed with this statement – in particular, they stated that human labour is expensive and therefore needs to be reduced.

The expansion and introduction of automation and robotization had the greatest impact on employment on dairy farms – robotic milking parlours replaced a large number of workers compared to other elements of the Fourth industrial revolution (such as GPS, sensors, etc.) that facilitate or improve work rather than replace it. Representatives of farms that operate livestock production (dairy farming) currently without a robotic milking parlour argued that they would definitely like to buy a robotic milking parlour in the future, precisely because of cost savings and because of the retirement of most employees, which cannot be fully replaced. The benefit of robotic milking parlours is that workers can come to the workplace later in the morning (early morning arrivals discourage some potential job applicants in cowshed).

Respondents were also asked about the benefits and threats of the Fourth Industrial Revolution in agriculture. Farm representatives most often cited

higher efficiency, cost savings, greater environmental friendliness, improved production quality, labour savings, the elimination of demanding mechanical work and, of course, the aforementioned replacement of future shortages of agricultural workers, as the benefits of Industry 4.0 in agriculture. The other respondents (i.e. agricultural advisers and secondary school principals) most often agreed with the above benefits. However, they also complemented, for example, the increase in prestige and knowledge of agriculture. As threats to this concept for the future, respondents reported that nature and weather fluctuations were erratic – a problem especially for plant production, pressure from interest organizations to “industrialization” of livestock production, or concerns about power outages and possible data loss. Above all, however, respondents reported that they were most concerned about the loss of contact with agriculture – that is, someone who would only want to monitor everything via computer and would not be interested in the condition (whether animals or soils, plants, etc.).

## 4 CONCLUSIONS

In conclusion, it is possible to summarise the ‘main’ statements of farm representatives, with which all other respondents have also agreed. The first concerns the general shortage of people, and especially the reluctance to go to agriculture to work (getting up early, odor in livestock production, etc.). This is related to another statement that agriculture does

not have an attractive appearance for the public, which could be improved by technology. In terms of automation and robotization, the vast majority of respondents also agreed that “human touch” would still be needed in livestock production – most often they were concerned about “over-engineering” and the consequent loss of contact with agriculture.

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# THE IMPACT OF INTRODUCING A FLAT RATE WITHHOLDING TAX FOR CAPITAL GAINS ON TAX REVENUE AND TAX RELIEF IN GERMANY

Andreas Kasper<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

capital gains tax, flat rate withholding tax, tax revenue, tax relief, Germany.

## JEL CODES

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H20, H21, H24

## 1 INTRODUCTION

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The German Government introduced the flat rate withholding tax on all types of private capital gains starting from January 1st 2009 with the corporate tax reform law 2008 of the 14th of August 2007 (BGBl. I 2007, p. 1912).

The implementation was among other things motivated by the idea of avoiding capital flight on basis of tax purposes. Other EU states made positive experience with introducing a flat rate withholding tax on capital gains, too. According to OECD Austria increased the tax revenue strongly.

Furthermore, considerations of justice, tax relief and simplifications of the taxation procedure had been used as justifications of legislation [1].

After ten years and various statements that indicate a potential violation of the principle of equality, criticize the complexity and violation of the objective net principle and indicate disadvantageous for Germany as a tax location [2] the objective of this letter is to evaluate whether the tax revenue for Germany and the tax relief for German taxpayer has increased.

## 2 MATERIAL AND METHODS

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In order to fulfill the above-mentioned objectives, the tax revenue as well as the tax burden will be investigated.

The tax revenue is published by the Federal Office of Statistics based on the accrual principle; the capital gains tax is split in these publications into tax on interest and divestment gain and not assessed tax on income which almost exclusively contains tax on dividend income. These figures will be investigated by a comparison as well as a correlation analysis for the years 2009 to 2019. Therefore, the capital gains tax on interest and divestment gain will be connected to the European base rate set by the European Central Bank. The capital gains tax on dividends

will be connected to the distributed dividends of the German stock market.

The tax relief for German taxpayers will be investigated by a case study. The case study compares the tax burden of the flat rate withholding tax with the progressive income tax. Therefore, three cases for a single person with capital gains of 1.000 € above the tax-exempt amount and a taxable income of 25.000 €, 50.000 € and 75.000 € will be compared. This case study is based on the assumptions that the taxpayer had no income related expense and the income results only from interest gains in order to be comparable to the legal framework before 2009.

### 3 RESULTS

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On the one hand, the total tax revenue from capital gains tax on interest and divestment gain has decreased from € 12 billion in 2009 to € 5 billion in 2019. A main reason for this decrease is the decrease of the European base rate from 2.5% in 2009 to 0.0% since March 10th, 2016 [3]. The correlation analysis shows a strong positive correlation between those figures.

On the other hand, the total tax revenue from capital gains tax on dividend income has increased from € 12 billion in 2009 to € 23 billion in 2019. This increase is based on the increase of the distributed dividends on the whole German stock market from € 29 billion in 2009 to € 57 billion in 2019 [4]. These figures show an even stronger positive correlation than the above-mentioned correlation.

The overall tax revenue on capital gains tax has increased from € 24 billion in 2009 to € 28 billion in 2019 with a positive trendline over the selected period.

The case study shows that the tax burden is always lower with the flat rate withholding tax compared to the personal progressive income tax rate no matter if the taxable income is 25.000 €, 50.000 € or 75.000 €. The saving increases by the increase of taxable income due to the fact of the progressive taxation. The option that taxpayers can request their personal progressive income tax rate by a cheaper check makes sure that even a lower taxable income as 25.000 € cannot lead to a disadvantage in this regard.

### 4 CONCLUSIONS

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The results show that the overall tax revenue of capital gains tax has slightly increased. Because of the world financial crisis in 2008 the tax revenue before and after introduction of the capital gains tax is hardly comparable as the decrease of the European base rate elucidated. The Federal Government of Germany admitted in October 2014 that the tax revenue increase is less than expected [5].

For taxpayers who are receiving interest gains the case study shows the advantage of the flat rate withholding tax. According to the Federal Government the change to the flat rate withholding tax created more tax revenue for the period 2009 to 2014 than the old system would have done [5]. This is an effect from the changes to the taxation of divestments

and dividends; like the limited deduction of income related expenses and the abolition of the speculation period. Therefore, in order to encourage saving and retirement provision and with the background of nearly no obtainable interest on saving deposits it is necessary to finally create an effective tax relief in this area. The main reason for the introduction namely the capital flight and tax evasion can be effectively reduced with the automatic exchange of information on financial accounts in tax matters with 100 nations participating in 2020.

Besides constitutional concerns especially regarding the limited loss compensation and the deduction of income related expenses are still present [6].

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# COMPARATIVE EXAMINATION OF QUANTITATIVE RISK MAPS AND SIMULATION-BASED SCENARIO ANALYSES

Stefan Ralf Koppold<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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risk, uncertainty, forecast, simulation

## JEL CODES

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C53, D81, E17

## 1 INTRODUCTION

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Managers analyze, make decisions and ensure their implementation. They do this to the best of their knowledge and belief, based on the duties of a prudent businessman and with the intention of always supporting or bringing about an increase in value for the benefit of their own company. Therefore, managers must consciously take risks in basically every decision. These risks are hidden for example in the limited information available and in an uncertain future, which also leads to possible changes in plans.

To illustrate major risks, risk maps have been established in the area of risk management, which

present risks from risk inventories or checklists in a clear and easy-to-understand graphic form. [1] In recent years, however, a new type of risk assessment method, the simulation-based scenario analysis, has become widespread. This simulation, based on random numbers, shows a more complex, but also technically more demanding way of risk assessment. [2] [3]

Therefore, the question arises where the advantages and disadvantages of both methods lie.

## 2 MATERIAL AND METHODS

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The core of the study is a comparative analysis of two methods and their results using three concrete and exemplary corporate risks with the aim of identifying the opportunities, risks and limitations of both. For this purpose, a partial analysis is performed for each risk. This begins in each case with a realistic, general description of a specific case, which is then parameterized and evaluated in both ways. The modeling of both evaluation methods is

purely quantitative. The focus of the risk maps is on the recording and evaluation of risks in the form of probability of occurrence and impact of damage, while the simulation-based scenario analysis focuses on the distribution functions used.

In the second part of the investigation, a combination and aggregation of the preceding examples within each method is carried out in an overall view.

### 3 RESULTS

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The results show that both methods are justified, but in different phases of a risk assessment and with different significance.

Thus, quantitative risk maps have their advantages in the initial assessment and in an isolated consideration of non-complex individual risks. However, the study also clearly works out the limits of risk maps. These are particularly evident in the model-internal uncertainties and the impossibility of aggregating the results.

On the other hand, it can be seen that although simulation-based scenario analysis requires more specialist knowledge in dealing with risks, an increased effort cannot be determined. This method proves to be very flexible and can be used realistically even for more complex risks. A further advantage is that it is also possible to aggregate the evaluated individual risks to form an overall risk scope and, in addition, to show perspectives for further developing the results into a control and management element with corresponding key figures. [4]

### 4 CONCLUSIONS

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The concluding discussion shows that risk maps have clear limitations in quantitative risk assessments and in the evaluation of an overall risk scope. This in turn is one of the biggest advantages of simulation-based scenario analysis. Since even simple risks can

be captured with such a simulation method and to ensure completeness towards all relevant risks, it seems sensible to prefer the aggregated method and use risk maps only in individual cases in the future.

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# REGULATORY CHANGES AND UKRAINIAN DOMESTIC TRADE

Ivan Korolov<sup>1</sup>, Michal Mádr<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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regulatory quality, institutions, domestic trade, enterprise performance Ukraine

## JEL CODES

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D02, K20, P26

## 1 INTRODUCTION

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It is impossible to find empirical works that would research the institutional development of domestic trade, in the leading economic journals of Ukraine. However, this sphere is crucial for the country's economy: it has a significant impact on the formation of aggregate material wealth, providing a significant share of employment, small business development, quality of life, and social stability. In 2016, the NACE category G (wholesale and retail trade; repair of motor vehicles and motorcycles) accounted for more than 13% of Ukrainian GDP, entering the top contributing economy sectors [1]. Regulatory reforms

in this sphere are particularly important in addressing accelerating economic growth and productivity. For example, in the USA, the liberalization of the retail sector was one of the few institutional changes that had a significant impact on overall productivity growth in 1995–2005 [2]. Therefore, this work deals with the empirical study of changes in specific regulations for the private sector. The purpose of the article is to analyze and assess the impact of the main institutional changes on the financial performance of domestic trade enterprises during 2009–2016.

## 2 MATERIAL AND METHODS

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To obtain desired results, work uses regression analysis with fixed effects based on the previous research [3]. Data on the private sector was taken from the Orbis database by Bureau van Dijk, due to the amount of available information, which made it possible to study the impact of regulations on more than 9,000 entrepreneurial subjects [4]. Shifts in the regulatory environment are divided into two separate research parts: changes in *Taxation* (overall three changes) and changes in *Regulations* (overall four changes). These are represented by dummy variables, which acquire the value of one in the year when the

change occurred. It is also important to note that special attention is paid to 2015 when the largest number of legislative changes affecting business took place.

To sum up, the regression model comprises five control proxies from the microeconomic point of view to explain the performance of companies: firms *Fixed Assets*, *Age* and number of *Employees*, *Debt to Equity* ratio, and *Market Share*. The first two firm-level proxies are employed as input factors, *Debt to Equity* ratio measures the inverse of potential slack, the company's *Age* is used to control market experience,

and *Market Share* capture market position and power. Moreover, there are four macroeconomic control proxies used to assess the outer environment, as *GDPpc Growth*, level of *Minimum Wage*, a percentage change in *Utility Tariffs*. Last but not least, there is a Political Stability and Absence of Violence index by the World Bank (GM2) to control the unstable Ukrainian political environment. *GDPpc Growth* controls the overall economic situation and *Utility Tariffs* represents a living standard, while *Minimum Wage* explains the growing burden of social insurance on entrepreneurs. As the dependent variable in the following regressions, *EBIT* (Earnings Before Interest and Taxation) is employed. To sum

up, the regression model consists of nine annual control proxies and four annual proxies measuring changes in business regulations:

$$\begin{aligned} EBIT_{it} = & \beta_0 + \beta_1 \text{FixedAssets}_{it} + \beta_2 \text{Employees}_{it} \\ & + \beta_3 \text{Debt/Equity}_{it} + \beta_4 \text{Age}_{it} \\ & + \beta_5 \text{MarketShare}_{it} + \beta_6 \text{Growth}_t \\ & + \beta_7 \text{MinimumWage}_t + \beta_8 \text{UtilityTariffs}_t \\ & + \beta_9 \text{GM2}_t + \beta_{10} \text{Tax}_t + \beta_{11} \text{Regulation}_t \\ & + \beta_{12} \text{Year2015} + \beta_{13} \text{After2015} \\ & + \beta_{14} \text{Constant}_t + \gamma_t + \mu_{it} \end{aligned}$$

### 3 RESULTS

The results of the regression analysis make it clear that shifts in the regulatory environment in the field of taxation affect the performance of the enterprise negatively in the year when the changes take place. On the other hand, innovations in business regulations have had a positive impact on *EBIT*. Key changes in 2015 harmed the financial results of enterprises, but after this turbulent period, business

deregulation began to bear positive results in the context of firm performance. It is also important to clarify that the effect of the control variables is in agreement with economic theory. The indicators have minor differences when comparing the situation on the market in general and small-medium enterprises' performance changes.

### 4 CONCLUSIONS

The results of the article confirm the positive changes in the Ukrainian regulatory environment. These innovations are noted in the international arena by institutions such as the International Monetary Fund and World Bank, and massively presented in the Ukrainian media by domestic authorities. Deregulation and reduced government control over trade are paying off. However, so-called "institutional spam" in the tax environment, when many amendments and

changes are made the next months after the release of a new law, does not positively affect business. It is also important to note the general instability of government decision-making regarding business regulations, as well as the unscientific approach in the application of changes. The path of building quality institutions in the field of domestic trade is thorny and not completed.

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# PECULIARITIES AND DIFFICULTIES IN ENTERING THE B2A MARKET COMPARED TO B2B AND B2C, BASED ON A CASE STUDY FROM THE PHILIPPINES

Bernhard Alexander Krah<sup>1</sup>

<sup>1</sup>*Comenius University, Bratislava, Slovakia*

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## KEY WORDS

marketing, B2G, B2A, market segments, business-to-administration, business-to-government, infrastructure, Philippines

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## JEL CODES

M10, M31, N25

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## 1 INTRODUCTION

In today's highly competitive marketing methods, the market segments B2B (Business-to-Business) and B2C (Business-to-Consumer) are very well established and applied. The worldwide largest market segment, the B2A/B2G (Business-to-Administration/Business-to-Government) however, has until now received little or no attention in the literature. Basically, B2G/B2A is the market that serves "public spending". The public spending enables governments to purchase/obtain services and goods in order to fulfil their objectives. The B2A/B2G market is a monopsony. That means, that a few companies bid to one demander – the state. Because of their unique position, monopsonies

have a wealth of power (Young, 2003). There is a great influence in decisions by political interests, geopolitics, and infrastructure. Decisions are mostly taken as a budget decision (a certain budget has to be spent, otherwise it will be reduced in the future).

Compared to B2C or B2B, contracts and decisions in governments (B2A/B2G) should be transparent. A disadvantage of the B2G/B2A market is, that it is very impenetrable, with bureaucratic obstacles, tight budgets, and comprehensive contracts. These problems will be examined more closely in this scientific work based on a case study from the Philippines.

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## 2 MATERIAL AND METHODS

In order to analyse the problems and obstacles of entering the B2G market, we have observed and analysed the market entry by a company in the Philippines. Krah Pipes Manila sells large diameter plastic pipes throughout the country and beyond. The complete company story of Krah Pipes Manila was monitored from start-up until now (the production capacity is doubled in the year 2020). The monitoring took place in all kind of business fields

(financing, human resourcing, etc.) but in this case study only the marketing part is published. During many customer visits, registration, and approval periods I had the opportunity to talk extensively with the people involved to find out where the difficulties and obstacles are. To obtain the relevant information, many interviews with the General Manager and the Sales Manager were conducted in January 2020. To shed light on the infrastructure

situation in the Philippines, we used information from the department of public works and highways (DPWH). The DPWH is using a special government agency called MWSS (Metropolitan Waterworks and Sewerage System) (2020, May 28.000Z). There we

got further information about the water supply and about sewerage projects in this country. We also used the internal management report from Krah Pipes Manila Inc. to analyse the sales structures of the company.

### 3 RESULTS

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In the B2G market, decisions on product introductions are usually made within the available budget of the state and only listed companies and products can be purchased. Therefore, the government must first be convinced that the product offered is the right one and of the best quality. The authorities are not very interested in new products, but in increasing efficiency and if it only means using the budget more efficiently. In our case, the product was completely new for the existing market. The existing market was served for many years via a few local companies with other pipe materials and system properties. The product itself was superior compared to the available alternatives. So, the marketing concept was an aggressive market-penetration strategy for a displacement market.

The ministry of construction in the Philippines is the DPWH (Department of Public Works and Highways). It is the only final customer for all national projects and the counterpart (divided in several branches, offices, structures) to handle, to promote and sell infrastructure products successfully in the Philippines. It was not easy to set up the

company occurred from the fact that start-ups have problems registering its new company, as balance sheets and history are missing. Therefore, reference was made to the balance sheets and histories of the shareholders. The fact that your product is approved and part of the “blue book” (Standards and Specification Book, a register of all products to be used in public tenders), made it easier for us to convince those responsible. Furthermore, our product could convince with the fact that we are using international standards and the approval of BRS, shop-drawings were needed for all products and the quality control procedure was accredited by the agencies. Krah Pipes Manila Inc. was very lucky to receive the big and famous project for the rehabilitation of the paradise island of Boracay, due to a lot of preparatory work and good relations with DPWH and the construction companies (Bläcker, 2020). To convince the government of the project, it was demonstrated how the product has already been successfully used in other projects. Moreover, many photos were shown, customers from other countries were visited and many details explained.

### 4 CONCLUSION

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The B2A/B2G market requires a long market penetration time and high start-up costs, but large volume business and loyalty will follow, when you could present good reference projects. The example of the Philippines has shown that it is possible to implement a new product on the market, but that it needs a certain starting period (especially

for infrastructure projects). It is important that the methods to penetrate the market are very different from those of the B2B and B2C markets. It has its own rules and structures that must be respected. But if everything is considered, you can be very successful in the B2G market.

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# THE IMPACT OF TRUST IN THE TEAM AT THE DIFFERENCE BETWEEN LOCAL AND DECENTRALIZED TEAMS

Simon Krause<sup>1</sup>, Viktoria Joy Behrens<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

trust, local teams, decentralized teams

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## JEL CODES

J28, M54

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## 1 INTRODUCTION

Consider the challenges facing companies and their employees in the 21st century. The opportunities offered by the Internet and global networking mean that global teams are facing new challenges at the same time. These challenges, the consequences of decentralized teams, as well as the possibilities and potentials are the main topics of this paper.

The increasing change away from local teams working together on one project at one location to

decentralized team distribution working globally on a common goal presents new challenges for both the companies and the teams themselves. Since the physical presence and thus a possible control of the team members is no longer or hardly possible, the factor “trust” plays a special role. In this study, the influence of trust on teams will be investigated. In particular, the difference in the factor of trust between local and decentralized teams will be analyzed.

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## 2 MATERIAL AND METHODS

Leadership in local and decentralized teams is fundamentally different because of different environmental influences. The trust factor is therefore becoming increasingly important. (Madrid, Totterdell, Niven, and Barros, 2016) The behavioral expectations of others are the foundation of trust. A congruent behavior as a character trait is the most important component for a basis of trust. Bennis (1999) defines this with his 5-factor analysis: Competence, Constancy, Caring, Candor and Congruity.

The standardized validated test procedure FAT was used, as it can be used to measure the factor of trust and the factor of achievement. The test is

based on the Kassel team pyramid, which is roughly based on the factors of Bennis. An online survey was conducted from 24.10.2017 to 24.11.2017 (Sarges and Wottawa, 2010). The target group of the survey was people who work in both local and de-central teams. A total of 145 datasets were generated, of which 41 datasets were excluded from use due to incomplete responses. The statistics program R-Studio was used to analyze the data. The research question of this study is: “*Is there a difference in the trust factor between the different types of teams?*” To answer the research questions at hand, a factor and correlation analysis of the available data was performed.

### 3 RESULTS

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The FAT was examined concerning the following moderator variables, geographical dynamics of the team, age-group related analysis, quantity and quality of exchange. The following significant results were found, with increasing age the importance of goal achievement and trust in the local team increases.

The age group between 20 and 29 years, known as digital natives, is the only group that has consistent results on both factors independently of local or decentralized teams with a standard deviation of .13. All other age groups have a significantly lower result in the FAT. The  $p$ -value for both values is

$> .006$ . This result allows the conclusion that the obstacles associated with the medial interfaces are equally pronounced in these age groups. (Klonek and Kauffeld, 2012)

When it comes to trust in decentralized teams, it is apparent that trust reaches a significantly lower value from a distance of over 2000 kilometers.

With increasing geographical distance there is a significant correlation away from a daily exchange to a weekly exchange and an exchange on demand.  $P$ -value is .05.

### 4 CONCLUSIONS

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The result of the presented study allows drawing the following conclusions about the introductory question. There was no significant correlation between trust and local and decentralized teams. The local and decentralized teams were much more dependent on individual environmental influences. It could be shown that trust in the team depends on geographical conditions and age structures.

The management conclusion is to create an optimal environment. This includes, on the other hand, by improving the environmental influences in the form of information systems for a structured, traceable and managed information flow and information exchange. On the other hand, by improving team trust, which is the basis for intercontinental teams. Both of these cornerstones contribute to the improvement of team performance in both local and decentralized teams.

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# THE BARRIERS IN THE FEMALE MANAGERS CAREER

Aneta Krejčová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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female managers, barriers, career, inequalities, female managers, qualitative research

## JEL CODES

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J16, J71

## 1 INTRODUCTION

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Through the 21st century, we still face discrimination against women based on gender. There have been changes for the better in this area, but this discrimination still exists. Gender equality is not only an urgent moral and social issue, but also a critical economic challenge. If the world's working population does not reach its full economic potential, the global economy will suffer. The McKinsey Institute states in its research that if the full potential of women's employment is realized, global GDP will increase by \$ 12 trillion. In order to permanently achieve better results in this area, it is necessary to examine in which areas women face discrimination (McKinsey, 2015).

The aim of this material is to provide information on the current barriers of managers in the work environment in the manufacturing sector of the Czech Republic.

There are many barriers to women's careers. Obstacles are complex and multifaceted, influencing career goals and decision-making (Leung, 2008). These include, for example, glass-ceiling, mini me, barriers to networking, conflict between multiple roles of women in the family model, concerns about childcare, sexual harassment, few opportunities for self-enforcement, lack of behavioral patterns that could lead a career (practical examples), etc. (Swanson and Tokar, 1991; Cochran et al., 2013).

## 2 MATERIAL AND METHODS

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Basic data for qualitative research were obtained from four focus groups at the selected company. The discussion took place among the female managers, who were asked the question "What barriers did they perceive during the advancement of their careers at selected company?" These discussions lasted approximately 2 hours each, were moderated by the professionals and the maximum participation in each discussion was 20 female managers. In total, more than half of the selected company's managers

took part in the discussions. The focus groups were recorded and then transcribed into text. Subsequently, the analysis was performed using MAXQDA software. At the end of each group discussion, managers were asked to complete a questionnaire on the same topic as the focus groups. The questionnaire was anonymous, so they could add more information here than they were willing to share with others in the discussion. The data obtained from the focus groups were rewritten and analyzed. Each of detected

barriers was assigned a code and the connection of the barrier with the given problems for women in

career growth. All given barriers were compared and analyzed.

### 3 RESULTS

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The barriers described in the focus groups were further divided into groups according to content. One of the most mentioned barriers is the so-called work-life balance. Many managers state that if you want to have a high position in the company and at the same time have a so-called work-life balance, it is very demanding. Some stated that this could not be achieved in the selected company.

Another significant barrier for women is the gender problem with the supervisor. This problem was mainly on the part of the supervisor. Many female

managers stated that they also attribute this problem to the company's environment, as the company is more men dominant, especially in senior management positions.

Other barriers mentioned more often include so-called small self-marketing (self-promotion), transfers within the company group, insufficient prioritization, career breaks and starting from zero (maternity leave), mistrust in women's abilities, combining motherhood and work, gaining respect from men.

### 4 CONCLUSIONS

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The topic of discrimination against women in organizations is constantly relevant, as evidenced by the present research. The main barriers in the selected company include the inability to achieve the so-called work-life balance and the gender problem with the supervisor, which stems from the supervisor.

The results of this research are similar to those from different countries. These barriers differ from other research mainly by the frequency of occurrence, which may be due, among other things, to the area in which the selected company manufactures its products.

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# AN ECONOMIC MODEL OF FAIR TAXATION IN THE DIGITAL AGE

Tina Krieger<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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digitalisation, fair taxation, theory on tax evasion, agency theory

## JEL CODES

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H26, H30, D90

## 1 INTRODUCTION

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Digitalisation might enable private individuals to move assets abroad quickly and easily – without the tax authorities necessarily knowing about the related income. The situation is similar for companies. Thanks to creative accounting they can shift their profits to tax – efficient foreign countries in which little or no economic activity is performed. That is why digitalisation is frequently perceived as a catalyst for increasingly unfair tax systems. Indeed, the rise of digital economy is creating many challenges for tax administrations to keep up with: “A focus on adapting and reinventing policies to stay ahead of the game is necessary to ensure they are regulating an economy that exists today—and not one more reminiscent of the past” (cf. Juswanto and Simms, 2017, p. 5). Fairness in the sense of tax equality is a fundamental principle in modern tax systems, which needs to be protected for a variety

of reasons: Beyond the distributional impacts and ethical implications, unfair tax systems increase income inequality and may lower economic growth (cf. Stiglitz, 2014, p. 389, 393). The tax administration is responsible for the entire and correct assessment and collection of taxes. In a mass procedure, and given limited resources, it is intended to realize the principles of equality and legality. Solid economic development therefore requires a tax administration which is capable of enforcing these principles. This paper examines the relationship between taxpayers and tax administrations from the perspective of agency theory. The underlying assumption is that an asymmetric distribution of information between the taxpayer and the authority may result in the tax administration being unable to determine tax bases correctly, which could jeopardise fair taxation.

## 2 MATERIAL AND METHODS

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In terms of agency theory this problem is known as moral hazard (cf. Holmström, 1979, p. 74). Measures to combat moral hazard could either be the direct reduction of information asymmetry or the resolution of conflicting objectives and – recent contributions have increasingly focused on – the building of trust between agent and principal as a further measure (Pauls, 2013, p. 101). Against this

background, we examine the digitalisation measures of the tax administration in the OECD context and with a special focus on Germany. We find that, the measures can be divided into three categories: First data and analytics, second digital services and administration and third behavioural insights and design. In order to make these findings usable for an agency theoretical consideration we assign

these categories to instruments from theory: Data and analytics can be instruments to directly reduce information asymmetry, digital services and administration can resolve conflicting objectives, while behavioural insights and design can be used to build trust. This means we regard the digitalisation measures from an agency theoretical point of view as a bundle of instruments to reduce the problem of moral hazard. To transfer these three areas into a model, the publication “Income tax evasion: A theoretical analysis” (Allingham and Sandmo, 1972, pp. 323–338) is used as a starting point and is transferred to the context of digitalisation and fair taxation. Based on exponential utility functions with constant absolute risk aversion within the frame of a LEN model, we stick to the assumption of the

utility maximising agent. We consider the degree of fairness, which shall be expressed by how much the declared income is compared to the actual income, as endogenous variable in our model. The exogenous variables are intended to influence the behaviour of the taxpayer and thus determine the level of fairness. Here we take into account the probability of detection  $p$  in order to address the digitalisation field of data and analytics. Digital services and administration is assumed to support the taxpayer in preparing the tax return and are therefore modelled using an exogenous parameter, which we call costs of compliance  $\alpha$ . Measures that include the field of behavioural insights and design are mirrored by psychological costs of tax evasion as exogenous variable  $\sigma$ .

### 3 RESULTS

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With our model we could mathematically derive the influence of different digitalisation categories in the form of the above mentioned exogenous parameters on the taxpayer’s decision. The model implies that the digitalisation measures from the three categories described above promote compliant behaviour as a complement to one another. It also shows that the objective of fair taxation can be promoted with a mix of deterrent and encouraging measures. These trend statements are checked by means of variation calculations determining the degree of fairness that would maximise the utility for the taxpayer, i.e. be the optimum, depending on the different specifications

of the exogenous variables. This demonstrates that the higher the assumed Arrow Pratt measure, the more measures from all three categories contribute to fair taxation. Moreover, the effects of the behavioural category of measures is all the stronger the more elastic the taxpayer’s decision is to have good contact with the tax authority – in other words, it depends on the basic moral setting of the individual taxpayer. The effect of the category digital services and administration seems to be the higher the more complicated and confusing the tax laws appear to the citizen.

### 4 CONCLUSIONS

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This paper represents a first attempt to examine the impact of digitalisation of the tax administration on the objective of fair taxation by means of model theory. Beyond this intention to contribute to economic

theory, our model is aimed at providing practitioners, namely politicians and decision – makers in the tax administration, with a sound tool helping to predict likely responses by taxpayers to digitalisation efforts.

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# FAIR TAXATION IN THE DIGITAL AGE: LITERATURE SURVEY

Tina Krieger<sup>1</sup>, Christine Hinrichsen<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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digitalisation, fair taxation, theory on tax evasion, literature survey

## JEL CODES

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H26, H30

## 1 INTRODUCTION

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“Digital” is everywhere. The past decade has been marked by great upheavals. Progressive digitalisation has proven to be an omnipresent trend that affects almost all areas of life (cf. Frach, Fehrmann and Pfannes, 2017, p. 25) and transforms the way economies and societies work. This situation provides new opportunities for economic growth and improvement of living conditions but it also bears the risk of deepening economic and social inequalities. Fairness in the sense of tax equality is a fundamental principle in modern tax systems, which needs to be protected for a variety of reasons (cf. European Commission, 2015). Over the last years, it was understood that there is a need for an administration that can effectively enforce the law and there has been increasing attention focused on the role of tax administrations and the concrete design of the tax enforcement process (cf. Slemrod and Gillitzer, 2014, p. 2). While digital economy is growing, tax administrations are transforming

too. There has been a significant shift towards e-administration, meaning tax administrations are upgrading using digital technologies to increase tax compliance. On the one hand, digitalisation entails the danger of tax evasion and avoidance but if used properly by the tax authorities, it may as well be a chance for more tax transparency. Aiming at contributing to this debate we perceive digitalisation of the tax administrations as an opportunity that can contribute to fairer taxation. By surveying the existing literature on tax compliance in the context of digitalisation this paper represents a first attempt to merge these two developments in order to explore the contribution that the rich research already done on tax evasion and compliance offers for the age of digitalisation. Objective of this paper is to provide a solid starting point for further research in the area of digitalisation and fair taxation addressing our overall research question “How can digitalisation of the tax administrations contribute to fair taxation?”.

## 2 MATERIAL AND METHODS

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Based on Stoetzer (cf. Stoetzer, 2012, pp. 30–32), the search for literature and sources was carried out in three steps: First, the relevant search terms were derived from the research question. These

search terms were then used in library catalogues and article databases. Finally, from the literature and sources found in this way, those were selected that are relevant in the context of the research

question. From the overall research question the subject areas “(Fair) Taxation” and “Digitalisation” can be derived. For several reasons we intend to use a principal agent model to solve the research question. Therefore the topic area “Agency Theory” will also be considered within our literature survey. To identify relevant literature, tax articles published in top journals, tax survey papers and textbooks dealing with the above mentioned subject areas have been reviewed. Additionally, several database searches

using the databases ‘Business Source Premier’ and ‘EconLit’ provided by EBSCO were conducted. The queries used the keywords (including corresponding synonyms) “agency theory” and the keyword “tax” or “digitalisation” in all titles and abstracts of the database content. The scope was limited to peer reviewed papers in English or German published in academic journals between 1969 and 2019. The search terms were successively combined with each other.

### 3 RESULTS

The search for the isolated terms “digital”, “agency theory” and “tax” resulted in 90,724, 5,688 or 105,936 hits. The search for the intersection of “digital” and “tax” led to 950 results. Those from “agency theory” and “tax” to 191 and the combination of “digital” and “agency theory” to 26 papers. The focused research area can then be covered by the result of the combined query of the terms “agency theory”, “digital” and “tax”. The latter combination revealed only one publication. The analysis has shown that the theory of tax evasion, which is mainly represented by the intersection “agency

theory”/“tax”, is increasingly shaped by concepts of behavioural economics and an interdisciplinary mixture of economic and psychological approaches. Largely uncoupled from this, research is developing in the field of the overlap “digital”/“tax”. The latter is obviously a much younger field of research. This also shows the dominance of published reports and project reviews in contrast to classical journal articles. The research field “digital”/“agency theory” as well as the intersection from all the three areas are largely unexplored.

### 4 CONCLUSIONS

It can be concluded that from the literature research it became clear that there is no publication of a theoretical nature that systematically deals with the influence of the digitalisation of the tax administration on the objectives of fair taxation. In this regard our intended contribution apparently addresses a “white spot” that hasn’t been explored yet. Above all, the results of the mentioned papers demonstrate that a

principal-agent model with certain modifications can be a viable concept in the field of tax evasion theory in the digital age. With regard to the objectives of this paper, it can be said that the literature research revealed numerous literary references that provide a valuable starting point to unite the three areas and bridge the research gap identified.

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# ENHANCING DATA QUALITY FOR DATA ANALYTICS THROUGH MACHINE LEARNING

Simon Luca Kropf<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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business information systems, data quality, data analytics, management reporting

## JEL CODES

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M15, C15

## 1 INTRODUCTION

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High data quality is a valuable asset for an organization. Data quality is not just about preparing information for managers, but also for example, improving customer satisfaction. This can be negatively influenced by poor data quality. Furthermore, poor data quality can lead to an impairment or slowing down of production and procurement processes, so that just-in-time production can no longer be carried out. This research paper deals with the question of how processes of data quality management can be

combined with the requirements of a modern data analytics concept. Due to the continuous increase in the amount of data and the rapidly developing possibilities with corresponding analytics methods, organizations have great potential to generate completely new information and knowledge. How successful these new concepts and approaches are depending heavily on the quality of the data and ultimately also on the mechanisms and processes that are responsible for cleansing and quality assurance.

## 2 MATERIAL AND METHODS

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Data quality is the greatest challenge for companies in the context of data analytics in 2020 (Trakken, 2020). This shows that data quality in the context of modern digital methods of information acquisition is a highly relevant part. This research paper aims to answer the following research question: “Which methods and tools are suitable for implementing data quality improvements in the area of data analytics?”

For this purpose, studies and empirical surveys are included in the consideration as well as a detailed literature research that scientifically deals with the topic of improving data quality. First of all, all relevant studies in this context are identified by means of a keyword-based literature search in

the Scopus, Springer and ScienceDirect database. Second, all identified studies are analyzed and summarized regarding their relevance and research goals. In a final step, the results of the literature analysis are structured, clustered and verbalized. At the same time, scientific studies are evaluated and analyzed.

