

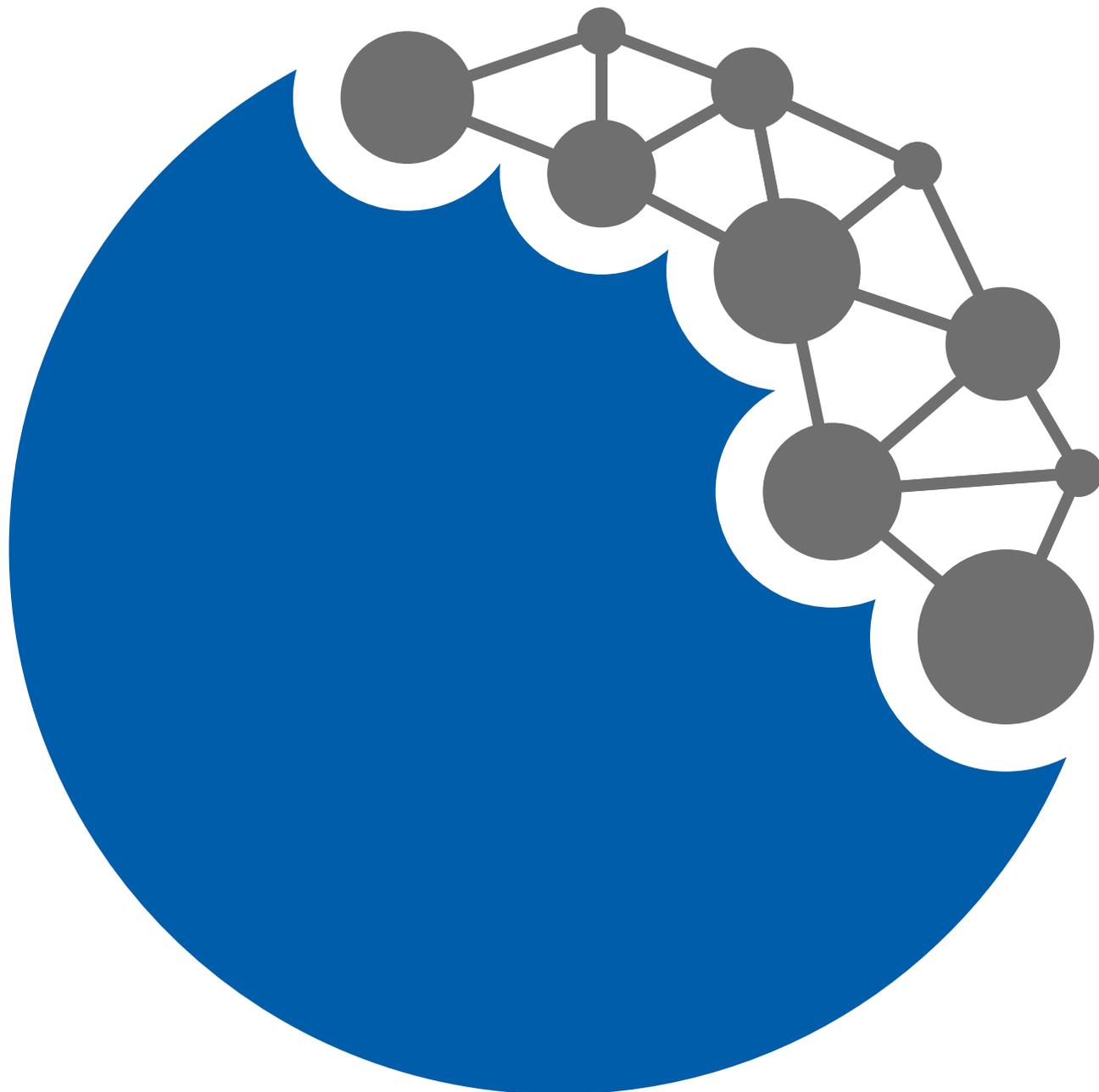
David Hampel, Hana Vránová (eds.)

# PEF*net* 2021

25<sup>th</sup> European Scientific Conference  
of Doctoral Students

November 26, 2021  
Extended Abstracts

● MENDELU  
● Faculty  
● of Business  
● and Economics



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# PEFnet 2021

European scientific conference PEFnet 2021 was organised by the Faculty of Business and Economics, Mendel University in Brno, as the 25<sup>th</sup> annual conference.

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First edition  
ISBN 978-80-7509-811-5

Proceedings were published by Mendel University Press

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# CRISIS MANAGEMENT: COMPARATIVE STUDY BETWEEN STATE AND PRIVATELY-OWNED ENTERPRISES IN GHANA

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## KEY WORDS

state and privately-owned enterprises, crisis, crisis management teams, organisational slack, internal controls

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## JEL CODES

L33, O17

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## 1 INTRODUCTION

The incessant closure of State and Privately-Owned Enterprises in Ghana due to liquidity and other organisational challenges calls for scientific inquisitiveness to ascertain the crisis management prowess of the leadership of these institutions. The impact of crises on the economy is dire, which demands immediate attention to forestall economic meltdown (Sami, 2014). The development has often generated uncertainties among investors as to whether the internal policies and structures such as Internal Controls, Crisis Management Teams and Organisational Slacks of State and Privately-Owned Enterprises are reliable enough to surmount the daunting challenges that regularly confront them. Even though a crisis could arise from various sources, its emergence in most cases is not random or spontaneous but rather the result of prolonged lax and negligent management practices (Swalih & Vinod, 2017). Resolving these crises requires dynamism, integration, and reconfiguration through external and internal competencies to ensure enterprise continuity (Di Stefano et al., 2010; Nwachukwu & Chládková, 2019; Nwachukwu & Vu, 2020). Bundy et al. (2017) see a crisis as “an

unprecedented or extraordinary event or situation that threatens an organisation and necessitates a strategic, adaptive, and timely response to maintain its viability and integrity” but when well managed its impact can be minimal. Admittedly, recent trends in organisational development reveal corporate crises around the globe (Sami, 2014), and it is obvious Ghana is not an exception. While various institutions such as IMF and the World Bank gave a definitive diagnosis of the Ghanaian situation regarding State and Privately-Owned Enterprises-Enterprises, there are missing links that need to be fixed. The information available to the best of the author’s knowledge did not adequately address the impact of Crisis Management Teams, Organisational Slack, and Internal Controls on Financial Performance. The study, therefore, finds it necessary to help fill these gaps through a survey of one hundred State and Privately-Owned Enterprises in Ghana to help guide investors, industry players, policymakers and those in academia on how these variables impact organisational performance.

## 2 MATERIAL AND METHODS

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The study adopted a longitudinal and quantitative approach covering five years (2013–2017) involving one hundred (100) State and Privately-Owned Enterprises. Based on the study objectives, the author gathered primary data (questionnaires) from employees and management. The study sourced secondary data from (Annual Reports and Obis) for additional information. Crisis Management Teams,

Organisational Slack, Internal Controls were the main Independent Variables, while Return on Assets was the dependent variable for the regressions analysis. The study adopted univariate regression, multivariate correlation matrix, cross-tabulation, chi-square analyses, and Jack Welch's (20-70-10) Vitality Curve in drawing the required conclusions.

## 3 RESULTS

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Based on the tests and analyses conducted, the findings indicate a positive and significant relationship between the activities of Crisis Management Teams and Financial Performance (ROA). The result further details a better performance of Crisis Management Teams of State-Owned Enterprises than the Privately-Owned Enterprises. The result, however, indicates a negative but significant relationship between Organisational Slack and financial performance (ROA). Regarding adherence to internal

controls based on the 2013 COSO Model, the findings indicate that State and Privately-Owned Enterprises do not adhere to internal controls. However, Privately Owned Enterprises performed better. The final result, which sought to compare and contrast the overall performance of State and Privately-Owned Enterprises based on Jack Welch's Vitality Curve, placed the performance of State-Owned Enterprises above that of the Privately Owned-Enterprises.

## 4 CONCLUSIONS

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The study sought to investigate, compare and contrast the impact of internal structures and policies on the financial performance of State and Privately-Owned Enterprises in Ghana as a crisis management mechanism. The differences in the performance of the sectors call for collaboration between State and Privately-Owned Enterprises, most especially in leveraging and sharing of best practices. The five-

year study reveals how relevant Crisis Management Teams, Internal Controls and Organisational Slacks are in managing crises. Further, it points out that solid internal structures and policies are critical in promoting organisational sustainability and financial performance, and as such, every effort must be made to strengthen them.

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# VOLATILITY SPILLOVERS OF CENTRAL AND EASTERN EUROPEAN CURRENCIES

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## KEY WORDS

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volatility spillovers, CEE countries, exchange rates, economic-policy shocks

## JEL CODES

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G41, E50

## 1 INTRODUCTION

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The emerging countries linked with their exports are very sensible to economic-policy shocks and such shocks like GFC increase the spillover effects on the markets. The ability to describe currency rates changes by fundamental variables using econometric models decreases during economic-policy shocks (King, 1994). Subjects motivated by emotions may decide ineffectively and in order to protect their portfolios, they start to rebalance portfolios denominated in foreign currencies.

That type of rebalancing increases asset volatility and related to that it increases foreign exchange rate volatility (Fratzcher et al 2015). Volatility spillovers are driven by the emotions affecting the behavior of subjects in economies (Pastor and Veronesi, 2012).

Portfolio rebalancing in such context is especially significant regarding emerging currencies (Fratzcher et al. 2015), as emerging countries are more sensitive to global economic-policy shocks (Bubák et al., 2011). These spillover effects were analysed also by Baruník, Kocenda, and Vacha, (2017) and they identified these effects as important for bond markets, stock markets, and currency markets. According to Hung (2020), a better understanding of spillover effects could help to manage portfolio investments and could give some useful information to portfolio managers regarding hedging or diversification strategies. Volatility spillovers are more significant during negative shocks (Segal et al. 2015).