In order to precisely examine the suitability of methods and tools for improving data quality, it is still necessary in advance to illuminate the process for comprehensive data quality management. This is relevant insofar as the methods and tools for improving data quality are embedded in the process of data quality management. Data quality can also

be split into different dimensions and categories, which should be integrated into the data quality management process (Wang and Strong 1996 and Lee

et al. 2002). At this point, the process of data quality management is derived from the plan-do-check-act cycle according to Deming (Deming, 1986).

### 3 RESULTS

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How successful data analytics instruments are depends to a large extent on the quality of the data and, ultimately, on the mechanisms and processes that are responsible for cleansing and quality assurance. This is also shown in the results of the research analysis. On the one hand, it has been shown that it has recently been possible to use specific machine learning methods to detect and correct data errors. This is due to the fact that the technical infrastructure is only suitable for this now. On the other hand, it is also important that the concept

of data quality is not based exclusively on technical methods and instruments. The topic of data quality should be understood as a system that should be lived in the minds of employees (English 1999). The methods and instruments to increase the data quality for data environments can be classified in three ways.

1. Appropriate statistical methods and tools
2. Mindset of employees
3. Technical infrastructures for the methods and instruments

### 4 CONCLUSIONS

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With the new digital possibilities of data analytics, the quality of the data is particularly of great importance. The paper shows the state-of-the-art possibilities of how data quality can be improved in a company using statistical methods, but also how employees can make their necessary contribution in

the process of data quality management. The literary review and the analysis of studies and surveys are suitable for developing a deep understanding and better classifying the topic of data quality and data quality management. It also provides the starting point for further research in the subject area.

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# CZECH WINE REGIONS IN THE CONTEXT OF VISITORS' HAPPINESS

Andrea Králiková<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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happiness, visitors' happiness, wine tourism

## JEL CODES

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Z330, Z332, M310

## 1 INTRODUCTION

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In regard to the current pandemic situation, it is even more crucial for the tourism industry to secure the loyal visitors. Not only are the marketing costs for attracting loyal visitors lower than attracting first-time visitors, loyal visitors will also spend more time in the destination as well as they will use various services in the destination more intensively (Lau and McKercher, 2004). It is therefore inevitable to know which factors have an influence on visitors' loyalty. Based on the previous studies, some of those factors are satisfaction (Yuksel et al., 2010), motivation (Yoon and Usal, 2005), perceived value

and quality (Petrick et al., 2001), culture differences (Chen and Gursoy, 2001) as well as an image of the destination (Bigné et al., 2001). However, none of these factors are primarily focusing on visitors' feelings and emotions. Therefore, the primary focus of this paper lies in the happiness of visitors, that is perceived as a presence of positive emotions and the lack of the negative ones (Karavadic and Baumann, 2014). Hence, the happiness might be the factor that will accurately reflect the visitors' feelings and emotions.

## 2 MATERIAL AND METHODS

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The goal of this paper is to closely examine the domestic visitors' happiness in Czech wine regions. In order to fulfill this goal, the primary data among Czech visitors of two main wine regions (Bohemia and Morava) were collected, using quota sampling based on gender and age. Five-point Likert scale was used with regard to formulating the questions regarding the visitors' happiness. More specifically two happiness indicators were used. The first one being that the stay in destination made visitors

happy and the second one is whether the stay in the destination contributed to their happiness. Furthermore, Kruskal-Wallis test was used in order to evaluate the dependence of visitors' happiness on their personal characteristics, like gender or income (Leard statistics, 2018). To closely analyze the visitors' happiness in the Czech wine regions, the visitors also answered an open-ended question regarding what makes them happy in the wine destination.

### 3 RESULTS

There are three personal characteristics that have an impact on the happiness indicator, that the stay in the destination made visitors happy. The first characteristic is the gender of respondents, where the women evaluated this indicator higher than men. Same goes for the second characteristic, the income of respondents. Those with a monthly income lower than 30 000 CZK (approximately 1 155 EUR), evaluated the indicator higher. Finally, the third characteristic is the frequency of visit. Those respondents, who are visiting the wine regions more than three times per year evaluated this indicator

higher. Similarly, for the second happiness indicator. The gender of respondents as well as the frequency of visit has the same impact as for the first happiness indicator.

By looking at the open-ended question of what makes people happy in the wine destination, there are three main characteristics that respondents mentioned. The most frequently mentioned one was wine (mostly the quality of wine), followed by the nature surrounding the vineyards, as well as the peace and quiet.

### 4 CONCLUSIONS

This study provides a brief overview of visitors' happiness in Czech wine regions. Generally speaking, women were happier in the Czech wine destinations than men. Furthermore, the happiness level was increasing by the number of visits to the particular destination. On the other hand, what made visitors happy were the key features of wine tourism (wine,

nature as well as the peace and quiet), which is a good sign for the service providers in his area. They can use this information to easily secure loyal visitors and better target the marketing strategy. The further research could therefore focus more on the particular happiness factors and their influence on the visitors' happiness.

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# CYCLING TOURISM CERTIFICATION AND ITS JUSTIFIED ROLE IN WINE TOURISM IN ZNOJMO SUBREGION

Patrik Kubát<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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enotourism, tourist certification, cycling tourism, the Czech Republic

## JEL CODES

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Z30, Z32, M30

## 1 INTRODUCTION

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Ryglová et al. (2011) points out to new forms of tourism emerging in the Czech Republic. The development of specific forms of tourism has been observed since 2001, such as: agritourism, congress tourism and cycling tourism (Han et al., 2020). Many travel agencies responded to the development of cycling tourism and began to offer cycling tours. The Czech Republic is unique in Europe due to the density of its cycling routes, in 2011 it was 37.000 km of cycling routes (Ryglová et al., 2011). To guarantee high-quality services among the territory with cycling routes a certificated system of facilities has been implemented in the Czech Republic. Example of certification applicable within rural tourism with emphasis on wine and cycling tourism is a certification Cyclists Welcome (Cyklisté vítáni) (wineofczechrepublic, 2018). This certification is in operation from 2005 and it is granted by the Partnership

Foundation (Nadace Partnerství) which is dedicated to the coordination of events and tourist infrastructure on the Moravian Wine Trails (Nadace Partnerství, 2020; Flamik, 2014).

The aim of research was to present the qualities and shortcomings of a certification operating in the area of tourism, especially wine tourism. A point of view directly from certificated facilities can be beneficial for the certification itself in a way of expressing information from the “inside” and not merely from the management of certification. The findings may be important not just for certification providers for further development and improvement of the insignia but also for already engaged facilities as well for those who are not yet involved and may consider this step of involvement.

## 2 MATERIAL AND METHODS

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The primary data have been obtained from the online questionnaire survey with certificated objects in the Znojmo wine subregion. Questionnaires were consisted of closed, open and identification questions; with a total of 28 questions. In some questions a Likert scale was applied. Contacted have been just facilities certified by a certification Cyclists Welcome. Generally, are four

categories to which certificated facility belongs. The total number of certificated facilities in Znojmo subregion is 31, where 61.3% (N=19) of them cooperated in this research. Responses were collected from March to April 2020. Contingency tables as well as absolute and relative frequencies and arithmetic mean were carried out.

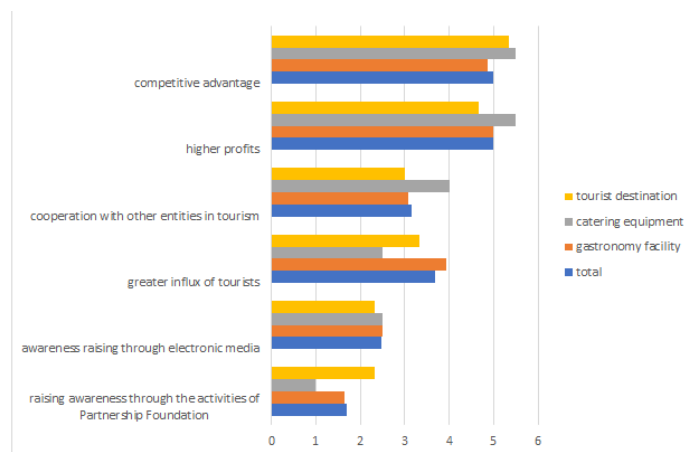


Fig. 1: Benefits of the certification by three types of the facilities, average points from Likert scale (Balharová, 2020)

### 3 RESULTS

In association with the Znojmo wine subregion certified facilities most often perceive as an advantage the tradition of viticulture and events such as the Znojmo Vintage, wine degustation and undoubtedly cycling. Communication with a management of the certification was another significant advantage. Further benefits of the certification may be seen in the Fig. 1. The biggest disadvantage of the certification is the implementation of equipment for cyclists for the facilities such a dry storage place for bicycles or tools for reparation. Another disadvan-

tage is missing of own databases about the visitors' attendance before and after they have been certificated. Implementation of this kind of certification, not just in the Czech Republic is beneficial. Beanland (2013) recommends developing a similar system of certification in the UK with the same goals for better marketing communications and partnerships. The inspiration was taken in Germany with project Bett und Bike or in Netherlands by Fietsers Welkom, as well as in the Czech cycling tourism certification Cyclists Welcome.

### 4 CONCLUSIONS

Research shows that certifications, for instance like the cycling certification Cyclists Welcome, have potential for the future and can be a crucial component in the development of cycling in the region. The facilities are

interested in this certification, due to the desire to repeatedly certify their facilities. It is therefore likely that the certification of these formats will increase in the future due to the interest of the facilities in these certifications.

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# PERSONAL DATA PROCESSING IN THE ACADEMIC CONDITIONS USING THE MODERN INSTRUMENTS OF GROUP ELECTRONIC COMMUNICATION

Libor Kyncl<sup>1</sup>, Michelle Jantulíková<sup>1</sup>, Katarína Kovalčíková<sup>1</sup>, Stratos Zerdaloglu<sup>1</sup>, Oldřich Trenz<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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Microsoft Teams, GDPR, privacy, privacy policies, data processing, group electronic communication, online communication tools

## JEL CODES

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K23, K24, I23

## 1 INTRODUCTION

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Much has changed in the online world in 2020. Businesses switched to the home office, students switched to online learning and it was necessary to find suitable online tools for communication. Compared to 2018, the global Internet population increased from 4.3 billion to 4.5 billion users, and compared to January 2019, the Internet population increased by up to 6%. In 2020, every minute of our

day on Zoom hosts 208 333 participants in meetings, in WhatsApp users, share 41 666 667 messages, 1 388 889 people make video or voice calls, on Facebook users share 150 000 messages and on Microsoft Teams are connected 52 083 users. (Ali, 2020) However, as the Internet population grows, so do the risks associated with the online communication environment and the online environment as a whole.

## 2 MATERIAL AND METHODS

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At the beginning of our research, we selected the most used online communication platforms in our latitudes in the Czech Republic based on experience and interviews incl. Microsoft Teams (Microsoft, 2020). We have described their operation advantages and disadvantages of use. We then summarized these tools to make it easier to understand the advantages and disadvantages of using them.

The quantitative questionnaire was attended by 959 respondents who are part of our organization and

have some relationship to the university (student, academic worker, non-academic worker, alumnus/a or other relationship). Based on the answers, we selected a representative sample for our qualitative research. For quantitative questionnaire, we used closed-ended questions. The questionnaire was created in a Czech and in an English version. The second part of our research was the qualitative research. From 80 respondents who provided us with their e-mail addresses for this research, we selected

10 respondents so that they represented the group depending on the person's relationship to the university. We decided to do qualitative research again using Google Forms, but using open-ended questions,

incl. the description of the person's relationship to the university and the person's relationship to IT (IT student, interest in IT, IT worker).

### 3 RESULTS

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We intended to find out the opinion and knowledge about personal data protection in the organization and also based on these answers and also our research to make recommendations on how to protect your personal data in online group communication tools. Based on our finding from our research, we prepared a set of recommendations that we believe would help the academic institution with personal data in modern electronic group communication. These recommendations were also rated by our research attendees in the qualitative questionnaire, where they received quite a positive response. We believe that these recommendations will be valid not only for our organization but for any university.

1. We recommend that academic institutions tighten up measures as well as practices regarding the protection of personal data in online communication.
2. To offer employees, professors, or students the course or the training.
3. To offer professors and staff the course on safe leading the online meeting.
4. We recommend to universities or other academic faculties, to have pre-set private accounts, files and folders.
5. To spread awareness of the importance of reading privacy policies on various tools or websites, as well as checking private settings in individual tools.

### 4 CONCLUSIONS

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Based on qualitative research, we perceive differences in understanding and awareness of how dangerous ignorance of personal data in online communication tools can be. Perhaps another solution will be to show the "price" of their personal data which could lead to acquirement of a higher awareness about the power of their data in the digital market and an effective empowered for the protection of their personal data

and overall privacy. (Malgieri, 2018) Or to show them how their actions and position towards personal data affects they live, future and future procedures in similar instruments, applications or websites. There is a great difference between those who are interested in IT and those who are not. Everyone is aware of the importance of protecting their data, but not everyone is doing anything about it.

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# IMPACT OF DIGITAL SUPPORTED PROCESS WORKFLOW OPTIMIZATION FOR KNEE JOINT ENDOPROSTHESIS IMPLANTATION ON HOSPITAL-SPECIFIC PROCESS AND QUALITY RATIOS

Benjamin Lahmann<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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quality management, digital workflows, operating room, healthcare system

## JEL CODES

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C12, I15, L15

## 1 INTRODUCTION

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In view of the constant change in the German healthcare system due to regular political health reforms, German hospitals are increasingly forced to improve their efficiency while at the same time trying to enhance their quality standards. In surgical departments, the main treatment takes place in the operating room (Behar et al., 2018). When it comes to increasing efficiency and quality in the operating room, the reduction of processing times is of crucial importance. Standard measures are run-through times and subsequently also the total hospital stay time. Thus, the efficiency and quality of surgical workflows are decisive for the subsequent treatment efficiency (Divatia and Ranganathan, 2015). Digital workflow support systems in operating rooms are

supposed to improve operational efficiency and reduce failure rates (Feige et al., 2017). The objective of this study is to analyse if the use of a digital support software (SPM) has a positive effect on selected clinical process and quality ratios in trauma surgery. This will be evaluated in a retrospective case-control study with data from knee joint endoprosthesis implantations in a German hospital. In retrospective clinical case-control studies, it is important that the patient groups of both studies are as comparable as possible, so that pretest matching to balance the covariates is indicated. Otherwise, too many factors would bias the results and thus reduce internal validity (Rosenbaum and Rubin, 1983; Garrido et al., 2014).

## 2 MATERIAL AND METHODS

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The study is based on a raw data set of 297 knee joint endoprosthesis implantations realized at a German hospital in the period from 1 January, 2016, to June 30, 2020. The surgical team switched

from conventional non-software guided operation procedures to SPM guided processes by June 21, 2019. That means the raw dataset contains 257 pre-

SPM implementation surgeries and 40 post-SPM implementation surgeries.

By using SPSS 27 a propensity score matching pretest with nearest neighbour matching is performed to comparably balance the groups with regard to the named covariates: Stationary treatment, Coded DRG, Main diagnosis M17.1 Gonarthrosis, Type of operation, Priority of surgery, Operation time, Type of implant, Gender, ASA Score, Surgeon, Age. After matching the final data set contains

70 patients, 35 patients each in the control and treatment group. Based on these data, hypotheses for efficiency and quality parameters will be tested. After testing the assumptions of normality and variance homogeneity, a t-test of means equality is conducted to assess whether the SPM and no-SPM samples differ in efficiency parameters. An odds ratio calculation examines whether the SPM and non-SPM subsamples differ in the quality parameter D62 acute hemorrhagic anemia.

### 3 RESULTS

After the estimation of propensity scores with a logit model, the groups are balanced with regard to the covariates mentioned above, so that the clinical and socio-demographic characteristics of patients in both groups are comparable and bias are reduced.

The *t*-test of means equality shows that SPM supported interventions significantly differs from no-SPM ones for hospital stay time and recovery room time, while the other tests on differences for run-through times show no significant differences between the groups. Hospital stay times are with 8.20 days as compared to 10.13 days without SPM significantly

(*p*-value 0.018) shorter for SPM treated patients. The duration of recovery room time is with 96.66 minutes as compared to 116.86 minutes without SPM also significantly (*p*-value 0.007) shorter for SPM treated patients.

The odds ratio for D62 is 0.589, which implies that the chance for the occurrence of D62 is 40.2% lower within the SPM group or 1.318 times higher within the no-SPM group compared to the SPM group. The confidence interval for the odds ratio includes one, so that the calculated odds ratio is considered for not being statistically significant.

### 4 CONCLUSIONS

Obtained results show that the application of digital workflow support software for knee joint endoprosthesis implantations significantly reduces patient's hospital stay time and recovery room time, but does

not influence operation times itself. No significant effects could be confirmed for the quality parameter D62 acute hemorrhagic anemia.

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# A BUSINESS MODEL INNOVATION METHODOLOGY FOR ESTABLISHED ORGANIZATIONS: SYSTEMATIC THEORY VALIDATION

Michael Lang<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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systematic theory validation, business model, business innovation, organizational mindset, focus group workshop.

## JEL CODES

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A11, A12, A14

## 1 INTRODUCTION

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*“One secret to maintaining a thriving business is recognizing when it needs a fundamental change.”* – Johnson, Christensen, and Kagermann (2008, p. 50)

In reference to Rogers (2016, pp. 1–18) and Wördenweber (2012, p.12), there is a lack of understanding how the mindset of organizations affects how it handles business model innovation. In contrast to that, Franke and Zu Knyphausen-Aufsess (2014, p. 35) and Bettis and Prahalad (1995, p. 7) highlight that there is evidence that overcoming the organization’s present culture is a major challenge in business model innovation. The research of Lang (2020, pp. 435–449) underlined that current theoretical methods for business model innovation don’t deliver the desired answers to the ongoing changes in a disruptive business environment. For this reason, the research goal is to present a business model innovation methodologies which integrates the overcoming

of incumbents’ organizations mindset and to validate it in practice by focus group workshops in different industries. More precisely, the following questions shall be answered through a systematic literature review:

1. What are the characteristics of a business model innovation methodology which supports the overcoming of organizational mindset of incumbent companies?
2. How can the business model innovation methodology can be validated in practice?
3. What are the key learnings of the theory validation and how does the model innovation methodology needs to be refined to cover the key learnings?
4. What are recommended further investigations on the topic business model innovation and organizational mindset for future research?

## 2 MATERIAL AND METHODS

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For validating and refining the preliminary results of the business model innovation methodology is applied and tested in focus group workshops. The workshops are executed in total nine time and three

times per business sector with teams of the following industries:

- *Automotive*: Workshop with an automotive supplier for bearings, transmissions and clutches who

is challenged by developing digital competencies for their business field.

- *Home Appliances*: Workshop with a home appliance producer who is executing a dual transformation methodology of products and digital services.
- *High-Tech*: Workshop with a consulting company in the high-tech business sector. The company's

business model is in a transition from project to an overall partner business.

*Overview of Structure for Focus Group Workshops (n = 9)*: The workshop structure covers the agenda with its four steps each with goals, applied methods and tools. The applied workshop methods are consolidated into the phases Initiation, Co-Sensing, Presenting and Creation.

### 3 RESULTS

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*Focus Group Workshops Processed (n = 9)*: Concluding, the methods of the business model innovation methodology are successful in identifying relevant levers for disruption. Even several starting points for new disruptive business models are found. However the groups could not come down to final business model canvas. For the future, a rating system for

the existing ideas and which one to work out in a first business model canvas draft should be integrated. Only discussing the ideas leads to no results. Moreover, for the future, it may be helpful to integrate a design thinking workshop to get a clearer picture of the potential customer segment.

### 4 CONCLUSIONS

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In the following, the findings of the focus group workshops are utilized to assess the generated methodology and implicate appropriate refinements to increase its suitability for generating business model innovations with disruptive potential. In general, focus group participants agree with the overall methodology and composition of the methodology. Nevertheless, regarding the distinct phases and steps, specific remarks and recommendations, based on experiences, are given, to increase the methodology's appropriateness. Subsequently, the assessment of the methodology is outlined and refinements are elucidated. The participants' feedback during the focus

group workshops implicate that aligning the process of overcoming the organizational mindset with the business model innovation process, is more effective than implementing a prepending phase to it, in order to address the dominant logic. Consequently, the methodology's overarching methodology of aligning the business model innovation process to Scharmer's (2016, pp. 113–226) Theory U to overcome the dominant logic, create a new mindset and, thus, enable the identification and exploitation of disruptive opportunities, is considered sufficient. With regard to this methodology assessment, alterations and refinements can be derived.

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# MODERN BUSINESS MODEL INNOVATION METHODOLOGIES: A SYSTEMATIC LITERATURE REVIEW (2015–2020)

Michael Lang<sup>1</sup>

<sup>1</sup>Mendel University in Brno, Czech Republic

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## KEY WORDS

systematic literature review, strategy, business model, business innovation, organizational mindset, dominant logic

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## JEL CODES

A11, A12, A14

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## 1 INTRODUCTION

*“The reason why it is so difficult for existing firms to capitalize on disruptive innovations is that their processes and their business model that make them good at the existing business, actually make them bad at competing for the disruption.”* – Bower and Christensen (1995)

No matter the industry, one common phenomenon has been witnessed within the last years: start-up companies were able to disrupt existing markets in a way that forced incumbent companies to either leave the market or declare bankruptcy altogether (Rogers, 2016, p. 210). However, established companies have already recognized the threat and importance of business model innovation. The problem with established companies is not seen in recognizing the

importance of investing in business model innovation, but rather on how to do it effectively. However, this leads to the question how existing scientific literature acknowledges and counteracts the blinding effect of incumbent organizations. More precisely, the following questions shall be answered through a systematic literature review:

1. What is the current status of research on modern business model innovation methodologies published 2015–2020?
2. What are special characteristics of the business model innovation methodologies focusing on their process model?
3. How is the overcoming of organizational mindset enclosed in their different process steps?

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## 2 MATERIAL AND METHODS

The research strategy is covered in a research funnel, which is composed of four phases. The first phase is a preliminary research with the goal of identifying valid open-access research papers in English language through a keyword search. The results are assessed in the primary screening by applying selection

criteria. The secondary screening evaluates if the present studies cover a business model innovation methodology by screening the abstracts. In the final screening, the identified methodologies are selected if they contain the dimension “process model”.

### 3 RESULTS

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*Descriptive Results of Studies (n = 14)*: The first research is focused on academic articles in English language covering the keyword “business model innovation” in the title. This leads to a first result of 287 articles. Further research with combination of “business model innovation” and keywords “methodology”, “approach”, “strategy” and “process” creates 35 additional results. The keyword “phases of business model innovation” leads to one additional article. However, the 36 additional articles are reduced during the three screening phases down to five studies. Finally, 14 studies are identified for further comparison. The methodologies, published between 2015 and 2020 focus on one of the topics “business transformation”, “digitalization”, “sustainability” or “circular economy”.

*Qualitative Results of Studies (n = 14)*: To generate findings on the current research status on process steps, the process models of the selected 14 studies

are also evaluated. After clustering the process models of the 14 studies shows that out of the generally accepted steps analysis, creation, implementation and steering only analysis and creation are part of all 14 scientific studies. The process steps analysis and creation are solely included in all 14 studies. This reveals that research primarily concentrates on those two steps. Thus, it is concluded that to innovate business models, all common business model elements and process steps need to be covered by the respective approach. Despite the extensive research on process models, the role of organizational mindset is only addressed by the following three methodologies Adrodegari, Pashou and Saccani (2017, p. 107), Vorbach, Wipfler, and Schimpf (2017, pp. 382–385), Pieroni, McAloone and Pigosso (2018, p. 2523). They acknowledge organizational mindset as an innovation barrier however do not give concrete advice how to overcome it.

### 4 CONCLUSIONS

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The main objective of the systematic literature review is to generate findings about the status quo of research on business model innovation with a special focus on organizational mindset. This is realized through an evaluation of 14 selected studies identified in a consecutive selection process of three phases. The research creates evidence that all analyzed studies have a different focus on one of the mega-trends

“business transformation”, “digitalization”, “sustainability” and “circular economy”. An important finding is that overcoming the organizational mindset as a main barrier in business model innovation is mentioned by three studies but not systematically integrated in any of them. In summary, the findings highlight that the current research is not sufficient and further research has to follow.

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# INTRODUCTION OF ROBOTIC CARE: RISKS AND BENEFITS IN THE AREA OF ETHICS

Birgit Lehner<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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robotic care, hospital management, ethics, autonomous systems

## JEL CODES

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I19, O33, Z13

## 1 INTRODUCTION

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Shortage of nursing personell is enduring and only solvable with technical aids, e. g. care robots. Their introduction in a hospital has a big organizational impact with risks and chances. The management has to take into consideration not only technical and financial issues, but here also the ethical dimension, which has effects on acceptance by customers (i. e. the patients), legal requirements and staff recruiting. Managers, who are used to make decisions based

on numerical key figures about measurable facts like sales and profit, now are confronted with the additional necessity to cope with ethical concerns. Here I try to provide an overview of the ethical aspects of a robotic care introduction strategy in a hospital especially including the situation of fast technological progress towards artificial intelligence and autonomous robots.

## 2 MATERIAL AND METHODS

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Up to now autonomous ethical systems are subject of philosophical reasoning, but at present time not available, so that microeconomic considerations about practical use are not yet relevant. But this can change disruptively with the next few generations of computer technology. Robot ethics is today a field of intensive research in philosophy, religion and technology assessment, but with upcoming use of robotics in the healthcare sector hospital management needs a guideline for the ethical aspects of an practical introduction. So after a research of the philosophical and religios literature I try to design and evaluate possible scenarios.

There are three basic approaches to ethics: A set of rules, which tell what is ethically good independent

of the outcome (duty based or deontologic ethics), an orientation on the attitude of the actor (ethics of attitude, founded by Aristoteles) or the evaluation of the outcome (the utilitarian point of view). German law follows the rule approach – no life may be sacrificed for the rescue of more lifes, except when very much people are hurt; then the doctor has to act as efficiently as possible. Which approach will robotic care follow? Is it prescribed by law or can patients choose? How stable are legal requirements? What influence does the public opinion and social media have? All these are “soft” factors, which can hardly be quantified. So it’s difficult to derive key figures as usual in financial management. More promising is a kind of scenario analysis.

### 3 RESULTS

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Scenarios like “legal requirements are stable and also flexible, so that to the patient can be offered diverse ethical configurations” can be characterized with properties like “stability”, “clearness”, etc. and for each of these properties the effects on risks, costs and benefits can be judged, e. g. flexible legal demands can facilitate bespoke offerings to patients with various confessions, which is an advantage in marketing.

The coming developments concerning the ethical issues of robotic care are not only quite unpredictable, moreover one has to be prepared for sudden even fundamental changes of important circumstances, e. g. by a data protection scandal, and it’s

important to have in advance a strategy to react on the transition between differing scenarios. For this among others watching the public discussion and trends in the social media is essential.

A computer application, which is already in use and will probably foster autonomous robots is “robotic process automation” (RPA), which tries to automate office tasks by simulating the inputs of a human user. With artificial intelligence more complicated tasks can be automated and as soon as ressource allocation is done with RPA, in the health-care sector these are also ethical questions, which have to be decided in advance when programming these systems.

### 4 CONCLUSIONS

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Robotic care needs big financial investments and far reaching organizational changes, but a change in the surrounding conditions can render these investments more or less invaluable. So the best strategy could be to be at the forefront of mainstream to have a competitive advantage, but not too far ahead of it, because otherwise with a change in the conditions

the advantage can quickly mutate to a big drawback relativ to the other hospitals.

Ethic aspects are as essential as financial and technical ones when introducing robotic care; simple models are not appropriate, perhaps for example catastrophe theory can help when evaluating changes in the public opinion etc. With such an expanded toolset risk minimization can be adressed.

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# DESCRIPTIVE ANALYSIS OF GERMAN LISTED COMPANIES REGARDING CLIMATE-RELATED REPORTING

Julia Bettina Leicht<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

climate-related reporting, CSR-reporting, sustainability reporting

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## JEL CODES

M41, Q56

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## 1 INTRODUCTION

The research report of the “Institut der deutschen Wirtschaft” indicates that Germany will be affected by the impacts of climate change in the future. Therefore, it is important that companies, as active participants, are aware of the opportunities and risks of climate change and take action to deal with these (Biebeler et al., 2013). In this context, the relevant question is which effects the companies have on

the climate and how the climate will influence the company’s activities in the long-run. The importance of disclosing this information is increasing in order to establish transparency regarding shareholders and stakeholders. The objective of this work is to identify possible approaches for the modification of the current legal regulations and guidelines for climate-related reporting.

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## 2 MATERIAL AND METHODS

Previous studies have drawn on a self-developed CSR disclosure index (Gamerschlag et al., 2011). In order to achieve the objectives of this work, a disclosure index was developed with regard to the non-financial statement, according to § 315b and c HGB, of German DAX and MDAX companies. The survey was based on the non-financial statements published by the companies for the 2018 fiscal year or, if the fiscal year was different, the 2017/2018 financial year. After adjustment regarding missing reports, exceptions or financial statements under other reporting standards, the total population were 76 companies.

For the descriptive analysis, the number of most significant financial and non-financial performance indicators marked with the word most significant was measured. Furthermore, among the most significant performance indicators were those that were included in the business performance analysis, the Group’s position, the forecast and the forecast report. The performance indicators were also divided according to their content into non-financial and financial indicators. A content related to the environment was recorded separately. Furthermore, information was also recorded regarding the use of a framework, the place of publication, the number of words of the non-financial statement, the number of environment-

related goals of the company and if statements about the impact of the climate on the company

or companies on the climate were recorded (Leicht, 2019).

### 3 RESULTS

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The results of the descriptive analysis indicate that MDAX companies publish on average 0.07 more non-financial performance indicators than companies listed in the DAX. The study demonstrated that only a small number of environment-related non-financial performance indicators were published during the reporting period and that most of the companies are listed in the DAX. Furthermore, the analysis shows that around 67% of the companies analysed used a framework for disclosure, but only just about 40% of them use the same framework. Moreover, approximately 50% of the companies published

the non-financial statement within the consolidated annual financial statements. The companies did not disclose any information regarding the nature of the impact of their operations on the climate. Regarding the published environmental goals, more than half of the companies declared that they aim to reduce their CO<sub>2</sub> emissions. This was followed by environmental goals such as the minimisation of energy consumption, waste and water consumption. Other objectives were also mentioned for which the number of matching companies was lower or could not be catalysed.

### 4 CONCLUSIONS

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The findings of the descriptive research suggest that companies disclose climate-related information on a low level. Additionally it can be deduced that, due to the diverse activities of the companies, the

comparability of companies and transparency in relation to the financial statement addressees requires further specifications and legal requirements for the standardisation of climate-related reporting.

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# EVALUATION OF PRICE TRANSMISSION IN THE COMMODITY CHAIN

Jana Lekešová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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milk, dairy products, price transmission, Czech Republic

## JEL CODES

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Q11, Q13, Q14

## 1 INTRODUCTION

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Milk, which has become one of the most volatile agricultural commodities in the world, is considered to be the European Union's main agricultural product. Its instability was influenced by many independent factors that affected its availability and demand. The reason for maintaining and increasing herds of dairy cattle may be the growth of the

world's population, which affects world demand for food. Milk is characterized by high production productivity. The aim of the paper is to analyse the price transmission in the milk commodity chain, which can give information on uneven distribution of market power in the commodity chain.

## 2 MATERIAL AND METHODS

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The analysis of price transmission within the selected commodity chain used data for the period January 2002 to August 2018 in the form of monthly farm-gate prices (FP), processors (PP) and consumer prices (CP). The price transmission coefficient (EPT<sub>ij</sub>) was used to evaluate the intensity of price transmission, as used, for example, by McCorrison (2002), Blažková and Syrovátka (2012);  $EPT_{ij} = \frac{\delta p_j}{\delta p_i} \cdot \frac{p_i}{p_j}$ ;

where  $p$  denotes prices (FP, PP, CP),  $i$  and  $j$  denote a specific market level. Price transmission mechanisms play an important role in all models of global agricultural verticals (Sarris and Hallam, 2006). Based on regression models, positive and negative price differences are tested. Using the correlation coefficient, the intensity of the dependence of positive and negative price differences can be assessed (Lechanová and Bečvářová, 2006).

## 3 RESULTS

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Values of the EPT coefficients show the elasticity of price transfer on the supply and the demand side on the market (in the form of a matrix).

Inelastic price transmission was observed in the supply direction. A change in farm prices (FP) by 1% affected the processor market price (PP) by 0.34% and the consumer price (CP) by 0.51%

in the observed period. A price change of 1% on the market of processors (PP) brought the price change on the consumer market of 0.97%, i.e. retail companies increased or decreased prices (CP) almost proportionally to the price of processors (PP).

Inelastic transmission was also observed in the demand direction. A change in the price of processors (PP) by 1% brought about a change in the farm price (FF) by 0.5%, while the change in the price by 1% in the consumer market (i.e. CP) brought the price change of 0.22% in the agricultural producer market (i.e. FP). The change in price of 1% in the consumer market (i.e. CP) meant the change of 0.37% in the processor market (i.e. PP). As a result, retailing companies may exercise greater market power.

## 4 CONCLUSIONS

Based on the price transmission, it can be confirmed the growing significance of market power on the partial markets within the analysed commodity chain in the period January 2008 – August 2018, namely at the level of processor and trade. This is evidenced by the asymmetric price transmission and better price

Further, the values of the correlation coefficients indicating the intensity of the dependences of positive and negative price differences were analysed. It was confirmed that the price increases are better transmitted than price decreased from the farm market to the processor market. Between processor and consumer market no significant differences in the intensity of the dependences of positive and negative price differences were observed.

The results of the time lag analysis showed the speed of transfer of milk prices to the next stage – milk is a perishable product, therefore price changes on one market will be reflected very quickly in the price changes on the downstream market.

transmission in the case of price increases than in the case of price decreases. In the analyzed commodity chain of semi-skimmed milk production, an uneven distribution of economic forces can be observed, as the agri-food market is characterized by imperfect competition.

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# AI AS INVENTOR – A STATISTICAL ANALYSIS OF THE CURRENT STATE OF DISCUSSION IN PATENT LAW

Antje Lüersmann<sup>1</sup>

<sup>1</sup>*Comenius University of Bratislava, Slovakia*

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## KEY WORDS

AI, inventor, AI generated inventions, patent law, DABUS, industry 4.0

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## JEL CODES

K11, K33, C00

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## 1 INTRODUCTION

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The relationship between Artificial Intelligence (AI) and Patent Law is two-sided. On the one hand, we have AI as an object of patentable inventions; on the other, we have the question of protection of the work generated by AI.

The concept of AI was already developed in the 1940s. Today's AI – meant as “systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment [...], interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal“ [1] – appears in many different ways in everyday life and also in the corporate environment, for example through machine translation, face recognition on smartphones, online commerce through personalized advertising or dynamic pricing, medicine and care up to autonomous driving, financial forecasting or predictive maintenance. So

even an AI that makes autonomous inventions and files them for patent protection itself is no longer just a thought experiment [2]. In August 2018, two patent applications were submitted to the European Patent Office [3] [4], among others, in which an AI, “DABUS” [5], was named as the inventor. With reference to the currently valid patent law regulations within the EU, however, the naming of an inventor requires the naming of a human inventor (Article 81, Rule 19(1) EPC), who is a so-called natural person with legal personality, and so the patent applications were rejected by the EPO in December 2019 [6].

The present paper offers a statistical analysis of whether and to what extent the subject of such current technical developments in the field of AI with reference to patent law, and in particular the aspect “AI as inventor” combined with the question whether and to what extent the current patent law regulations can (still) cover these developments, is discussed in the legal community.

## 2 MATERIAL AND METHODS

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The data source for this paper are journal articles from 2015 onwards, listed in google.scholar, oxford academic, JIPLP and GRUR International. 2015 was chosen as a starting point responding to the date when the patent application concerning DABUS itself was filed [7]. Papers had to be written in English, as the search parameter were in English.

Search parameters were identified as "AI generated invention" OR AI Inventions AND Patent Law, supplemented by exclusions like -liability -tax -indien -india -taiwan -china -chinese -Japan -tokyo -australia -canada -canadian -Zealand -education -scholarship -medical -drug -plant -cancer.

## 3 RESULTS

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403 papers were selected in total. 17 of these were identified as relevant to the topic. 1 of these 17 articles appeared in 2015, 1 in 2017, 2 in 2018, 3 in 2019 and 10 in 2020. The papers classified as not relevant mainly resulted from generally inappropriate selection of topics (275) or inappropriate legal topics (55). Google.scholar has, with a share of 9 out of 298 articles, a hit rate of 3.02% referring to the share of relevant papers in the total number of articles

researched; oxford academic has, with a share of 8 out of 75 articles, a hit rate of 10.67%; JIPLP has, with a share of 0 out of 20 articles, a hit rate of 0.00%; GRUR International has, with a share of 0 out of 10 articles, a hit rate of 0.00%. 3 out of 10 articles in JIPLP were previously found in the google.scholar and oxford academic-search, as well as 5 out of 10 of the GRUR International-articles and thus not counted twice as relevant.

## 4 CONCLUSIONS

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Based on the question whether current technical developments in AI with reference to patent law are discussed just as up-to-date in legal science, it can be stated that from 2019 and significant from 2020 the number of articles published on this topic has increased, accompanied by the rejection of patent

applications for the inventions generated by DABUS in 2019 and the publication of this decision in the beginning of 2020. The topic has been included in the legal science discussion. According to the current status, there is no end in sight.

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# AI AS INVENTOR – A QUALITATIVE ANALYSIS OF THE CURRENT STATE OF DISCUSSION IN PATENT LAW

Antje Lüersmann<sup>1</sup>

<sup>1</sup>*Comenius University of Bratislava, Slovakia*

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## KEY WORDS

AI, inventor, AI generated inventions, patent law, DABUS, industry 4.0

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## JEL CODES

K11, K33, O30

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## 1 INTRODUCTION

Artificial intelligence technologies have come to stay. Already now, AIs that make inventions on their own and then apply for a patent themselves are reality. It is therefore necessary to clarify under patent law how to deal with innovations that are created by an AI without a human inventor being involved in any way. The patent application filed with the European

Patent Office and others, in which an AI was named as inventor (DABUS [1]), was rejected with reference to the currently valid patent law provisions.

This paper offers the qualitative analysis of a former literature search dealing with the current state of discussion in the legal community concerning the topic “AI as Inventor & Patent Law”.

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## 2 MATERIAL AND METHODS

In order to identify the current state of research in the field of “AI as Inventor & Patent Law” the underlying relevant literature, identified in a former search, is reviewed based on the three-step analysis by Webster

and Watson [2] and clustered into groups by using the qualitative research tool “MAXQDA”.

The following main cluster (codes) were created, each with further subcategories:

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## 3 RESULTS

The detailed analysis of the relevant articles shows, besides information about what exactly constitutes a modern AI and what characteristics it has and thus seen as the most disruptive technology in history, that some authors consider the current patent system to be suitable to cover the current technical developments related to AI systems as an

inventor. The majority of the authors are critical of this, consider the current patent system obsolete, inapplicable and irrelevant with regard to inventions created by AI systems. In addition, the authors argue that the identification of a human inventor is no longer relevant, and that inventions are no longer made by a single inventor, whether human

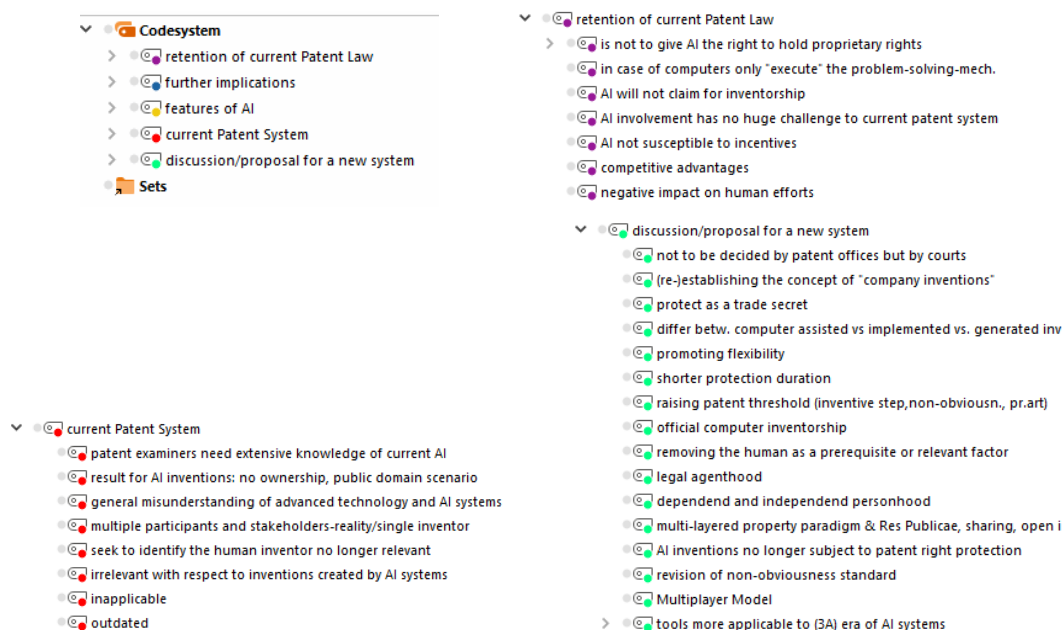


Fig. 1: Main cluster (codes); extract from the codesystem with subcategories

or not. Furthermore, the existence of a general misunderstanding among policy makers regarding advanced technology and AI systems is mentioned. Accordingly, recommendations are made, on the one hand with regard to general technical questions concerning the state of the art, but also in detail with regard to more complex, still unanswered questions on legal issues such as copyright, criminal or tort law. The focus of the articles analyzes proposals for a new approach to patent law. The focus is on aspects such

as open source, sharing, licensing systems and multi-layered property paradigm, as well as the shortening of the duration of protection, the discussion of different personhood-variants and the approach that AI inventions should no longer be subject to patent law protection, depending on the exact technical status of the AI invention, i.e. computer-aided, -implemented or -generated invention. Exemplary representation of the code-system (excerpts):

## 4 CONCLUSIONS

Since the current research has not yet been finally finished, the current analysis based on only 16 articles, it is not possible to draw a conclusion. However, what can already be said from the result of the literature analysis is that the discussion on the topic is in full swing. The arguments and solution approaches are broadly based. Besides authors who consider an amendment of the patent law to be

necessary, there are also authors who consider the current system to be sufficient, so that it can be assumed that the discussion is not yet concluded, especially as further studies and discussions on the capacity of inventing AI and a broader technical inquiry concerning the technical state of the art is recommended by the authors themselves.

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# REPORTING OF NON-FINANCIAL INFORMATION FROM THE PERSPECTIVE OF AUDIT COMPANIES

Ivana Malinková<sup>1</sup>, Petra Zeráková<sup>1</sup>, Tereza Lázničková<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

directive 2014/95/EU, non-financial information, social responsibility, assurance, environmental and social impact

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## JEL CODES

M40, M41, M42

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## 1 INTRODUCTION

Directive 2014/95/EU of the European Parliament and of the Council amending Directive 2013/34/EU as regards the disclosure of non-financial and diversity information by certain large enterprises and groups was issued in 2014. (The European Parliament and the Council, 2014) This directive aimed to increase the transparency of social and environmental

information provided by companies from all sectors in all Member States. (Knížek, 2015) Reporting non-financial information is perceived as a fundamental step towards a sustainable global economy combining long-term profitability with social justice and environmental protection. (Čevela, 2016)

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## 2 MATERIAL AND METHODS

The aim of this paper is to determine the quality and quantity of non-financial reporting in the Czech Republic, based on a survey conducted at the so-called Big 4, which includes the four largest audit companies – KPMG, Deloitte, PricewaterhouseCoopers and Ernst & Young. These companies act as experts in the field of consulting and provision of services with regard to the preparation of non-financial statements, especially for large companies. The aim was to find out the opinions of selected companies whether the non-financial information published by the companies is significant and useful.

The study was conducted through a survey, in which respondents were asked several questions. Emphasis was placed on questions concerning the provision of services in connection with the preparation of non-financial statements, the extent to which the companies surveyed contribute to the identification of published information and the share of companies required to report non-financial information by law. To achieve these objectives, standard scientific methods for reporting non-financial information, comparative methods and descriptive methods will be used.

### 3 RESULTS

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In connection with the reporting of non-financial information, all the companies contacted provide advisory services with regard to the reporting of non-financial information, especially for large companies. However, it should be noted that the main reason for using the services of these companies is not cooperation in the field of non-financial reporting. This area is rather an additional service of audit companies. Clients with the obligation to report non-financial information decide for themselves to what extent they will use the services of audit companies.

The reason is the fact that many clients already have several years of experience with this reporting. The requirements of the NFRD transposed into Czech legislation represent a bare minimum, which does not guarantee sufficient and relevant publication. Companies are aware of the dual importance of non-financial reporting, ie financial significance and social and environmental impact. Thanks to this awareness, companies can change the way they behave and at the same time there can be an impulse to continuously improve their corporate culture and policy.

### 4 CONCLUSIONS

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The new regulation aims to achieve a higher level of transparency of social and environmental information provided by companies in all sectors. Due to the very limited scope of organizations that are required to report under the NFRD (as transposed into Czech legislation), it cannot be considered as the main driving force for improving the availability and quality of non-financial information. The reason is that the reporting of non-financial information

is obviously fragmented and unsystematic, which in most cases results only from the general legal requirements for non-financial reporting in the Czech Republic. There is no requirement for mandatory reporting and external verification is limited to verifying the existence of the report but not to the reliability of the reported information. Most developments take place only on a voluntary basis in the private sector.

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# THE EUROPEAN CORPORATE GREEN BOND MARKET – QUO VADIS?

Samira Meier<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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fixed income, sustainable finance, climate finance, green bonds

## JEL CODES

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G15, G23, G29

## 1 INTRODUCTION

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Impact of carbon emissions, global warming, and climate change mitigation are on everyone's lips and inspire numerous innovations in various industries. The financial industry has not been untouched by these pressing issues and a new financial instrument is celebrated as the industry's solution to climate change: Green Bonds (Tuerk, 2019; Morgan Stanley, 2017). This article analysis the structure of Europe's corporate Green Bond market and sheds light on likely future directions of developments. Against this background, the following research questions are discussed: How is the corporate Green Bond market in Europe shaped and what impacts the direction of development of this market? The breakdown of corporate Green Bond issuers by country in Europe reveals that most of them are located in France and the Netherlands, as well as in Italy and Spain. German corporates appear underrepresented and lagging behind. Underlying reasons may be connected

to the country's largest groups of issuers, namely the real estate and automotive companies, which are currently undergoing substantial transitions. The vast majority of academic works on these financial instruments focus on pricing benefits paid by (ESG)-investors for the explicit characteristics of a Green Bond. Scholars suggest diverse designs and models to calculate potential price advantages of Green Bonds. Interestingly, there appears to be no clear positioning among academics on this topic (see, Zerbib, 2016; Karpf and Mandel, 2018; Clapp, 2018; Gianfrate and Peri, 2019; Hachenberg and Schiereck, 2018).

The study at hand extends existing literature on Green Bonds by providing a detailed analysis of structure of the corporate Green Bond market in Europe. Emphasis is placed on the overall market structure with regard to issuance volumes, as well as diversification by country and industry.

## 2 MATERIAL AND METHODS

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In order to undertake this analysis, a Green Bond data bank had been built, which consists of all Green Bond tranches issued by SSAs, FIs and Corporates world-wide. In a first step, relevant data has been extracted from Dealogic, as well as the Bloomberg

Terminal. If bonds have been issued based on a Green Bond Framework, both systems flag these bonds by including the label "Green Bond", e.g. Bloomberg specifies in the field "use of proceeds" if a specific bond is "green". Currencies have been converted to

the Euro equivalent. As two data providers have been consulted, the underlying data base is highly likely to comprise all corporate bonds issued under the Green Bond label. For the detailed of corporate Green

Bonds, the data set has been narrowed to benchmark issuances (issuance volume of at least EUR 500mn). In total, the data base comprises 2521 individual tranches for the years 2007–2019.

### 3 RESULTS

With issuance volumes significantly increasing over time and various types of issuers selling Green Bonds, it is demonstrated that this asset class became more and more prevalent, especially in the recent past. Remarkably, Green Bond issuance by corporates quickly gained traction with this issuer group selling the greatest amount of Green Bonds in 2019 (by volume and number of tranches).

The breakdown of corporate Green Bond issuers by country in Europe reveals that most of them are located in France and the Netherlands, as well as in Italy and Spain. Germany's and the Nordic's role is rather trifling. This comes as a surprise since governments and civil societies in these countries place great emphasis on sustainability and effective climate change mitigation strategies.

Surprisingly, the German corporate Green Bond market appears to be lagging behind. Underlying

reasons may be connected to the country's largest groups of issuers, namely the real estate and automotive companies. The latter are currently undergoing substantial transitions and still define their role with respect to future mobility. However, nothing prevents German corporates to step up and meet funding needs for low-carbon production with the issuance of Green Bonds in the near future.

Looking ahead, topics relating to the aspired standardization process of the Green Bond Market are of great importance and most likely defining the future of this market segment. Moreover, new financial instruments inspired by and closely connected to the Green Bond market have been established. These Green Bond-like instruments, namely Sustainability-Linked Bonds and Transition Bonds, are likely to give an additional boost to sustainable finance.

### 4 CONCLUSIONS

Green Bonds are the financial industry's approach to finance the transition of our economy to a more sustainable future and contribute to achieving the

sustainability goals outlined in the Paris Agreement. The article at hand provides a structural analysis of Europe's corporate Green Bond market.

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# OFFSHORE WIND TURBINE COST STRUCTURE ANALYSIS

Maximilian Meißner<sup>1</sup>

<sup>1</sup>*Comenius University in Bratislava, Slovakia*

## KEY WORDS

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renewable energy, climate change, wind energy, turbine cost, offshore wind turbine, CAPEX, cost breakdown

## JEL CODES

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E27, E37, G11

## 1 INTRODUCTION

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Scientists agree on one thing; climate change is real! The average temperature is rising and was never higher than in the 20th century. Therefore, in December 2015 in Paris the United Nations Framework Convention on Climate Change (UNFCCC) have signed the Paris Climate Agreement. The goal of this agreement is to keep the global average temperature well below 2 °C compared to pre-industrial levels. To reach this goal, member states declared to reduce greenhouse gas emissions by the end of the century. [1] Among all low-carbon technology options, accelerated deployment of wind power when coupled with deep electrification would contribute to more than one-quarter of the total emissions reductions needed. [2]

Since that, offshore wind electricity is booming, and turbines are growing in size in order to reduce the levelized cost of energy (LCOE). [3] Previous research demonstrated an extensive research gap for accurate scaling and calculation models future offshore wind turbine CAPEX which leads to inaccurate portfolio decisions which the risk of low profit margins for the OEM's.

Therefore, this paper provides the scientific foundation by presenting the offshore direct drive turbine cost drivers. Aiming to use the presented results in future research in order to create accurate cost calculation models for the turbine main components and with it the creation of an overall turbine CAPEX scaling model to improve the OEM's future portfolio decisions.

## 2 MATERIAL AND METHODS

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This study conducted an explanatory research as the study show an updated cost breakdown of offshore wind turbines. The explanatory research design involved formulating the hypothesis and collecting the necessary cost information data that leads to the achievement of the objectives of the intended research. The cost information of all sub components got collected and processed at an offshore wind

turbine OEM. In Addition, the research design demands that the researcher needed to elaborate on the results to understand how the results impact the overall research. The outlined research design is most efficient in analyzing the received data statistically and demonstrate the possible impact of the collected cost data.

### 3 RESULTS

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For the cost breakdown of the 6 MW turbine, purchasing data from October 2016 until September 2017 have been collected and analyzed. The through the research resulted breakdown presents the components with the highest costs per turbine module. The result shows that the copper segments, the main bearing, the rotor house, the magnets and the fixed shaft are the main cost drivers in the Generator. The category “Large steel components” consists out of several large steel plate parts which are needed for the structure of the generator. The category “Rest” represents, as in all modules, all other components from the stated module.

The Backends’, or machine-houses, main cost driver is the Control & Power category which consist out of the converters, cables and other control panels. Further, the four other main cost drivers are the canopy, the transformer, the bed frame and the yaw system. Last consists out of the yaw ring, yaw motors and gears. The Hub module’s main cost driver is

the bearings & lubrication category. This category includes the three blade bearings and its lubrication system. Further cost drivers are the casted hub and the spinner cover. The modules Blades and Side Parts have not been broken down. First, consist of a whole set of three blades. The category Side Parts include parts for the assembly or so-called marriage of the four other main modules. In order to prove that these cost drivers are not a one-time effect, research was repeated for an offshore direct drive seven MW wind turbine for the year 2017 and 2019 and an eight MW for the year 2020.

The data analysis proved that the main cost drivers per offshore wind turbine are the same over the observed time and development from six to seven MW turbine. Only the proportions of cost for the components have changed slightly. E.g. the blades and the transformer increased proportionally to the other components in costs.

### 4 CONCLUSIONS

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The analysis proves that excluding the tower cost just 15 component groups make 78% (6MW; 2016), 80% (7MW; 2016) and 83% (7MW; 2019) of the overall turbine CAPEX turbine cost. A component group mainly consist out of one component but can consist also out of more parts which are representing one technical function. It has been proven that the component groups have not changed over the development and the overserved time period of two years. The present study thus provides a scientifically sound insight into the percentual cost weighting of offshore direct drive wind turbines main components. The results have changed slightly which is caused

next to other reasons by technical variations, learning curve price decreases and material price increases. As this research have presented the main cost drivers of offshore direct drive wind turbines, future research can concentrate on these detected component groups. As this component groups cover around 80% of the turbine CAPEX, cost scaling equations for each of the groups can be researched, build together and used for LCOE estimations for future offshore wind turbines. As well internal price estimations at turbine OEMs could benefit from cost scaling formulas for these component groups as with these, accurate price forecasts for future designs can be made.

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# PERSONALITY, PERCEIVED LEADERSHIP AND COMMITMENT

Thomas Meixner<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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organizational commitment, leadership, personality, big five

## JEL CODES

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M12, M14, J24

## 1 INTRODUCTION

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More than two decades ago the term war for talent was coined, to describe the development, that individuals who are able to perform in a highly complex environment and who are able to innovate and transform companies and businesses are in higher demand than ever before (Chambers et al., 1999). The present work focuses on the aspect of retainment of employees, thus on ways to foster their organizational commitment (Meyer and Allen, 1991; Meixner, 2020). Organizational commitment describes the commitment employees feel in regards to their company. One of the core

questions of modern leadership is how this organizational commitment can be fostered – leadership approaches like transformational leadership aim at fostering commitment and at motivating employees, thus actively contributing to a successful pathway through the aforementioned war for talent (Busse, 2014a). Basing on a study of Meixner (2020), the present work seeks to address the question, how emotional commitment and behavioral commitment are linked to employee personality and to employee perception of their leaders.

## 2 MATERIAL AND METHODS

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In order to assess the research question of this research paper, using a German research panel, a total of  $n = 300$  participants were presented with the questionnaire presented below, consisting of measures of commitment, perceived leadership communication quality, perceived leadership style and personality. The scales for emotional and behavioral commitment are derived from the empirical work presented by Meixner (2020). Based on a confirmatory factor analyses, this work proposed a two-factor mode of commitment, consisting of emotional and behavioral factors. The Perceived Leadership Communication Questionnaire (PLCQ; Schneider, Maier, Lovrekovic and Retzbach, 2015) is used to

survey leadership communication as it is perceived by the participants of the study. In order to assess the perceived leadership approach, participants were asked to assess their leader using the 45 items of the multifactor leadership questionnaire (MLQ, Bass and Avolio, 1995). Personality was assessed following the Big Five model of personality, using the The Big Five Inventory (BFI, short version; Rammstedt and John, 2007). The focus of the research was the employees' perspectives, thus, all 300 participants were employees, describing their own commitment and their perception of their leaders' approaches and behaviors.

### 3 RESULTS

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The descriptive analytics and the depiction of the results of the bivariate correlations imply, emotional and behavioral aspects of commitment are distinctive variables with (partially) unique correlates. Thus, for the subsequent analyses in regards to how both aspects of organizational commitment can be predicted by employee personality, employees' perception of leadership communication quality and leadership style, both indicators of commitment were considered. Thus, two separate multiple, stepwise regression analyses were conducted. In the first block of each regression, the set of big five variables was proposed as possible predictors. The second block of proposed predictors were the variables derived from the MLQ (leadership styles and leadership outcomes) and the perceived leadership communication quality.

The results of both analyses show comparable, although distinctive results. Conscientiousness,

transformational leadership (perceived) and leadership communication quality (perceived) are relevant predictors for both criteria, although with different impacts, as the results in both tables above show. Also, neuroticism proved to be a relevant predictor only for the emotional commitment, while it seems irrelevant for behavioral commitment. With an  $R^2 = .312$  for behavioral commitment and  $R^2 = .362$  for emotional commitment for both aspects of commitment meaningful predictions can be made by the set of variables chosen within the study. Out of the set of personality factors only conscientiousness proved to be a relevant factor for both aspects of commitment and out of the set of leadership aspects only transformational leadership (perceived) and perceived leadership communication quality seem relevant on this level.

### 4 CONCLUSIONS

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Concludingly, the present work was able to show, that both employees' personalities and leadership behavior are relevant for the formation of organizational commitment. Organizational commitment, thus, is dependent both on internal and external sources, as

– among others. Leaders who use a transformational approach and who are able to communicate in a clear, positive way, can improve organizational commitment.

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# FACTORS ACCOUNTING FOR THE DEFAULT IN REPAYMENT OF DEBT CAPITAL BY SMALL-SCALE BUSINESSES: A CASE STUDY OF DEVELOPED AND DEVELOPING COUNTRIES

Ebenezer Kwabla Mensah<sup>1</sup>, Caleb Kwadwo Osafo<sup>2</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

<sup>2</sup>*University of Ghana, Accra, Ghana*

## KEY WORDS

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SMEs, loan, default, debt capital, factors, repayment

## JEL CODES

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G21

## 1 INTRODUCTION

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Small and Medium Enterprises (SMEs) play an important role in economic development both in developing and developed economies in terms of contribution to GDP and creation of employment opportunities. Recent empirical studies show that SMEs contribute to over 55% of GDP and over 65% of total employment in high-income countries. SMEs also contribute over 60% of GDP and over 70% of total employment in low-income countries,

while they contribute over 95% of total employment and about 70% of GDP in middle-income countries. The development of SMEs is seen as accelerating the achievement of wider economic and socio-economic objectives, including poverty alleviation according to Cook and Nixon (2000). In the Sub-Saharan Africa region, SMEs account for more than 95% of all firms according to Hatega (2007).

## 2 MATERIAL AND METHODS

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The researcher will use Simple random sampling technique in selecting samples for this study. Thus, both primary and secondary data would be used. A set of questionnaires would be constructed and purposively administered to 200 SMEs in both developing and developed countries. The data to be gathered from administered questionnaire will

be coded into SPSS (Statistical Package for Social Sciences) software and relevant output would be generated. The factors that cause loan default would be examined with the SPSS, ANOVA, Correlation and Regression Analysis model would be used to estimate the results.

### 3 RESULTS

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The findings will be very useful to banks and other financial institutions that offer this product to SMEs in selecting and implementing suitable policies to

reduce defaults. Also, SMEs will be in the position to appreciate managerial, economics and accounting skills to employ in the operation of their businesses.

### 4 CONCLUSIONS

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The factors accounting for the default in repayment of debt capital by Small Scale Businesses in both Developed and Developing countries would be considered in this research work. Policy makers

and SMEs managers should endeavour to retain or plough-back profit in their first five years of their operations into the business.

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# SYSTEMATIC LITERATURE REVIEW ON THE ECONOMY OF FIRE PROTECTION MEASURES IN GERMANY

Ralf Alexander Michael<sup>1</sup>, David Stein<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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fire protection, economics, efficiency, cost-benefit

## JEL CODES

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C, K

## 1 INTRODUCTION

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Large fires have repeatedly led to significant property damage and personal injury in recent years. In today's media age, this has been spectacularly transported all over the world and has resulted in sometimes irrational behavior and reactions on the part of the authorities and individual operators. [1]

The fire in London's Greenfell Tower led, for example, to individual federal states in Germany reviewing the fire protection status of all high-rise buildings with official reference to the above-mentioned high-rise fire. [6]

There was no concrete change in the risk situation about that time.

Many operators and those involved in construction are now complaining about the steadily increasing fire protection requirements and the associated costs. The number of fires is almost constant and the

number of fatalities is falling slightly at a low level in European comparison [5]

Due to the federal structure in Germany with 16 federal states, there are also 16 basically similar building regulations and thus fire protection regulations, but these differ in various points and above all in their interpretation. This creates a large number of different specifications, that almost always leads to excessive measures without a specific risk assessment for fear of legal consequences and thus risk aversion. However, this is also legally unfounded [7]

Is there an evidence-based analysis of the cost-benefit ratio of fire protection measures in buildings in Germany?

Is there a sufficient data base and if not, how can it be generated?

## 2 MATERIAL AND METHODS

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A systematic literature review was conducted according to the methodological approach of Cooper [2]. First categories of the field of review was defined (business, economically, life and health aspects).

Electronic databases were used for searches from the year January 2010 to August 2020.

Titles and abstracts were screened for inclusion and exclusion criteria. The review included only papers and articles in German.

### 3 RESULTS

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The results showed a very unstructured and weak data situation in Germany. There are individual studies on economic cost-benefit analyzes of individual technical fire protection measures on the operating costs of buildings. One publication relied

mainly on the damage reports of the property insurers [3]

An economic analysis (cost-benefit or cost-utility analysis) including the effects on life and health is not available for Germany as a whole, similar to other countries [4]

### 4 CONCLUSIONS

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Currently, official fire protection measures are mainly justified by an ethically motivated zero risk strategy regarding the absolute protection of life and limb.

A cost-benefit assessment exists for fire protection measures by the building insurance companies. However, these have almost no influence on official requirements.

A macroeconomic overall risk assessment, analogous to evidence-based medicine, does not exist.

The development of fire damage statistics by the Association for the Promotion of German Fire Protection (Vereinigung zur Förderung des Deutschen Brandschutzes – vfdb) is currently in progress.

The first evaluations and interim results already exist [8]. However, there is expressly no economic consideration, but the work could provide a basis for evidence-based observations.

This also requires a better implementation of the research in practice. For this purpose, universities must expand the focus from a purely technical view and evaluation of individual measures to a comprehensive economic view.

In the field of the economy of fire protection measures in Germany the approach of further scientific research is necessary.

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# FORMULARY APPORTIONMENT OF COMMON CONSOLIDATED CORPORATE TAX BASE IN THE EUROPEAN UNION

Markéta Mlčúchová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

common consolidated corporate tax base, formulary apportionment, European union, fiscal federalism

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## JEL CODES

G38, H25, H77

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## 1 INTRODUCTION

The theory of Fiscal Federalism follows up with principles explaining which functions and instruments are best centralized and which are supposed to be decentralized at certain vertical levels of administration. The Formulary Apportionment (FA) of the corporate tax base is used in federal economies for the purpose of the redistribution of corporate tax base among lower levels of government. The keynote of the EU Commission's proposal of the Common Consolidated Corporate Tax Base (CCCTB) is to provide a single set of rules to calculate the tax base for corporations operating within the internal market of the EU. The main aim of the European Commission is to minimize profit shifting and tax frauds done by multinational corporations. In the regard of the current level of the EU integration, the introduction of CCCTB and the coherent FA,

is a significant development in the context of tax harmonization in the EU. The main aim of the paper is to explore the possible FA composition of the CCCTB mechanism in the EU and the revenue impact of the CCCTB introduction on the budget of the Czech Republic. The research aims to analyse factors, including but not limited to labour, fixed tangible assets and sales, integrated into the allocation formula and the possibility of differentiating the formulae for its use in different economic sectors. The paper investigates which FA mechanism – currently used in federal economies – is appropriate to be adopted within the internal market of the European Union. Further, it aims to determine the explanatory power of the FA proposed by the European Commission in COM (2016) 685 final.

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## 2 MATERIAL AND METHODS

The research questions addressed in this paper are RQ1: Is the introduction of the FA in the EU in accordance with principles of the fiscal federalism and the current level of the EU economic integration? RQ2: Which FA mechanism – currently used in

federal economies – is appropriate to be adopted within the internal market of the EU? RQ3: What is the explanatory power of the FA proposed by the European Commission in COM (2016) 685 final? RQ4: What would be the effect of the introduction of

the COM (2016) 685 final on the budget of the Czech Republic. The analysis is conducted using secondary cross-sectional data, researched year 2016, obtained from the Orbis database provided by Bureau van Dijk. The research dataset consists of financial data of 21 684 corporations, operating within the EU single market. As the main focus of the paper is the determination of the impact of CCCTB on the budget of the Czech Republic, only companies with at least one subsidiary operating in the Czech Republic were considered in the analysis. The reasech

was focused on the FA proposed by the European Commission in 2016 (COM(2016) 685 final). Regression models reflecting FA mechanisms in federal economies, considering the case of the United States of America, Canada, Germany and Switzerland. Moreover, a hypothetical alocation mechanism based on the COM (2016) 685 final, was examined in the conducted analyses. Simple and multiple regression analysis examined the explanatory power of the particular FA considered in the paper. Parameter estimates are calculated using the OLS method.

### 3 RESULTS

All treated models of FA were, based on F-test, statistically significant on a selected level of significance ( $\alpha = 0.05$ ). Similarly, the statistical significance, based on  $p$ -values, of all parameters used in respective models was verified. The highest explanatory power of the particular FA, based on the adjusted coefficient of determination, was detected in the model based on the European Commission proposal (COM (2016) 685 final), using the variable of a two-component labor factor and one-component factor of fixed tangible assets and sales. The model was

able to explain 27.41% of variability in corporation's profitability. Moreover, the total impact of the hyphotetical implementiton of the FA on the budget of the Czech Republic was estimated to be 3.51% of the relative share of the corporate tax base of all EU Member States. In comparison to the current system of corporate taxation within the EU single market, the share of the total corporate tax base belonging to the jurisdiction of the Czech Republic would increased by 0.62% with the implementation of the COM (2016) 685 final as proposed.

### 4 CONCLUSIONS

The results show that the implementation of the CCCTB has a positive impact on the corporate tax revenues for the budget of the Czech Republic. Above that, the application of allocation factors such as labour (reflecting number of employees and total

costs of employees), fixed tangible assets and sales, as proposed by the European Commission in COM (2016) 685 final, have been proved to have the highest explanatory power of the variability in corporation's profitability among other FA considered in the paper.

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# CONTINUOUS AUDITING – THE NEW NORMAL?

Hagen Müller<sup>1</sup>, Manfred Schönleber<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

continuous auditing, digitization, data analytics, big data, audit approach

## JEL CODES

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M41, M42, O30

## 1 INTRODUCTION

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The challenges of how to increase the efficiency of the financial audit despite ever larger amounts of data is a focus of the scientific and professional discussion. Various methodological approaches were developed in this discussion. In the last few years, numerous approaches have been developed, particularly in the context of the Design Science Methodology. It is examined which methods and instruments can be used to further develop the annual financial audit. The use of continuous auditing methods is one

such element. Following the discussion in science and practice, such methods are only implemented sporadically and unsystematically. With regard to the four phases of a digital innovation, it can be stated that the phases of discovery and development are well advanced, while the diffusion and impact of these methods seem to be little advanced. The aim of this article is to determine whether the methods discussed fulfil the requirement of increasing the efficiency of the final audit.

## 2 MATERIAL AND METHODS

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The basis of the study is an analysis of the results and approaches discussed in the literature. Based on this, the present paper is intended to contribute how the methods are implemented in practice and what efficiency improvement potential emerges from

an existing continuous auditing tool. It was possible to evaluate data from real financial audits that were carried out in the recent past. It was analysed which types of data analyses were carried out and whether patterns can be identified from them.

## 3 RESULTS

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A look at the relevant literature shows some approaches to the integration of data analysis methods. These range from methods for more efficient sample selection in a big data environment to design proposals for continuous audit systems. In addition to this method development, other contributions attempted

to answer the question of why the methods developed in science are used only rarely and in an unstructured manner in practice. The studies on which this paper is based reveal a similar dilemma. In the study that was carried out, it was found again that the selection

of the available data analysis instruments appears inconsistent and unsystematic.

The analysis of the tools now available for continuous testing shows further potential for overcoming

the challenges of big data analysis with modern audit methods.

## 4 CONCLUSIONS

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Numerous approaches and methods can be discovered in the literature that lead to a further development of the audit methods. On the other hand, the studies also show that these methods have not yet been fully implemented in practice.

For example, it seems that the continuous audit approach appears to be a deep set of tools and that appropriate tools are available in practice. It therefore remains to investigate in further investigations which obstacles have prevented a broader application so far.

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# THE DEVELOPMENT AND EFFECTS OF DIGITALIZATION ON STATIONARY RETAIL USING THE EXAMPLE OF MOBILE PHONE CONTRACTS FOR OLDER CONSUMERS

Johannes Neumann<sup>1</sup>, Milan Fekete<sup>1</sup>

<sup>1</sup>*Comenius University in Bratislava, Slovakia*

## KEY WORDS

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telecommunications industry, digitalization, consumer behavior, target group 50+, targeted survey

## JEL CODES

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L81

## 1 INTRODUCTION

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Within the last few years, the digitalization of the industry has become extremely important. Big Data, digitalization and transformation, and Industry 4.0 are headlines that we encounter in the media every day. Meanwhile, the terms play such an important role that they have penetrated all areas of life. Progressive digitalization enables the customer to decide about the Where, When, How and What at all times, regardless of whether the sales channel, the type of delivery or the payment method is concerned (Roik, 2016, p. 13). Especially in the area of “stationary trade and work”, more and more changes are planned and realized through digitalization (Ternès et al, 2015, p. 2). Digitalization is not only causing the sales channels to grow ever closer together, but it is also changing the entire business

model as a network of producers, suppliers, service providers, dealers and customers (Biesel and Hame, 2018, p. 5). Many social changes leave their mark on consumer behavior. Both usage of the Internet and the demographic change contribute to the fact that purchasing behavior is subject to change (Hoffman and Akbar, p. 192). Different generations deal with these changes in different ways. The “digital natives” form the generation that grew up with the use of digital technologies, whereas the 50+ generation was only confronted with digital technologies later in their life. Based on this, this paper deals with the current problems and effects of digitalization on the purchasing behavior of the target group with over 50 years of age when buying mobile devices and contracts.