## 2 MATERIAL AND METHODS

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The dataset contains local currencies data for the currencies of Central and Eastern Europe belonging to the European Union and EURUSD, EURGBP, EURCHF, and EURJPY as the currencies representing global markets. These nine currencies are the currencies of the Czech Republic, Croatia, Hungary, Poland, Romania, and developed countries (EURUSD, EURGBP, EURCHF, and EURJPY), whose impact on other currencies is analyzed separate. The

period begins by November 2013 on a daily dataset until the end of May 2021.

Related to shocks causing volatility spillovers on the exchange rates market are created indexes identifying portfolio rebalancing channels between CEE countries. These indexes define both causalities separately – spillovers FROM and TO some currency. The volatility spillovers are identified employing the DYCI method created by Diebold and Yilmaz

(2009). It is variance decomposition demonstrating the quantity of information, that each variable adds to other in regression and it demonstrates how much of the forecast error variance of each variable can be explained by exogenous shocks from the different

variables. The authors (Diebold and Yilmaz, 2014) use variance decompositions that they can divide into forecast error parts, and these can be allocated to systemic shocks.

### 3 RESULTS

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EUR, USD, GBP, and CHF transmit the volatility to local currencies mostly during periods of economic-policy shocks. These events like the COVID-19 crisis and so on have a global impact as investors rebalance their portfolios. RON and HRK are affected by the volatility of other countries only to a small extent.

Significant are mostly volatility spillovers between CE3 currencies. CZK is a net volatility transmitter

during the whole period. The volatility transmitted almost doubled to 40% when the ČNB ended the exchange rate commitment. PLN is also a net volatility transmitter while HUF obtains volatility from these two currencies. The following research should identify the lags between shared volatility to help portfolio managers manage their portfolios during the short period.

### 4 CONCLUSIONS

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We find significant volatility spillovers from global to local currencies mostly in times of economic-policy shocks. Global currencies transmit up to 70% of volatility during uncertain periods. Interesting are

also spillovers between local currencies, mainly between CE3 currencies. These spillovers are significant during the whole selected period where CZK and PLN transmit volatility to HUF.

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### 6 ACKNOWLEDGEMENT

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Supported by the grant No. PEF\_DP\_2021013 of the PEF Mendelu Internal Grant Agency.

# SOCIAL RESPONSIBILITY FOR INSURANCE COMPANIES

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## KEY WORDS

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non-financial information, non-financial reporting, directive 2014/95/EU, insurance companies, sustainability

## JEL CODES

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M14

## 1 INTRODUCTION

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The paper focuses on Directive 2014/95/EU and an evaluation of its impact on the reporting of non-financial information by insurance companies. This directive was implemented into the Czech accounting legislation with effect from 2017. According to this directive, large companies and public interest companies are obliged to disclose non-financial information,

for both of which the condition of number of employees exceeding 500 applies. Insurance companies are among the companies of public interest. The article also compares the level of reporting of financial institutions in the Czech Republic with financial institutions in the Visegrad Four countries, France and Germany.

## 2 MATERIAL AND METHODS

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To assess the impact of the Directive on non-financial reporting, an analysis of financial institutions' annual reports was carried out. The research included insurance companies on the list of regulated and registered financial institutions maintained by the Czech National Bank. Annual reports from 2016, the year before the Directive came into force, and

2019, as the most recent annual reports available, were analysed. We focused on the following areas: environmental protection, social issues and employee care, human rights and the fight against corruption and bribery. Information on non-financial reporting in the V4 countries, France and Germany was obtained from the EUKI 2020 database.

## 3 RESULTS

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There has been an increase in reporting for the group of insurance companies with an obligation to report non-financial information. However, the same trend has also occurred in the group of insurance companies that do not have this obligation. In most of the

areas examined, the results achieved by the Czech Republic were above the V4 average. In the area of anti-corruption, the Czech Republic is even above the average found for Germany and France.

## 4 CONCLUSIONS

Our findings shows that the increase in non-financial reporting by insurance companies with reporting obligations was not only due to the implementation of the Directive into Czech accounting legislation. In

a lot of the examined areas, the results achieved by the Czech Republic were above the V4 average. The Czech Republic is in the area of anti-corruption even above the average found for Germany and France.

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# ADVANCED THERMAL AND TRUE-COLOR IMAGE FUSION FOR OBJECT RECOGNITION IN LOW LIGHT CONDITIONS

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## KEY WORDS

thermal, camera, image, fusion

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## JEL CODES

C88, L63, L86

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## 1 INTRODUCTION

Primary purpose of this article is to provide insight on the usage of thermal cameras alongside RGB cameras for various purposes. The text describes the possibilities to improve the amount of information gathered from images taken in low light conditions. It compares different approaches to image fusion and

evaluates the amount of useful information gathered using commonly known techniques in the field of image processing, such as edge detection. The goal is to prepare a path for pattern and object recognition algorithms which will use the best method of image fusion.

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## 2 MATERIAL AND METHODS

FLIR Lepton 3.5 is used as the thermal camera of choice. The differences between industrial thermal cameras and Lepton is primarily in the intended field of usage, resolution, frames per second, price and the support of the community rather than the company. A common webcam with 720p resolution is used as a RGB camera. The images used for experiments are common item pictures in natural environment.

Main problem in the preparation of the images is the different focal point of each camera. It creates differences in the images of each camera that they appear to be taken from different distances from the object. To resolve this issue the image with more features must be cropped to correct size. Although both cameras are positioned as close to each other as possible the angle difference is observable by bare

eye. This can be adjusted by warping one or both images. The amount of warping can be calculated with triangle similarity method from physical properties of the cameras and relative lengths of features in both images in pixels.

After the image adjustments the three chosen methods can be run to create the fused images from the originals. The methods used in this work are learning framework with CNN (Shopovska et al., 2019), LPT (Bulanon and Burks, 2009) and Spatial Domain Fusion (Hanif and Ali, 2006).

Each fused image is then processed by the basic image analysis tool such as edge detector (Mohammad et al., 2014) alongside the true-color image and the results are compared.

### 3 RESULTS

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The results are clearly showing that the fused images contain more useful features for the edge detector than the true-color images. The best results are shown by the Spatial Domain Fusion, although both

remaining methods show considerable improvement of the image as well. The learning framework had some difficulties to correctly process some of the images from the set.

### 4 CONCLUSIONS

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The results proved that the thermal and RGB fusion before the image analysis provides far better results than the other way around. The three methods in the experiments show larger percentage of successfully extracted information. The amount of noise in the

fused image can be further reduced by additional image manipulation and processing. Further studies will reveal the appropriate fusion method for pattern and object recognition algorithms.

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### 6 ACKNOWLEDGEMENT

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Supported by the grant No. PEF\_DP\_2021030 of the Grant Agency IGA FBE MENDELU.

# HOW DOES MONETARY POLICY AFFECT INVESTMENTS BY EMERGING MARKETS COMPANIES?

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## KEY WORDS

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monetary policy, investments, macroeconomics, investment activity, emerging markets

## JEL CODES

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E52, G31

## 1 INTRODUCTION

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The purpose of this research is to determine how monetary policy decisions affect the incentives of emerging markets firms to invest. We assume that through the transmission mechanism of financial markets, as well as global investment flows, monetary

policy decisions affect the incentives of companies in emerging markets to invest, therefore, within the framework of this research, we plan to obtain confirmation of this assumption, as well as to determine quantitative estimates of this influence.

## 2 MATERIAL AND METHODS

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The data for this study were accumulated using the database of Bureau Van Dijk of Moody's Analytics. As a result of the selection and sampling procedures, we obtained data including 29,583 observations for 3,983 companies from 8 non-financial industries, representing 23 emerging markets during 2010–2017 period.

As we study companies investment activity, the dependent quantitative variable in our models is the

rate of changes in company's fixed assets for the given period. Considering that we are analyzing panel data, which is a non-random set of objects (emerging markets), the composition of which (companies) does not change over time, a fixed-effects model is an appropriate regression analysis model to use in the framework of this research.

### 3 RESULTS

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We found that EMEA, Asia and America macro regions firms react differently on the monetary policy changes, as well as firms from different industries, with different size, age, and capital structure.

First, we showed that the investment activity of companies is influenced by decisions on monetary policy through the transmission mechanism of financial markets. Second, we found that America region companies are more affected by monetary policy decisions than other emerging market companies, while Asian companies are indifferent to monetary decisions. Third, we received confirmation that capital-intensive and large companies, as well

as companies with a high debt leverage, are more sensitive to monetary policy decisions. Finally, we have confirmed that companies at different stages of their development react differently to monetary policy decisions.

The obtained results of the models, as well as quantitative estimates of investments and monetary policy parameters, allow us to conclude that there is an existing, but insufficient transmission mechanism between the monetary policy decisions and real investments made by emerging markets companies during the period 2010–2017.

### 4 CONCLUSIONS

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We obtained quantitative estimates of the models for testing the research hypotheses. We identified the ambiguous impact of monetary policy decisions on investment made by emerging markets firms; we have established the relationship between monetary conditions and the capitalization of the capital markets of emerging markets. We also obtained valuable results regarding the impact of the investigated determinants on the investments of companies from different macro regions and industries, companies at

different stages of development, with different debt leverage and different age.

Within the framework of this study, complex econometric models have been formed to assess the companies investment activity in emerging markets. Using a sample of data on 3,983 companies from 8 industries across 23 emerging economies, valuable multi-level descriptive statistics were obtained to assess the companies investment activity on the industry, country and macro regional levels.