## 2 RESEARCH METHODOLOGY TO INVESTIGATE THE PURCHASING BEHAVIOR OF THE TARGET GROUP 50+

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In empirical social research, a distinction can be made between the qualitative and the quantitative method. Although these result from different methods, they

are not mutually exclusive. Quantitative research is more object-related and its results provide explanations and causes, whereas qualitative approaches

are subject-related and provide interpretative results (Röbken and Wetzel, 2016, p. 10–12). The use of both research approaches enables triangulation method. To answer the research questions, the mixed-method approach is followed here, where different methods such as observation, oral questioning, for example in the form of interviews or document analysis (brochures, flyers) are considered (Röbken and Wetzel, 2016, p. 10–12). The approach taken here is that the use of different complementary methods in

an investigation prevents the bias and adulterations associated with each method. Looking at the research question from different angles provides a stronger support for assumptions to be developed (Steinke, 1999, p. 46). Data collection tools are described and discussed in detail. The focus is then on the samples used to identify the characteristics of the respondents. Furthermore, the process of conducting the empirical study is explained and the findings of the data analysis are presented.

### 3 CONCLUSION AND OUTLOOK

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Each age group plays an important role for companies and the market. For this reason, the retail trade is intent on addressing all age groups so that they are not lost as potential sales generators, especially since the consumer group 50+ has a large number of potential customers.

In addition, uncertainties, difficulties and the complexity of the technologies show an impact, which means that further clarification of the definition is necessary for this target group. Within the framework of this paper, the definition of “50+” was too general. This is again confirmed by the data collection, which leads to the conclusion that the scientific elaboration does not claim to be complete in view of the target group definition. The research approach must therefore be pursued with regard to the defined consumer group 50+, in which the age of these end consumers is even further restricted in order to make the influence of digitalization on purchasing behavior more clear. The challenges

for companies are the major changes in business. The processes will become increasingly digital in the coming years. The expansion of broadband Internet with fiber-optic lines, as well as the new 5G transmission standard of the mobile radio network, will lead to high capital expenditure requirements (Fraunhofer Institute, 2019). As a result, obvious savings potential can be seen in the reduction of personnel. This reduction could be justified by the simplification and digitalization of processes within the company. Furthermore, these will have an impact on the concept of stationary trade in the future. The branches will increasingly adapt to customer requirements in order to increase customer frequency. As a result of digitalization and the resulting opportunities for savings, telecommunications companies should not ignore the fact that the defined customer group 50+ is dependent on the branch system and its given advantages.

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# ONLINE PRICE DISCRIMINATION: PRECURSORS TO A QUANTITATIVE STUDY OF DIFFERENT APPROACHES

Christian Roland Niemeier<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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price discrimination, price differentiation, dynamic pricing, online shopping

## JEL CODES

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C15, M39, Z39

## 1 INTRODUCTION

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Only little is known also about the technical aspect of dynamic, individual prices in various forms of online-shops as well as how exactly these prices are calculated. Known is, that parameters such as origin of the consumer, recent on-page behavior or the device type used for online shopping might influence the price. It remains unclear, to which extent prices are influenced by these parameters and how/if they are connected with each other. Usually, also, if parameters focus on one individual aspect, typically overlooking the interplay that might exist between, not allowing for comparisons in regards to the full extent of these factors.

The present work, therefore, aims to foster understanding of price differentiation by providing quantitative results on the influence of various factors on prices in online shops. The focus on quantitative estimations of the various factors seeks to set the present work apart from existing literature in the field. Different branches will be compared in order to understand, whether the same factors have the same effect of whether differences exist.

The first research question aims to connect the thesis with existing research on the topic – such as the research paper by Hindermann [1] – and to build the foundation, on which the second research question should be addressed.

1. Which approaches of user behavioral steering and online price discrimination can be identified?
2. How do these approaches influence the user experience and the price given?

The research is thus based on a broad overview of the various approaches of behavioral steering and online price discrimination and the concepts related to those practical approaches. General research on consumer's willingness to pay and on the social scientific aspects of human decision making in purchasing situations [2][3][4] explains the foundation of price discrimination and the reasons, why approaches such as the ones described below seem to work so well for companies in order to maximize their profits.

As the state of research shows, the implementation of various aspects of price individualization varies widely between different branches and platforms.

## 2 MATERIAL AND METHODS

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The main goal behind the research methodology of this paper is to foster understanding, which aspects of price discrimination are applied to different

products at different vendors. The potential factors are derived from the scientific literature, with the research of Hindermann (2018) forming the foun-

dation. The author differentiates between different factors, based on which prices can be individualized. Hindermann [1] names user-based aspects, such as recent on-page user behavior, the availability of a user account and information stored within it or the browser cache (cookies, browser history). Technical aspects include the operating system type or the differentiation between mobile and desktop devices. Also, the browser itself can be used as a way of differentiating users. For the purpose of this study, apart from the general distinction between various operating systems (Windows, Mac, Linux for desktop devices; iOS and Android for mobile devices) a distinction between various devices themselves will be made. Location-based price-discrimination will also be analyzed within the work.

By using software developed by the researcher to simulate those variations described above and

different user-locations, which will – in accordance with existing findings on the strong influence of user-location – be one of the core goals of the proposed work, the quantitative comparison of the effect of those factors will be analysed. Following the approach described by [5] simulated users will be in the center of this work.

The travel and electronics branches were chosen, because – as the state of research shows – already a certain amount of scientific literature on those fields exists, indicating that price discrimination is a branch standard. Therefore, it can be assumed, that it will be an appropriate sample to foster understanding of the interplay of the various factors of price discrimination. Furthermore, both these fields are known to be a) data-driven and b) rapidly changing and evolving ones.

### 3 RESULTS

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Among the main results are those concerning the first research question and thus, the identification of relevant approaches to behavioral steering and price differentiation and discrimination. A distinction between user-based, technical-based, time-based and

geographical-based approaches to price discrimination could be identified, forming the foundation of the further empirical work described above and discussed below.

### 4 CONCLUSIONS

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The approach chosen for the empirical work offers two advantages to the researcher: By using simulated users that are created for the sole purpose of the study, a purely experimental paradigm is chosen, that is able to control all relevant variables easily and cannot be influenced by (probably unknown) previous behavior. Experimental designs are typi-

cally described to have high internal validity for this reason. However, external validity can in some cases be lower, due to experimental settings usually describing hypothetical situations. The simulated users for the present study are designed with this potential limitation in mind.

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# INSTITUTIONAL QUALITY AND INCOME INEQUALITY: EVIDENCE FROM POST-SOVIET COUNTRIES

Radek Náplava<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

institutional quality, income distribution, income inequality, middle class

## JEL CODES

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O15, P48

## 1 INTRODUCTION

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Topic of income inequality is one of the biggest challenges of our time not only in labor market research, but also for policymakers ([3] and [5]). In the context of institutions, the research is often reduced only to selected labor market institutions such as minimum

wages, social security, unionization and employment protection ([3]). However, the aim of this paper is to find out how the overall institutional quality affects income inequality and income distribution in chosen post-soviet countries.

## 2 MATERIAL AND METHODS

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Selected countries are Estonia, Latvia, Lithuania, Belarus, Russia and Ukraine during the period 2002–2017. Panel regression is employed to quantify the influence of institutional quality on income inequality and income distribution. The first dependent variable is Gini coefficient (for estimation of income inequality). Other dependent variables (for income distribution) are quintiles, which express the income share. We observe how institutional quality and other selected variables affect the class of the richest (5th quintile), the poorest (1st quintile) and the middle

class (the share of the 2–4th quintile in total income). Selected groups are defined on the basis of [1] and [2]. The main explanatory variable representing institutional quality is, as in the case of [7], the set of variables Worldwide Governance Indicators (WGI) from [6]. In addition to GDP growth, other explanatory variables are government spending on education, investment and the country's openness. All data used come from the World Bank and have an annual frequency.

### 3 RESULTS

The results of pooled OLS and TSLS imply a positive statistically significant relationship between improvement of institutional quality and the growth of income inequality, which is a similar conclusion as in [4]. In particular, improving the “Regulatory Quality”, aimed at developing the private sector, and increasing “Political Stability” seem to have the greatest weight. Income inequality is also increased by net investment in government nonfinancial assets, while rising expenditure on education reduces income inequality. The growth of the share of exports and imports in GDP also has a negative effect, which implies that greater international trade does not necessarily mean a deepening of inequalities (versus [5]).

Institutional quality is also statistically significant in explaining the development of income distribution.

### 4 CONCLUSIONS

The results of this contribution imply that improvement of the institutional environment in selected post-soviet countries leads to an increase in income inequality and favors the richest social class (riches 20%) over the poorest (bottom 20%) and middle class. Technological change and globalization are

Better institutions seem to favor the richest (the share of the 5th quintile in total income), while they disadvantage (have a negative effect) the poorest and middle class. In particular, “Regulatory Quality” and “Political Stability” make it possible to create an environment that allows the richest to get the most rich, while negatively affecting the middle class and the poorest, which is probably the reason for the previous positive relationship between positive relationship between improvement of institutional quality and growing income inequality (gini coefficient). Expenditure on education reduces the gap between the rich on the one hand and the middle class and the poorest on the other. The growth of the share of exports and imports in GDP seems to also reduce the gap.

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# DECISION TREE SURVEY TOOL

Ondřej Nováček<sup>1</sup>, Pavel Turčínek<sup>1</sup>, Tomáš Foltýnek<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

---

survey, questionnaire, web-application, decision tree

## JEL CODES

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C88

## 1 INTRODUCTION

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There are many ways how to create and conduct a survey. Usually, a survey is created as a static form of predefined questions divided into sections. However, the downside of this approach is that as the respondent goes deeper into the survey, the questions can get less relevant for him/her. The solution for this might be creating these surveys dynamically, so that respondent gets next questions according to his/her previously selected answers and

thus, the survey might get more relevant which can also mean reducing the number of total questions. This approach of dynamic questionnaires could be useful in many areas. Mwamikazi et al. (2014) discuss this issue in problematic of learning style assessment. Another use of dynamic questionnaire that was introduced by Liu et al. (2019) is search of clinical trials.

## 2 MATERIAL AND METHODS

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How we can achieve this behavior is with something like a decision tree. Each question is essentially a node that has one to many answers and each answer also represents a node. Then, each answer has one

or zero questions as a child node and the process repeats again. We end up with a tree, with root node as a starting question from which we select the survey behavior.

## 3 RESULTS

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An application that implements this logic will be created. The application will consist of two separated parts. The first one will be an admin part where a user can create these survey structures easily, manage them and also see the results. There will be many question types that a user can choose from. The admin part will provide survey data via REST API to the second part. The second part will use these

data and render them accordingly to show the actual survey form. Users will be then able to fill out the surveys there. After each submission results will be sent back to the admin part and processed. Thanks to the REST API structure, it provides also an option for other web or even mobile applications to use and integrate this survey decision tree tool.

## 4 CONCLUSIONS

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The aim of this contribution is to simplify the creation of dynamic questionnaires and also give a possibility to provide feedback to the respondent. This tool will be mainly created and used for creating questionnaires about the topic of academic integrity. There are many cases in this area, where a respondent does not know, what is the correct thing to do in a certain situation, so this survey

can also guide him/her to some specific advices and recommendations relevant to his/her problem or provide some useful feedback. Not only that, respondent will also learn some new things that he/she was not aware not while he/she will not have to go through topics that he/she seems to be confident in.

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# PUBLIC PERCEPTION OF THE EUROPEAN INTEGRATION PROCESS: EVIDENCE FROM THE UNITED KINGDOM AND GERMANY

Daniel Pastorek<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

public perception, integration, European Union, Google trends, media news

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## JEL CODES

E70, F02

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## 1 INTRODUCTION

The important part of further development and successfulness of the European integration depends on political decisions, which are determinate by public perception of the European Union. These future political decisions are a priori uncertain and motivated by both economic and non-economic (political) objectives (Pastor and Veronesi 2013). The public perception that differs from the objectives of politicians represents a non-economic cost. Yet, despite the European integration process shaping the European development, there is a missing news-based proxy to capture public perception of this process as well as relatively small economic literature focusing this concern. This study uses two different proxies to measure the public perception and interest of individuals in Germany and the United Kingdom. To measure individual interest, obtained data are

from Google Trends analysis. To measure public perception, the study constructed media news-based indexes, represent the period from 2020:1 to 2018:12. The paper evaluates, that indexes seem to be an appropriate proxy to capture the concerns about European integration process on country level. That provides an interesting insight within the comparison of individual search and coverage of news in the major country newspapers. Besides, another interesting insight occurs, when we compare public perception in one of the major EU countries, which was the first to leave European project, and the country which is often referred as to be the driving force of the European Union. To investigate the relationship between new indexes and the economic development is used vector autoregression models.

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## 2 MATERIAL AND METHODS

To measure individual perception is used Google trend analysis, which monitors the frequency of search terms related to the topic of the European Union. The data used to construct public perception indexes were extracted from the digital

newspaper archives of the ProQuest database. The index reflects the frequency of the articles containing following combinations of keywords “integration” or “enlargement”; and “Europe” or “European” or “EU”; and “uncertain” or “uncertainty” or “concern”

or “problem”. The index is generated at the monthly frequency from January 2010 to December 2018. Methodology approach follows Baker et al. (2016), the same as an effort to select the identical newspapers used to create their economic policy uncertainty index (EPU). To aggregate new indexes, collected data are adjusted as

$$\text{freq}_{i,p,t} = \frac{n_{i,p,t}}{N_{p,t}}, \quad (1)$$

where  $n$  stands for a number of articles meeting the condition of keyword combination  $i$ ,  $p$  with  $1, \dots, P$  represent selected newspaper, where  $P$  is a total number of newspapers,  $t$  with  $1, \dots, T$  denotes time,  $N$  represents the total number of articles published in the newspaper  $p$  at time  $t$ . Then is computed standard deviation,  $\sigma$ , at time  $T$ , for each

### 3 RESULTS

The main results clearly show that individuals searches differ from new indexes, and while peaks can be observed only in times of European parliament election and Brexit, the newly developed indexes capturing peaks in all main events related to European integration. Another interesting result occurs in the comparison of Germany and the United Kingdom. In the UK, several peaks are corresponding to events preceding Brexit (blocks EU treaty, sovereign debt crisis, negotiations before referendum ...). On the contrary, in Germany is the first significant peak,

### 4 CONCLUSIONS

Newly developed indexes seem like an appropriate proxy for measuring of the public perception of the European integration process. Its reliably capturing all European related events as was mentioned above, same as confirm correlation with widely used EPU index. These indexes open several paths for future

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*i*. Subsequently expression (1) standardizes as

$$\frac{\text{freq}_{i,p,t}}{\text{stdev}(\text{freq}_{i,p,t})}. \quad (2)$$

The values of expression (2) are averaged together for every newspaper  $p$ , month  $t$ , and finally, normalized to have a mean of 100. To investigate the link between the perception of the European integration process and the real economy is estimated the vector autoregression model (VAR) with the following specification (uncertainty index, cost of borrowing, inflation, industrial production). Data are transformed using annual percentage changes including three lag of all variables. The results are reported as response impulse functions of one standard deviation of uncertainty index with 90% confidence bands. The macro data were extracted from FRED websites.

same as a change in the level of perception, in times of migration crisis and the open policy of Germany, which led to the German government crisis. To confirm results, indexes were compared to the economic policy uncertainty index (EPU). Results confirm correlation with EPU index, though new indexes attach more importance to events related to EU integration. As for the VAR results, there can be observed responses of variables to one standard deviation shock, however, shocks are within specified 90% confidence bands.

research. For example, it would be interesting to extend the empirical analysis to propose different channels through public perception could affect the real economy. However, it can also be useful in fulfilling the theoretical gap in this specific topic.

BAKER, S. R., N. BLOOM, and S. J. DAVIS (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics* 131 (4), 1593–1636.

# REFRAIN FROM REDUNDANCIES AND PERMANENT EMPLOYMENTS IN THE PUBLIC SERVICE IN GERMANY DUE TO EMPLOYMENT PROTECTION

Stefan Pelz<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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dismissal protection, labour law, public service, public employees, economic effects

## JEL CODES

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J45, J63, K31

## 1 INTRODUCTION

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One of the research questions of the referring dissertation is, if employment protection in public employments refrains public employers from dismissing employees in the face of high severance pay and procedural costs of dismissal (Heimberger 2020). The second question, subject to this paper, is, if public employers hesitate to conclude permanent employments because they fear that these employees

cannot be laid off easily (e.g. Addison and Teixeira 2003). The questions are part of the dissertation “economic effects of dismissal protection in public employments in Germany” and subject to this paper is to show empirical evidence for the questions, if public employers really are reluctant to hire and to dismiss employees.

## 2 MATERIAL AND METHODS

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The dissertation focusses the research gap of the economic effects of employment protection in public employments in Germany. The mainly empirical-based research uses a) existing literature concerning the known theoretical effects of employment protection on various factors in the private sector as well as existing empirical evidence and b) the results out of

a quantitative survey, conducted in September and October 2020 amongst about 8,200 administrative authorities of all size classes in Germany. The results are compared to the already known theoretical effects and existing empirical evidence in other sectors in order to show differences or similarities and to answer the research questions.

### 3 RESULTS

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According to the results of the survey, smaller administrative authorities tend not to let themselves be impressed from employment protection concerning dismissals. The larger the authorities, the more likely they refrain from dismissing employees, even if commercial or personal aspects recommend a termination. For the smaller administrations up to 50 employees, 36% refrain from terminations due to employment protection legislation. This number increases with an increase in the number of employees, until it is finally around 90% in the administrations with 500 or more employees. There is a clear trend here: the larger the administration, the

more likely the administration waives a termination due to the existing protection against dismissal. The answer of the question whether the administrations have renounced permanent employment at least once because of the existing protection against dismissal gives a more uniform picture over the administrative sizes. On average, about 25% of the administrations in each of the eight size classes from up to 50 to more than 1,000 employees have refrained from such new hires. Thus, there is no significant increase or decrease depending to the size of the authority, as was the case with the waiver of redundancies.

### 4 CONCLUSIONS

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Due to the ambiguous results of post-crisis literature on the before said effects it becomes obvious, that employment protection in the public service does influence decisions of the authorities concerning dismissals and permanent hires. The larger the authority, the more likely do they refrain from dismissals due to possible employment protection. This may be the result of the possibility, that other people do the job of employees, who may have quit internally. They can reorganise work, which is not

done; smaller authorities with less employees do not have this opportunity, because all the staff is busy and have no further capacities. With view to the refrain from new permanent hires the situation is uniform, because all authorities are affected equally and independent from existing staff. So, the hindering effect concerning dismissals results from the fear of facing costs and an unpredictable court proceeding but supported by the opportunity to delegate work and to can go on without the employees performance.

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# IMPACTS OF THE CIRCULATION TAX INTRODUCTION ON THE VEHICLE FLEET OF SLOVAKIA

Jana Péteriová<sup>1</sup>, Břetislav Andrlík<sup>1</sup>, Martin Vatrť<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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circulation tax, motor vehicle tax, property taxation principle, environmental tax

## JEL CODES

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H20, H25

## 1 INTRODUCTION

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The government can effectively influence and change taxpayers' behaviour through taxes, and can therefore achieve various goals, for example, in the environmental protection field (Vermeend, Ploeg, Timmer, 2008). However, the achievement of environmental goals through motor vehicle tax is considerably limited in Slovakia, due to the narrow application scope of this tax (Andrlík, Péteriová, 2019). According to the Ministry of Finance of the Slovak Republic, the current setting for motor vehicle tax discriminates against business entities to the

detriment of other motor vehicle holders. Konečný, Gnap, Šimková (2016) also agree with this opinion, claiming that there is no economic justification for motor vehicle tax to be paid only by business entities. Due to the current definition of motor vehicle tax in Slovakia, it is difficult to defend the environmental function with regard to this tax. Therefore, the first step in creating an environmental tax on motor vehicles is to find a suitable model for the taxation of all entities owning a motor vehicle.

## 2 MATERIAL AND METHODS

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The circulation tax proposal is based on the theoretical concept of motor vehicle taxation in Slovakia presented by the Ministry of Finance of the Slovak Republic in 2012. According to this proposal, circulation tax was set purely as a property tax. This tax was to be levied on all motor vehicle owners in the selected categories of (L, M1, N1), without linking the tax entity to business activities (IFP, 2012).

Based on the Slovak vehicle fleet data application to the circulation tax proposal, this motor vehicle taxation principle and its suitability for implemen-

tation in regard to the current Slovak vehicle fleet are discussed. The paper aims to point out some limitations of the circulation tax concerning the Slovak vehicle fleet's composition if this tax should represent the environmental basis of motor vehicle taxation in Slovakia.

The research was carried out using descriptive analysis, data processing, and its subsequent interpretation. For the requirements of the paper, the data was obtained from the Presidium of the Police Force of the Slovak Republic based on a request for

the provision of information under Act no. 211/2000 Coll. on free access to information. The obtained data come from the Slovak Republic National Vehicle Registry. Statistical data provided is in the total number of 3,305,842 records (vehicles). This number refers to all vehicles registered in Slovakia until June 3rd, 2020. The database does not contain vehicles excluded from the Slovak Republic vehicle registry until this date. The data was processed using

### 3 RESULTS

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According to the fleet data analysis results, selected vehicle categories (L, M1, N1), which fall into the circulation tax subject, make up 85.90% of all vehicles in Slovakia. The basis of the circulation tax is the maximum engine power in kW. The tax rates range from 10 to 539 EUR and are progressively set, which largely reflects the property approach of this tax. Regarding the vehicle fleet distribution, vehicles with lower engine power, and therefore lower class vehicles, are predominant in Slovakia. Up to 87.93% of vehicles belong to the category with an engine power of less than or equal to 110 kW. These vehicles would account for 53.25% of the total circulation tax proceeds. The remaining participation of proceeds

the Microsoft SQL Server Express database system, where they were processed using the SQL (Structured Query Language) programming language. For research purposes, it was necessary to select vehicles belonging to categories L, M, and N1 concerning the issue investigated. After selecting these vehicles, the database was narrowed to 2,835,214 records (vehicles).

would be provided by only 10.07% of vehicles in the higher and luxury classes. The owners of vehicles in higher and luxury classes are mostly business entities. Maintaining the then tax rate setting and the current vehicle fleet distribution, the total proceeds from the circulation tax would be approximately 131 million EUR. Legal entities and entrepreneurs using vehicles for business purposes would contribute with approximately 47.7 million EUR to the proceeds. In contrast, natural persons, i.e. non-entrepreneurs, would contribute with approximately 83.4 million EUR to the proceeds. Selected vehicle categories currently generate motor vehicle tax proceeds of approximately 67.1 million EUR.

### 4 CONCLUSIONS

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A significant tax base expansion would allow to reduce the tax burden for most current taxpayers. On the other hand, a circulation tax would additionally burden entities that are not currently paying the tax. The analysis showed that non-entrepreneurs are mainly owners of older vehicles and lower to middle-class vehicles. Despite the highly progressive

setting of circulation tax rates, its introduction would significantly impact the undesirable redistribution of income and wealth in the economy. If environmental elements were introduced into calculating circulation tax, for example, as a reflection of the vehicle's age, this tax would mainly penalise lower-income entities.

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# FACTORS INFLUENCING A CHANGE OF FARMERS BEHAVIOUR IN TRACTOR ACQUISITION

Aleš Petr<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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durable goods, agriculture, tractors, purchase behaviour, industry 4.0

## JEL CODES

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D22, O33

## 1 INTRODUCTION

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The paper provides an insight into the market of agricultural tractors in the Czech Republic, which faces challenges related to new digital technologies, commonly referred to as Industry 4.0. New technologies not only increase purchase prices and operational requirements but also decrease reliability that farmers grew to get used to. Agricultural machinery manufacturers now have to answer the question of whether or not the Industry 4.0 phenomenon will cause a change in the purchasing behavior of farmers and agribusinesses and significantly influence the

marketing distribution channels as it did on consumer goods now already. Therefore the purpose of this article is to identify – based on data from 281 large agribusinesses owning an agricultural tractor (165hp and more) – whether or not the Industry 4.0 brings about changes in the behavior of agribusinesses when purchasing tractors, and to define typical behavior and its basic characteristics in companies that react proactively and make use of Industry 4.0 technologies in their operation.

## 2 MATERIAL AND METHODS

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Since the paper is focused on technological changes, the analysis of the macro-environment starts in the area of technologies that is followed by the social-legal area and demographic area; this covers all important aspects of environments in companies that Kotler (2011) works with. The selection of technologies and changes analyzed in the environment was carried out based on secondary data (Kingaostanska, 2019). Plausible effects of the environment changes were inferred using the theory regarding distribution channels management (Coughlan, 2006) and durable goods microeconomics (Carlton, 2015). All

together 7 research questions were developed and then analyzed using secondary data from tractor registrations (Merk database) enhanced by tractor power segments, along with primary data from a telephone survey of 281 farmers. The analysis was based on the logistic regression with the aim to find a purchasing behavior that can be associated with companies that actively accept new technologies in Industry 4.0. The dependent variable (Y) for logistic regression was constructed artificially, and is based on both primary data acquired in telephonic surveys, and on secondary data from the Merk database.

### 3 RESULTS

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Eventually, variables acquired from the Merk database turned out to be the most significant ones and were capable of explaining behavior typical for companies using “4.0” technologies in agriculture in two-thirds of cases (65.8%). They were the age of machinery and the number of brands present among the tractor fleet. Not perceiving older machines as a substitute for new ones proved to be the only statistically significant independent variable that was

acquired by the telephone survey. On the other hand, the telephone survey has shown that a good number (48%) of large farms tested new systems based on Industry 4.0 technologies like telematics, yield mapping, etc. But it is likely that the farmers do not use them on daily basis for common work and therefore they are not forced to change behavior during new tractor acquisition now.

### 4 CONCLUSIONS

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Paper explores durable goods microeconomic theories relevant for incoming changes driven by “Industry 4.0” technologies. A number of owned machine brands, age of the machinery, and the low perception that older machines can be used as a substitute for a new machine proved to stand as factors significantly affecting the consumers’ behavior. On the other

hand, many changes in company behavior expected by microeconomic theory were not confirmed, which was caused by technological optimism of companies, the strength of presuppositions that are the basis of theoretical conclusions, or the underdeveloped influence of new technologies on respondents questioned herein.

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# COMPLIANCE REPORTING IN THE ANNUAL REPORT OF THE GERMAN DAX30 COMPANIES: LOOKING FOR BEST PRACTICES

Peter Petrat<sup>1</sup>, Gerhard Hans Fiss<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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compliance reporting, compliance performance, key performance indicators

## JEL CODES

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K20, L29

## 1 INTRODUCTION

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The statutory reporting requirements for listed companies only include statements on compliance aspects to a small extent. However, this reporting is of great importance in terms of external presentation, especially to shareholders.

There are no binding requirements for reporting on compliance issues and only a few requirements are specified even for internal use. How do you measure compliance in a company? How do you show

the benefits? There is an urgent desire to justify the enormous expense for compliance measures in companies towards donors, shareholders, employees and business partners. The companies listed in the DAX30 can serve as pioneers for compliance reporting and shape possible best practices due to their size, their financial possibilities and the special observation they are exposed to. There are also used to justify their actions.

## 2 MATERIAL AND METHODS

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The annual reports for the past five years were evaluated from the 30 listed companies in the DAX30 (reporting period 2015 to 2019). These 150 reports were examined for content-related statements on compliance in the respective company. It was analyzed on which compliance topic the reports contain statements and whether these were purely textual mentions or include quantifiable values.

For this purpose, the documents were searched for the terms “compliance” and similar and technically related topics. Mere mentions were not taken into account, only those findings were determined relevant for which a minimum of scope and depth of content was available. The contents were sorted and summarized according to subject areas and general terms in order to ensure comparability.

### 3 RESULTS

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In the annual reports of the German DAX30 companies, the average usage of the word “compliance” has increased by around 50% over the past five years.

Of the 30 companies examined, between 25 and 27 companies (83.33 to 86.67%) made statements about compliance at all during this period. In each of the cases, this included descriptions and explanations. Far fewer companies reported concrete quantifiable figures. The number of these companies almost doubled from 2015 (7) to 2019 (13).

As far as compliance has been reported, the overall scope has increased significantly. In the purely textual mentions, information was most often given on the structure and organization of the compliance management system. Next is the information on

the handling and treatment of compliance risks and finally information on reports, suspected cases and actual violations. Explanations of compliance training were also frequently reported, but have been slightly decreasing since 2018. In terms of specific figures, values on reports, suspected cases and actual violations have been the most frequently cited values since 2018. This is followed by figures on compliance training (training courses, participants and training costs) as well as information on the compliance staff employed. Almost 62% of the companies that report specific figures provide information on the subject of compliance training. Almost 85% of the companies that report specific figures provide information on reports, suspected cases and actual violations.

### 4 CONCLUSIONS

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In general, many companies report more than what they are legally obliged to do. Overall, more is reported, in particular significantly more specific figures are reported.

This is in harmony with the developments in the compliance sector in science and practice, that compliance increasingly has to justify its efforts and costs. The slight decrease in reporting on compliance training and the substitution with more information on reports, suspected cases and actual violations also fits in with this. Training courses as preventive measures are also referred to as pure activity indicators and is primarily seen as input

aspect. Reports, suspected cases and violations are described as negative success factors and primarily seen as output. So there is a shift from the simple evidence of activity to the concrete results of the measures. The intention is recognizable to make compliance performance measurable, tangible and presentable.

However, this is still inconsistent and unsorted. The details and the scale of the representations still show a huge range and variety. Compliance reporting is still a long way from having a uniform industry standard. At least the major topics can be considered as best practice.

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# LOAN COVENANTS: EFFECTIVE PROTECTION FOR COMMERCIAL REAL ESTATE LENDERS OR ADMINISTRATIVE BURDEN?

Beate Monika Philipps<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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financial contracting, commercial real estate loans, agent principal theory

## JEL CODES

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G21, G32, D82

## 1 INTRODUCTION

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Loan covenants might be included in commercial real estate (CRE) loan agreements to diminish the information gap that inherently exists between a borrower and a lender, often referred to as asymmetric information. Existing literature refers to contracts that provide for adverse selection or moral hazard as incomplete contracts. In a comparative analysis, Mansor and Rashid (2016) stigmatise asymmetric information as one feature of incomplete contracts. In order to protect its position, a lender has a strong interest to bridge the information gap and

to detect hitches at an early stage. Loan covenants might hence serve as an early warning system to avoid loan default. They might reduce transaction costs and consequently mitigate lender's risk. Conversely, loan covenant monitoring is cost intensive risk management. The identification and utilisation of most effective covenants is therefore essential. This work shall give an overview of loan covenants categorisation based on three studies and reflect which covenants might be most effective for CRE loan risk management.

## 2 MATERIAL AND METHODS

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After reviewing existing literature, the decision was made to focus on three contemporary articles of economic journals that utilise loan covenants as variables in their quantitative examinations. This selection was made, as each paper deals with a different loan type and thus they might provide for an adequate basis for a synopsis. Wang (2017) investigates a sample of 1,000 non-financial US public corporate loans originated from 1996 to 2005. Cremer (2019) uses aggregated mortgage loan data of life insurance companies provided by the American Council of Life Insurers (ACLI) from Q1/2000 to Q4/2017. Lee and Miller (2020) examine financial data of the 150 largest US bank holding companies in

a period prior to the Financial Crisis 2008, between 1996 and 2007. Their centre of interest is subordinate bonds.

In this assessment a qualitative inductive approach is conducted. First, the main categorisations of loan covenants used in the articles are detected. Next, predominant loan covenants utilised in the papers are outlined and compared. Various motives for the employment of loan covenants are identified. This paper concludes developing hypotheses to be tested in future research on effective loan covenants for CRE finance and the avoidance of redundant covenant monitoring.

### 3 RESULTS

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Wang (2017) classifies three main types of financial covenants depending on the objectives of the lender. If leverage and the limitation of a company's indebtedness is the point of interest, capital covenants are relevant according to Wang (2017). Performance covenants force the borrower to comply with defined minimum performance thresholds. Capital expenditure restrictions belong to a third group of financial covenants and shall limit borrower's capital investments (Wang, 2017). Lee and Miller (2020) categorise dividend covenants, financing covenants and investment covenants. Cremer (2019) considers conservative lenders' underwriting policy and draws attention to initial leverage covenants and forward-looking cash-flow covenants.

In general, loan covenants are potential instruments for a lender to exercise control rights (Wang, 2017). Covenants might be relevant for risk management, the reduction of agency costs (Lee and Miller, 2020) and transaction costs. Restriction on

the borrower's leverage and minimum amount of equity – both capital covenants – might help lender to reduce adverse selection and moral hazard according to Wang (2017), especially when installed ex-ante. Non-compliance during loan term might trigger a credit margin increase and protect lender against inadequate pricing of risk. Loan covenants could support the alignment of shareholder-creditor interest and performance covenants might shift control from shareholder to lender (Wang, 2017). Excessive dividend payments may erode bondholders' position (Lee and Miller, 2020), therefore a dividend covenant might prevent a shift of risk from shareholder to bondholder. Lender regulation could be a further motive for the implementation of loan covenants. Cremer (2019) points out that the Basel Committee on Banking Supervision (2017) focuses on e.g. a Loan to Value (LTV) covenant. According to Lee and Miller (2020) deregulation could increase the demand for covenants.

### 4 CONCLUSIONS

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Basic categorisations of loan covenants as well as various reasons for their utilisation are depicted in this paper, based on three examinations. With regard to the origination of CRE loans, an initial LTV restriction might be essential to avoid moral hazard and adverse selection. Nevertheless, an ongoing LTV covenant might be ineffective as long as the cash flow of the underlying property is sufficient to cover debt service of the loan and given that a non-compliance does not trigger a margin increase. Within non-recourse CRE loan structures, the loan performance

depends strongly on the performance of the underlying property. Consequently, the implementation of a performance covenant could be an important tool for lender protection. Yield on Debt covenant or Debt Service Coverage Ratio might effectively protect lender's position. Non-compliance usually triggers a cash trap of property cash flow and ceases the distribution of excess cash flow to shareholders. These hypotheses give space for testing and allow for future research.

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# DOES EUROPEAN UNION MEMBERSHIP STIMULATE ECONOMIC GROWTH? THE CASE OF VISEGRAD GROUP

Lenka Pomykalová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

European union, Visegrad group, GDP per capita, synthetic control method

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## JEL CODES

O11, O57

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## 1 INTRODUCTION

It has been more than fifteen years since the Visegrad Group (VG) countries joined the European Union (EU). The expectations from entering the EU were high (money inflow from the EU budget, GDP per capita growth, living standards growth). Nonetheless, GDP per capita of the VG countries is still well below the average GDP per capita of the previous EU members. Would the economies of the VG countries be better off without the EU? Would the GDP per capita in the VG countries be higher without their EU membership? To answer these questions, this paper uses the Synthetic Control Method (SCM) to estimate the impact of joining the EU on the GDP per capita of the VG countries.

Crespo Cuaresma, Ritzberger-Grünwald and Silgoner (2008) found that joining the EU positively

influences the long-term economic growth of the EU countries, but the effect is unbalanced, and the poorer countries experience a higher GDP per capita growth compared to the richer countries. Campos, Coricelli and Moretti (2014) used the SCM to estimate the joining effect on the EU members, and the results showed diverse impacts on the VG countries with the only positive impact experienced by the Czech Republic and for the last treated years, by Slovakia. However, the authors used a relatively short post-treatment period that finished in year 2008, therefore it did not consider the global economic crisis. To broaden the current research, this paper focuses solely on the four VG countries, and an extended post-treatment (after EU accession) period complemented by several new covariates is used.

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## 2 MATERIAL AND METHODS

The analysis is conducted by using the SCM that creates a synthetic country that has never entered the EU from a pool of non-EU countries. The retrieved synthetic outcome variable is compared with the actual outcome variable observed over a certain time period. For the Czech Republic and Hungary, the

data are retrieved from 1991 to 2017, for Slovakia from 1992 to 2017 and for Poland from 1995 to 2017. This gives 13 years, 12 years and 9 years long pre-treatment panels, respectively.

The dataset consists of macroeconomic growth predictors retrieved from the World Bank (GDP per

capita based on PPP in constant 2011 international dollars, inflation, industry share in GDP, agriculture share in GDP, age dependency ratio, labor force participation rate, population growth) and the United Nations Development Programme's Human Development Report (Human Development Index). The selection of the outcome variable and covariates follows previous research by Abadie, Diamond and Hainmueller (2015). The outcome variable is

GDP per capita. The treated countries are the VG countries. The treatment is the year 2004, the EU accession date. By using the SCM, a synthetic unit that has never received the treatment was built from a pool of 28 countries that are not members of the EU. The selection of countries included in the donor pool was based on a paper by Böwer and Turrini (2010), where the least developed and the most oil dependent countries were omitted from the dataset.

### 3 RESULTS

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Joining the EU positively affected three VG countries, Czech Republic, Slovakia and Poland. Right after the EU accession, Poland experienced a small negative impact on its GDP per capita that turned positive after the global crisis. The largest effect from joining the EU was measured in Slovakia with an average positive effect of 2 646 USD on its GDP per capita during the post-treatment period. On the other hand, in Hungary, the effect of joining the EU on the GDP per capita was negative. If Hungary did

not join the EU, its GDP per capita would be on average higher by almost 3 000 USD in the post-treatment period. The results show that obtaining a positive impact from joining the EU is not certain. It is also dependent on the economic situation of the treated country. Hungary generated a relatively high budget deficit and in order to lower it, Hungary had to make several government spending cuts in the post-treatment period, which could be a possible cause of the negative impact.

### 4 CONCLUSIONS

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The results showed that the treated countries generated mainly positive, however, statistically insignificant effects on their GDP per capita levels from their accession to the EU. Moreover, Hungary was the only country that did not benefit from joining the EU in terms of GDP per capita. Hungary is an important example of badly executed EU accession. If a country

decides to join the EU, it has to consider its economic situation, because joining the EU in and of itself does not always lead to faster economic growth. Poland also took relatively long to experience the positive effect from joining the EU. The winners from joining the EU were the Czech Republic and Slovakia.

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# DOES THE ATTRACTIVENESS OF PRODUCT PHOTOGRAPHY AFFECT CONSUMER PREFERENCES?

Michal Pšurný<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

consumers behaviour, product image, product picture, product selection factors, product utility.

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## JEL CODES

D12, M31

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## 1 INTRODUCTION

Product image display can affect their rating by consumers [1, 2, 3, 4]. A number of studies have looked at the direction in which a product is depicted [2, 4]. Managers often use product images that face a direction at a 45- and 90-degree angle while designing their ads [4]. The study [4] showed that product direction toward the center of an ad enhances product evaluations. Another study [2] showed that the consumers which have their temporal focus on the past, they evaluate products more favorably if these products in images are orientated toward the left (versus right), whereas the reverse holds true when consumers focus on the future.

In this experiment, we had subjects make 270 selections between pairs of ten products. From these selections, we were able to create a preferential order for these products. However, at the time of this selection, the subjects did not think about the preferential order. Subjects were also sent a questionnaire after the experiment. We focused on whether the way the photo is depicted has an effect on the final evaluation of the product against the utility and possible choice of this product. We also looked to see if the product facing direction in the image has an impact on the final assessment of photo attractiveness as the study [2] has shown.

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## 2 MATERIAL AND METHODS

Forty subjects (26 men, mean age = 28,73, SD = 2.16) participated in experiment. At first, the subject became familiar with the products with different utility – table alarm clock (product 1 – P1), flash disk (P2), teapot (P3), spice grinder (P4), French press (P5), Kettle cooked (P6), SD memory card (P7), shaker (P8), headphones (P9), wireless doorbell (P10). The price of all products purchased at the Czech e-shop was similar (ranged from 249 to 299

CZK; November 2019). In the next part, pairs of products were presented on the projector to the subject from which always had to choose one of them that would prefer (or choose). Each pair of products was presented 6 times (in random order, randomly distributed – left or right). 10 products = 45 pairs; 270 pairs in total. From these selections, subjects' preferential scores for individual products were then generated without subjects consciously

ranking the products. Finally, after the experiment, a questionnaire was sent to the subject, where the subject had to answer questions about how the product he wanted, whether he already had the

product, and also how attractive is the photo of the product. Subsequently, a correlation analysis was performed to determine the relationship between utility and how attractive the product was.

### 3 RESULTS

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Correlation analysis showed that there is a strong dependence between the attractiveness of the product photo and the preference for this product. Six products had left direction (P1, P2, P3, P5, P6, P7), two right direction (P4, P10) and the two products

were oriented straight (P7, P8). The difference in binary selection between the products shown to the right and the products shown to the left is statistically significant (two sample  $t$ -test,  $p = 0.047$ ).

### 4 CONCLUSIONS

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An important factor in evaluating products was the fact whether the subject owned the product or not. If not, it was important for the subject to feel that he needed the product. The findings of a previous study [2, 4] were confirmed, showing that the product orientation left or right in the product image could

affect the consumer's assessment of the product. The biggest weakness of the research is the sample size ( $n = 40$ ). It will be necessary to repeat the research on a larger sample in order to generalize these conclusions. The study also does not analyze the reasons why subjects rated the products like that.

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# IS RECIPROCITY STILL THE SILVER BULLET OF TRADE POLICY?

Christoph Riemer<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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reciprocity, trade policy, TIT for TAT, trade barriers, protectorism

## JEL CODES

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F13, F51, C7

## 1 INTRODUCTION

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International trade policy has always been characterised by various forms of tariff and non-tariff barriers to trade. Descriptions of these can already be found in the Bible. In the course of globalisation, they have fallen more and more in various forms and a large network of trade agreements has spread around the globe. The agreements have emerged from comprehensive negotiations in the form of mutual concessions, which is described as reciprocity. The aim of both negotiating parties has always been to develop their own advantage, which requires a concession from both nations, but also from

multinational institutions (e.g. the European Union). This step-by-step approach is also described as “TIT for TAT”. However, this trend towards the opening of national markets has declined significantly in recent years. Former close trading partners use trade policy measures, such as punitive tariffs, to shield their economies from the outside world, which can be described as classic protectorism.

So the question now is quite open whether reciprocity, which has caused many trade barriers to fall, is still the best way forward in trade policy.

## 2 MATERIAL AND METHODS

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A systematic analysis of the relevant sources was carried out to prepare this paper. An essential medium to find out about the gaps in the research to be pointed out were the databases of scientific publications (e.g. Jstor.org). It was not surprising that the individual elements were dealt with many times internationally, but a corresponding combination, which was carried out in the second step of the search, achieved considerably fewer hits. In

the course of the evaluation of the articles, papers and other publications, it became apparent that on the one hand there is a scientific interest in the topic at hand, but that only very few papers show a corresponding combination. In addition, statistical data from various sources (e.g. WTO, Statis) were analysed to prove the increase in trade barriers, but these analyse is not the focus of this paper.

## 3 RESULTS

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If you are looking for a date since when international trade policy has abandoned much of free trade, it is 8 November 2016, not the day on which one

of the potentially most important trade agreements failed, because the negotiations on TTIP, which were based on the principle of reciprocity, have only

paused, but it is the day which Donald Trump was elected President of the USA. Since the presidency of the Republican Official, the USA has imposed the highest trade barriers against Germany and China since 1945. With punitive and countervailing duties since 2020, these comprise almost the entire volume of trade between the USA (approx. 550 billion US dollars) and China (approx. 185 billion US dollars). The picture is also becoming more comparable with the European Union. The principle of reciprocity is apparently no longer applied to free international trade relations from trade barriers. However, it must not be ignored that China has also been levying tariffs on imports from the EU and the USA to varying degrees for some time.

The ever-increasing protectorism of many strong trading nations could at best be interpreted as negative reciprocity, where unfair behaviour is paid back in kind. The principle of reciprocity, which has been described in “The Evolution of Cooperation”

by Prof. Axelrod and whose more fundamental TIT for TAT is, basically works in both directions. A positive or negative action is always followed by an action in the same direction. This path of reciprocity has long led to a steady reduction of trade barriers. Although the change from positive to negative has not changed the principle of reciprocity, the tariff spiral continues turning. The (moving) reasons for this are manifold, the protection of the national economy plays only a minor role, since history shows that in the long run an open trade framework is advantageous. The “Public Choice Theory” states that the individual puts his or her own benefit first, which therefore also applies to political office holders who may subordinate larger goals to “selfish” goals, a re-election. Whether this highly actual thesis (US presidential election: 03 November 2020) also applies to the current president would be a topic for a deep-psychological consideration of this field.

## 4 CONCLUSIONS

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Reciprocity remains the most common tool in international trade policy. In many negotiations between countries and multinational institutions, positive reciprocity also provides a common benefit in that “TIT for TAT” reduces barriers to trade. However, positive reciprocity between the major international trading nations has long since ceased to exist. A spiral of ever higher (protective) tariffs strengthens the walls of protectorism.

Reciprocity is therefore not lost and remains the most common way to remove barriers to trade in a co-operative manner. However, at present it is questionable whether it remains the silver bullet or whether new approaches will have to be found in some cases to re-establish the path to global free trade.

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# ESTIMATION OF SUPPLIER'S INDIRECT PLANT SALARY COST WITHIN THE AUTOMOTIVE INDUSTRY

Remo Rossi<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

plant/factory overheads, automotive industry, cost engineering, plant salaries

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## JEL CODES

C02 , C20

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## 1 INTRODUCTION

So called “Should Cost Calculations” performed by carmakers cost engineers have become a standart within the automobile industry. They are supporting the sourcing process of externally manufactured components and are a key enabler for fact-based negotiations (Hülsbömer, 2015). Although they are directly affecting carmaker’s profitability only few authors such as Roy et al. (2011) describe the process and information requirements of automotive cost engineering in order to conduct these calculations. Academic literature is focussing primarily on the calculation of so called value added, direct manufacturing cost. This is surprising since overheads can have a major impact on the total product costs driven by the requirements of modern manufacturing processes (Miller/Vollmann, 1985). The calculation of cost related to the indirect plantworkforce -which is a crucial part

of overall plant overheads- is described only rudimental by empahzising to consider an adequate markup on the total portion of direct labor cost within the product cost structure (Roy et. al., 2011, 4). This approach is questionable since indirect labor activities and costs might not necessarily proportional to total direct labor costs, which bears the risk to generate huge cost disortions (Chiang, 2013). A structured and detailed approach focussing on the estimation of average salary cost for different indirect job functions within an automotive supplier plant and an improved cost allocation based on individual plant configurations is missing. This paper provides a methodological approach in order to estimate country-specific plant salary cost per head for different indirect job categories.

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## 2 MATERIAL AND METHODS

Within a first step crucial indirect job categories of an automotive plant are collected and their average annual salaries are derived based on country-specific statistical data of the german automotive industry. The data is in major parts based on the results of a detailed salary study (Hermann/Zimmermann, 2020) and is used in order to create cost estimation formulae utilizing the method of scale. The dominant scale or cost factor within this cost estimation is the qualification level of the individual

job function, which is expressed by a percentage ratio based on the average annual salary of the specific job category in relation to the salary of a direct operator. After having derived country specific percentage ratios for each indirect job category local salary cost can be estimated by multiplying these percentage ratios with the average region-specific annual salary of a direct operator. By finally adding country specific fringe benefits total salary cost can be estimated for a specific plant location.

Tab. 1: Plant salary spectrum for Stuttgart/Baden-Württemberg/Germany

$i = 1..21$	plant job categories	Si_germany	Pi_germany	Si_germany_local	Si_germany_local_total
1	Plant Director	138.636 €	313%	150.419 €	182.007 €
2	Head of Plant Finance and Controlling	92.012 €	208%	99.832 €	120.797 €
/	[...]	[...]	[...]	[...]	[...]
17	Fork lift driver and material handler	45.812 €	104%	49.706 €	60.144 €
18	Direct labor-skilled operator	44.240 €	100%	48.000 €	58.080 €
/	[...]	[...]	[...]	[...]	[...]
21	Employee Plant Security	29.275 €	66%	31.763 €	38.434 €

### 3 RESULTS

In total 21 different job categories of an automotive supplier plant have been identified in order to cover most important job functions. Based on statistical averages of annual salaries a country specific plant salary spectrum is created. Following three equations are used in order to conduct the two calculative steps, which were previously described in the section data and methods. Partial results are visualised in Table 1 for a plant located in Baden Württemberg/Stuttgart:

- [1]  $Pi\_country = Si\_country / SDL\_country$
- [2]  $Si\_country\_local = SDL\_country\_local * Pi$
- [3]  $Si\_country\_local\_total = Si\_country\_local * (1 + fcountry)$

- Si\_country: Country specific average annual salary [€]
- Pi\_country: Country specific percentage of salary in relation to direct labor salary  $SDL\_country = S19\_country$  [%]
- Si\_country\_local: Country specific average annual salary within a specific region of the country [€]
- fcountry: country specific fringe benefits [%]; equals 21% for Germany
- Si\_country\_local\_total: Total fully fringed employing cost [€]

### 4 CONCLUSIONS

The approach described within this paper is effective since cost information related to direct labor is a general available information to carmakers cost engineers. Consequently cost estimations can be conducted relatively fast and transparent once a county specific plant salary spectrum was created. By adapting a plant salary spectrum to local requirements even regional labor market conditions can be considered. The results of this paper

could be extended in future research in order to support the development of a plant cost model focussing on supplier's plant overheads, in which indirect plant salaries are a crucial cost element. Individual plant headcount configurations could be considered, while appropriate overhead allocations need to be identified in order to improve the overall transparency and accuracy of future cost estimations.

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# AIR POLLUTION FROM TRANSPORT AND HUMAN HEALTH IN EU COUNTRIES

Hana Rozehnalová<sup>1</sup>, Michal Mádr<sup>1</sup>, Lucie Formanová<sup>1</sup>, Břetislav Andrlík<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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air pollution, life expectancy, human health, NO<sub>x</sub>, SO<sub>x</sub>

## JEL CODES

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H23, I10, Q53

## 1 INTRODUCTION

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Road transport has become the major source of environmental pollution and it is also one of the biggest environmental risks in the EU countries (EEA, 2019). Awareness of global air pollution is increasing and is a priority on the environmental, political and health agenda (Miller, 2020). Emissions of pollutants caused by transport are namely particulate matter, nitrogen oxides and sulphur, volatile organic compounds, ground-level ozone, carbon monoxide, ammonia and toxic metals (EEA, 2019). Of course, the existence of pollutants also creates negative externalities, i.e. additional costs, and in addition causes damage to buildings, soil, water, the biosphere, and, in addition, damage to human health is an indisputable

fact (Maibach et al., 2008). Good air quality is very important for population as pollutants have negative impacts on human health, it mostly causes cardiovascular or respiratory diseases but there are possible consequences leading up to premature death (Kampa a Castanas, 2008). Air pollution is an even more common cause of death than known risk causes, such as malaria, traffic accidents or excessive alcohol consumption (HEI, 2019). In terms of the economic cost of air pollution worldwide, the amount is estimated at \$ 2.9 trillion, representing 3.3% of world GDP (McCarthy, 2020). In the EU-28, the total cost of pollution is estimated at € 33.36 billion (van Essen, 2019).

## 2 MATERIAL AND METHODS

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The paper deals with relationship between air pollution and human health, especially with effects of the air pollutants generated by road transport on the life expectancy in EU countries. We use regression analysis of panel data, namely fixed effects method, to analyse the mentioned relationship. The analysis includes panel data of 28 cross-sectional units (EU countries) and 23 time periods (1995–2017). The explained variable representing human health is life expectancy at birth ( $L_E$ ). The explanatory variables

are pollutants that appear in the air as a result of the use of motor vehicles – particulate matters with a diameter of up to 2.5  $\mu\text{m}$  (variable  $PM_{25}$ ) and up to 10  $\mu\text{m}$  (variable  $PM_{10}$ ), oxides of sulphur (variable  $SO$ ) and nitrogen (variable  $NO$ ), ammonia (variable  $A$ ) and volatile organic compounds (variable  $VOC$ ). Socio-economic factors as control variables are used as well (median age, level of education, gender, GDP per capita and size of health care expenditure). We assume that pollutants reduce life expectancy

and thus negatively affect human life expectancy. The final regression model can be expressed by the following equation:

$$LE_{i,t} = \beta_0 + \beta_1 \log X_{i,t} + \sum(\beta_k \text{ Controls})_{i,t} + \omega_{i,t} + \varphi_{i,t} + \epsilon_{i,t},$$

### 3 RESULTS

The results indicate a statistically insignificant effect of particulate matters of both sizes ( $PM_{25}$ ,  $PM_{10}$ ), ammonia ( $A$ ) and volatile organic compounds ( $VOC$ ). This means that we have not been able to prove that these substances have a negative effect on human health. On the other hand, our results show that we can observe negative impacts in the case of nitrogen oxide ( $NO$ ) and sulphur oxide ( $SO$ ). For nitrogen oxides, this is the impact in the form of a reduction in life expectancy by 1.49 years with

where  $i$  represents individual EU member states,  $t$  denotes individual years,  $LE_{i,t}$  is life expectancy at birth,  $\log X_{i,t}$  is set of variables representing individual pollutants ( $PM_{25}$ ,  $PM_{10}$ ,  $NO$ ,  $SO$ ,  $A$ ,  $VOC$ ; logarithmic functional form),  $\sum(\text{Controls})_{i,t}$  is set of control proxies,  $\omega_{i,t}$  captures year fixed effects,  $\varphi_{i,t}$  captures country fixed effects, and  $\epsilon_{i,t}$  is an unobserved error term.

### 4 CONCLUSIONS

As transport is a very important contributor to air pollution which is closely related to the human health and in line with our findings, the actions of economic policy makers should primarily lead to the reduction of nitrogen and sulphur oxides (e.g. through the introduction of environmental elements

an increase of the pollutant by 1% and for sulphur oxides by 0.28 years with an increase of the pollutant also by 1%. These substances therefore confirmed the assumption that pollutants from transport reduce the life expectancy. The knowledge gained from these models can therefore only be evaluated in such a way that nitrogen oxides and sulphur oxides reduce the expected lifetime and the remaining pollutants (both particulate matter sizes, ammonia, volatile organic compounds) do not confirm this relationship.

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# LINK BETWEEN DIGITALIZATION AND NEW PRODUCT LAUNCH: LESSONS LEARNED FROM AN EMPIRICAL SURVEY

Alexander Salmen<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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new product success, product launch, digitalization, innovation strategy

## JEL CODES

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L81, M31, O14, O33

## 1 INTRODUCTION

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The article enlightens the link between the degree to which a company is digitalized, and new product success. The ability to successfully innovate, means developing and launching new products successfully, has been identified to be one of the key drivers behind financial performance of companies. New product launch is the last and most important step within innovation projects. Even though its importance proved, only 4% of literature concern new product launch which is the most costly step within innovation projects. Digitalization has been identified as key booster of efficiency and productivity of companies' production and administration. If

digitalization could boost new product launch as well, it could contribute a lot to overall companies' success. Nevertheless, the link between the degree to which companies have been digitalized, and new product success, has never been inspected. Research on this subject would therefore close a relevant scientific gap. The method of this work is to collect data within German ironware traders and to run a correlation and regression analysis to answer the question, if companies who took relevant digitalization measures, report also higher new product success and therefore, if a link exists.

## 2 MATERIAL AND METHODS

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Empirical data has been collected from a survey among ca. 3,000 ironware trading companies in Germany. The survey has been launched via email in June 2020 and was sent after a pretest to all members of the ironware trading associations EDE, Nordwest and EIS. The ingredients of the survey has been induced by literature review and expert interviews which had been used to find relevant digitalization measures that could be identified to

influence new product launch success; The findings from literature research and expert interviews have been used to create measurement scales that have been measured on 7-level-Likert scales. An existing survey design could be used to measure new product launch success. The related data has been analysed concerning reliability and validity; Results have also been used to run a correlation analysis and regression analysis.

### 3 RESULTS

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The study could find a significant link between the deepness of implemented digitalization measures of a company, and new product launch success within the last 5 years. Digitalization apparently boosts

new product success. Ingredients of digitalization measures should be derived from a strategic, holistic approach, and customer centralization of measures. Further results and discussion within the article.

### 4 CONCLUSIONS

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The study shows a strong link between both aspects of digitalization (customer orientation of digitalization measures, and strategic fit of digitalization measures) and new product performance. The right digitalization measures can boost new product success within companies. Further research has to be done to explore the character of the relationship between digitalization and new product success and identify suitable tools, best-practices and effects

behind the general link. Also, the results of this study have to be transferred to other markets. The project of the author of this work is to further investigate the link between new product success and digitalization in the German B2B production market. For managers, the study reveals further hints how to use digitalization measures to obtain better new product launch results.

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# THE RAISE OF DATA ANALYTICS AND DATA-LEAD DECISION MAKING IN GLOBAL SPORTING ORGANIZATIONS

Marina Schloesser<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

data analytics, sports organisation, rightsholders, sponsorship, innovation, fan engagement

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## JEL CODES

M31

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## 1 INTRODUCTION

Data capturing and analytics has been integrated into professional sports for several years. But the technology available and its use has been intensely improved in quality and increased in quantity over the very recent years. With more and more data being tracked, data analytics has already become the daily business in the highly competitive sports

environment. It has transformed the way sports are played, marketed and managed.

In this paper I will compare existing research to understand if and how data can help sports managers and business professionals to improve their professional practice to ultimately increase efficiencies, fan engagement and revenues across the different business units.

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## 2 MATERIAL AND METHODS

While many research papers have focused on player performance metrics in order to use data to improve training, rehabilitation and game strategies amongst others, I want to compare existing research on how analytics can be applied to other functional areas of the sports business, such as marketing, sponsorship, TV rights or even ticketing.

The sports market is a multi-million business that has become very saturated. As loyalty and increasing revenues unfortunately are not a given for rightsholders, they have to understand and individually target their business partners, i.e. fans, media, sponsors etc. Business analytics has become an important tool to manage campaigns, sponsorship

sales, fan engagement as well as ticket sales more effectively.

Data analytics is defined as “the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact based management to derive decisions and actions” (Davenport and Harris, 2007, p. 7). Different authors have begun to investigate how data analytics can positively impact not only the sporting side of the game but the commercial arm behind it as well. From market research in order to understand your fan profile, competitor performance analysis, social media monitoring to ticket pricing predictions and sponsorship ROI evaluation. Data can be collected

from different angles and in different forms but will ultimately increase the rightsholders' knowledge and market insights and reduce the companies' cost if

correctly interpreted and used to take appropriate actions

### 3 RESULTS

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The use of analytics in the sporting environment has grown tremendously all over the world, but especially in the USA and Europe, home of the most popular sports leagues and clubs in the world. Sports marketers have acknowledged the advantage of data to support or guide them when taking important business relevant decisions.

While it might seem challenging to some organisations at the beginning, once successfully implemented data analytics will help to reach complex decisions while relying on supporting data. Further, data

can help the organisation to be more cost efficient, increase revenues by better sponsorship or TV offerings, build and strengthen fan loyalty by better game experiences or by sending customised messages to the fans' preferred medium at their preferred time which is something a CRM tool can offer. The benefits are various and hence, in order to stay competitive and cost efficient, sports organisations at all levels will need to employ some kind of data collection and analytics to drive commercial value in this very competitive environment moving forward.

### 4 CONCLUSIONS

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Sports Marketing has become data oriented due to fact-based decision-making employed by most marketing managers and the need to proof success (Fried, G., Mumcu, C., 2016). What was initially introduced to the training and recruiting area of the sporting business has now taken over most business-relevant departments of global sporting organizations. From ticket pricing models, fan databases to social media

analytics, the possibilities to collect and analyse data has become so wide that it can take up significant investments to comb through the data lakes in order to identify the key insights. Nonetheless, even when starting small and only focusing on a few data points, commercial benefits for sports organizations will be impactful.

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# SMART DAIRY NUTRITION: HOW TO HARVEST THE NEW “GREEN GOLD”?

Manfred Schönleben<sup>1</sup>, Hagen Müller<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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neutral detergent fiber, rumen degradability, climate change, income over feed cost, sustainability

## JEL CODES

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Q01, Q14, Q56

## 1 INTRODUCTION

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To satisfy increasing quality food and nutrient supply requirements for our growing human population, farmers carry vital responsibilities. Their husbandry of ruminant animals with the ruminants unique, poly-gastric digestive system, upgrades for human consumption unsuitable plant fiber into highly nutritious milk and meat. Especially relevant within the climate change debate, dairy cows upcycle plant fiber from marginal soils, unfit for efficient cropping, by-products from human food production like almond and soy hulls, beet and citrus pulp, as well as fermentation by-products in a highly economical and ecologically sustainable way [1, 2]. For instance, the melioration of highly rumen degradable plant fiber, or in other words, neutral detergent fiber (NDF) into milk, can improve the farms soil market service per ha by more than 50% and simultaneously reduce

the ecological “hoofprint” per unit produced [1, 3]. Since high quality and rumen degradable NDF can be seen as the new “green gold” of sustainable dairy farming, the question: “how to manage and harvest the new “green gold” needs to be answered. Combining refined Weender analytical results and variety-specific crop yields, the objectives of this study were to assess the influential parameters which allow the economically sustainable harvest of highly rumen degradable NDF crop biomass, using a set of 30 representative corn silage varieties, cropped and analyzed at three locations.

Results show, the correct variety choice (Fig. 1) is the crucial variable in efficiently increasing dairy farms monetary income over feed cost and economic sustainability.

## 2 MATERIAL AND METHODS

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From the cropping season 2020, a representative set of 30 temperate silage maize varieties from ten breeding companies were individually analyzed for rumen degradable fiber and whole crop yield components, following refined Weender analytical standard procedures. Total rumen degradable dry matter yield (dDMY) was modeled using a linear mixed model approach, following:

$$y_{ijk} = m + g_i + l_j + (gl)_{ij} + b_{jk} + e_{ijk}, \quad (1)$$

where  $y_{ijk}$  is the dDMY (t/ha) for the  $i$ th variety, cropped in the  $j$ th location and  $k$ th incomplete block,  $m$  is the grand mean,  $g_i$  is the effect of the  $i$ th variety,  $l_j$  is the effect of  $j$ th location,  $gl$  is the interaction of the  $i$ th variety and  $j$ th location,  $b_{jk}$  the effect of the  $k$ th incomplete block, nested within the  $j$ th location, and  $e_{ijk}$  is the residual. The factor location ( $j$ ) was considered as a fixed effect, the factors variety ( $i$ ), the interaction between variety and location ( $ij$ ), and incomplete block ( $jk$ ) were considered as random effects. All analyses were performed using R [4].

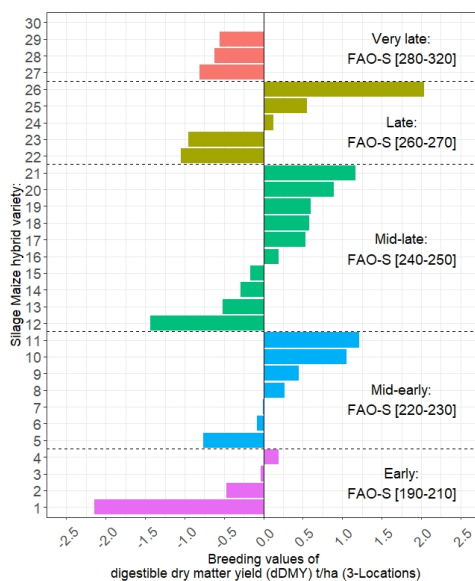


Fig. 1: Breeding values of digestible dry matter yield (dDMY) t/ha from 30 silage maize hybrids cropped at three locations, stratified by maturity groups. Yield basis (0) is 16.82 t/ha dDMY (median harvest dry matter  $\sim$  38.2%)

### 3 RESULTS

The mixed model analysis yielded a strong differentiation of variety-specific dDMY random effects (breeding values; heritability  $h^2 = 0.85$ ), within and among maturity groups (Fig. 1). The mean (min) within maturity group dDMY difference of 2.17 (0.83) t/ha translates into an economic advantage of

1,389 (532) €/ha to the benefit of a higher dDMY (0.32 €/kg milk revenue). On the other hand, the broadly applied ELOS (enzymatic soluble organic substance) trait yielded a nonsignificant Pearson correlation of 0.29 with the dDMY.

### 4 CONCLUSIONS

The presented evaluations show the substantial effect of variety choice on increasing dDMY, and consequently, in increasing farms monetary income. To identify varieties with high rumen degradable fiber content and dDMY, we, therefore, recommend

farmers to rely on rumen degradable fiber traits like the 30h NDF rumen degradability. These analytics yield promising guidelines within the quest to harvest the new “green gold” for sustainable dairy farming.

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# THE HISTORICAL BEGINNINGS OF QUALITY AND ITS TRANSFER TO GLOBAL QUALITY MANAGEMENT SYSTEMS NOWADAYS

Oliver Schneider<sup>1</sup>

<sup>1</sup>*Comenius University, Bratislava, Slovakia*

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## KEY WORDS

global quality management, quality principles, quality strategies, best practice

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## JEL CODES

L15, L21

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## 1 INTRODUCTION

Due to the constantly changing challenges and framework conditions, quality management has also been subject to constant change and development. The origins of quality management can already be found in antiquity, in the construction of the Egyptian pyramids with uniform length measurement. In the Middle Ages, the formation of guilds with corresponding norms, masters and journeymen can be seen as a first step. In the modern age, Taylorism and the accompanying changes in industrial production have shaped the development of quality management. The origin of Taylorism lies in the late 19th century, when the American Frederick Winslow Taylor aimed

at increasing the efficiency of industrial resources by the principle of division of labour allows local specialisation were. Taylor essentially separated the planning of the work from the implementation.

The study examines a partial historical aspect out of the concept of global quality management introduced by Roland Jochem (2015) for its direct impact on quality management today. The main point of the present study is the derivation of the historical origin of quality and its direct impact on today's quality management key points and strategies also in a global context.

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## 2 MATERIAL AND METHODS

Occupational science identifies how quality-relevant methods and principles have found their way into the work of modern times. The logic of all-encompassing quality management methods goes back to the 80ies, when Noriaki Kano (1984) established that the effects of fixed and recurring processes have a positive influence on work sequences and lead to a positive quality result. William Edwards Deming (1986) also found out that interdependencies have to be taken

into account in a defined generalist approach, as these can have a positive or, if not observed, negative effect on a quality performance result. These assumptions of Deming form the basis for the concept and the implementation of quality management and contain fourteen key points which the top management has to ensure.

The fourteen key points plus specific items were analysed and evaluated by the utility-value-analysis

and finally shown by a network diagram. The grouping of all elements was clustered with a gradation of 5 categories on the abscissa from very important to unimportant, the allocation of the topic points along the organisational structure of local, continental and intercontinental with weighting factor on the ordinate. These data base and findings was a outcome of internal analyses from my previous company for successful implementation of national

(6 subsidiaries in Germany), international (Italy, Hungary) and intercontinental (China, Thailand) quality management systems.

The research question of this study is: What are the requirements and influences of those key points in the context of local, continental and intercontinental circumstances for companies in regards to built up a global quality management system?

### 3 RESULTS

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The result shows a high degree of interdependence and linkage. Without the respective core elements as an overarching basic construct, global quality management cannot be implemented in order to work, interact and operate in the named corporate context on site. All key points contain and refer to or-

ganisational, personal and leadership behaviour and a strict discipline to comply with them accordingly.

The challenge for implementation and the complexity of particularities in terms of local cultural conditions, local regulations and the intellectual knowledge of employees is constantly increasing from local to continental into intercontinental context.

### 4 CONCLUSIONS

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The results of the study presented the following conclusions to top management: Firstly, there is no doubt about that systematically structured and efficiently operating companies with a global quality management improve their reputation and standing both local, nationally and internationally. Moreover, this also has a downstream influence along the value stream on how we deal with and being perceived by

customers, suppliers and sub-suppliers in terms of performance and principles.

However, it is essential that top management allows the creation of frameworks and structures that enable the organisation to shape them according to its needs. If this is not the case, all efforts to introduce and operate a global quality management will fail.

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# AVERAGE COSTS FOR ONE PERSON WITH DISABILITIES FROM THE STATE AND EMPLOYER PERSPECTIVE

Lucie Sedláková<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

people with disabilities, costs from state, labor market, work in team, effectiveness of work, implementation

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## JEL CODES

J14, J71

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## 1 INTRODUCTION

Everybody has met a person with a disability at work or elsewhere. According to available sources, the number of people with disabilities is increasing. State support for companies is contributions to handicapped employees or tax relief. On the other hand, the growing number of handicapped increases the costs of the state budget.

The Czech Republic has more than half a million inhabitants with disabilities from I.–III. degree. This represents the need for the state to pay disability pensions as support for the disabled. The average

amount of a first-degree disability pension is CZK 7 681 and the cost of social and health insurance if the disabled person is not working. The state is constantly increasing the contribution for companies per disabled worker to reduce the costs of the social and health pillar, furthermore support workers with disabilities in the work process and harmonization into work teams. The research aims to evaluate the effectiveness of people with disabilities in work teams. Further, evaluate the cost item of the state for disabled people.

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## 2 MATERIAL AND METHODS

We used data from CSO and data from a particular company. We provided a descriptive analysis from available quantitative CSO data from 2010 to 2Q 2020 in the area of disability pension payments for quarters according to the degree of disability concerning gender. There is a big difference between the amount of disability pension and gender.

Another part of the research was performed in the security agency in the years 2019–2020. Primary data

were collected in the form of questionnaires. The questionnaire contained closed and open questions. Part of the obtained data was statistically evaluated. Furthermore was performed an analysis of open questions and their evaluation. The last part was an evaluation of the worked hours for disabled and non-disabled workers.

### 3 RESULTS

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The evaluation of the results obtained so far shows that the costs expended by the state per person with a disability are very high. In the long run, they are necessary to effectively support the employment of people with disabilities. For the period 2010–2020, the Czech Republic paid the average cost per disabled worker in the amount of CZK 19.597,97.

The average costs per disabled man are: I. degree of disability CZK 18.103,14; II. degree of disability CZK 18.858,45; III. degree of disability CZK 22.590,26.

The average cost per disabled woman is: I. degree of disability CZK 18.103,14; II. degree of

disability CZK 18.248,86; III. degree of disability CZK 21.683,97. Research conducted on the security agency staff from 2019–2020 showed that all disabled employees receiving a disability pension are more satisfied with the job, the employer and the work team than workers without disabilities. The difference between the amount of the invalidity pension between the gender is clear, thanks to the fact that the invalidity pension is calculated according to the person's previous income and its categorization according to disabilities.

### 4 CONCLUSIONS

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The obtained results show that the topic of employment of people with disabilities is still actual in the context of the increasing number of handicapped people.