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# PEOPLE WITH DISABILITIES IN THE LABOUR MARKET: A CASE STUDY

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## KEY WORDS

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disabled people, social exclusion, labour market, employment policy

## JEL CODES

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A13, J08, J15

## 1 INTRODUCTION

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People with disabilities are one of the risk groups in the labor market, which is at the same time endangered by problems in finding a job, integration into the work team or maintaining a permanent job position. In connection with the employment of people with disabilities, a number of myths and prejudices still persist in society. Among the frequent prejudices related to the employment of people with disabilities – which are described mainly by authors Graham Thornicroft; Alecia Santuzzi – belong low work performance, distrust in the ability and level of qualification of these people, as well as distrust

in taking responsibility for the job. These and other prejudices can really affect the employment opportunities of people with disabilities. The diversity of disabilities undoubtedly creates the need for an individual approach, which can cause employers a frequent loss of motivation in the employment of these people. At a time when exist a real shortage of employees in the labour market, it is the group of people with disabilities that represents an adequate workforce that is compatible to represent several job positions.

## 2 MATERIAL AND METHODS

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Based on the sensitivity of the chosen topic, I used qualitative methods of data collection for the research, especially in-depth interviews. As part of a qualitative method of data collection, I used semi-structured interviews with open-ended questions. Since I deal in large part with the issue of certain forms of mental disabilities, it was necessary to

approach this topic through personal interviews. I used the purposeful selection method for the research. I realized total of 21 interviews with total average length of 60 hours. The interviews were recorded as audio recordings and notes. The data analysis was preceded by the classification of key findings into individual categories through coding.

### 3 RESULTS

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Based on the research, specific aspects were identified that cyclically leads to a reduction in the economic activity of people with disabilities in the labour market and the motivation to employ these people. These and other factors lead to high fluctuations in individual job positions, which in turn leads to an increase in wage and personnel costs and further economic loss. The issue of job retention and frequent fluctuations are one of the most striking issues in the labour market of people with disabilities according

to statistical data, which I evaluated in the research and it is also described by foreign author Graham Thornicroft, especially in the field of mental disabilities. One of the most important results is also the occurrence of the model of stigmatization and self-stigmatization, in which the research coincides with the numerous literatures and is discussed by other authors (L. Procházková, D. Opatřilová, A. Santuzzi, G. Thornicroft).

### 4 CONCLUSIONS

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Work as a factor of production is essential to society's socio-economic development but it is also one of the sources of human worth and dignity which offers possibilities for socialisation and inclusion. Creating adequate employment opportunities for people with

disabilities is not only a solution to the social problem but can bring a significant contribution to making the labour market more efficient, as employment of people with disabilities is an important source of work that is often overlooked or underestimated.

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# BOOK VALUE IN BUSINESS VALUATION: P/BV RATIO IN THE CZECH BREWERY INDUSTRY

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## KEY WORDS

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business valuation, book value, DCF, brewing

## JEL CODES

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G12, G32

## 1 INTRODUCTION

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The easiest approach to evaluate an enterprise is indisputably the method of book value based on the historical prices. This outcome matches with the book value of enterprises equity which is directly reported in obligatory published statements – balance sheet, row 02 of liabilities page. However the simplicity of this method is linked with one important question – can the market value of valued enterprise be assessed precisely enough by this method?

According to Fernández (2019) and Mařík et al. (2018), the reported book values differ significantly from the economic reality and they consider this method just to be secondary except certain situations. However, according to Damodaran (2012), the

connection between market- and book value is more complex than most investors realize. This market-book connection is the subject of more studies e. g. Doblas, Lagaras and Enriquez (2020) for financial enterprises in Bahrain, Chai, Chiah and Zhong (2020) focused on the Australian market and Ball et al. (2020) in the USA.

According to those authors, there should be a connection between market and book value, but in most cases, they mutually differ. This paper revises the connection between market- and book value in the background of studies above in the brewery industry of the Czech Republic.

## 2 MATERIAL AND METHODS

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The analyzed sample consists of the fifty most important enterprises (according to the sum of sales) with a turnover of more than 99% of the relevant market. The data include financial reports (P&L, balance sheet, annual report) for the 2015–2019 period.

For the market value assessment, the discounted cash flow method in the entity variant is used. Free cash flow for the 10Y plan is calculated as operating EBIT after-tax adjusted for net investment and changes in working capital, the terminal value

is set by parametrical formula. The discount rate is set at the level of WACC where the market capital structure is determined by iteration of the final market value of equity and debt. The cost of debt reflects market data in the ARAD database, the cost of equity is calculated by the use of the CAPM model modified with country and market cap risk premiums.

The valuation model is assembled for each of the enterprises in the sample.

Calculation of P/BV ratio is based on DCF outputs (as the market value) and a book value of balance sheet equity (as the book value). The final sample of enterprises was then reduced by three entities because of extreme values caused by anomalies in company accounts or the start-up phase.

### 3 RESULTS

The results of regression analysis show that a book value is a significant factor that determined an enterprise's market value in the Czech brewing industry. The centered coefficient of determination shows 47.53% dependency (non-centered 65.59%). The correlation coefficient also shows quite significant dependence between market and book value (69.69%).

The results in basic statistical parameters show the difference between six top enterprises in the industry and the rest of the sample.

### 4 CONCLUSIONS

The results show significant dependency between book and market value for the Czech brewing industry. Almost 50% of market value determination was explained by the book value.

However, the usability of book value in business valuation may be questionable. On one hand, the book access can not assess the market value as

For the analysis of market-book differences, the descriptive statistics for the P/BV ratio are used. The market-book connection is verified by regression analysis.

P/BV ratio median for the sample of 47 enterprises reaches 0.80. For the reduced sample (without top 6) the median P/BV ratio is 0.74. This indicates that market value in the industry is lower than book value by 20%, respectively 26%, in general.

The half of analyzed enterprises match the difference between the P/BV ratio and value 1 (which means equality in market-book) up to 75%, about a quarter of them match the difference up to 50%.

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### 6 ACKNOWLEDGEMENT

Supported by the grant No. PEF\_DP\_2021016 of the PEF Mendelu Internal Grant Agency.

# THE INFLUENCE OF COVID-19 CRISIS ON AR INITIATIVES WITHIN PRODUCTION NETWORKS IN AUTOMOTIVE SECTOR

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## KEY WORDS

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COVID-19, crisis, augmented reality, production network

## JEL CODES

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O21, L16

## 1 INTRODUCTION

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As of 2019, 71% of surveyed people have heard or read about Augmented Reality (AR). [1] “AR is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology.” [2] This technology is mainly used by computer and video games (61%) in 2021. While 59% have used AR for social media, 31% for educational and 25% for construction purpose, just 11% have used AR in working environment. [3]

It has been seen for previous innovations that the gaming industry has pioneered the usage of new technologies. The development of AR usecases strenghtens this tendency. For business purpose the usage of AR applications was relatively low and especially in difficult times, a very tight calculation needs to ensure a quick return on invest and significant savings. The COVID-19 crisis enabled enterprises to predict required potentials and therefore push the implementation of AR technology also for business purpose.

## 2 MATERIAL AND METHODS

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A three step approach of Webster & Watson is used for the identification of the current state of research in the field of “Influence of COVID-19 crises on AR innovations in the automotive sector”. [4] At first relevant key words identified existing literature before appropriate articles are analysed and clustered by groups according to their relevance

and research objective. Ultimately, a summary of generalized statements is created for each group.

Additionally, a calculation based on an automotive suppliers investment for an AR application (Hololens), potential savings and proved outcomes is taken into consideration.

### 3 RESULTS

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The COVID-19 crisis has not influenced the digitalization initiatives themselves. Development of such technologies like AR, has started several years ago and publicity was noted before. But business critical situations, like restrictions on personal meetings within the plant, distance regulations and travel constraints have forced companies to implement and

apply new technologies to ensure smooth business and customer satisfaction. This trend will speed up in the next years. [5]

AR initiatives have not been changed in their entirety by the COVID-19 crisis, but have been accelerated in their adaption and implementation process in business environment.

### 4 CONCLUSIONS

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The valley of revenue based on AR in 2019 [5] can be illustrated by the Gartner Hype Cycle, which “is a graphical depiction of a common pattern that arises with each new technology ...”. It evaluates the technology’s maturity and its future potential in five phases. [6] Since 2005 Gartner’s Hype Cycle has considered ARs journey through its first three phases. In 2019 it was removed from the Hype Cycle as it has matured and therefore is no longer considered as emerging technology. [7] This maturity was mainly driven by upper mentioned application scenarios like gaming, social media and travelling. Hereafter the adaption of AR application for business purposes was mainly pushed by crisis-related measures.

This status has persisted through the COVID-19 crisis and has continuous influence on revenues of Augmented Reality, both in hardware and content. [5] Microsoft for example has enhanced the development of new features and functions for bussiness such as Spectator View, which allows users to synchronize information from a Hololens in regards to position and characteristics of AR-objects with a camera. Therefore it creates the AR scenario from the viewers perspective and provides a significant advantage for enterprises in their business environment. [8]

The trend of increased AR usage has been demonstrably pushed through the COVID-19 crisis, which has lasting influence on production network planning.