The costs of the state in the form of the contribution of employers' companies and the payment of disability pensions for people with disabilities, despite the high costs, are effectively spent for the state when we look at it with the long-term perspective of people with disabilities by receiving invalid pensions. continue to pay income tax, but at least for one partial return of costs to the state

budget and acceptance for payment of social and health insurance by the employee of the disability and his employer, which would otherwise have to be paid by the state itself from its budget. This contributes to the pension pillar. Therefore, it is necessary to support people with disabilities in starting work and to integrate them effectively into the work team.

In the next part of the research, we will focus on the processing of company data and the development of the effectiveness of workers with disabilities in the security agency.

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# THE IMPACT OF THE OPERATION OF PASSENGER CARS REGISTERED IN THE SLOVAK REPUBLIC ON THE ENVIRONMENT

Marianna Sekerešová<sup>1</sup>, Břetislav Andrlík<sup>1</sup>, Lucie Formanová<sup>1</sup>, Michal Mádr<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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motor vehicles, externalities of transport, emissions, emission factors

## JEL CODES

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I18, Q53, R41

## 1 INTRODUCTION

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Road transport is a very important part of the whole transport infrastructure, that enables the transport of either persons or goods closest to the destination compared to its competitors. It would be certainly found many other benefits, on the contrary, this paper focuses on the negative externalities of road transport. The importance of addressing these negative consequences is also confirmed by the European Union's (EU) ongoing interventions in this area to ensure cleaner transport. It seeks to achieve this, for example, Regulation No. 715/2007, which sets emission standards (EURO 5, EURO 6) for light passenger and commercial vehicles.

The most frequently mentioned negative externalities from transport are accidents, noise, congestion and air pollution, which are closely related to greenhouse gas emissions that have an impact on climate

change (Parry et al., 2007). European Environment Agency (2016) in his article points out that up to one in four EU citizen is afflicted by high traffic noise, which has a negative impact on human health and can result in hospitalization.

The size of the volume of emissions produced by road motor vehicles can be influenced by many factors. As reported by the Press Agency of the Slovak Republic (TASR) in the electronic portal EURACTIV (2016), one of the ways how car manufacturers trying to reduce emissions and thereby comply with emission standards set by the European Union was to reduce engine capacity. This indirectly implies that a vehicle with a smaller engine capacity should produce lower emissions than a higher engine capacity.

## 2 MATERIAL AND METHODS

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The paper focuses on the negative impact of road transport on the environment and human health. These are more detailed the consequences of the operation of motor vehicles of category M1 and the associated size of the volume of emitted emissions

contained in the exhaust gases. The aim of the paper is to identify the factors that may cause differences in real measured emissions within a selected group of M1 vehicles.

Scientific methods such as analysis, description, comparison and finally synthesis are used in the processing of the paper. The analysis is performed on a set of data obtained from S-EKA, spol. s ro, which contains selected data on vehicles of categories M, N and T from emission control stations in Slovakia for the year 2019. This data package also includes real measured values of emissions of CO, CO<sub>2</sub>, HC, Lambda in the conditions of idling engine speed (VO) as well as increased engine speed (ZO), which serve as the main basis for further processing of the

paper. The selected vehicles are Škoda Fabia brands powered by petrol with an engine capacity of 1197, 1198, 1390 or 1397 cm<sup>3</sup>, which is 5.50% of the total data provided.

As part of the solution of the above goal, pivot tables and boxplots were used, which are a graphical representation of emission variability for a given engine type. For a higher telling ability of the box plot results, 5% of the highest values for each type of emission at a given engine volume were removed.

### 3 RESULTS

The obtained data of Škoda Fabia vehicles were used to determine whether the volume of the vehicle's engine influences the emissions produced. The research verified the relationship: with increasing volume, the production of emissions increases. Based on the achieved results, we can say that vehicles with different engine volumes produce different amounts of emissions and despite a small difference in engine volume (1 cm<sup>3</sup>), the volume of emissions varies signif-

icantly. However, it is not possible to unambiguously determine for all types of selected emissions together which of the engine volumes is the highest emitter. It depends on which of the emissions we are observing and whether the conditions are at idle speed or increased. On the contrary, based on the results of our research, we are able to refute the assumption of increasing emissions at increased volumes.

### 4 CONCLUSIONS

Using the obtained data, containing data on motor vehicles of categories M, N and T from Slovak emission control stations for 2019, the paper examined the relationship between real measured emissions of CO, CO<sub>2</sub>, HC, lambda and engine volumes 1197, 1198, 1390 and 1397 cm<sup>3</sup> Škoda Fabia petrol vehicles. In the research part, it was shown that the size of the engine has an effect on the amount of emissions, but could not prove the claim from the article EUROACTIVE (TASR, 2016), which does not directly imply that

with decreasing engine capacity the vehicle should reduce production emissions. At the same time, TASR (2016) claims that reducing engine volume is one of the tools of automobiles to meet emission standards. However, if there is an increase in the production of cars with lower engine volumes (which have in reality been measured at higher values), this may result in an increase in air emissions compared to the original assumption.

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# AGEISM DURING THE JOB COMPETITION OF WORKERS ON THE CZECH LABOR MARKET

Veronika Spáčilová<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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discrimination, labor market, correspondence experiment, age management, age disadvantage, employment discrimination, ageism, age discrimination, population aging

## JEL CODES

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J14, J28, J71

## 1 INTRODUCTION

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The current demographic trends in the Czech Republic and also in Europe are stern and explicit – population is aging. That will also cause the decline in the number of economically active people. It is practically inevitable to increase the retirement age and, in this context, to ensure that these workers are willing and able to work.

This paper is focused on the labour market. Employment is an important chapter in life. A person normally spends one third of the time at work. So it is important employees feel good at work. If a

person is disadvantaged in the workplace, it has a significant effect on his or her behavior and access to employment. It is necessary to eliminate every discrimination. There are many reasons why and how to discriminate people on the labor market, but for this paper was selected the most common according to available resources. It is age disadvantage. The age of a worker evokes stereotypes and prejudices about his or her performance at work, which are often incorrect and these people are rejected due to age.

## 2 MATERIAL AND METHODS

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The resulting part is based on the collected primary data, which are processed in a correspondence experiment and semi-structured interviews.

The primary research of this work was a correspondence experiment, the subject was the age disadvantage of job seekers in the Czech Republic.

Two basic fictional CVs were prepared for correspondence research. The individual CVs were drafted to make it clear that the former belonged to an older woman and the latter to a young woman applicant. Next part of the experiment was answering to job advertisements by both candidates. The monitored

values of the research were positive answers by a potential employer with an invitation to the admission procedure. If the candidate received a reply with this invitation, she was considered in the research to be successfully hired. The aim was to clear the experiment of possible variability. The research measures only the chance of being hired, an invitation to an interview. It does not further examine whether the candidates would actually be accepted or not. It does not deal with the amount of wages. The obtained data were then statistically evaluated.

The correspondence experiment was followed by research using qualitative interviews. First, conversations were set up regarding age management and the correspondence experiment. Two groups of respondents were randomly selected. The first group was managers, executives or HR staff. The second

group was younger and older candidates. The aim of this research was to find out the respondents' view of the area of age management and age differences. First, individual interviews with respondents took place. Then an analysis of the interviews and their evaluation was performed.

### 3 RESULTS

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The evaluation of the correspondence experiment shows that the possibility of finding a job (probability of obtaining a positive answer) is lower for an older candidate than for a young woman. In the ratio of positive answers, the older woman received a positive answer in 38% and the younger woman in 62%. It indicates that there is age-related disadvantage in the labor market. Older job seekers have less chance of being invited for an interview than younger candidates.

Research based on qualitative interviews has shown that companies are not focused on the age and individuality of employees. The concept of age management is not applied in companies. Furthermore, research has revealed the fact that not only the older age is disadvantaged, but also the younger age group as well. This finding does not correspond to the result of the correspondence experiment. The reason is that younger candidates are age disadvantaged at personal contact during an interview or at work.

### 4 CONCLUSIONS

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Research suggests a problem in the field of age and its disadvantage in the labor market. According to the point of view, there is an age disadvantage for younger and older people. The disadvantage of older people affects all parts of the work process, while the younger group encounters this problem only through personal contact.

In an aging population it is necessary to count with the increasing number of older employees and apply age management methods, it is necessary to respect the individuality of employees. Further

work on effective communication between employees, subordinates, superiors.

The results of the experiments indicate the need to address not only the issue of population aging. Due to the gradual application of Industry 4.0 and changes in work procedures, it will be necessary to effectively integrate these workers into changes in work processes and not to distance them from changes. Based on the performed experiment, the author will also deal with age disadvantage in the context of industry 4.0.

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# ANALYTICAL HIERARCHY PROCESS ON THE IMPACT OF SELECTED LOCAL ENVIRONMENT FACTORS ON FOUNDER'S DECISION MAKING IN GERMAN DENTISTRY

David Stein<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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analytical hierarchy process, career choice, location factors, dentistry

## JEL CODES

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C18, C44, I31

## 1 INTRODUCTION

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For years, the existing disparities of undersupply of rural regions and the oversupply of general practitioners in cities in the Federal Republic of Germany have been analyzed [1]. For dentists, the developments in the forecasts also see an imminent undersupply of rural areas. The urban centers are already oversupplied [2]. In addition, there is a decreasing number of start-ups [3], a significant increase in the number of dentists in employment [4] and an upward trend in the age of founders [5]. Measures seem to be necessary to counteract an impending undersupply of regional dental care in

Germany. It is an accepted fact that classical theories of economic decision making can make very specific and verifiable predictions about the behavior of decision agents [6]. However, the individual decisions are subjective and highly complex. A systematic literature analysis shows that the personal aspects of dentists have not yet been sufficiently researched. Which environmental location factors have what influence on the founder's decision on the business type of dentist's practice? Consequently, what motivates dentists as decision making agent to settle?

## 2 MATERIAL AND METHODS

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According to Herbert Simons theory of bounded rationality heuristics are useful assuming that dentists take shortcuts to discover which business type (alternative) of future practice is meeting the level of aspiration. To overcome satisficing criteria that terminates search and leads to choose a business type the environmental location factors for founders in dentistry were extracted by a structured systematic

literature analysis in the scientific publications from 2010-2020 in three databases (PubMed, SpringerLink and Elsevier). Simon postulated that aspiration levels as well are not static but tend to rise and fall according to changing experiences [6]. Aiming at a decision model that integrates satisficing criteria and enables to evaluate the level of aspiration that terminates search for the decision-making agent (dentist)

in order to understand the needs for supply and to create incentives for preventing dentist's deficiency the methodology for objectifying the decision-making

processes is to be achieved through an Analytical Hierarchical Process [7] was chosen.

### 3 RESULTS

The selected environmental factors that influence founder's decisions on the business type of dentist's practice as found by the literature analysis are financial conditions, real income and support programs, infrastructure, location of the practice, dentist density, environment for the family, quality of life in the private environment and professional

cooperation. These can be compared on a 9-1-9 scale [8]. With  $N = (n \cdot (n - 1))/2$ , there are 36 pairwise comparison ratios for nine criteria. The sociodemographic characteristics age, gender, marital status, persons in household, children, main wage earner, hometown, distance from home to work, working hours are shown as relevant.

### 4 CONCLUSIONS

Being able to understand the influences that lead to decisions on the type of dental practice is an important planning tool to avert undersupply of the population in parts of Germany. Since dentists are free in their decision whether and where to settle (freedom of settlement), it is relevant for health policy actors to classify the influences and understand what satisfies dentists. A survey with a designed questionnaire of persons, who have a dental license or are students of dentistry ( $N = 82129$ ) can be conducted. The collected data can be factorized and

put into relation by means of statistical regression. This makes it possible to analyse the factors and draw comparisons using statistical regression. To ensure security of supply, a better understanding of the significance of environmental location factors among the founders of new practices can help to improve and control the process of managing the supply. An implementation of a continuous review of the influence of the selected environmental location factors on the founder's decision on the business type of dental practice seems appropriate here.

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# SYSTEMATIC LITERATURE REVIEW ON THE IMPACT OF LOCAL ENVIRONMENT FACTORS ON FOUNDER'S DECISIONS IN GERMAN DENTISTRY

David Stein<sup>1</sup>, Ralf Michael<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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career choice, dentistry, practice, location factors

## JEL CODES

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I10, I31, M13

## 1 INTRODUCTION

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In 1993 almost 4,000 establishments of dental practices were recorded. In 1999 there were 2,500 new branches [1]. However, since the year 2000, the number of new practices in dentistry has been declining. With 1,195 new foundations, it reached a historic low in 2012 [2]. With 1,214 dentists opting for self-employment in 2018, the number of branches has risen only slightly [3]. The forecast of the care atlas for the federal state of Rhineland-Palatinate [4] shows a total of 1,524 dentists in need of replacement by 2023, which corresponds to 57% of the dentists currently working in Rhineland-Palatinate [4]. Dental care in some rural regions is already below the average level of care. More than 4,500 inhabitants are covered by a single dentist. But what are the reasons for the decreasing dental start-ups?

The average age of dentistry founders rose from under 34 years old in 1994 to 36.9 years in 2014 [2]. Rising investment costs for a dental practice

must be considered as well. In 2018, the average financing volume for founding a practice was 598,000 euros [5], compared to 422,000 EUR in 2014. This is an investment volume increase of 42% in only four years. The attraction of a permanent employment must be considered as a factor. Since 2007, *Vertragsarztrechtsänderungsgesetz*, dentists can be permanently employed. While in 2006 there was an average of 0.12 employed dentists per practice, in 2016 there were already 0.32 employed dentists [3]. Also in 2007 the *GKV-Wettbewerbsstärkungsgesetz* lifted the previously existing barriers for dentists to start a practice. In contrary to physicians, they have no governmental prescribed allocation. The range of factors with influence on the founding decision leads to the question: What factor have what degree of influence on the dentists decision to start a practice and its business type?

## 2 MATERIAL AND METHODS

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A systematic literature review was conducted according to the methodological approach of Cooper [6]. First, the foci of the field of review was

defined (financial, geographical, personal, regulatory, educational aspects). Three electronic databases (Scopus-Elsevier, SpringerLink, PubMed) were used

for searches from the year 2010 to August 2020. In total 54 search terms were used to find the topic matching studies. After identifying 1840146 papers with single keywords, the combination lead to 101 matches. Titles and abstracts were screened for inclusion and exclusion criteria. The review included only studies in English or German, with peer-reviews

and empirical statistical analysis. Meta studies or topic related studies that did not meet the inclusion criteria were excluded. A total of 33 papers were selected for the review.

The papers were structured in focus groups, analyzed by methods, models used and results.

### 3 RESULTS

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Existing studies focused on general practitioners. They show that environmental factors influence the decision individually for starting a practice in cities or rural areas. The analysed environmental factors can be clustered in three categories. Two subcategories are hard location factors. (A) monetary driven: financial conditions, real income and support programs and (B) region-oriented factors: infrastructure, location of the practice, (dentist) density. The soft

location factors include (C) environment for the family, quality of life in the private environment and professional cooperation.

For dentistry, the data of financial aspects and geographical priority could be collected. But the personnel preferences on the decision for dentists starting a practice could not be found in the reviewed studies.

### 4 CONCLUSIONS

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Dentists are free in their decision, weather to be employed or to start a practice. There is a decreasing number of new practices and a rising number of employed dentists Rural regions lack dental offices. Therefore the communities and state planning authorities, as well as the health insurance companies, see a need for action to ensure dental care in all

geographical areas. In order to be able to cope with this emerging issue, it is necessary to analyse the influence of location factors on the decision of dentists to found a practice. For this purpose, an objectifiable evaluation model would help since these subjective decisions should always be seen in the course of time.

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# AN EVALUATION OF IDENTIFIED AND UNIDENTIFIED OBSTACLES TO AN IMPLEMENTATION OF VALUE-BASED PRICING

Florian Steinbrenner<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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obstacle, implementation, value-based, pricing, unidentified, evaluation

## JEL CODES

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L11

## 1 INTRODUCTION

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The most commonly used pricing methods on a global scale are mainly cost-based pricing and competition-based pricing [1]. Literature has already found significant weaknesses and detrimental financial impacts of using these pricing methods [e.g. 2;3]. Value-based pricing as a newly emerging pricing method has rather proven to be the most profitable pricing method available to business

practitioners – while being the least frequently implemented one [4]. Several barriers to an implementation of value-based pricing have been identified by researchers already. The goal of this research paper is to identify if further obstacles to implementing value-based pricing can be found or if research has already covered all of them.

## 2 MATERIAL AND METHODS

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An extensive literature review was conducted focusing on the previously identified obstacles to an implementation of value-based pricing. The main obstacles found include, among others, the lack of experience and skills [3], the lack of motivation of the respective department [3;5] and the lack of support from top management [2;6;7]. In order to test if additional barriers to implementing value-based pricing can be observed, qualitative data was collected in the form of 20 semi-structured expert interviews with leading pricing experts from the German market. The

expert interviews as part of the qualitative data collection were used in a Grounded Theory methodology analysis. The responses of the expert interviews were recorded, transcribed, translated, coded and analysed using the qualitative analysis of content by Mayring & Brunner [8]. The major objective of conducting the expert interviews is to comprehend pricing experts' understandings about value-based pricing and what is preventing its successful implementation.

## 3 RESULTS

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Four obstacles were found which have not been identified in previous research studies about the implementation of value-based pricing methods. These four obstacles are the

non-holistic pricing approach (1), the fear to lose (2), the lack of value recognition (3) and the inconsistency in execution (4). According to several experts interviewed,

businesses fail to develop a pricing approach that includes several aspects within pricing, like the distribution of strategic pricing roles, the establishment of regular pricing meetings or a pricing council as well as the strategic re-evaluation of utilized pricing practices (1). While value-based pricing is seen to be a highly profitable pricing method, it needs to be combined with cost-based and competition-based pricing in a holistic perspective. If the calculated value-based price of a given product or service strongly exceeds a competitor's price in a given market, the customer perceived value of the company's product is diluted. Second, the fear to lose was mentioned by several pricing experts in business practice (2). Industrial companies often fear large sales drops after a price increase. However, several business cases have shown that not all price decreases lead to sales increases, while not all price increases necessarily lead to a drop in demand. Thus, this fear to lose seems unwarranted. Third, the lack of value recognition was seen as a major obstacle to the implementation of value-based pricing which has not been identified by previous research on the topic yet (3). According to several pricing experts interviewed,

companies fail to realize or categorically underestimate the true customer perceived value of a market offering.

Consequential focus on price among sales force can, again, lead to brand or product dilution as customers perceive the price as main purchase criteria. Fourth, the inconsistency in execution is a further major barrier to implementing value-based pricing, yet being unidentified as such in literature yet (4). In business practice, a chosen pricing method or pricing strategy often needs time to be accepted by the customer and by the market. A significant failure among companies is the inconsistency and sensitivity towards external market changes. During a recession, for instance, a common error is giving discounts too extensively on a certain product or service. This leads to a diluted reputation of the market offering and makes future price increases extremely difficult. Rather, a basic version of the initially basic product can be added to extend the product portfolio horizontally, addressing a wider scope of customers and making future price increases feasible. This inconsistency detrimentally affects pricing strategy execution.

## 4 CONCLUSIONS

Value-based pricing is often considered one of the most profitable pricing methods available for pricing practitioners, however, it is rarely implemented among companies. In an evaluation of the currently identified obstacles and a subsequent comparison to the results of the qualitative research conducted in the scope of the author's doctoral studies, differences have been observed. The main obstacles found in today's literature can be clustered into several categories. According to the conducted qualitative

data analysis of 20 coded expert interviews with leading pricing experts in the German market, additional – so far unidentified – obstacles have been found and can be added to current value-based pricing literature. These four obstacles are the non-holistic pricing approach, the fear to lose, the lack of value recognition and the inconsistency in execution. Further research about these four obstacles to implementing value-based pricing is recommended to aid business practitioners cope with these barriers.

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# FUTURE DISRUPTIVE TRENDS IN VALUE-BASED PRICING METHODS

Florian Steinbrenner<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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future, trends, value-based, pricing, pricing method

## JEL CODES

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L11

## 1 INTRODUCTION

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Over the last decades, a growing interest in the constantly emerging pricing method value-based pricing has been observed and has been explained by researchers with the belief that value-based pricing may increase chances of success [1]. As this pricing method increasingly receives more attention among researchers and business practitioners even still today, it can be seen as a disrupting trend in

the field of pricing research and practice. Alongside the trend towards value-based pricing, more trends have been observed in the scope of the author's doctoral study. The goal of this paper is to illustrate and describe the trends accompanying value-based pricing and disrupting pricing practices across all industries on a global scale.

## 2 MATERIAL AND METHODS

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An extensive literature review was conducted focusing on value-based pricing and its obstacles for implementation into business practice. One research gap in current literature is the lack of identification of disruptive pricing trends within the field of value-based pricing methods and processes. Therefore, in order to investigate this research gap and to identify such disruptive pricing trends, qualitative data was collected by conducting 20 semi-structured expert interviews with leading pricing experts from the four German industries technology, retail, travel & tourism and pharmacy. The responses of the expert

interviews were recorded, transcribed, translated, coded and analysed using the qualitative analysis of content by Mayring and Brunner [2]. The major objective of conducting the expert interviews was to investigate pricing experts' experiences and outlooks about future disruptive pricing trends in the field of value-based pricing in order to create beneficial outcomes both for research and business practice. Therefore, the research question is RQ: Which pricing trends are likely to occur alongside value-based pricing in the future? Based on the conducted data analysis, the following results have been derived.

### 3 RESULTS

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The environment of value-based pricing will mainly be characterized by four major pricing trends. These four trends are a stronger pricing awareness (1), big data & artificial intelligence (2), behavioural pricing (3) and modern price models: Product as a service (4). According to the pricing experts interviewed in the scope of this research study, the whole field of pricing is increasingly receiving more awareness (1). Companies acknowledge the power and relevance of pricing, often with senior executives taking first steps into the professionalization of pricing. Big data & artificial intelligence is another trend likely to revolutionize pricing practices on a global scale in the medium to long-term perspective (2). With an increasing amount of data becoming available, both consumers and competitors are more transparent. With a smart processing of data, dynamic price models will be introduced to the market and game theory will become an interesting research topic aligned with pricing. Additional knowledge of the consumer and consumer empowerment through

increased market offering transparency is likely to disrupt current pricing strategies. As a third major trend, behavioural pricing and the area of pricing psychology will receive further interest among business practitioners and research (3). Irrationality is rampant among consumer purchasing decision-making processes. Dynamic pricing based on previous consumer shopping behavioural patterns can significantly disrupt current pricing practices and lead to a data-driven megatrend in pricing. Lastly, modern price models are likely to be the new industry standard (4). Companies like Spotify, Dropbox, Netflix and other software providers have disrupted the industry by using product-as-a-service pricing models on a subscription-based payment plan. Instead of one-time acquisitions of a certain product, subscriptions are used as a delivered service and have proven highly successful. Further examples of value-based pricing methods are the emerging trends of pay-per-use, pay-per-watch, pay-per-outcome, being included in the trend of modern price models as well.

### 4 CONCLUSIONS

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The increasingly powerful trend towards value-based pricing is accompanied by several other trends in the field of pricing. Four main trends have been found in the scope of this qualitative data analysis which has been conducted in the form of 20 expert interviews with leading pricing experts from Germany. These four trends are the stronger pricing awareness, big data & artificial intelligence, behavioural pricing and

the modern price models: Product as a service. It is likely to state that these four trends will be accompanying value-based pricing in the upcoming years. Further research about these four trends in the field of value-based pricing is highly recommended and may lead to significant conclusions for research and business practice.

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# FORECASTING WITH GOOGLE TRENDS: EVIDENCE FROM AUTO INDUSTRY

Jolana Stejskalová<sup>1</sup>

<sup>1</sup>Mendel University in Brno, Czech Republic

## KEY WORDS

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behavioral attention, behavioral finance, Google Trends

## JEL CODES

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G4

## 1 INTRODUCTION

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The internet has become a significant resource for consumers' reviews on companies or their products, which can influence users in their buying or selling decisions. For consumers, there are no barriers to finding information or becoming part of a group that has the same interests. Furthermore, companies can analyze data for product sales forecasting in order to reduce losses in production or use it to draw up marketing plans.

In terms of research, it has become a recent challenge to obtain value from online resources. Our main contribution in this paper is to confirm the findings of the first and one

of the most well-known articles dealing with behavioral attention – that of Da et al. (2011). We employed the same attention variable along with similar calculations and applied these to the automobile industry. To extend the study, we showed that negative events change a user's sentiment. Furthermore, Dieselgate, an event specific to this industry, engulfed the affected company and set off a nationwide scandal, although the increase in interest did not play a significant role in terms of its effect on automobile companies in other countries.

## 2 MATERIAL AND METHODS

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The dataset contains daily data from 1 January 2004 to 30 June 2020 and includes 17 stocks. We chose Google Trends to source data on behavioral attention. The application includes a search volume of keywords or groups of keywords (known as an SVI index). The data are selected in a time series index from 0 to 100.

We followed Da et al. (2011) and used abnormal search volume index (ASVI), defined as:

$$ASVI_t = \log(SVI_t) - \log[\text{Med}(SVI_{t-1}, \dots, SVI_{t-n})], \quad (1)$$

where  $\log SVI_t$  represents the logarithm of SVI during day  $t$ , and  $\log[\text{Med}(SVI_{t-1}, \dots, SVI_{t-n})]$  is the logarithm of the median value of SVI during the prior  $n$  days. The process was automated by using a median moving window.

The hypothesis behind the calculation is that time trends and other low-frequency seasonality were removed.

Using our rich dataset, we focused on the stock returns, defined as a first differences of log adjusted stock prices of automobile company  $i$  in time  $t$ . We used OLS panel regression specified as:

$$\begin{aligned} ret_{it} = & \text{const} + \beta_1 Mkt\_ret_{t-1} + \beta_2 SMB_{t-1} + \\ & + \beta_3 HML_{t-1} + \beta_4 RMW_{t-1} + \\ & + \beta_5 CMA_{t-1} + \beta_6 ASVI7_{i,t-1} + \\ & + \beta_7 ASVI14_{i,t-1} + \beta_8 ASVI21_{i,t-1} + \\ & + \mu_i + \epsilon_{it}, \end{aligned} \quad (2)$$

where the independent variable  $Mkt\_ret_{t-1}$  represents return of the SP500 market. We employ Fama-French

variables (SMB, HML, RMW, and CMA), while further information is available on the Fama–French websites. The last set of variables included ASVI for specific automobile companies  $i$  and time  $t$ . The differences between the companies were captured by sector fixed effects  $\mu_i$ . This approach is in line with Choi and Varian (2012). They applied fixed effects to investigate the link between

car sales and Google searches for a car manufacturer. Moreover, the time dimension is linked to the market returns, which are the same for each company  $i$  in time  $t$ . Finally, we employed clustering by company to capture similarities and all independent variables is defined as one day lag.

### 3 RESULTS

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The data from reveals a significant and positive correlation between the dependent variable and lagged market returns, which is in line with multiple studies that have also proven this hypothesis. To investigate further, we employed the Fama–French variables. Comparing a study by Joseph, Wintoki, and Zhang (2011), they presented a positive correlation between the SMB factor and S&P 500 stock prices, while also incorporating a behavioral variable from Google Trends. They found that the automobile sector is strongly defined by different risk factors, including historical stock prices and market development. The Fama–French factors play a significant role if we focus on a specific time. The positive correlation was found between the lagged SMB factor and stock returns.

Aside from these factors, the last set of explanatory variables reflects the assumption that investors act according to additional information. Moreover, the variable represents unsystematic risk, thus proving that stocks

are regarded as heterogeneous by investors. In such context, the study provides evidence that an increase in behavioral attention to car brands is accompanied by an increase in stock returns at a significance level of 1%. The evidence confirms general results on the relationship between stock returns and behavioral attention expressed by search volume index from the application Google Trends. More precisely, Da et al. (2011) were the first to put forward the hypothesis that gathering information influences searchers' decision-making, and this does not differ in the case of the car industry. In order to analyze this hypothesis in a specific sector, we strictly adhered to Da et al.'s (2011) ASVI calculation. In terms of results, for example, ASVI7 with a one-day lag increased the stock price by 0.04%. Moreover, the coefficient increased with the number of days used in the ASVI calculation. In other words, behavioral attention is more relevant with a decrease in time trends and low-frequency seasonality.

### 4 CONCLUSIONS

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Online users are seeking information related to car brands. We claim that consumers search for information to buy a selected automobile. Behavioral attention is associated with positive influence on stock returns that is in line with

several relevant studies, even though the searched keyword is related to car brands compared to others investigating the attention through ticker symbols.

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# EFFECTS OF FATHERHOOD ONTO BEHAVIOUR OF MANAGERS: A LITERATURE REVIEW

Bernhard Stellner<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

management behaviour, leadership, fatherhood, parenthood, work-life enrichment

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## JEL CODES

M12, M51, M54

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## 1 INTRODUCTION

Becoming a father and hence taking over additional, new responsibilities in life is expected to change men's psychological structures and behaviours (Graves et al., 2007). Studies have found that fatherhood decreases testosterone levels of human males (Gettler et al., 2011), a hormone that is known to influence character traits like dominance and aggression (Mazur and Booth, 1998). Due to an assumed change in priorities and social setting, men have to find a new balance between personal and professional life. Put another way, they travel between two worlds (Aaltio-Marjosola and Lehtinen, 1998). Research and public discussion have set an

emphasis onto elaborating on the job influence of parenthood onto female leaders and only partially onto males. The topic is especially interesting when looking at male managers: Diametrical behavioural role expectations onto fathers (e.g. warm, nurturing, emotional, vulnerable) and leaders (e.g. self-reliance, emotional stability, aggressiveness, objectivity) may be observed that can potentially lead to mutual influences (Greenhaus and Beutell, 1985). This study analyses and reviews existing literature regarding the influence of fatherhood on the behaviour of managers and thus creates a basis for future research.

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## 2 MATERIAL AND METHODS

The research is based on analysis of primary sources mainly conducted via the databases "EBSCO", "Science Direct" and "Google Scholar". Emphasis is given to the work-family interface model (Greenhaus and

Powell, 2006) as it forms the theoretical foundation for further studies. In addition, a synopsis of common management styles and their typical behavioural patterns is going to be made.

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## 3 RESULTS

Academics have elaborated the rationale of dynamic, bidirectional enrichment between family and work (expansionist hypothesis) that goes beyond a static

scarcity approach assuming a fixed amount of time and human energy. Enrichment happens in the fields of skills and perspectives, psychological and physical

resources, social capital resources, flexibility and material resources (Greenhaus and Powell, 2006). The influence of parenthood onto (female) leadership has been mentioned as “an excellent school” and compared with “a type of management training” (Carney, 2004). Positive influence on communication and organizational skills has been observed as well. Most recent empirical research found a positive link between being a male parent and increased management skills (Grau Grau, 2017 and Nunes-

Costa et al., 2020). Grau Grau confirms the work-family interface model by analysing semi-structured interviews with 20 Catalonian working fathers, amongst them also top and middle managers. Some of these confirmed that having children improved their people management skills. Nunes-Costa et al. recently elaborated on the mediating role of empathy and the resulting positive effects of fatherhood-onto management skills with a sample of n=94 men and women.

## 4 CONCLUSIONS

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Studies or detailed theories on the effects of fatherhood on management behaviour are scarce even though the topic is highly relevant also for practitioners. Academia has only recently picked up this field of research and recognized first (inter-)connections. Further quantitative-empirical studies should include a variety of control variables to better isolate the effect of fatherhood and work with sufficiently dimensioned samples. Examined management behaviour

could be drilled down to more specific attributes and patterns like level of delegation, innovativeness, patience, diligence and mobility. Moreover, perceived management behaviour should be analysed both from managers’ and employees’ views. Contribution to practice should include answers on what happens with managers when they turn fathers and how the situation can be dealt with by individuals and organisations.

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# EVALUATION OF SMART CITY CONCEPT CHARACTERISTICS

Kristýna Michaela Stuchlíková<sup>1</sup>, Oldřich Faldík<sup>1</sup>, Barbora Bühnová<sup>2</sup>,  
Oldřich Trenz<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

<sup>2</sup>*Masaryk University, Brno, Czech Republic*

## KEY WORDS

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smart cities, environmental protection, SWOT

## JEL CODES

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L8, O3

## 1 INTRODUCTION

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Cities around the world are facing a high level of overpopulation caused by increasing urbanization. The governments of the biggest cities in the world are trying to find the most successful way to face the great influx of new residents. The best approach in these days seems to be the smart city concept [1]. The smart city concept aims to increase the ability of cities all around the world to cope with new residents and to enable them to achieve a better standard of living.

The aim of this study is to analyse the possibilities of applicability of the smart city concept. Although the smart city is a very current and widespread concept with numerous benefits, many cities have not yet joined this initiative and do not even want to. This study will relate to positive as well as negative aspects of smart city and summarize whether the concept is generally a suitable investment.

## 2 MATERIAL AND METHODS

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To carry out this study, analysis and synthesis based on literature sources and self-observation were used. To evaluate the collected data, a SWOT analysis was used. SWOT analysis is a universal analytical technique used in the evaluation of external and

internal factors influencing a given concept. The SWOT analysis specifically assesses the strengths, weaknesses, opportunities and threats of the smart city concept.

## 3 RESULTS

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The first of the strengths of the smart city concept listed in Table 1 is the possibility of economic prosperity in the future years, e.g. saving electricity

by introducing smart city lamps which are switched off when there are no people in the street. Another strength of the smart city concept is better commu-

Tab. 1: SWOT analysis

Strengths	Weaknesses
The possibility of economic prosperity in the future years Better communication of the city management with residents Higher flexibility in case of new residents and tourists CO2 reduction Decentralization New jobs	The need for experts Financial complexity in implementation Difficult enforcement by city government
Opportunities	Threats
Coronavirus Interest of financial institutions in modern technology projects Improving the tools solving environmental issues	Coronavirus Ambiguous understanding of the smart city concept Ageing of the population Insufficient legislative regulation Data protection

nication between city government and inhabitants of the city, e.g. the introduction of electronic tickets or electronic ID cards. Related to this point is also some platform like a city app that might help not only city residents to find e.g. free parking zones, while making the city more friendly for tourists. Another

strength of the smart city concept might be seen in CO2 reduction which is a pressing topic [2]. Smart city also supports decentralization by allowing people to make more decisions about self-governance etc. [3]. Another key point that might be seen as a strength is the possibility of new jobs.

## 4 CONCLUSIONS

Based on the points mentioned above the smart city concept has more strengths and possible opportunities than weaknesses or threats. However, in the case of weaknesses, it is mainly necessary for the city to work and improve the conditions for accepting new

projects. On the other hand, in the case of threats, city governments cannot solve those problems by themselves, it depends on other factors, e.g. state government decisions, economic crisis.

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# USING COSTS STATES IN A SEMI-MARKOV MODEL TO ESTIMATE COST-EFFECTIVENESS: AN ILLUSTRATION FOR METASTATIC HER2+ BREAST CANCER IN THE CZECH REPUBLIC

Lenka Šlegerová<sup>1</sup>

<sup>1</sup>*Charles University, Prague, Czech Republic*

## KEY WORDS

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cost-effectiveness, semi-Markov process, Kaplan-Meier estimator, HER2+ metastatic breast cancer, pertuzumab, Czech Republic

## JEL CODES

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C41, D61, I18

## 1 INTRODUCTION

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This paper proposes a method for costs estimation by focusing on periods defined by administration of specific treatment. We define states in a semi-Markov model that are associated with specific (repeating) treatment, e.g., regularly administered medication or procedures. On the contrary, it is common practice to have health states defined based on the health condition of the observed patients, such as progression-free, progression, and death [1]. There are three main advantages of our approach. It is relatively straightforward to assign costs based on administered procedures. Moreover, our ‘costs states’ allow us to estimate the periods separately when

no treatment is administered. Furthermore, we also avoid interval censoring that arises when using states defined by changes in health status that can usually only be detected during a check-up [2].

We apply the method of ‘costs states’ to data drawn from the Czech clinical practice. These are on treatment of metastatic breast cancer with amplification of human epidermal growth factor 2 protein (HER2+), a very aggressive type of breast cancer. The aim is to assess the cost-effectiveness of adding the pharmaceutical pertuzumab to the combination of trastuzumab and docetaxel within first-line therapy.

## 2 MATERIAL AND METHODS

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We divide the whole survival period into four states, each associated with the administration of a specific medication: first-line medication, no medication, next-line medication, death. Each patient belongs to exactly one of these states at each time during the follow-up. All patients begin in the first state; patients who are not in the fourth state at the end of the follow-up are censored.

We compare two treatment arms. First, where patients are treated in their first line with the combination pertuzumab + trastuzumab + docetaxel (the pertuzumab arm), and second, with just the combination trastuzumab + docetaxel (the trastuzumab arm). The latter is the comparator in this study. The data set consists of 274 patients in the pertuzumab arm and 254 patients in the trastuzumab

arm. The majority of patients is subjected to end-of-study censoring, 74.5% and 68.9% in the pertuzumab and trastuzumab arms, respectively.

We employ a semi-Markov process to estimate the mean time spent in the first three states. The advantage of such a process lies primarily in its flexibility. The hazard functions can be modelled by any suitable distribution, and the distribution parameters can differ among transitions between pairs of states. Moreover, compared to a pure Markov process, the future evolution of a semi-Markov process depends not only on the present state but also on the waiting time in the current state, which we find appropriate for our data [1,3]. We use the time spent in each state together with unit costs of medication and medication administration

(costs expended by health insurance companies) for estimating the average costs of treatment.

We use the Kaplan-Meier method to estimate the benefits of adding pertuzumab to the combination of trastuzumab and docetaxel in terms of patients' overall survival. Then the log-rank test is used to verify the statistical difference between the two survival functions. As we employ individuals' data from the clinical practice, the Kaplan-Meier estimates with the log-rank test are supplemented by the Cox proportional hazard model and the accelerated failure time (AFT) model to control for differences in patients' characteristics across the studied patient groups [4,5]. The AFT model provides estimates of distribution parameters that are further used for median survival estimation.

### 3 RESULTS

The resulting costs of treatment are discounted by the 3% annual rate to around 4.3m and 2.0m Kč in the pertuzumab and trastuzumab arms, respectively. The resulting median quality-adjusted life years are discounted by the same annual rate to 1.89 and 0.91,

respectively. However, the overall survival of patients is found not to be significantly different between the two treatment arms, so neither are the median quality-adjusted life years.

### 4 CONCLUSIONS

We find the proposed method of costs estimation appropriate for the chosen treatment characterised by regular medication administration with periods of no medication. Based on our data, the addition of pertuzumab does not result in significantly longer patients' survival in the Czech Republic. Since the

treatment is associated with higher costs, adding pertuzumab cannot be considered cost-effective; however, this could be due to relatively short patients' follow-ups available at the moment of the study conducting.

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# ZERO WASTE EVALUATION CRITERIA IDENTIFICATION – CASE OF HOTEL INDUSTRY

Karin Tóthová<sup>1</sup>, Alica Kahúnová<sup>1</sup>, Martina Chládková<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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circular economy, green hotels, environment, tourism

## JEL CODES

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M14, M16, Q5

## 1 INTRODUCTION

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We live in a world of constant change. There is technical and technological progress, an increase in the number of people on the planet and economic growth. Unfortunately, these changes also have negative impact, such as the threat of depletion of natural resources and excessive waste generation (Song and Zeng, 2015). One approach to reducing these consequences is the circular economy in which the company focuses on savings in production and tries to avoid wasting material. This also includes the concept of zero waste, which represents a new technological process for improving or completely eliminating waste (Connett, 2013). As hotels play a major role in environmental pollution, this concept

is being used in the hotel industry more than before (Kasim, 2004). Many existing hotels are working intensively on the implementation of environmental strategies in their business and there is also a new type of hotel so-called “Green hotel”. This hotel represents a long-term trend in environmental policy leading to success in terms of more environmentally friendly hotel behavior (Chan, 2013 and Green Hotel Association, 2014). The aim of the work is to identify the criteria for the evaluation of hotels from the point of view of the zero-waste concept and to verify their environmental usability together with the feasibility in practice.

## 2 MATERIAL AND METHODS

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At first, the secondary data collection will be done from the European Commission’s data related to the principles of the zero-waste concept, standards 9001 and 14001 issued by the International Organization for Standardization and also from the officially available information of selected foreign “green” hotels. Then the primary data used for the qualitative research will be performed as a pilot study through

semi-structured interviews with the management of the selected hotel “Academy hall”, which is already involved in the field of sustainable business. This qualitative research will verify the environmental applicability of the set criteria, their subsequent feasibility, and at the same time it will be examined whether any problems with their implementation can occur.

### 3 RESULTS

Secondary research related to the principles of the zero-waste concept defined by the European Commission (European Commission, 2019) and the wording of selected ISO standards 9001 and 14001 (EuroISO, 2015a,b) together with the results of the primary research led to the definition 12 criteria in 5 listed below areas based on which the environmental involvement of hotels should be assessed. Cross-cutting problems – motivation, education and training, promotion, guest awareness, interior design, Water – water efficiency, launderette, Energy – energy efficiency, Waste management – waste reduction, cleaning, Restaurants and hotel kitchens – operation of the dining room, food and beverages.

Qualitative research has also shown that the established criteria are environmentally applicable, as it has been shown that the Academy itself has already worked in many areas and meets some of

the evaluation criteria. And this was also approved by comparison of this hotel with other green foreign accommodation facilities (Kanderová, 2020). As part of this research, the authors encountered a problem only when verifying the feasibility of the criteria at the Academy hall, which is related to Czech legislation and strict hygiene standards. The biggest discrepancy occurs in the area of supplier selection, where the hotel cannot choose the location of production branches as a criterion due to the fact that it is a university hotel. The second problematic area are cleaning agents, where legislation requires the use of only those products that have a strong disinfectant and antibacterial effect, which complicates the use of organic equivalents based on baking soda or vinegar. However, it can be said that the established criteria are feasible, because the Czech legislation should not cause significant difficulties for hotels.

### 4 CONCLUSIONS

This research dealt with the solution of the problem of environmental pollution within the zero-waste concept and its specific use in the hotel industry. The aim of the work was to identify the criteria for the evaluation of hotels in terms of the zero-waste concept and to verify their usability of the environmental aspect and feasibility in practice. Given

that, after processing the results of the secondary and primary research, the criteria were identified and their usability and feasibility was approved. the main objective of the research has been fulfilled. As this is a pilot study, there is an opportunity to further develop it.

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# THE BEHAVIOUR OF SOCIAL TRADERS

Zdravko Tretinjak<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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social trading, social investing, social influence, behavioral finance

## JEL CODES

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G01, G11, G23

## 1 INTRODUCTION

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The word creation “social trading” consists of two known words, the word “social”, representative of the community approach or a community, and the word “trading”, which stands for the trade or exchange of a good (Posner, 2015). Social trading platforms combine the trading functionalities of classical online broker services with the communication and interaction features of social networks (Glaser and Risius, 2018) which is an advantage (Reith et al., 2020). Social trading platforms are transparent online

markets, where order flow is publicly disclosed. Participants on social trading platforms can be categorized into traders (trade leaders or signal providers) and investors (copiers or signal followers), where the former execute unique trades and manage the funds allocated to them by the latter in return for compensation (Gemayel and Preda, 2018). Social trading networks provide access to hedge funds-like returns, but in contrast offer a high transparency, liquidity and accessibility (Neumann et al., 2013).

## 2 MATERIAL AND METHODS

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The primary data for this study are collected exclusively on a social trading platform. At the beginning, interviews from a TradersTalk series are collected. Social traders are asked about their background there. The use of an interview guide ensures the quality of the analysis. The social traders reveal something from their private lives, e.g. the profession exercised. Finally, you disclose information that relates to trading in securities. You can find out why these social traders came to trade, why they chose this social trading platform or what their trading strategy is. Advice to beginners and recommended

books also provide further information on social traders.

The research is carried out as part of empirical research using a Mixed Methods Research, which is complemented by data analysis (desk research). A sequential design was chosen for this study. Since a quantitative analysis follows a qualitative analysis, we speak of a generalized design. First qualitative research is carried out by using dictionary-based structured content analysis. This is followed by transfer design or quantification. Afterwards this sample size would be suitable for a quantitative research approach.

### 3 RESULTS

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One partial study was to examine existing interviews conducted by a social trading platform with its social traders. As a signal provider, social traders influence investors who act as signal followers on a social trading platform. Qualitative research was used to gather personal and professional information

about the social traders. The sample consisted of 84 social trader interviews on one social trading platform. The research results of this study showed the book recommendations of social traders. In times of influence marketing, this distribution channel can be quite exciting (Tretinjak, 2020).

### 4 CONCLUSIONS

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This work could possibly provide information on how a private investor can find a non-professional social

trader who can assert himself against professional fund managers

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# DIMENSIONS AND QUALITY CHECK USING IMAGE PROCESSING METHODS

Jiří Valach<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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machine vision, quality check, image processing

## JEL CODES

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C88, Y90

## 1 INTRODUCTION

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Nowadays, automation of the manufacturing industry is essential for further development in this sector. The automation can enhance production time, quality and even more benefits could be achieved with the right solutions. Cameras as modern sensors and machine vision algorithms (MVA) play a key role in industrial automation. They are used to control robotic arms, do quality check, presence control, etc.

MVA is also used beyond the industry sector in many other areas of human life. To be able to perform quality control using MVA it is necessary to do object detection in the first place. These two issues are the main aim of this article. A small metal plate with two different tags is used as a test item. The main goal is to develop an MVA that will be able to determine the size of the metal plate and identify both tags.

## 2 MATERIAL AND METHODS

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Metal product with five holes and specific shape is placed in the camera view. Object detection performs identifying the product position in the captured scene, reading two identification tags (barcode and simple text), and checking the product quality.

Correctly set up light scene is the key to perform accurate object detection. The “bright light method” is used. The light from the source illuminates the metal object and reflects directly to the camera lens. To achieve the best results, the camera is placed between two light sources with diffusers. Both contain two rows of 18 LEDs that emit a  $10^\circ$  cone of light. The emitted light has a temperature of  $5500\text{ K} \pm 500\text{ K}$ . The space between lights and the detected object is 275 mm. With a setup like this, the final brightness in the scene is approximately  $2 \times 1500\text{ lx}$

[1]. The captured frame size is  $2040 \times 1086\text{ px}$ . The polarization filter on the camera lens is used. The goal of setting the scene for capturing an image is to make the lighting conditions on the detected object the same and independent of the background and surroundings of the captured scene. The consistent light scene with surrounding lights conditions in mind is solvable by overlapping the scene with opaque black fabric. For the scene background, the fabric with a velvet surface is used. The scene is captured with Basler ace – acA2000-165u [2] camera in combination with Kowa LM16JC10M [3] lens and polarization filter MIDOPT PR032-30.5 [4]. The image processing algorithm is created in IDE NI LabVIEW Vision together with the Vision Assistant (VA) module. The UI of VA is very user-friendly,

and LabVIEW is a visual programming language that also makes it easier to use.

Final software is able to check the object quality, read identification tags and determine if the object is even in the captured scene. To achieve this, the algorithm needs to perform several steps. First necessary step is to adjust photos to get the highest possible contrast between the object and the background, the same for the barcode/text without loss of quality. This can be achieved using the “Brightness” function in the VA. The next step is to determine the object position, size, its angle to reference point, and other less substantial information. This step is accomplished by function “Geometric Matching” in VA. It detects the object based on a found set of various geometric shapes (edges, contours, circles, rectangles, etc.) [5]. Afterwards, it is necessary to rotate and extract area of interest, so it is possible to

measure the object size and read identification tags in the next step. For this subtask the “Vision IMAQ Rotate” and “Vision IMAQ Extract” functions from the Vision library are used. It is necessary to calculate new coordinates after the rotation which is a big disadvantage. Own algorithm is designed for this calculation. Dimensions of the extracted photo are calculated by output information from the “Geometric Matching” function. This function is not accurate enough to measure the object dimensions, but it is accurate enough to perform an extraction. After extraction, the measurement of an object and reading identification tags follows. Measurement is accomplished by the “Clamp (Rake)” function from VA. The reading of identification tags is performed by “Barcode Reader” and “OCR/OCV” functions also from the VA. Function “OCR/OCV” use a classification to recognize the letters. [1]

### 3 RESULTS AND CONCLUSIONS

The main criterion for the successful solution is that the detection time should be as close as possible to the real-time. This has been achieved, and the algorithm manages with acceptable time deviation to do the object detection in the required time with sufficient reserve. Testing took place in two phases, with a correctly manufactured product and a product with one missing hole that represents a manufacturing defect. In every phase, the product is rotated at five different angles which are  $0^\circ$ ,  $45^\circ$ ,  $90^\circ$ ,  $180^\circ$ , and  $270^\circ$ . Per every rotation, ten detections of the object are performed. So, in total, the test consists of 100 object detections. The detected product coordinates difference is negligible, so the object detection in

two- dimensional space is successful. Quality control passed successfully for every detection. The same success was achieved during reading identification tags.

The established goal was achieved by the executed test. The only weak point is the inadaptability of proposed software solution. The designed algorithm is not able to work properly when surrounding conditions are changed, i.e. changing the intensity of light, type of lens, or color of background requires new calibration of the software solution. Stable conditions must be achieved, but that’s pretty much common in these kinds of software solutions.

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# UNSUPERVISED ASPECT PHRASE EXTRACTION IN CZECH DATASET

Roman Valovič<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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aspect extraction, aspect based sentiment analysis, absa, nlp, text mining, opinion mining

## JEL CODES

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C83, C88

## 1 INTRODUCTION

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One of the current trends in the field of e-commerce is focused on the analysis of online content created by users, such as discussion forums, online reviews, social media... For almost two decades, there has been an effort to automatically obtain customer opinions on a particular product or service. This information, on the one hand, helps manufacturers to improve their product and, on the other hand, potential customers obtain important information before making a purchasing decision. The granularity of the sentiment analysis can be applied to the whole document, individual sentences, or so called chunks of

these sentences. In online reviews, an informal style prevails, where customers express their opinions on various aspects of the product within one sentence, e.g. in the sentence “Meal was delicious but the staff was really slow” we recognize two aspects – “meal” and “staff”, both of which are evaluated in the opposite mood. When evaluating sentiment at higher levels of granularity, we would probably not capture this information. By solving tasks of this type, i.e. identifying an aspect and evaluating its polarity, a new area of ABSA – Aspect based sentiment analysis – has been formed within the NLP.

## 2 MATERIAL AND METHODS

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We can approach the ABSA sub-task, i.e. the identification of an aspect, in different ways. Modern systems based on machine learning e.g. [1] achieve excellent results, but as these are mostly supervised approaches requiring a lot of annotated data, their practical application is quite demanding. Each product domain is specific and knowledge gained within one domain does not apply to another [2]. These reasons are the motivation for exploring unsupervised approaches. Recently, unsupervised systems [3], based on neural networks were introduced using the attention mechanism, which achieved state of art

results comparable to supervised approaches, but due to their complexity and high number of parameters they are computationally demanding. Simpler models use cosine similarity to a reference dictionary [4] to identify an aspect in open text, or a simple form of attention mechanism [5]. However, these systems can identify only 1 aspect in a sentence [5], respectively recognize only aspects represented by one word [4]. In this paper, we present an unsupervised system capable of processing arbitrarily complex text and identify in it several aspects typical for the examined domain. It is not limited to just one-word terms,

but also recognizes more verbal phrases such as “fingerprint reader”. Although the system is language and domain dependent, as unsupervised it solves the problem of lack of annotated data in certain domains. The input requires one of the known models of word embeddings. The system relies on the cosine similarity of the vector at the input to the phrase vector from the aspects reference dictionary. The aspects reference dictionary is generated using unsupervised algorithms such as K-Means. Clusters

are formed by simple short documents, which usually describe 1 aspect and occur in the examined data more often than others. They thus form an ideal list of desired phrases, which represent aspects and can be searched for in a more developed text. The method is fast, intuitive, computationally intensive and does not bind to any parsing. By not excluding any word types from the analysis, it can also capture implicit aspects.

### 3 RESULTS

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Researched domain – mobile phone reviews included reviews of customers from various online stores in the Czech language. Corpus consists of more than 250,000 sentence tokens. As part of preprocessing, stop words were removed and the text was lem-

matized into a dictionary form. Word embeddings by the word2vec algorithm were obtained on the same corpus [5]. The system therefore worked with domain embeddings. An accuracy value of 93.6% was achieved on a manually annotated test dataset.

### 4 CONCLUSIONS

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The presented approach identifies and extracts key aspects in open text. It solves one of the sub-tasks of ABSA and its outputs can be input for further analysis such as determining sentiment or document classification. Compared to other unsupervised systems, it can also identify an aspect consisting of

several words. At present, it has been tested only on text data in the Czech language, as a similar system for the analysis of Czech has not been published. However, we would like to apply the system to the English dataset in the future and compare its outputs with the results of foreign authors.

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# THE ROLE OF ECONOMIC SENTIMENT INDICATOR IN THE CONSUMPTION FUNCTIONS OF THE V4 COUNTRIES

Terézia Vančová<sup>1</sup>

<sup>1</sup>Mendel University in Brno, Czech Republic

## KEY WORDS

consumption, disposable income, economic sentiment indicator, time series, Visegrad Group (V4) countries

## JEL CODES

C01, C22, E21

## 1 INTRODUCTION

The economic sentiment is often portrayed as the basic driving force in the economy. If consumers as well as investors become convinced that the economy is developing in a positive direction, they will continue to spin it with their positive attitudes

and expectations. On the contrary, the attitudes of extreme prudence weaken the forces that would normally contribute to economic recovery. [1] conclude that “consumer sentiment does indeed forecast future changes in household spending”.

## 2 MATERIAL AND METHODS

The empirical study is based on the time series analysis using individual Visegrad Four countries data covering the period from the first quarter of 1995 until the final quarter of 2018. The data source for the time series of consumption expenditures, disposable income, gross domestic product, economic sentiment indicator (ESI) and GDP implicit deflator is Eurostat. The time series are measured as per capita aggregates in euro currency and a GDP implicit deflator is used to acquire the real terms of employed variables, the reference year being 2010. Only an annual frequency of disposable income data is available. An annual frequency of disposable income is segregated into a quarterly frequency by using gross domestic product as an external, relevant and economically related variable. Chosen economic variables are seasonally adjusted by the TRAMO/SEATS procedure.

A dynamic regression models are estimated for every Visegrad Group country. Autoregressive dis-

tributed lag models are applied in the most suitable form of lagged consumption and various lags of disposable income (1).

$$C_t = \beta_0 + \beta_1 C_{(t-1)} + \beta_2 Y d_t + \beta_3 Y D_{(t-1)} + \dots + \beta_k Y D_{(t-k)} + \epsilon_t \quad (1)$$

The special case of restricted ARDL(1,1) model can be interpreted as differenced data. This function is enhanced by the variable of the economic sentiment indicator (2). These simple estimations are used to test for the statistical and the economic importance of the sentiment in the forecasting consumption expenditures. The economic sentiment indicator might be statistically significant if it improves forecasts in every period, even only by a bit.

$$\Delta C_t = \beta_0 + \beta_1 \Delta Y D_t + \beta_2 ESI + \epsilon_t \quad (2)$$

### 3 RESULTS

Firstly, the origin consumption functions of every Visegrad Four country are estimated. There are parameters estimations of the dynamic and differenced data regression models for individual V4 countries in the Table 1 and 2. ARDL(1,1) model is the most suitable form of dynamic model for each of V4 countries, more lags are not significant. Beside the lagged consumption, current and one lagged disposable income help to explain current consumption. These results show that a lagged disposable income has a predictable value on current consumption in every Visegrad Four country. This reveals an evidence against the Permanent Income Hypothesis/Random Walk Hypothesis and points out to the excess sensitivity of consumption to current income. This conclusion is consistent with the traditional work of [3] as well as more recent studies like [4] or [2] who find the explanation of these circumstances in the presence of liquidity constraints or precautionary savings.

Tab. 1: The coefficients estimations of dynamic regression models for individual V4 countries

Country	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$
Czechia	1.054	0.890	0.634	-0.535
Hungary	8.861	0.952	0.721	-0.683
Poland	-9.480	0.939	0.604	-0.535
Slovakia	3.158	0.993	0.900	-0.895

Tab. 2: The coefficients estimations of regression models of differenced data for individual V4 countries.  $P$ -values of the significance test of the economic sentiment indicator parameters are reported in the parentheses

Country	$\beta_0$	$\beta_1$	$\beta_2$
Czechia	-15.691	0.557	0.202 (<0.001)
Hungary	-35.976	0.600	0.393 (0.007)
Poland	-6.119	0.580	0.116 (0.136)
Slovakia	-14.071	0.876	0.154 (0.019)

The parameters of economic sentiment indicator are positive, statistically significant and improve predictions in the Czech Republic, Hungary and Slovakia. The only exception is Poland. The coefficients of determination of regression models for individual V4 countries with and without the variable of the economic sentiment indicator have been calculated. There is an increase in  $\bar{R}^2$  caused by adding the economic sentiment indicator to the model (2).

### 4 CONCLUSIONS

Dynamic regression models for individual Visegrad Four countries indicate the excess sensitivity of consumption to disposable income. This paper assumes

that the predictive power of these model can be improved by adding aggregate economic sentiment indicator in the models.

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# PROSPECTS FOR ATTRACTING FOREIGN INVESTMENT IN THE CONTEXT OF GREEN TRANSFORMATION IN UKRAINE

Nataliya Vesela<sup>1</sup>, Volodymyr Rodchenko<sup>2</sup>, David Hampel<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

<sup>2</sup>*Kharkiv National University, Ukraine*

## KEY WORDS

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green economy, Ukrainian enterprises, energy generation

## JEL CODES

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E22, F21

## 1 INTRODUCTION

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The newly defined E.U. trends in the energy production assert a shift from classical coal – nuclear dominated power generation to renewable energy sources and problems related to energy storage and backup. Ukraine is currently very attractive from the perspective of green energy FDI (Sokolova et al., 2019, Kharlamova, 2016). The modernization or replacement of the current asset depreciated electric energy production facilities is vital for the Ukrainian economy competitiveness (Bryzhan, 2016). The classical assets used for energy generation have one of the longest depreciation plans and their actual

values relate directly to the need of their renewal. In the proposed research we want to analyze the relationship between the level of depreciation (Kruglikova, 2019) as a transgression factor directly related to the need of the new FDI investments in Ukraine in the energy sector. The study will encompass E.U. and Ukraine companies in NACE1 sector 35 – Electricity, gas, steam and air conditioning supply, with the major focus on building a comparative study of FDI related to green energy and respective fixed assets amortization levels.

## 2 MATERIAL AND METHODS

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The required data will be obtained from Orbis database of Bureau van Dijk. Specifically, total assets, depreciation, profitability, solvency ratio, gross profit, liquidity ratio, added value, ROA, number of employees, costs of employees, total assets. The data will be collected for the companies in the sector with NACE 35 – Electricity, gas, steam and air

conditioning supply. The comparative analysis will be carried out for the years 2004, 2013, and the last year available in the database. The countries we plan to include in research include Germany, United Kingdom, Czech Republic, Poland and Ukraine. Correlation and regression analysis will be employed to evaluate existing dependencies and future trends.

### 3 RESULTS

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The expected results from comparative correlation analysis should be a set of polar graphs along with time progressions diagrams graphically representing the amount of investments and related asset depreciation levels dependencies in all analyzed countries in sector 35. Further results should be the estimation of future trends in FDI investments in Ukraine in

the sector of green energy production. The results should be useful in evaluating progression and FDI potentials in comparison to historical and current trends in E.U. in relationship to ecologically and politically motivated decarbonization of E.U. energy sector.

### 4 CONCLUSIONS

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The outcome of the proposed research should map and quantitatively evaluate the relationship between amortization of classical energy related coal and nuclear power generation sources in Ukraine and the respective prospects of FDI investments into renewable energy sources in the light of the new E.U. green economy initiative. The conclusions from the study will be used to identify the Ukrainian energy

related companies benefiting mostly from FDI in renewable energy production. We also plan to assess some factors in the formation of value chains, taking into account the prospects for a green transition and how these chains will determine the possibility of integration between the EU member states and partner countries.

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# PEOPLE TRANSIT COUNTER

Adam Vlček<sup>1</sup>, Jakub Drajsajtl<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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people counting, ESP32, MQTT, IR sensor

## JEL CODES

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C88, Y90

## 1 INTRODUCTION

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The more increasing availability of IoT devices and smart sensors to the public made a collection of various environment data a relatively easy task. Extensive data collecting could lead to many ways of easement of work and monitoring. An example of such environment data collection can be a people passage counter.

People passage counter has a form of an electronic device placed wherever statistics regarding passage are useful. A great example of such technology can be TOF camera that measures the distance for each pixel and with these data can produce 3D images. [1] Another way to identify persons and keep track of the number of people is by using RFID. This technology uses radio frequencies to transfer data. One disadvantage is that every person must have his RFID identifier in the form of a card or tag and approach the reader when entering a specific area. [3] Photoelectric beam gates are also widely used.

Usually, the beam of IR light is used, and whenever the beam is blocked it is considered as a passage. [2]

By using these technologies, we can gather information like the total number of people inside a room or building at a given time or most popular times of visits. Passage data can be used for various marketing and economic applications but could also have just informative character. These days, as we all face the world pandemic Covid-19, this kind of data can be useful to help with regulating the maximum number of people in a room.

Gathering information about passages is also motivation for Mendel University in Brno, which built a wireless network dedicated for smart sensors and IoT devices to collect informative data. Thus, this paper is about creating such a people transit counting device the main aim of this paper is to design a people transit counter.

## 2 MATERIAL AND METHODS

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Passage counting devices can have many forms, and we have decided to count passages using two infrared sensors placed in serial. The advantages of this form are the low cost of sensors, relatively easy implementation and no need for ID cards that lead to the possibility of faster passages. The disadvantages

could be that people have to pass the sensor one by one, otherwise, the passage is read wrong.

The device is implemented using WROOM32 development kit made by Espressif Systems. The development kit consists of single PCB containing a dual-core processor that is hooked up to an antenna and general input/output pins.

### 3 RESULTS

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These pins allow connecting of other external sensors such as two IR sensors in our case. Since we need to know how many people are in the room, we need to identify the direction of the passage. To be able to recognize the direction, we need to use two of the IR sensors since the IR sensors are capable of determination only if an object is within the allowed range of the sensor. Knowing this, we developed an algorithm that periodically reads data from both sensors and depending on which sensor was the object detected first, we can determine the direction of passage. In other words, if the direction is in the way inside, then there is a voltage gain measured firstly on the sensor A and only then on the sensor B. If the direction is in the way outside, then the voltage gain is measured firstly on the sensor B and only then on the sensor A.

Detected passages are then sent over Wi-Fi to the MQTT broker every ten seconds. Handling such tasks requires a lot of processor time so this is the reason we have decided to use the multi-core processor. The processor is capable of handling both, reading passages and sending the results at the same time.

Another part of this solution is a simple Python script that runs on the internal server and listens to the incoming messages on the MQTT broker. All incoming data are then saved to the database. This allows us to do advanced queries and timelines over room occupancy. The development kit with sensors is placed into a modeled and 3D printed case that provides protection to electronic parts and overall aesthetics when placed near the passage.

### 4 CONCLUSIONS

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The device is deployed at the entrance to the student's room. The correctness of the device can be measured by the number of people left in the room at the end of the day. Any other number than zero could be considered as the lowest estimated fault detection.

The device works with approximate 95% accuracy based on the control measurements and tests. To

ensure that the device detects passages correctly, it is best to place it at the entrance, where you can guarantee that there will not be two people entering the room next to each other. This kind of passages cannot be detected. Same situation is in the case two passages with zero gap between people, because of the used technology limitations.

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# THE “NEED FOR TOUCH” AND CZECH GENERATION Y

Jan Vrána<sup>1</sup>, Stanislav Mokrý<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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sensory marketing, touch, need for touch, consumer decision making

## JEL CODES

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M510, M390

## 1 INTRODUCTION

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Touch and its organ – skin – is the largest sensory organ of the body (Gallace et al., 2010). According to Stevens and Green (1996), touch could be defined as a feeling that is initialized by the stimulation of skin receptors. Touch is also considered as the first sense that is developed in the prenatal period. Touch is also considered as the first sense that is developed in the prenatal period. On the contrary, with advanced age there is a gradual loss of senses in order: sight, taste, hearing and the very last is touch. Tactile sensation is the only sense that is considered as proximal or contact sense. Although informations perceived by other senses could be mediated by a certain medium, this does not apply to tactile sensation. (Krishna, 2012). When examining the material properties of a product such as texture, hardness, temperature

and weight, it is extremely important to involve touch. The information thus obtained plays a very important role in customer behavior (Chen, et al., 2009). Touch allows the customer to obtain relevant information and helps him make decisions. Individual customers differ in the need for touch or haptic preference. This difference is defined as “a preference for obtaining and using information obtained through the haptic.” For some consumers, the information obtained by touch is more important and used and will rather give them great weight when evaluating products (Peck, Childers, 2003). Peck and Childers (2003) have created a scale that records individual preferences of need for touch (NFT). The scale consists of two subscales, the instrumental scale and autotelic scale.

## 2 MATERIAL AND METHODS

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The aim of this paper is to present the individual preferences of Czech generation Y in their need for touch. The need for touch preferences was collected via a questionnaire survey focused on the importance of haptics in the consumer decision-making process. The survey was conducted as a part of a study focused on sensory marketing in March and April 2020. The questionnaire was disseminated on-line via questionnaire system [umbrella.mendelu.cz](http://umbrella.mendelu.cz). The

total number of respondents was 323, where 108 participants were men (33.4%) and 215 participants were women (66.6%). All participants were aged from 18 to 34 thus all representing the Y generation. We used the Chi-square test with the chosen significance level  $\alpha = 0.05$  to compare differences between men and women. Data were processed using IBM SPSS Statistics 25.

Tab. 1: Need For Touch: Gender differences, A = autotelic scale, I = instrumental scale

Question	AVG women	AVG men	p-value
1. When walking through stores, I can't help touching all kinds of products. (A)	4.04	3.23	<b>0.005</b>
2. Touching products can be fun. (A)	3.61	3.43	0.471
3. I place more trust in products that can be touched before purchase. (I)	5.07	4.45	<b>0.016</b>
4. I feel more comfortable purchasing a product after physically examining it. (I)	5.77	5.10	<b>0.002</b>
5. When browsing in stores, it is important for me to handle all kinds of product. (A)	4.30	3.51	<b>0.002</b>
6. If I can't touch a product in the store, I am reluctant to purchase a product. (I)	4.08	3.46	0.090
7. I like to touch products even if I have no intention of buying them. (A)	3.69	3.11	0.162
8. I feel more confident in making a purchase after touching a product. (I)	4.80	4.28	0.083
9. When browsing in stores, I like to touch lots of products. (A)	3.08	2.73	0.390
10. The only way to make sure a product is worth buying is to actually touch it. (I)	3.24	2.92	0.287
11. There are many products that I would only buy if I could handle them before purchase. (I)	4.07	3.65	0.052
12. I find myself touching all kinds of products in stores. (A)	3.52	2.95	0.106

### 3 RESULTS

The need for touch scale consists of 12 scale questions. In table 1 see results for gender differences in the evaluation of the NFT scale questions. For

each question, participants were answering on a seven point scale, where 1 = strongly disagree and 7 = strongly agree.

### 4 CONCLUSIONS

According to our results, the main differences are evident in the evaluation of questions no. 1, 3, 4, and 5 where the  $p$ -value is lower than the chosen significance level  $\alpha = 0.05$ . Next, from our

results, participants on both sides have evaluated instrumental subscale questions higher than autotelic subscale questions.

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# WHAT WE HAVE LEARNED FROM THE LITERATURE REVIEW

Lenka Vyrostková<sup>1</sup>, Rajmund Mirdala<sup>1</sup>

<sup>1</sup>*Technical University of Košice, Slovakia*

## KEY WORDS

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inflation persistence, monetary policy, exchange rate regime, economic shocks

## JEL CODES

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E31, E52, F31

## 1 INTRODUCTION

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Recent economic crisis and its deteriorating effects on the macroeconomic performance of the Euro Area member countries initiated the period of persisting deflationary pressures. End of this period in the late 2016 accompanied by increasing inflation, thought the key European Central Bank interest rates still remained near the zero level, draws increasing attention of economists especially in terms of the behaviour of inflation, its features and responsiveness to the various fundamental shocks. While the inflation persistence is generally well documented in the empirical

literature, fundamental features of the recent crisis and post-crisis periods changed the response patterns of inflation to the various types of macroeconomic shocks. The main objective of the paper is to provide a summary of theoretical and empirical evidence on the inflation persistence. Comprehensive review of the literature enables us to understand the key features of inflation and a variety of the baseline aspects that central banks should consider when shaping the framework for the stability of inflation.

## 2 MATERIAL AND METHODS

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In our paper we used method of comparison, deduction and synthesis in aim to provided comprehensive review of literature.

## 3 RESULTS

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Willis (2003) defines the degree of persistence as the rate at which inflation approaches equilibrium after a certain monetary policy shock. Fuhrer (2010) defines two groups of inflation persistence – reduced and structural. While the reduced form of inflation persistence does not provide us with its sources and

causes, in estimating the size of the structural form of persistence, it is important and desirable to know the sources of persistence, such as various exogenous shocks. Angeloni (2006) stated that there is a so-called internal and external inflation persistence. As is well known, the main goal of the European Central

Bank is to achieve price stability. High inflation persistence in the post-World War II period was revealed by studies by Fuhrer and Moore (1995) and Pivetta and Reis (2004). Caporin and Gupta (2016) concludes that the inflation persistence is higher during the expansion period than during the recession. Alogoskoufis (1992) concluded that adjusting to price shocks could lead to higher inflation, but a mild accommodative monetary policy leads to low inflation. Kočenda and Papell (1997) examined the consequences of convergence of inflation rates in the European Union. The research also focused on whether the Exchange Rate Mechanism contributed to accelerating the convergence of inflation in its member countries. Not all economic theories support the idea that a change in the nominal exchange rate regime will have a real effect. Baxter and Stockman

(1989) found that the real exchange rate is the only macroeconomic aggregate that systematically depends on the exchange rate system. The conclusion of a more recent study by Kočenda and Varga (2017) is that there are structural pauses of inflation persistence as endogeneity in policy strategies with respect to persistence as such. Kanellopoulos and Koutroulis (2016) found that the degree of inflation persistence depends on whether the inflation rate is much higher, lower or negative in relation to the European Central Bank's inflation target. Stabilization policy in the short term will have longer-term effects. Amano (2007) used in his work the New Keynesian Phillips curve and contributes to the knowledge that there is a positive relationship between the rate of inflation and demand, and there is a negative relationship between the rate of inflation and the unemployment rate.