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# THE IMPACT OF THE COMPANYS' DIGITAL MATURITY LEVEL ON THE CUSTOMER ACQUISITION PROCESS

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## KEY WORDS

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digitalisation, digital maturity level, maturity model, customer acquisition

## JEL CODES

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M31

## 1 INTRODUCTION

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The internet has fundamentally changed the business landscape by creating a whole range of digital marketing tactics. However, not every company starts from the same initial position and possesses neither similar resources nor identical skills [1a]. There are companies which are described as the “born digitals”. These companies are already partially, predominantly or completely digitalised from the start. Most of them are from the Net Economy that achieve their value creation digitally. Companies that are not part of the Net Economy must also digitalise their business model [2] to stay competitive. According to the study of [3], for the group of analysers sales leads and customer acquisition were identified as very high priority by over 50% within their digital marketing tactics. If all responses from the “very high priority” category are considered,

the result is as high as 95%. This once again underscores the importance of the topic and thus also why solutions must be researched here in order to support management. Further studies demonstrate that the importance of the digitalisation is visible, however a holistic approach is still very rare [4a]. If digital marketing has an influence on the customer acquisition process is not fully proven. In order to find out, if digital marketing plays a significant role, the digital maturity level is an essential indicator [5a]. With the help of a digital maturity model (DMM) it can be clarified in which phase or in which starting position the company is classified [1b]. It is a method for managers to gain an understanding of the status quo and, on this basis, to determine the necessary steps in the company [5b].

## 2 MATERIAL AND METHODS

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[5c] have even defined nine dimensions within their model, which will be applied here: Customer experience, product innovation, strategy, organisation, process digitalisation, cooperation, information technology, culture and expertise as well as transformation

management. Each dimension of the model contains about three maturity criterias. To measure these criterias, there will be approx. two or three questions in the online survey (quantitative research). For evaluating concrete characteristics are defined in

advance. The participants estimate how strongly the described characteristics apply to their company. As the focus primarily lies on theory building rather than on pure testing of existing theory it is also suitable using qualitative research approaches [6]. In this context, interviews in particular enable researchers to collect meaningful and comprehensive data sets and thus represent one of the most commonly used types

of data collection in qualitative research [7]. The second step is therefore to evaluate which company has a high degree of digitalisation and interview corresponding experts (within these firms) in the field of sales and marketing in order to find out whether they acquire their new customers via digital channels and how successful they already are in doing so.

### 3 RESULTS

If all data are available there will be a structure-testing procedures to define if there is a correlation between digital maturity level and customer acquisitions process. The regression analysis is hereby an extraordinarily versatile and flexible analytical procedure that is of great importance both for describing and explaining correlations as well as for forecasting. It is therefore certainly the most impor-

tant and most frequently used multivariate analysis procedure. In particular it is used in cases where effective relationships exist between a dependent variable and one or more independent variables. With the help of regression analysis, such relationships can be quantified and thus be described with a high degree of accuracy [8].

### 4 CONCLUSIONS

The use of digital marketing for customer acquisition has grown tremendously within the last years. However, a holistic approach is still very rare [4b]. If digital marketing has an impact and influence on the customer acquisition process it is very important for companies to structure their digital transformation

accordingly. The study on the mentioned correlation forms the base for identifying success factors which support marketers and management within their digital transformation process and to stay competitive in future.

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# THE LABOR MARKETS OF THE V4 COUNTRIES MAY BE THREATENED BY TECHNOLOGICAL PROGRESS

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## KEY WORDS

labour market, technological progress, V4, retraining

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## JEL CODES

F66, J08, J21

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## 1 INTRODUCTION

In the 19th century, the work of English textile workers was threatened by the invention of automatic looms. The workers then revolted and destroyed machines and creatures until they were stopped by the British government (Brynjolfsson, McAfee 2015). Are workers in riot for automation, robotics and digitization? In the study of traditional schools of economics, conjectures can be noted that relate to the impact on employees due to the introduction of new technologies in the workplace. For example, Keynes (1963) saw technology as an opportunity to raise living standards, for example in the form of reduced working hours. However, Ricardo (1934) talked about the fact that replacing human labor with new technologies causes great harm to workers.

If new technologies are on the rise, they can change the structure of the labor market. Mařík (2016) mentions that technological progress causes the dismissal of mainly low-skilled workers. These workers are replaced by autonomous machines.

New technologies are constantly being introduced in the workplace and are changing the face of the economy and society as a whole. If the V4 states want to be among the states with innovative economies, they must not allow them to miss the train in this area. So far, however, it seems that the governments of the V4 countries do not pay enough attention to technological progress (Euractiv.cz 2018).

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## 2 MATERIAL AND METHODS

Technological progress can cause relocations of employees between occupations and can also force employees to retrain, as some jobs may be lost. In this respect, it is not just workers' fields. For example, Carr (2015) describes that jobs in finance or healthcare can also be lost.

The aim of the author is to propose a methodology for the empirical part of the work, which will lead to the identification of the impacts of technological progress on the labor market. It will be necessary to identify suitable data sources and variables.

These data sources and variables will be identified using descriptive data analysis. With the help of

this analysis it is possible to obtain and analyze the quantitative properties of the researched problem (Mann 1995). These should be data sources and variables, eg from the following thematic areas: Wage differences between individual labor sectors, decrease and increase of employees in the given labor sectors, level of education in the given labor sectors, etc. After

identifying specific data sources and variables and summarizing theoretical knowledge and results from previous research in the same field, it will be possible to identify a suitable method for research that would focus on the impact of technological progress in labor markets in the V4 countries.

### 3 RESULTS

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The found method together with given data sources and variables can be used for research that would deal with how technological changes affect labor markets in V4 countries. This research would thus find answers to the specific fields in which employers should most support their employees for training or in which fields the need for retraining can be expected to progress. This finding can then motivate the respective governments, but also the employers themselves, to support education in specific fields in

order to prevent the unfavorable trend of technological unemployment.

Identifying the effects of technological progress on the labor markets of the V4 countries can show the answer to why it is necessary to support the education of workers. After all, a skilled workforce is an attraction for the arrival of foreign investors in a given state – this has a positive impact on strengthening the state economy.

### 4 CONCLUSIONS

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Understanding changes in labor markets in connection with the introduction of new technologies in the workplace can help to identify negative impacts on these labor markets. For example, the pay gap for workers may increase or employees may lose their

jobs because their qualifications do not allow them to work with new technologies. These changes can also lead to destabilization of society. The work can be a contribution to the discussion on how to prevent these inconveniences.

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# DIGITALISATION IN HEALTH CARE – INFLUENCE OF SPEECH RECOGNITION ON DIAGNOSTIC COSTS

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## KEY WORDS

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digitalisation, speech recognition, health care

## JEL CODES

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O31, O330, I1

## 1 INTRODUCTION

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Digital healthcare solutions are expected to improve the quality and increase the efficiency of health care. Due to the pandemic, there is a growing interest in digital technology-based healthcare process optimizations. As speech recognition-assisted clinical documentation becomes more widespread, implications of speech recognition technology on hospital workflow are being called into question. Automatic processing of the spoken language into digital text can reduce the transcription costs and shorten the work process. The aim of the paper is to examine the impact of speech recognition in the context of digitalization on the clinical documentation process. The descriptive case study focuses on the speech recognition application in the Institute of Radiology at the Pyhrn-Eisenwurzen Hospital Kirchdorf Steyr. The literature research

conducted brought the result that the maturity level of the literature on the topic of speech recognition can be described as intermediate. However, speech recognition in healthcare is a new phenomenon in research. The maturity level of the literature is accordingly between “nascent” and “intermediate”. The empirical part of the study surveys the status of digitisation in the hospital. Subsequently, the clinical documentation process, the use, and the performance of the Recognosco speech recognition technology in terms of accuracy are analysed. As a result, the impact of digitalization in terms of implemented speech recognition on the institutional cost of clinical documentation is derived. The empirical data was collected under the scientific approach of grounded theory using qualitative structured interviews as well as document analysis.

## 2 MATERIAL AND METHODS

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In the first step, a literature review is conducted to gain knowledge about the Austrian healthcare system and the topic of “digitalisation”. In addition, the results of the existing literature on digitisation and speech recognition in healthcare and their influence on performance are compared and summarised (Miebach, 2020; Pfister & Kaufmann,

2017). Both the current state of the literature and existing concepts on the topic are analysed. The focus of the literature review is on articles published in professional journals, reports from public and renowned institutions, as well as monographs and reference books. Recent research contributions from the last five years are in focus, whereby the basic

definitions and concepts are also reviewed in older literature.

In order to answer the research question, the process of report generation using the Recognosco speech recognition system at the Institute of Radiology in Steyr was investigated. The data were collected by means of staff interviews and analysis of the available documentation and data on the use of speech recognition. The process of report generation was examined from the point of view of the different roles involved. In the first step,

the technical data on the Recognosco speech recognition system was collected and interpreted. The performance of the speech recognition system was analysed and compared between clinics of the Upper Austrian Health Holding. Subsequently, the process of report generation was mapped, expert opinions on the possible design of the process were requested and the impact of speech recognition on the process was determined. In the last step, the effects of the application of the speech recognition system on the costs of findings were derived.

### 3 RESULTS

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The results of clinical documentation process modelling confirm that using speech recognition technology can lead to a significant reduction in costs over time. Moreover, even without abandoning the support of medical transcription service in the clinical documentation process, a cost reduction can be achieved. According to results of the study, the mixed option of radiology documentation process, which is carried out both with Recognosco speech recognition and with the help of typists, records a cost advantage of up to 4% compared to traditional transcription. Measuring average transcription time per radiological report five years after the implementation of speech recognition technology showed time saving

of 70% compared to documentation which is not speech recognition assisted. On the contrary, speech recognition-based clinical documentation without involvement of the medical transcription service achieves a cost reduction of up to 34% compared to traditional transcription according to the modelling. The results show that the additional time needed on corrections by dictating medical staff can be compensated through the avoidance of circular communication between physicians and transcriptionists, on the one hand, and by savvy handling of the speech recognition software because of accumulated experience, on the other.

### 4 CONCLUSIONS

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This case study investigated the effects of digitalisation using speech recognition in the preparation of reports at the Institute of Radiology at the Pyhrn-Eisenwurzen Hospital Kirchdorf Steyr. The focus of the analysis was on the processing costs of reporting and their change based on process-cost-oriented calculations.