## 4 CONCLUSIONS

Comprehensive review of the literature enables us to understand the key features of inflation and helps us in our further analysis. The aim of this article was to create a comprehensive review of the theoretical and empirical literature dealing with persistence in inflation. In the following analysis, we wanted to

focus on inflation persistence in euro area countries, examine the rate of convergence of inflation to a steady state, and assess the effectiveness of monetary policy in relation to price stability in euro area countries.

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# THE (SUSTAINABLE?) FUTURE OF THE OIL INDUSTRY

Martin Wallner<sup>1</sup>, Jonas Pfeffer<sup>1</sup>

<sup>1</sup>*Comenius University, Bratislava, Slovakia*

## KEY WORDS

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oil industry, CCS, renewables, oil price, energy mix, energy demand

## JEL CODES

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L71, Q01, O30

## 1 INTRODUCTION

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Since the recovery period after the global economic crisis in 2008 oil and gas companies have experienced an almost constant growth. Especially companies in the US which invested in the shale gas technology, profited from the boom during the years 2010 to 2014. Because the supply was at times higher than the demand the OPEC discussed a cut production, to keep the oil price at a high level (January 2014 the price per barrel was over 100 USD). Saudi Arabia voted against those measures, and so no production cut resolved. Instead Saudi Arabia started a crowding out strategy against the shale gas companies in the US. This strategy was successful but carried the whole market into a deep downturn. Many of the oil drilling and exploration companies could not

compete at such a low price level and had to stop their projects or worse declare bankruptcy. Since this severely price decline was not covered by any scenario with which the oil companies calculated, it became a turning point in the strategic planning for the oil industry. Particularly how to deal with expensive long-term projects, such as deep-water oil or tar sands and if they are really worth the risk with this volatile oil price. Further issues that massively put pressure on the oil and gas companies are new climate change policies that put pressure on their main business. An example for the seriousness of this situation is the 2015 adopted Paris Agreement, which is a legally binding framework for an internationally coordinated effort to tackle climate change.

## 2 MATERIAL AND METHODS

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Originating from the research question an extensive literature review has been performed. Main focus areas of this research have been the outlook and sustainability reports from the major oil companies such as Exxon Mobil or BP and articles about the

shift in business practices. These articles have then been qualitatively analyzed using a three-step-analysis based on Webster and Watson (2002) to come up with the current state of the oil industry and be able to assess an outlook.

### 3 RESULTS

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The World's GDP is about to double in 2040 because of the growth in Asia, that means that there will be a high energy demand, which from today's view can only be managed with a high share of fossil fuels. What is almost certain is that natural gas will replace coal as the second most important energy source after crude oil in the upcoming years. Natural gas is environmentally friendly, cost effective and guarantees a secure energy supply. Besides that, only around 15% of the total recoverable natural gas reserves have been extracted, which means that there are a lot of reserves left which are not that cost intense to be extracted. On the other hand there are new business models and new focus areas which could become more important in the upcoming years, because of upcoming regulations, changing demands in some sectors and as part of a marketing campaign.

Carbon dioxide e.g. is one of the main factors of the man-made global warming, therefore the prevention from letting it into the atmosphere, is an important issue. The oil and gas industry is investing a lot of money into the carbon capture technology. Another interesting field are renewable energy sources, doesn't matter which future energy mix scenario you take into consideration for the upcoming years. Especially their share in electricity generation will be highly relevant. Therefore, the oil majors already try to secure their piece of that growth by investing in solar and wind or biomass. Geothermal energy is another form of a renewable energy source for oil and gas companies, but the big difference for oil and gas companies is that they have a high expertise from the drilled oil and gas wells.

### 4 CONCLUSIONS

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The oil industry faces some real challenges in the upcoming years with a very volatile oil price, which makes expensive operations e.g. deep-water drilling or drilling in the Arctic harder to perform. In addition to that the assertiveness of renewables in all sectors is hard to predict, but especially in the transport sector, a growing share is very likely. Finally, the efforts when it comes to sustainability have to be assessed, here it's also hard to tell whether the efforts, which for certain take place are just a "green washing" campaign to convince the public that the

oil companies are making every effort possible to save the world, or if they have a real interest in those measures. Some of those measures are resolved by the state and therefore have to be implemented. Other measures are implemented because of the growing completion of cleaner energy. Finally, it has to be stated that the oil and gas industry should have a personal interest in making their operations more efficient and cheaper, to stay ahead of the competition.

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# A CRITICAL ANALYSIS OF THE CURRENT STATE OF RESEARCH ON BUSINESS SUCCESSION

Jürgen Weltermann<sup>1</sup>, Sascha Klein<sup>2</sup>

<sup>1</sup>*Comenius University, Bratislava, Slovakia*

<sup>2</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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succession scheme SMEs, Business successor, strategies for succession

## JEL CODES

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M00, M1, M20

## 1 INTRODUCTION

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2020 is the year of an ever-changing economic world, due to global and national economic crises (e.g. trade barriers due to the unilateral termination of long-term reliable trade agreements, a more pronounced decline in the labour force potential) [1] and sudden severe economic upheavals due to the COVID-19 pandemic, forcing national and international economies to radically adapt micro- and macroeconomic developments.

Especially in Europe and here, with the focus on industrial and agricultural areas and the lack of increasingly necessary raw materials today, small, and medium-sized enterprises shape the corporate landscape.

The aim of this article is, therefore, on the one hand, to raise awareness of this issue among entrepreneurs and potential successors and, on the other hand, to aid with such projects.

## 2 MATERIAL AND METHODS

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The purpose of this article is to answer the following research question: *‘What are the reasons and strategies for finding a business successor considering the company analysis for small and medium-sized enterprises in Germany?’*

In order to answer the proposed research question, an extensive literature research and qualitative literature analysis were carried out [2].

Literature research identified 453 potential sources, 157 of which were identified as relevant sources. All sources which met the generally valid scientific requirement of the level of detail and the

quality of the preparation were considered relevant. Twenty-five primary sources were used in this work. These are all scientific publications and articles in scientific journals.

This literature was encoded with the MaxQDA software. For this purpose, 4 main codes and 14 subcodes were defined inductively and deductively, and the present literature was encoded according to the method of structured content analysis. To this end, 673 codings were carried out and then analysed in the context of the research questions.

### 3 RESULTS

Regardless of where the successor comes from, it must meet certain requirements. *Expertise* is an important requirement for a successor. It consists of a commercial and a professional competence. Often, the successor is selected only according to this criterion [3]. The term *social competence* is used to summarize qualifications of the management silence. A new style of leadership cannot be prescribed, but is based on a willingness to talk, to be able to listen, to be able to relate to a clear position, to see one another as a role model and to be open. Talking to employees and managers, understanding their feelings and thoughts is an important, indispensable tool in this context. Therefore, decision-making,

delegation and constructive conflict capability are among the requirements for a successor [4]. The most important requirements for the successor:

- Leadership skills / skills
- Social skills, willingness, and ability to talk
- Mediation and negotiation skills
- Business and professional competence
- He should fit to the team of the company no resistance already generates by his person
- Decision-making, assertiveness
- A clear concept should be presented by a successor to demonstrate his seriousness, but also his competence.

### 4 CONCLUSIONS

The present study has clearly shown the reasons and strategies for finding a successor in Germany. Going beyond the core of this central research question, the following recommendations can be given, as they provide significant support for the planning, implementation, and full implementation of a regulated succession of entrepreneurs.

Succession solutions cannot be implemented overnight and can take 3–5 years if the planning is well planned. The “lonely decisions” are often not the best. An entrepreneur is well advised to work hand in hand with special lists in the business sector as well as tax and commercial law for the transfer of the company. The research question of this article

*‘What are the reasons and strategies for finding a business successor considering the company analysis for small and medium-sized enterprises in Germany?’* can therefore be regarded as fully answered.

The following recommendations for the rules on succession of entrepreneurs should be identified:

- Choose the right one, not the best, as a successor.
- Align the purchase price with the financial resilience of the company
- Get competent consultants “on board” to ensure professional competence and avoid one-sided “blinded” own view of things.
- Operate an open information policy

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# DECISION MAKING MODELS IN GERMANY'S NATURAL GAS INFRASTRUCTURE: ANALYSIS OF MAINTENANCE COSTS

Stefan Wieke<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

LCC analysis, maintenance costs, natural gas stations, case studies

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## JEL CODES

G11, D24

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## 1 INTRODUCTION

Strategic decisions are combined with significant costs and risks and are long term. (Crundwell, 2008). The decision-makers need a reliable basis to decide for the option that meets the requirements best for the investment project.

This general statement applies also to major investments in Germany's natural gas infrastructure.

For choosing the right option for compressors gas suppliers utilize a decision making model which is based on Life Cycle Cost (LCC) analysis in combination with NPV method. NPV method is the

prime instrument for creating a firm basis for decision making for major investments.

A systematic evaluation of case studies which are based on LCC in Germany's gas infrastructure in terms of examining the reliability of results and risk assessment is not provided in literature.

For this paper seven case studies and one paper are analysed in terms of maintenance costs. The reliability of the applied maintenance costs is examined and assessed.

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## 2 MATERIAL AND METHODS

In this paper the maintenance costs which were utilized in case studies will be assessed. The case studies were executed by consulting companies and reviewed by natural gas suppliers. The assessment of maintenance costs of seven case studies and one paper shall provide a picture of the reliability of maintenance costs

Based on data provided by manufacturer of compressors and related drivers maintenance costs for types of compressors and drivers were calculated

The studies were executed in different years. In order to make the data in the studies comparable to each other an alignment of maintenance costs on the timeline is required. In general compressor units in natural gas stations consist of a compressor and a driver. Compressors are either turbo compressors (TC) or reciprocating compressors (RC). Drivers are e-motor (EM), gasturbine (GT) or gas engine (GE) In order to make the different approaches in the studies comparable to each and to data provided by manufacturer the following method is used:

- Convert all maintenance costs to €/operating hour
- Calculate the operating costs for compressor/driver sets
- Apply the index of maintenance costs and transfer the costs to year 2019
- Benchmarking

After processing the data through these steps the data of the studies are comparable and can be analysed.

As a benchmark data from manufacturers are used. These data were submitted under competitive conditions in two tendering processes.

### 3 RESULTS

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The maintenance costs that were applied in the examined studies were assessed. These maintenance costs per operating hour are transformed to year 2019.

In bar charts the maintenance costs per operating hour for compressor sets “turbo Compressor plus

gas turbine“, “High Speed compressor (HS)“, “turbo compressor with electric motor (TC+EM) and Recips are shown and related to a benchmark.

### 4 CONCLUSIONS

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In the bar charts differences between the maintenance costs in the individual studies are significant. A comparison with the benchmark “manufacturer average” shows significant deviations.

The reasons are evaluated and described.

Although the studies are prepared by experts for experts, the significant difference in maintenance costs is significant.

The maintenance costs are needed to calculate the NPV (Net Present Value) in the context of an LLC (Live Cycle Cost) analysis. The next step is to investigate to what extent significant deviations of the maintenance costs from the benchmark have an impact on the result of an LLC analysis and if this can lead to an incorrect selection of an investment option.

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- Norsok O-CR-001/002 Life Cycle Cost for systems and equipment (001) and Life Cycle Cost for facilities (002).
- Seven unpublished case studies on compressor sets in natural gas stations

# THE EVALUATION OF ECONOMIC BENEFITS OF SMART CITY INITIATIVES

Aik Wirsinna<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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smart city, smart city initiatives, economic benefits, urban studies, digital city

## JEL CODES

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H41, H40, O18, O33

## 1 INTRODUCTION

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Research on Smart City (SC) is very fragmented [1] and has grown strongly since 2012 [2]. The path of research is characterized by the concept of the smart city, the technological context, the impact on the various research areas as well and the implementation. Recently, the contribution of Smart City Initiatives (SCI) studies has been more increased. The interpretation of the SC approaches raises several problems, how to measure the SC benefits in the first place, if one does not really know exactly what a SC is. Nevertheless, a number of different studies on components, measurability and

results have already been published [3]. The study was carried out using different research methods. Some research deals with the maturity of a city to SC [4] and its components and results [5]. With regard to the benefits of SCI, there are also papers that focus on the overall system [6] or refer to individual aspects, such as quality of life [7]. A derivation to the economic value of a smart city, especially in Germany, is not available yet. This paper evaluates the economic benefits of smart city initiatives.

*The research question (RQ) is: What are the economic benefits of smart city initiatives?*

## 2 MATERIAL AND METHODS

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In order to answer the questions, what the economic benefits of SCI are, a further intensive analysis is necessary. First, a scientific literature with qualitative content analysis has been done. Scientific literature databases were analyzed.

The search terms and clustering were defined as follows: “Smart Cit\*” and “Economic Benefit\*”,

publication not older than 10 years and reviewed scientific paper or conference paper. The relevant sources were filtered by title, keywords and associated abstracts. For further investigation paper were encoded with the help of a software. The software MAXQDA [8] has been used to categorize code and analyze the given information.

### 3 RESULTS

It has been shown that there is no uniform picture of the economic benefits of SCI in literature. Each SCI is considered separately in the literature. By encoding the literature certain clusters can be formed. 10 economic advantages were identified, which can be proven in the literature. The most important factor seems to be the long-term cost reduction. This can be realized by digitization, in particular by SCI in the field of e-government. The law on the promotion of electronic administration in Germany is a formaliza-

tion of such initiatives. The legislature has assessed the economic viability of such a project. For example, it is assumed that for Germany, annual reliefs of up to 36 million euros are due to saved postage costs through secure electronic correspondence. In addition, savings for the economy of 191 million euros (over 30 years) are made by eliminating of written information obligations and a further 15 million euros per year for online data transmission [9].

### 4 CONCLUSIONS

With regard to the economic benefit of SCI research is not broadly based yet. A first classification by possible categories has been developed. In the area of cost savings, concrete results can be hoped for. However, questions remain as to how valid the classifications are. In literature, these have always been mentioned only superficially. This has to be asked what role they play in SC strategies in the first place. In order to do so, further qualitative analyses

of SCI would have to be carried out. An expert survey could provide further insights. A qualitative approach as a research method seems to be a good one. The measurability will be a major challenge. The SCI are very different per se, because cities and their contexts are also very different. The most successful way to find out how to get the economic benefit of SCI is the deep analysis of case studies and the questioning of experts.

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# THE PROCESS OF AN EMPLOYEE PERFORMANCE APPRAISAL

Mandy Witt<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

employee performance appraisal, performance review, motivation, appraisal process, appraisal problems occurring

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## JEL CODES

M12, M50

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## 1 INTRODUCTION

People are not able to process information in an objective way. In order to make the assessment of another person less difficult, people use to lapse into clichés and stereotypes. In spite of all efforts to evaluate the employee's performance in a fair, objective and factual way, performance appraisals always represent a subjective act, which is affected by numerous factors (Werth & Mayer, 2008).

Employee performance appraisals are supposed to clarify whether the respective employee is able to meet the employer's demands. In case an employee is hired on the basis of misjudgement or rating errors, or if someone is employed for an inappropriate position, this can result in considerable costs, i.e.

consequential costs. Inappropriate employees will not provide the expected benefit; moreover, if the worse comes the worse, they could even damage the employer's enterprise.

However, the recording of the employees' strengths and weaknesses does not only serve as a record of results, professional conduct and potentials in order to provide the best possible employment, but also as the basis for the definition of an adequate salary (Crisand & Raab, 2011). Performance appraisals can result in – positive or negative – personnel measures. Hence, the employee performance appraisal represents an essential leadership task of any executive.

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## 2 MATERIAL AND METHODS

In the course of writing this paper, extensive literature has been used, though primary sources only. Furthermore, the different employee appraisal methods have been analysed as to their adequacy,

potential sources of error, weaknesses and possible rating errors as to their application and interpretation.

### 3 RESULTS

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Taking into consideration that our own sensory perception is limited, the human factor seems to represent the weakest point in the course of an employee performance appraisal. It is this lack of objectivity which heavily affects an appraisal (Crisand & Raab, 2011).

Such weaknesses within the employee evaluation ways and methods can additionally impede the process of an objective, reliable and applicable employee performance appraisal (Stock-Homburg, 2008).

Though raters use to differentiate between the specific items of an appraisal, they also use to take

aspects foreign to the performance as a basis for their review, in a strategically intentional way. They do so for different reasons, for fear of occupational trouble or because the rater does not want to offend or demotivate the employee to be evaluated (Menzel, Grotzfeld & Haub, 2012). Furthermore, the working atmosphere could be strongly damaged by the employee's feeling that he or she is permanently being watched (Crisand & Raab, 2011). Last, but not least, personal sympathy and feelings may also play an important role.

### 4 CONCLUSIONS

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Employee performance appraisal is a matter and an essential element of the state-of-the-art human resource management. The different appraisal forms (e.g. self-assessment, appraisal by subordinates, appraisal by colleagues) and methods offer different pros and cons. This is why, in practice, hybrid forms are used.

Any organisation or company should find its own method of employee performance appraisal. In doing so, the principal purpose should be an objective, just and fair appraisal. In this way only, it will be possible to prod an employee to go for top performance.

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# HOW CAN ACCIDENTS AT WORK BE PREVENTED? STATE OF RESEARCH AND OUTLOOK

Valéry Wöll<sup>1</sup>

<sup>1</sup>*Comenius University Bratislava, Slovakia*

## KEY WORDS

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work safety, behaviour analysis, consequences, behavior based safety

## JEL CODES

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J28, J81

## 1 INTRODUCTION

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Every year in Germany alone there are over 1,000,000 accidents at work, with 497 fatal accidents at workplaces. In addition to the suffering of the people, the economy suffers considerable financial losses of around 75 billion euros per year. (DGUV, 2020) The article mainly follows the research work of Bördlein (Bördlein, 2015), which is currently regarded as the most relevant source in the German-speaking region for research on behaviour-oriented occupational safety. The aim of the study is to

summarise the current state of research on the occurrence and possible prevention of occupational accidents and to identify gaps in research.

- Question 1: What are the researched main-causes of accidents at work?
- Question 2: What theoretical models are currently used to explain the main-causes of accidents at work?
- Question 3: What methods are used to eliminate the main-causes of accidents at work?

## 2 MATERIAL AND METHODS

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The method used was a literature search according to Webster and Watson (Webster & Watson, 2002). With the help of the databases JSTOR, Google Scholar and Google literature was collected on the keywords industrial accident, hazardous conditions, cause of accident, behaviour, misconduct, behaviour analysis, reinforcement and methods of occupational safety, which was then evaluated in terms of its relevance. The research was limited to freely available texts in German language in order

to get a representative picture of the practically applied literature in the German language area. The criteria used to categorize relevance were the content-related agreement with the topic and the relevance categorization of google Scholar. 41 texts by authors with a high relevance rating and a thematic reference were given preference in the study. The texts were examined with the tool maxQDA. Different codes were used to structure and synthesise the relevant literature references.

## 3 RESULTS

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Cognition 1: According to a recent meta-analysis of the literature, the proportion of human error as the

cause of an accident at work is 76%–96%. (Bördlein, 2015)

WÖLL, Valéry. 2020. How Can Accidents at Work be Prevented? State of Research and Outlook. *PEFnet 2020 – 24<sup>th</sup> European Scientific Conference of Doctoral Students*, pp. 225–226. Mendel University in Brno. ISBN 978-80-7509-749-1.

Cognition 2: Although it is a scientific consensus in the field of accident research that human error is regarded as the main cause of accidents at work, only 14 of the 41 texts examined deal with the subject of human error at all. There is currently no standardised, generally valid catalogue to classify and categorise the causes of accidents at work, which is why all texts and publications have their own definitions of categories of accident causes.

Cognition 3: Only three texts mention behavioural analysis as a tool for changing human misconduct in occupational safety. Two texts are by C. Bördlein and the third text quotes Bördlein. The method of behaviour analysis is not mentioned in laws or regulations on occupational safety.

In laws and regulations, human misconduct is mentioned only in one place, and only in a minor role in the case of exemplary enumeration. The causes of accidents, which are mainly listed in the scientific literature and in scientific publications of state offices are mostly different types of accidents,

such as falls and tripping accidents. Human error is not mentioned in the annual accident reports of the state offices. Investigations into the use and effectiveness of behaviour change measures based on Skinner's behaviour analysis have been part of the German-language literature for about 8 years. However, the findings of the research work have not yet found their way into the state predominant technical literature and are not relevant in the daily practical work of occupational safety specialists in the industry. One reason for the lack of relevance in practice could be the lack of a quantifying method for assessing the consequences in the ABC model in behavioural analysis in connection with occupational safety. Bördlein, too, evaluates only 3 of the 4 relevant weighting factors in its consequence analysis and these are only evaluated in a qualified manner, so that a rather subjective and difficult to interpret evaluation tends to emerge, which is currently not used in practice.

## 4 CONCLUSIONS

There is a research gap regarding the use of quantified analysis of consequences in the area of human error in occupational safety. A quantified consequence analysis would have the advantage that a targeted change of consequences in a certain direction could be better planned. Furthermore, such an analysis would make it easier to compare different bundles of consequences from different areas. By introducing standardised evaluation tables, the four decisive factors of severity of the consequence, the time lag between the consequence and the behaviour, the probability of the occurrence of the consequence and the direction of action of the consequence can be quantified. By multiplying the first 3 factors and a positive or negative sign by the 4 factor, a simple

practical model for the evaluation of bundles of consequences can be created which evaluates the consequences in a number. Using such a model would make it easier to predict the behaviour of employees. The scientific proof of the probability with which an employee will behave as predicted in the quantified consequence analysis still has to be provided. In the automotive sector, however, standardised tables with scales from 1–10 have been successfully used for years to quantify safety risks and probabilities of occurrence. Here, an empirical study could provide information about the functionality of the method and the significance of the assessments of consequence bundles.

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WEBSTER, J. and WATSON, R.: Analysing the past to prepare for the future: Writing a literature review, *MIS Quarterly* Vol. 26 No. 2, Page 13–24, MIS Research Center, Minneapolis, 2002

# DOES FATHERHOOD BONUS EXIST IN THE CZECH REPUBLIC?

Drahomíra Zajíčková<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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fatherhood, labor market, earnings, EU SILC

## JEL CODES

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J01, J16, J20

## 1 INTRODUCTION

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In the labor market, the fact that fathers have higher incomes than childless men can be observed empirically. However, in contrast to the influence of motherhood on labor market outcomes, which has been the subject of a relatively large literature, paternity and its influence on wages receive significantly less attention in professional literature (eg

Glauber 2008; Budig and Hodges, 2010, Killewald, 2013). There is no comprehensive study on this topic in the Czech economic literature, despite the fact that understanding the consequences of parenthood on labor market activity and labor income is important for both social science research and the conception of public policies.

## 2 MATERIAL AND METHODS

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Economic theory offers several justifications for higher fathers' incomes compared to childless ones. The argument why fathers should have higher incomes than childless men can be divided into three groups: (1) the theory of the division of labor in the household, (2) the theory of discrimination and (3) the theory of choice. The first theory is based on Becker's theory of the division of labor in the household based on comparative advantages (Becker, 1965), where the division and specialization of couples into individual activities is more effective than the sharing of responsibilities. The second explanation is based on the theory of discrimination in the labor market, where fathers, unlike childless men, are perceived by employers as more efficient, loyal and competent (Correll, Benard, and Paik, 2007). Discrimination against the employer may

manifest itself in other ways, affect not only fathers' pay in employment, but also access to well-paid jobs and opportunities to build human capital (Killewald, 2013), or fathers may be taken into account in dismissing employees. The third theory is selection theory, where the causality between paternity and wages leads from higher wages to paternity, ie fathers become men with higher incomes, not the other way around. From a quantitative point of view, the size of the paternity bonus varies considerably between countries and may not be detected in all countries. In northern European countries (Denmark, Norway, Sweden, Finland) a paternity bonus of up to 2% is detected (Kellokumpu, 2007). In the United Kingdom, Germany and France, according to various studies, the paternity bonus amounts to 2 to 10% (Meurs et al., 2010). For the analysis of

the fatherhood bonus in the Czech Republic, we use the EU SILC data set, where the mutual year-on-year comparability of data allows us to monitor the development of measured quantities over time. The data we use have the character of cross-sectional data and include the complete time series of EU SILC from 2006 to 2017 for the Czech Republic, where each year the set includes more than 8,000 households with 20,000 people. We use a standard OLS model with

control variables – place of residence, education and length of work experience – see (1).

$$\begin{aligned} \ln Y = & \alpha + \beta_1 \text{ RODIC} + \beta_2 \text{ PRAHA} + \\ & + \beta_3 \text{ STRCECHY} + \beta_4 \text{ EDUHIGH} + \\ & + \beta_5 \text{ EDUMIDDLE} + \\ & + \beta_6 \text{ ODPRAC\_LET} + \epsilon_i, \end{aligned} \quad (1)$$

### 3 RESULTS

The net fatherhood bonus is statistically significant throughout the observed period and its value ranges between 8% and 20%, however, bonus values lower than 10% and higher than 16% are rather exceptional. The average value of the paternity bonus in

the observed period is 13.3% and shows considerable stability and unchangingness due to the development of economic and social conditions. The influence of individual control variables and their statistical significance also remains stable.

### 4 CONCLUSIONS

As there were significant changes in the amount of the fatherhood bonus in the monitored period (ie its increase after 2010), we analyzed the reasons for this change. It turned out that the effect that caused the increase in the fatherhood bonus was the decision of families in which the father had a high income

after 2010 to expand the family with a third child. The average income of fathers with three children increased by 15% compared to the period up to 2010. The data suggest that causality is evolving from high incomes to higher numbers of children.

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# EMPLOYEE RETENTION IN SELECTED SPANISH HOTELS: QUALITY OF INVESTMENT IN THE MOTIVATION FACTOR

Silvie Zámečník<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

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## KEY WORDS

motivation, satisfaction index, training, employee productivity, employee needs, fluctuation, loyalty

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## JEL CODES

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## 1 INTRODUCTION

The aim of the study is to clarify the main motivation factors which influence individual employee commitment in order to increase internal satisfaction, improve the performance and avoid the staff fluctuation in hospitality environment. Respondents were full-time employed managers of the five- and four-star hotels in Barcelona, a world-class reference city in the world in the area of conferences. The results demonstrated that the more motivated the human factor is, the higher efficacy, loyalty, and individual performance is given to the institution in area of chosen three dimensions: strategy, communications, and common feedback. The results would support the importance of effective implementation and implications for Czech hospitality organizations.

According to AHRCR (2020) there are a total of 9007 accommodation facilities in Czechia, but only 414 of them are certified formally. Except the international hotel chains, which have already developed standards and processes, we can suppose that there is a majority of hotels which are still missing a coherent form of internal processes that can help to the institution to improve quality of service and prevent staff fluctuation or motivate employees to become loyal within the corporate environment.

David L. Rainey (2006) describes that the dynamics of how to influence client satisfaction and loyalty and differentiate in hospitality environment has been crucial for most hotels and other companies in hospitality business in recent years and should be in synergy with global standards where high product quality and satisfied customer is a part of building a competitive advantage. Internationally, the composition of clients, demands, habits and requirements are also changing. According to Inghilleri (2010) experience, unusualness, uniqueness, attractiveness, adrenaline, as well as utility, advantage or exclusivity are acknowledged. Highly valued is a healthy lifestyle, absolute relax and lifestyle regeneration. The segmentation and orientation of offers is continually specified for various types of clients from children, through the generation Y to seniors or singles. Communication channels for information and current offers are also changing. With the development of social media, especially internet and television, the structure of users and target clients has changed significantly. The hotel marketing and the entire hotel industry in general is open to client's requests; it is important create to the client some impression of exceptionality Yang et al. (2011).

## 2 MATERIAL AND METHODS

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The data was collected through interviewing 10 managers based in Spain which were selected within the must have criteria as well experienced in hospitality environment, working minimum 15 years in hotels (minimum category of \*\*\*\* SUP and \*\*\*\*\*), middle or high management, hospitality degree and direct contact with the client. During the interviews of the qualitative study there was an important focus

on questions to explore the strategies of hospitality managers which need to improve employee motivation factor and retention within the organization. The interview questions that were used to interview managers for this proposed study were sorted into 3 blocks: strategy for good climate within the hotel, communication within the hotel and feedback within the hotel.

## 3 RESULTS

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Based on an analysis of qualitative data, it has been verified that all 10 managers participating in the research a 100% of respondents' highlight communication and importance of the motivation factor to increase the staff productivity. The element of employee growth, cross-training opportunities, regular training, investment in human talent, constant support of talent management was determined for 80% of managers. Almost 100% of the respondents think that the employee must acquire the need and the feeling of being his own entrepreneur in the

company, because a respected and valued worker will engage overall. On the other hand, 2/3 say that there is a common standard for service organizations to invest primarily time in their staff, but also finance through internal educational training tools or internal special programs (such as cross-training, extra trainings), which can also be supported by external suppliers for individual development and the professional growth of staff to maximize efficiency and results for the organization, avoiding a high staff turnover rate.

## 4 CONCLUSIONS

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The conclusion of the research so far states the importance of the topic of the motivational programs within the hotel. A positive climate, trust, values between the same co-workers and superiors increase the motivation factor. Working on a strategy of

benefit plans, personal development plans, improving the cognitive skills or efficiency to make decisions as well as cooperation on human talent factor are some of the differential factors in retaining employees and reducing staff turnover.

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# MERGING OF VIRTUAL AND REAL SPACE FOR AUGMENTED REALITY APPLICATIONS

Martin Zejda<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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augmented reality, Microsoft HoloLens, Unreal Engine, user interfaces, user experience

## JEL CODES

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C88

## 1 INTRODUCTION

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As described in [1], “Spatial mapping provides a detailed representation of real-world surfaces in the environment around the HoloLens, allowing developers to create a convincing mixed reality experience. By merging the real world with the virtual world, an application can make holograms seem real. Applications can also more naturally align with user expectations by providing familiar real-world behaviors and interactions.”

Spatial mapping can take place in several ways, with the most common method being automatic environment detection using computer vision or laser scanning. Using these inputs, the algorithm recognizes real objects to merge the virtual scene with the real one. However, this mapping is not always possible. Not all devices are adapted to provide data on surrounding objects with sufficient accuracy, as

provided by Microsoft HoloLens glasses, and sometimes automatic detection of surrounding objects can be problematic, complex or even disruptive.

Detection can be disruptive, for example, in design applications such as room and manufacturing hall design. These environments may contain real objects that we do not want to include in the detection, thus we could replace them with virtual objects. For example, this kind of issue is present in AR application by IKEA [2], where is not possible to replace real old furniture with virtual models of new goods.

In a situation where it is not possible to work with automatic detection or it is not a suitable tool for a specific application, it is necessary to deal with an alternative solution of spatial mapping.

## 2 MATERIAL AND METHODS

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All methods were tested in the Unreal Engine 4 game engine with one of the most advanced augmented reality glasses Microsoft HoloLens 1 and 2. The initial need for an alternative spatial mapping solution was due to the lack of UE4 functionality, but later proved to be a suitable application for many uses.

The created methods work in a way that the user detects essential information about the environment, such as the height of the floor and the location of the walls or corners of the room by his movement. From these inputs basic data are created such as volume of the room, without the disrupted real objects. In order to add virtual objects to a scene that are compatible

with the real world, the real world coordinate system must be linked to the virtual world. Glasses for augmented or virtual reality (head mounted display – HMD) are usually set to zero coordinates with zero rotation after starting the application, so the start of the application always occurs in another real place with a different rotation [3]. This means that each application start provides random data on

### 3 RESULTS

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Several methods have been created that can use manual user input to define the basic boundaries of space in various ways. These methods work with the location and rotation of the user, his movement and input at his location, or other inputs such as buttons, gestures or voice commands. When solving these methods, the same problem always arose and it was the merging of real imaginary directional axes with the Euclidean virtual space.

The problem was to transform the HMD in the scene, because in the AR and VR application it is highly recommended not to move or rotate the camera. If HMD moves or rotates within the application it is possible that the virtual environment will

the position of the HMD. It is necessary to let the program know where HMD is in the real scene. In this case, however, we do not work with computer vision or laser scanning, but only with user input. This user input includes manual detection of basic space parameters such as the position of corners, walls, floor or ceiling height or simply setting the orientation in the environment.

### 4 CONCLUSIONS

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We managed to create and user-test an augmented reality application running on the Microsoft HoloLens platform. In this application, it was possible to create an environment detection and its merging with a virtual scene for AR applications without the need to recognize surrounding objects using laser scanning or computer vision. The detection method can be theoretically deployed on any AR device with a camera. In application we cannot work with real objects inside the real environment, but they do not

be deformed or a subsequent erroneous movement will occur. This has also happened when attempting to transform the camera in any way. The problem has been solved by function, which automatically adds the user movement by the required angle and distance. This non-existent and very precise “movement of the user” will unify the virtual and real coordinate system. User testing has shown that users quickly understood how to perform manual input. There were occasional problems with input, which were caused by the limit of the use of the device itself such as difficulty of gestures and small FOV. These problems have been alleviated by using better devices such as Microsoft HoloLens version 2.

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# BANKING SYSTEM IN EUROPEAN UNION

Martina Zelená<sup>1</sup>, Tomáš Fišer<sup>1</sup>

<sup>1</sup>*Mendel University in Brno, Czech Republic*

## KEY WORDS

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centralization, decentralization, banking system, cluster

## JEL CODES

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G21, G23, E58

## 1 INTRODUCTION

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The banking system within the European Union is under the auspices of the European Central Bank, but each country has its own banking system serving the target customers. There are two types of banking systems that can be distinguished within the institutional structure of the financial sector: decentralized and centralized. The decentralized system is characterized by autonomous banks operating in regional markets, while in the centralized system

only large banks with limited geographical expansion can be found. The decentralized systems are found in the USA, Germany, and Japan, for example. One of the consequences of different systems can be found different regional interest rates for individual stakeholders. The main goal of this work is to identify the degree of centralization / decentralization of individual banking markets in the member states of the European Union.

## 2 MATERIAL AND METHODS

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As the papers deals with individual banks and their branches, the main data for the analysis are used from the Eurostat and the Orbis database. The data contain information not only about the number of individual branches and their location, but also other details. Due to the large amount of data, cluster analysis is chosen as a suitable method, which allows

to divide the studied sample according to the degree of centralization into more categories. Due to the Magretta (2012) cluster defined as interconnection of concentrated companies in a geographically limited area and they have an impact not only on the economic stability of the business environment, but also on the living standards of the region.

## 3 RESULTS

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The main goal of this work is to identify the degree of centralization of the banking system of each member state of the European Union. The set goal was achieved on the basis of a cluster analysis. The result of the analysis is to assign a number that captures the degree of centralization to each state and to define

the differences that centralization / decentralization causes. Based on the degree of localization, it is possible to define what consequences result from the chosen system for end customers and the financial market in general.

## 4 CONCLUSIONS

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The division of the banking market in the European Union according to individual member states enables a better understanding of the functioning of the banking system as a whole. Based on the theoretical basis, it is possible to define the differences that are created in individual markets on the basis of their centralization. According to Blažek (2011),

significant differentiations can be found that affect end customers, mainly in the different interest rates provided. A more thorough study of the differences caused by the degree of centralization of the banking system is a suitable topic for further study in connection with the results of this study.

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