The overview of the current state of research provided the theory on the importance of the human factor for the success of the digital change of the reporting process using speech recognition

technologies. In addition, the shortening of the reporting turnaround time as well as a possible cost reduction using a speech recognition system were reported. The results of available studies confirm the effects of speech recognition on the reporting process mentioned in the literature. On the other hand, the hypothesis that proofreading and correction of errors on the part of the dictating radiologists cause higher costs than the savings of the typing service could not be proven based on the case study.

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# DIGITAL TWINS ONTOLOGY INTEROPERABILITY OPTIONS

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## KEY WORDS

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Digital twin, model ontology

## JEL CODES

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L8, O3

## 1 INTRODUCTION

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In today's world it is very important for most people to optimize the usage of resources such as electricity and different kinds of energy sources. One of the ways to globally achieve optimization (e.g. optimize the usage of energy in entire city) is implementation of Digital twin, which is a virtual model of physical entity which might be used for simulation.

Before we can simulate anything, it is necessary to create these models. This process is called modelling and is widely used in many branches of science. Creating different models is a lengthy process that

requires a lot of studying of the object that is to be modelled as well as creating the model itself. [1, 2]

From this struggle came the idea of creating a standard model for common entities so they do not have to be created over and over again. These models can be then only adjusted for specific application and used repeatedly. [3]

In this article we want to look into possibilities of standard models creating. If it would be helpful to create new models and what they might be.

## 2 MATERIAL AND METHODS

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First an overview of offered models in existing platforms will be conducted. It is necessary to find available options for different models creation that are offered by main players in Digital twin industry

such as MS Azure, Amazon Web Services, Google Cloud Platform, IBM Cloud or Oracle Cloud.

These platforms will be examined and evaluated from the point of view of standard model offer.

## 3 RESULTS

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From the existing platforms there is only one to the best of our knowledge that currently offers standardized models for digital twin implementation. The platform is called Microsoft Azure and as of now there is only a standardized model of light pole. On the other hand there is premise of creation of other

models as well as encouragement for user to create standardized models by themselves. [4]

On one side it is a shame that there are not many options to be used but on the other it opens a possibility of creation of many different models that could be then widely used.

## 4 CONCLUSIONS

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There is only one developer that consider the option of creating standardized models for digital twin implementation as of now. But this gives a space to contribute to this area and create different kins

of standardized models of entities often represented in smart cities. These entities could be small ones, such as traffic lights or tollgates all the way to whole houses or office buildings.

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# RISK ASSESSMENT 2.0 – DEMAND FOR THE CONSISTENT IMPLEMENTATION OF RISK MANAGEMENT IN THE POLICE FORCE

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## KEY WORDS

risk management, police, police force, decision-making processes

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## JEL CODES

F51, H12, H56

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## 1 INTRODUCTION

This article examines which modern management methods can be adapted in police decision-making processes. In doing so, the article continues the work of the author, in which he previously dealt with the risk assessment of police action. Here, it became apparent that police organisations and their members are under high social, ethical and financial pressure in the face of a population that is reacting more critically across border [1]. In this context, international police missions with German participation are of particular interest. Probably the best-known project of international police co-

operation based on bilateral agreements was the “German Police Project Team” (GPPT). The GPPT was established in 2002 under the name “German Police Project Office” and renamed GPPT in 2008. From then on, German police officers trained Afghan police forces. However, with the withdrawal of the Bundeswehr from Afghanistan, the last remaining German police officers were also withdrawn from Afghanistan. Obscured by the failure of this project, the obvious risks of the German police’s involvement in Myanmar, which went unnoticed by the public, are examined and analysed in more detail.

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## 2 MATERIAL AND METHODS

The situation in Myanmar is marked by violent conflicts between the military and ethnic minorities in the country. In 2010, the new central government announced constitutional reforms. Despite the ongoing fighting between the conflicting parties, German police officers took part in a European Union mission in Myanmar (MYPOL) from 2013 to 2015. In November 2020, Myanmar held elections that were still assessed as free and fair by the European Union (EU) and the USA. However, on 1 February 2021, the

arrest of the head of government, Aung San Suu Kyi, marked a turning point. Since then, there have been repeated reports from the country that the military has taken control in a coup. Politicians from the EU, the USA, China and India disapprove of the violent crackdown on demonstrators and government critics, which they say also involves the Myanmar Police Force (MPF) trained by German police officers. Research in this area aims to clarify the fundamental academic question of the extent to which wrong

decisions by the police could not have been recognised earlier. In doing so, this article draws on guideline-based expert interviews. These are considered a

widely used and differentiated method for obtaining qualitative data [2].

### 3 RESULTS

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The empirical sciences do not lay down a dogmatic procedure for the qualitative content analysis of guideline-based expert interviews. However, the scientific paper must fulfil the requirement of comprehensibility [3]. For this purpose, three different experts were interviewed, who had participated in missions in Myanmar, had been involved in them themselves or had experienced comparable projects. The aim is to provide as broad an overall view as possible of the decision-making process and the risks that already existed in advance. Meaningful text passages in the interview transcripts were extracted with the help of the text analysis software MAXQDA and recorded section by section in table form (synopses). This was followed by a comparative

analysis (evaluation) of the juxtaposed text passages. It can be stated that the experts interviewed welcome international police missions. In their opinion, international police missions should be further promoted and not only focus on a quick achievement of goals. Dangers to life and limb of police officers are always inherent in international police missions in crisis areas. However, it can be stated that the participants are trained in the best possible way to minimise these dangers. International police missions in crisis areas can, however, contribute to damaging the reputation of mandate donors and sending states. This applies in particular to the deployment of international police missions to countries undergoing unstable political system change.

### 4 CONCLUSIONS

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In the context of the investigation, a time-critical moment has to be considered in which a transfer of knowledge took place, despite the lack of democratic and rule-of-law structures. Further dangers arose from the wrongly measured duration of the international police mission. Political system change involves several components that require different time investments. Too little time can jeopardise the success of an international police mission in the long term and contribute to the return of authoritarian structures. Furthermore, the decision on the deployment and continuation of the international police mission was made too readily. A lack of risk management in

particular had a negative impact here. Such risk management, which had been tried and tested in the private sector, was established in the post-war period by large insurance companies and corporations in order to be able to better calculate risks as they arose. Enterprise risk management, which has been further developed in the meantime, secures the existence of a company [4]. It has to be stated that authorities, especially the police, lack such risk management. In this respect, a limitation of the study is indicated at this point. This should encourage further research that builds a bridge from the police decision-making process to risk management.

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# SIGNIFICANCE OF MS EXCEL IN AUDIT PROCEDURES

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## KEY WORDS

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audit sampling, Audit, MS Excel, audit tests

## JEL CODES

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M42, M48

## 1 INTRODUCTION

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Auditing is, in the most general sense, understood as a scientific discipline, which in its realization includes observation and recognition of certain facts, initial collection and subsequent evaluation of relevant data, while conclusions are drawn and subsequently communicated to stakeholders. [1]

The extended abstract focuses on the possibilities of using sample selection in the computer environment of MS Excel. Audit sampling is a necessary procedure for the carrying capacity and efficiency of the verification of modern large-scale accounting data, which must be performed in a computer environment, while small audit entities can perform various audit procedures in MS Excel.

ISA 530 characterizes the selection of samples for audit verification purposes as an application of audit procedures to less than 100% of the items in the population, which is defined in ISA 530 as a group of

all data about which the auditor draws conclusions, while from that group of all data the auditor selects the sample in question. The population must be relevant from the audit point of view, and the aim of the audit sampling is to provide a reasonable basis. Subsequently, from this reasonable basis, the auditor should draw conclusions that are valid for the entire population defined above. An important condition for audit sampling is also the fact that each item in the population must have a chance to be selected for the sample. [2]

The aim of this paper is to identify the benefits and feasibility of using the created methodological tool for the performance of audit procedures and to test this methodological tool demonstrably and thus confirm its functionality and effectiveness for the implementation in the process of audit sampling.

## 2 MATERIAL AND METHODS

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According to Bulková's research [3], the MS Excel program is one of the most used platforms in the computer environment for auditing. This research was carried out through a questionnaire survey and the inclusion of MS Excel among the most used platforms justified the creation and development of effective audit improvements and specialized adjustments in MS Excel, as this program is user-friendly

for auditors. For this reason, it is possible to request it to be necessary to offer improved software solutions for audit procedures in the MS Excel program.

The design of the methodology and subsequent work aimed at creating a methodologically determined mechanism for the realization of audit sampling in MS Excel through the method of stratification, which would be created in MS Excel

on the basis of available program functions and could be used in the realization of audit sampling.

IFAC states that stratification is one of the factors to be considered and documented when the auditor considers the use of audit sampling (both statistical

and non-statistical), literally stipulating: “Consider whether the population can be stratified by dividing it into discrete subpopulations which have identifying characteristic.” [4]

### 3 RESULTS

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The result of own work was the creation of a methodological tool in the MS Excel program, through which it is possible to process the selection of samples by the method of stratification in combination with other selection methods. It is a stratification of the population on the basis of monetary amounts, which is implemented by the created tool, while this procedure simplifies orientation in accounting data, analysis of the population and also helps to methodically divide the number of samples in subsets and subsequently assign the affiliation to individual subsets. This methodological and functional tool is

the basis for the use of several selection methods in the audit testing process, while it is possible to use the benefits resulting from the stratification of the population according to ISA 530 and other relevant literature. This methodological tool was tested on several real audit engagements in a czech audit company, while also passing a large number of tests in the process of verifying its benefits and functionality. The result of testing the methodological tool was the confirmation of its full functionality and effectiveness, while the result was also the continuation of its use in the environment of real audit engagements.

### 4 CONCLUSIONS

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The extended abstract dealt with the possibility of using audit sampling in the form of stratification in MS Excel through a standardized tool that can be used to simplify and streamline processes in the realization of audit verification, while this abstract also emphasized the importance of audit sampling for modern audit. The developed tool is an effective way to facilitate the realization of audit sampling in a computer environment, combining with several types of audit sampling that the auditor specifically chooses through his professional judgment, in the context of the needs and specifics of the audit

procedures, or in general in the context of needs and specifics of the entire audit engagement. The developed audit sampling tool was used and tested in several audit engagements, in which its functionality was demonstrably verified, while also demonstrating its overall contribution to specific audit procedures. The result of this testing was the regular use and development of this methodological tool in other audit engagements, in which it continues to demonstrate its functionality, effectiveness and contribution to professional audit work in a computer environment.

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### 6 ACKNOWLEDGEMENT

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Supported by the Internal Grant Agency Faculty of Business and Economics No. PEF\_TP\_2021001.

# SUMMARIZATION OF DOCUMENTS FOCUSED ON FINANCIAL MARKETS

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## KEY WORDS

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natural language processing, summarization, extractive, abstractive, deep learning

## JEL CODES

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C83, C88

## 1 INTRODUCTION

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It has been more than sixty years since Luhn [1] has used a computer for text summarization. During these years there has been a lot of money and effort put into improving the outputs produced by machines. All has been done to save the most valuable resource on earth – time. Nowadays there are plenty of approaches that can be used to produce summarization. It has been shown that the best results are achieved with domain-specific techniques [2] using deep neural networks. These networks are trained on various datasets. The most popular and

used one is the CNN/Daily News [3] dataset that consists of more than 300 000 news articles. These articles describe politics, sports but also financial events, and many more. Therefore; it is reasonable to presume that the language models trained using CNN/DailyNews dataset are capable of condensing the financial articles. However, to determine the best ones, new research has to be done. To my best knowledge, there has been no research published examining and evaluating existing language models on the task of financial text summarization.

## 2 MATERIAL AND METHODS

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Because of the high number of existing summarization approaches it is unfeasible to work with all of them. Even comparing only language models focused on text summarization of financial articles is undoable. Therefore; an in-depth analysis of the literature had to be done. Based on the literature, seven language models and one statistical approach have been chosen. These approaches were focused both on generating the summary based on picking up the best/most informative sentences (so-called extractive summarization) and also on generating completely new summary word by word (abstractive summarization). To compare the approaches none of

the existing datasets could be used. Even though the neural networks had been trained on datasets consisting of news articles that contains also the financial ones, these datasets could not be used. The metadata provided with these datasets is not sufficient to filter out non-financial articles. Using other texts than financial articles is undesirable thus, a new dataset was produced. This dataset consists of 8000 articles obtained from SeekingAlpha portal. Oracle/Golden summarizations were not included in these articles and were created using the ROUGE-F1 [4] method which was also used in the production of the CNN/Daily News dataset. As a starting point

was chosen an author conclusion which could be found at the end of an article. The final comparison

was also done using ROUGE methods, namely ROUGE-1, ROUGE-2, and ROUGE-L.

### 3 RESULTS

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The best language model was trained by Facebook and is called bart-large-cnn [5]. This model produces extractive summarization. In general, when evaluated using ROUGE, extractive approaches achieve a higher score in comparison to abstractive approaches. Among abstractive models, the Longformer [6] gained the highest score. Another interesting finding was discovered when analyzing results. More information gain can be found in the first sentences of the article. Later sentences that can be found in the

middle or at the end of the article are rarely chosen by summarization models as the key ones. This finding was affirmed by golden/oracle summaries that also contained more sentences that can be seen at the beginning of the article. The last product of this work is the unique dataset of financial article-summarization pairs. This dataset can be further used to evaluate new approaches of financial text summarization. It can also be used for fine-tuning trained summarization language models.

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# NLG FROM STRUCTURED DATA

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## KEY WORDS

NLG, T5, CommonGen, words to sentence

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## JEL CODES

C83, C88

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## 1 INTRODUCTION

Natural language generation (NLG) can be defined as an automatic process of creating sentences, phrases and entire texts in natural language easily understood by humans. A number of requirements are placed on the form of the output, such as meaningfulness, correct form, fluency, simplicity, adaptability. Generating texts from structured data [1], i.e. data-to-text generation, is an important task that is crucial to many downstream NLP and real-world applications. In this type of generation, the

input is a graph, table, chart, dialogue history or differently structured meaning representation. The textual output can be weather report [2], news [3], dialogue response [4], document summarization etc. To address this problem, many researchers have recently developed sophisticated neural models, that have outperformed traditional approaches based on linguistic rules, grammars and templates and achieved state-of-the-art on many datasets.

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## 2 MATERIAL AND METHODS

Language models pre-trained on large-scale open-domain corpora have gained a huge research interest throughout the NLP community. These generation models serve as a knowledge base for general language representation and improve the performance of models on downstream tasks [5]. However, their self-supervised objectives i.e. language modelling or text denoising were initially intended to accept only text input, leaving them unable to encode structured data easily. To generate natural surface forms conditioned on injection of structured data it is necessary to add an extra layer on top of the pre-pretrained model.

Before the actual implementation, a suitable pre-trained model and NLG dataset need to be selected. Their overview and more detailed analyses are omitted in this abstract.

[6] presented a unified framework called T5 (Text-To-Text Transfer Transformer) that generalizes (or

converts) all textual language problems into a text-to-text format, so both, the input and output, are text strings. T5 model is pre-trained with randomly corrupted pieces of text (with different spans) and with different numbers of masking tokens and model learns to unmask them during training. To pre-train this model, the authors introduced a huge corpus C4 (750 GB, 1 trillion tokens). Thanks to its versatility, the T5 model is suitable for solving several NLP tasks at the same time (i.e. translation, QA, classification, summarization) and model has achieved great results in many metrics or datasets [7].

The CommonGen dataset [8] focuses on common-sense generation or reasoning, task of generating a plausible sentence describing an everyday scenario using the provided terms (concepts). This task is challenging because the system itself must organize the provided concepts into the most likely scenario,

follow common sense (avoid illogical associations), ensure grammatical correctness of generated sentence, mention all the concepts and not to hallucinate. To accomplish such a task, the model should understand the correlation between the given

concepts and complete the necessary words to form a fluent sentence. Since there may be different ways of interpreting the correlation between the input terms, the corresponding output sentence is not unique in terms of meaning and formulation.

### 3 RESULTS

The HuggingFace transformer library and Google Colab were used to fine-tune the whole model on TPU units. In 2 evaluation metrics (ROUGE-2, ROUGE-L) the results are slightly improved compared to the original paper [8] for the same model.

However, the model does not achieve results that are close to SoTA on CommonGen dataset mainly because a significantly smaller T5base model was used. The following table contains some examples.

Concepts	Generated sentence
friday, karaoke, girl, cry	A girl is crying while playing karaoke on friday
kitchen, cut, knife, watermelon	A man is cutting a watermelon with a knife in a kitchen
throw, phone, window, anger, kid	A kid is throwing a phone, a window, and man is angry

### 4 CONCLUSIONS

This experimental prototype will be further improved. For future work, I would like to explore 2 steps fine-tuning, which before the final fine-tuning

on the labelled dataset, is first fine-tuned on massive related noisy data.

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# SOVEREIGNTY IN THE DIGITAL AGE – HOW CAN WE MEASURE DIGITAL SOVEREIGNTY AND SUPPORT THE EU’S ACTION PLAN?

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## KEY WORDS

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digital sovereignty, technology, EU

## JEL CODES

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N4, N7, O33, O38

## 1 INTRODUCTION

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The EU addresses the need of action to increase Digital Sovereignty. This is necessary because the IT software- and hardware-systems used are predominantly sourced from non-European countries and dependence is increasing. The relevance of the EU’s IT industry is largely negligible, whereas it is becoming increasingly important for keeping a state’s ability to act and thus state sovereignty.

There are calls for an “action plan for greater digital sovereignty” to identify critical technologies, manage dependencies on suppliers and rigorously monitor progress in the EU. However, there is currently neither a common understanding of what is meant by Digital Sovereignty, nor is there a measurement that can be used to quantify the digital sovereignty of a state.

## 2 MATERIAL AND METHODS

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To define Digital Sovereignty, the individual terms are analysed and described. This is first done through a literature research. In this, both terms are examined through a historical description of their emergence up to the status quo (Zimmer 2008) (Abbate 2017) (DeNardis et al. 2020). The convergence of both terms on Digital Sovereignty is analysed deductively and structured using term derivatives. In doing so, important aspects are separated from unimportant ones, which finally leads to a new definition of Digital Sovereignty for this work through synthesis.

Metrics describing digitisation and sovereignty of states are collected as a basis for a quantitative analysis to be conducted (Kaufmann und Kraay 2020) (Arndt 2008). These are secondary data, such as Worldbank data catalog or OECD databases.

Functional correlations are determined on the basis of the key figures through a quantitative analysis using induction (OECD 2020). Here, the focus is mainly on regression methods. From the findings of the analysis, a model is developed that enables the formation of a Digital Sovereignty index for states from essential, abstracted key figures.

### 3 RESULTS

A state is digitally sovereign precisely when (1) its sovereignty is preserved in the sense of a foucauldian approach of “good governance” based on Europe’s democratic and liberal values, i.e. administrative and governmental work must be carried out sovereignly, (2) technological digitisation by means of key enabling technologies is defined for the respective state, revised if necessary and generally accepted, and (3) under the aspect of strong data sovereignty, technology sovereignty is also established, so that the technologies used by state organisations are understood and can be controlled or replaced at any time if necessary.

A digital sovereignty index  $DSI_n$  is formed by multiplying the Barnett Sovereignty Index  $\theta_n$  by the  $\gamma_i$  weighted summands of parameters  $x_{ni}$ ,  $i \in 1, \dots, m$  of a state  $n$ , describing the sovereign and digital characteristics of a state. Digital Sovereignty

is evaluated in the first step with a focus on three parameters, namely EGDI (United Nations 2020) (Anderton et al 2020), WDC digital competitiveness (IMD business school 2021) und Barnett Sovereignty Index  $\theta_n$  (Barnett 2017). So the model is weighted with  $\gamma_i = 1$  for EGDI and WDC. All other input parameters are ignored in the analysis with  $\gamma_i = 0$ .

It is striking that certain autocratic states have a high level of digitisation despite a lower sovereignty index: China, Russia, Ukraine, Kazakhstan and Thailand. In contrast, certain states with a high sovereignty index do not manage to migrate to the “linear” level of digitisation and lag behind: Japan, Germany, Ireland, Croatia, Cyprus, Slovakia, Luxembourg or New Zealand.

The top 3 countries of the DSI formed in this way are Denmark, Sweden and Finland, the low 3 are Jordan, Korea and Venezuela.

### 4 CONCLUSIONS

From the historical development of the concepts of sovereignty and digitisation, a clearly definition can be derived and thus defined as a new basis for the EU’s path towards strengthening Digital Sovereignty in Europe. Based on the concept, a DSI can be

developed that enables a quantitative classification of states and from which economic policy and political recommendations for strengthening digital sovereignty can be formulated in further analyses.

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# E-LEADERSHIP COMPETENCIES BETWEEN COHESION AND LOCOMOTION

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## KEY WORDS

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e-leadership, competencies, locomotion, cohesion

## JEL CODES

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M10, M12, M21

## 1 INTRODUCTION

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The framework for leadership has basically changed in recent times. The new theories and models of leadership focus not only the leader him- or herself but also the followers, working conditions and the company culture. In this context approaches like Super Leadership, Agile Leadership, Shared leadership, Digital leadership and above all “E-Leadership” [1] have raised. The term E-Leadership is mainly defined as “a social influence process mediated by artificial intelligent technologies to produce a change in attitudes, feelings, thinking, behavior, and/or performance with individuals, groups, and/or organizations“ [1]. Different researchers have created a new context of leadership which demand more skills and competencies than traditional leadership approaches with a main focus on the use of technologies. Furthermore there is no unambiguity

whether E-Leadership should be interpreted from the organizational or from the individual point of view. This discussion is based on the conflict between locomotion and cohesion. Locomotion defines the redistribution of information which is today one of the most important key factors for companies success and which represents the organizational point of view expressed by leadership theories like digital leadership, remote leadership or virtual leadership [2]. Cohesion on the other side forms a new understanding of communication, collaboration and group dynamics which can be characterized by terms like shared leadership, mentoring leadership or super leadership. In this context the question arises which relevant competencies are mainly related with the term E-Leadership and how they can be assigned into the two fields of locomotion and cohesion.

## 2 MATERIAL AND METHODS

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Based on the literature review and the two extracted E-Leadership pillars a quantitative survey was used conducted between April and June 2021 amongst about 471 persons. The survey didn't focus specific groups or characters and was redistributed via online networks like Facebook, Xing, LinkedIn and university channels. The questionnaire was separated into five groups:

- General knowledge of E-Leadership as a term and differentiation from other terms (finally a precise definition was given as a base for the ongoing questions).
- Leadership experience (to identify the perspective ‘leader’ or ‘follower’)
- Rating scale of competencies in the context of leadership in general

- Rating scale of competencies in the context of E-Leadership as the specific part
- Allocation of different competencies in the fields of cohesion and locomotion.

The selection of competencies was based on the analysis of van Waart [3] who has identified six areas of E-Leadership competencies based on the traditional leadership theories. He

defines E-Communication, E-Trustworthiness, E-Social-Abilities, E-Teambuilding, E-Technology-Competences and E-Change-Management and spread each group in individual items of competencies. The questions relating to the competence assessments were carried out using a five-point Likert scale. In the area of E-Leadership the participants were also asked to fill in open space questions concerning potential new or other formulated competencies.

### 3 RESULTS

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According to the results of the survey, the term e-leader is neither particularly pronounced nor uniform. A differentiation between digital leader and e-leader could often not be formulated in one's own words, nor with regard to the terms virtual and remote leader. With regard to the delimitation of the competencies between a general leader and an e-leader in particular, a shift to the right of the answers could be identified. If the respondents judge the competence of information distribution within the framework of a normal management relationship, e.g. as relevant (61% of all respondents), the answer 'very relevant' could be determined as particularly frequent with a rate of 82% of all respondents in the context

of an e-leadership. This also applies to aspects of technology competence with a similar difference. Communicative competencies are seen very equal but the ability to share and distribute information is seen as particular higher relevant for an E-Leader. In general there was a wide spread concerning the two pillars cohesion and locomotion which shows that a lot of survey participants are not really aware of the difference. To summarize the filtered and analyzed competencies by codes in MAXQDA the cohesion part includes the three competencies conflict-, social- and self-competence and the locomotion part technology/media competence, change and decision competence and communication competence.

### 4 CONCLUSIONS

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The definition and the specification of the term E-Leadership as well as its resulting competencies seem to be unsure and not precisely researched until now. Both in the literature and in practice, there are uncertainties with regard to its design. The survey could be suitable for identifying the relevant

competencies of an e-leader and assigning them to the two pillars, cohesion and locomotion. However, further research needs to be done concerning more precise differentiations which should be made not only in terms of research literature but also in relation to practice.

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# THE VALUE OF SUSTAINABILITY REPORTING FOR SOVEREIGN WEALTH FUNDS – AN ANALYSIS OF THE DISCLOSURE BEHAVIOUR FOR ENVIRONMENTAL, SOCIAL & GOVERNANCE ASPECTS AND SUSTAINABLE DEVELOPMENT GOALS

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## KEY WORDS

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ESG, SDG, sovereign wealth funds, sustainability reporting

## JEL CODES

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M14, Q56

## 1 INTRODUCTION

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Sovereign Wealth Funds (SWFs) are the world's fourth biggest investor group in terms of assets under management with total assets of more than USD 9 trillion. With that, SWFs do have massive investor influence on capital markets. Many market participants see SWFs with their long-term investment horizon well-positioned to promote long-term value creation in Environmental, Social & Governance (ESG) and Sustainable Development Goals (SDG)

investments and sustainable market outcomes. In this context, one of the relevant research questions is to what degree SWFs do care about ESG and SDG reporting and sustainable disclosure. The objective of this work is to give an overview of the current disclosure behaviour in relation to the specific type of SWF and on a regional bias considering the macro-economic environment.

## 2 MATERIAL AND METHODS

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This study is based on the evaluation of 98 SWFs which stand for 99% of global total assets of SWFs. As this research shall give an answer with regard to transparency on ESG and SDG reporting, an in-depth analysis on SWFs's homepages plus additional internet research and literature review has been done. The survey is based on non-financial statements,

published by SWFs in relation to ESG and SDG. Quantitative count is "0" for no publication and "1" at least for one SWF source of official ESG reporting and SDG publication respectively. Furthermore, the survey also pays attention to the qualitative reporting. Deadline was June 2, 2021.

### 3 RESULTS

#### Total ESG and SDG reporting observations by type of SWF (n=98)

Type of SWF	n	ESG reporting		no ESG reporting		SDG reporting		no SDG reporting	
		%	#	%	#	%	#	%	#
Savings Fund	13	73%	10	23%	3	31%	4	69%	9
Pension Reserve Fund	7	71%	5	29%	2	43%	3	57%	4
Development Fund	18	61%	11	39%	7	39%	7	61%	11
Stabilization Fund	13	38%	5	62%	8	23%	3	77%	10
Reserve Investment Fund	12	33%	4	67%	8	25%	3	75%	9
Other	35	40%	14	60%	21	23%	8	77%	27
<b>Total</b>	<b>98</b>	<b>50%</b>	<b>49</b>	<b>50%</b>	<b>49</b>	<b>29%</b>	<b>28</b>	<b>71%</b>	<b>70</b>

#### TOP 30 SWFs (by Assets) ESG and SDG reporting observations by type of SWFs (n=30)

Type of SWF	n	ESG reporting		no ESG reporting		SDG reporting		no SDG reporting	
		%	#	%	#	%	#	%	#
Savings Fund	6	100%	6	0%	0	50%	3	50%	3
Development Fund	3	100%	3	0%	0	67%	2	33%	1
Pension Reserve Fund	5	60%	3	40%	2	40%	2	60%	3
Reserve Investment Fund	6	50%	3	50%	3	50%	3	50%	3
Stabilization Fund	2	0%	0	100%	2	0%	0	100%	2
Other	8	63%	5	37%	3	37%	3	63%	5
<b>Total</b>	<b>30</b>	<b>67%</b>	<b>20</b>	<b>33%</b>	<b>10</b>	<b>43%</b>	<b>13</b>	<b>57%</b>	<b>17</b>

### 4 CONCLUSIONS

The evaluation shows that SWFs are more likely to have an SDG report if they have an ESG report. Top 30 SWFs are more likely to have either an ESG reporting, SDG reporting or both compared to the full population of 98 SWFs. The higher the total amount of assets, the higher is the probability of reporting. However, there are clear indicators and reasons why SWFs show interest in transparency on ESG and SDG matters. First, the type of SWF defines its overall goal of doing business. Stabilization funds support macroeconomic stability through fiscal impact and are management driven by commodity – oil and gas in particular (e.g., SWF from Mexico, Algeria and Russia). Reserve investment funds invest excess reserves including risk management for foreign exchange (e.g., SWFs from Saudi Arabia, China and Hong Kong). Both types have the lowest rates

on ESG and SDG reporting. For most of them these kind of transparency does not seem to be important enough as of now. Some of them do not even have a website (e.g., Kazakhstan). Ahead of the curve are those savings funds, pension reserve fund and development funds like SWFs from Norway, Alberta, Korea and Turkey with a separate and details ESG reporting. Also their websites show public information. There is a positive correlation between especially ESG disclosure and a SWFs participation in the One Planet Sovereign Wealth Fund Working Group and their participation in the International Forum of SWF International Forum of SWF (IFSOF) supporting the Santiago Principles 2009. However, the lack of ESG and SDG reporting does not necessarily stand for a SWF's lack of ESG and/or SDG involvement.

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# DETERMINATION OF FACTORS AFFECTING WAGE DIFFERENTIATION IN THE EU COUNTRIES

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## KEY WORDS

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wage differentiation, EU countries, regression analysis, cluster analysis

## JEL CODES

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C10, C21, C38

## 1 INTRODUCTION

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Wage differentiation is a popular topic for researchers for many decades and there is still a lot of space for new findings. The wage gap in general seems to be bigger at the higher end of earnings, where it has been also increasing. The difference between people earning less is on the other hand narrowing [1]. There are two main categories: cross-country wage differentiation and the wage differences within a country or region. This paper will focus on the wage differentiation across countries.

Most of the research papers have employed regression models in their analyses, with individual employee, job, and enterprise characteristics as regressors [1, 2]. For example, in [1] authors used following independent variables: gender, age, occupation

classification, region, sector, full- versus part-time status, permanent or temporary status, job tenure, and organization size. According to Mincer [3], wages are dependent on “net investment to self” (for example on years of education, attending specialised courses and on years of potential experience). Other research [4] on this topic suggests that the difference in wage levels is mostly caused by a lower return on skills in some economic sectors in low-wage countries. Analyses working with country-level data are not commonly available.

The aim of this paper is to determine factors affecting wage differentiation across the countries of the European Union.

## 2 MATERIAL AND METHODS

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The data used for the purpose of this analysis were gathered from Eurostat and ILOSTAT databases. All indicators reflect the situation in the EU countries in 2020 or 2019 (depending on availability). As this analysis deals with determining the factors affecting wage differential across the EU countries, the dependent variable used was average wage – represented by annual net earnings of a single person without children earning 100% of the average earning. The potential determinants, based on the previous analyses and economic theories, were gen-

der employment gap calculated from the difference between the employment rates of males and females in the age group 20–64, gross fixed capital formation as a percentage of GDP as well as absolute number calculated with the use of GDP per capita, income inequality measured by Gini coefficient, ratio of part-time workers as a percentage of the total employment (age group 15–64), productivity represented by output per worker calculated from GDP in PPS, percentage of employed persons with obtained tertiary education out of all employed persons in age

group 20–64, average number of usual weekly hours of work of employed persons, tax rate as the income tax on gross wages, unemployment rate as a percentage of unemployed persons of population in the labour force in the age group 15–74, digital economy and society index (DESI) and its two components separately – connectivity and human capital.

Firstly, the cluster analysis (both hierarchical and non-hierarchical) was applied to the above-

mentioned data (including GDP per capita and excluding individual DESI components) with the aim of dividing the EU countries into homogenous groups. Then, with the usage of the dummy variables defining the clusters, regression analysis was performed (using cross-sectional data). Computational system MATLAB R2021a was used for the data manipulation and cluster analysis, and Gretl 2021b software for the regression and assumptions checking.

### 3 RESULTS

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Hierarchical cluster analysis using the three methods for computing the distance between clusters – average, farthest, and inner squared (Ward) – resulted in various group formations. Shortest distance did not provide any valuable result. Considering the average distance, the countries were divided into three main clusters – Northwest, South, and East + Portugal. The non-hierarchical cluster analysis suggested to separate Luxembourg and Ireland from all other countries, and the remaining 25 countries were divided into Northwest and Southeast groups.

Using regression analysis, the division of the countries into three clusters proved to be useful. The dummy variables (dividing the countries into clusters) alone explained slightly more than 80% of the variance in the net income what indicates a geographical imbalance in the formation of average wages. Based on other models, productivity, ratio of part-time workers, gross fixed capital formation, DESI and some other of the potential regressors showed to be significant (in various variants).

### 4 CONCLUSIONS

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The aim of this paper was to find determinants of wage differentiation. Many of the suggested regressors were proven to be significant and models with high determination reaching 36–95% were con-

structed. Additionally, forming the three clusters of countries was useful as the division itself explained high percentage of the variance in the dependent variable.

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### 6 ACKNOWLEDGEMENT

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Supported by the grant PEF\_TP\_2021007 of the Internal Grant Agency of FBE MENDELU.

# MINIMUM WAGE AS DETERMINANT OF PRODUCTIVITY IN EU COUNTRIES

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## KEY WORDS

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cluster analysis, minimum wage, productivity, regression analysis

## JEL CODES

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C10, J30

## 1 INTRODUCTION

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Historically, the national minimum wage (NMW) was introduced mainly for social reasons, such as tool to reduce gender inequality [1]. Actually, NMW affects many economic sectors, so possible impacts and causal relations of NMW are studied to understand underlying mechanisms. Examining the implications of the NMW is complicated by the fact that in some countries the minimum wage is introduced only in certain sectors or at sector-specific levels, while in other countries a single minimum wage level is introduced for all sectors. In all cases, one of the most important influenced variables is productivity, which is also a center of focus in this analysis.

More definitions and ways to establish productivity exist and this fact can be seen as a evidence of how complicated productivity tasks can be. Detailed

discussion about defining productivity is brought by Metcalf [2]. As NMW affects workers, we will deal with productivity of labour, although this indicator will certainly be affected by capital equipment. There is only a limited number of authors analysing impacts of NMW on productivity or other factors, for instance, in the UK Forth and O'Mahony analysed impacts of NWM to productivity [3] and in the USA Card and Krueger [4] studied impacts on employment caused by changes in NMW. Basically all currently published studies focus only on limited sectoral datasets in one or several countries leading to a reseach gap in several directions.

This study aims to empirically verify the possible relation of NMW and productivity in European Union countries.

## 2 MATERIAL AND METHODS

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In order to analyse multiple EU countries, needed data were sourced from the database of European Statistical Office (Eurostat) and from the database EU KLEMS, which is hosted by the Vienna Institute for International Economic Studies.

Productivity was computed by the following manner: value added was divided by the total hours worked by persons engaged. Minimum wage and

other indicators such as unemployment, tertiary level education rate, gross fixed capital and gross domestic product per capita in current prices were taken into account to differentiate the countries.

There are several states without any national minimum wage (Austria, Denmark, Finland, Italy, Sweden). In this case the default value of NMW is set as zero. There is also a special case of Cyprus,

where the minimum wage is set by government for some specific occupations. Even in this case the NMW is considered as zero. For the countries, where NMW was set as zero, dummy variable indicator was established with the purpose to catch effect of these countries in regression analysis.

The first step of analysis is to separate the dataset into different groups of similar countries by cluster analysis. After obtaining the clusters, regression analysis was performed. Taking advantage of knowledge on clustering, appropriate dummy

variables identifying particular clusters was included. Regression analysis was performed for cross-sectional data (year 2017 – the newest available data) and panel data covering a period of 8 years (2010–2017). Within panel regression, the fact that Germany implemented NMW in 2015 was also taken into account. Calculations were provided in computational system MATLAB R2021a (cluster analysis, data manipulation) and statistical software Gretl 2021b (regression analysis, regression assumptions checking).

### 3 RESULTS

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The cluster analysis was resulting in sorting out the countries into two clusters. The first cluster was consisted of the most developed EU countries. Dummy variable indicating countries from this group was taken into account when computing regression analysis. The outcome of regression was a statistically

significant positive link between NMW and productivity in both cross-sectional data and panel data. The latter gave slightly better results as it is not as prone to outliers as in the option with cross-sectional data used.

### 4 CONCLUSIONS

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The current levels of NMW positively affect productivity in terms of economy as whole. Even though there are countries without NMW, some have very high productivity while some of them not, it is clear that NMW is not the only factor increasing

productivity. We can also assume that an excessively high minimum wage will cease to be a factor in raising productivity throughout the economy, as it will affect wage growth in all sectors and rising wage costs will cause investment in capital equipment to fall.

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### 6 ACKNOWLEDGEMENT

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Supported by the grant PEF\_TP\_2021007 of the Internal Grant Agency of FBE MENDELU.

# THE DIFFERENT POPULARITY OF E-MOBILITY IN EUROPE

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## KEY WORDS

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battery electric vehicle, Europe, cluster analysis, significant factors

## JEL CODES

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C38, O52, R41

## 1 INTRODUCTION

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Although the first successful electric car made its debut earlier than a car equipped with an internal combustion engine, their popularity has grown only over the last decade. Currently the popularity of electric cars is growing significantly, supported by interest from most developed countries. Today, almost every country in Europe envisages some sort of plan to reduce the operation of conventional vehicles. According to [1], this effort is motivated mainly by the growth in air pollution and by environmental needs in general. The proliferation of electric cars

could also help to reduce energy consumption in transport and improve the quality of life of the population in large cities.

Europe (and some countries especially) is heavily dependent on the car industry. Companies such as car manufacturers and factories producing accessories and components for internal combustion engines are among the largest businesses and employers in Europe. The main aim of this article is to classify (divide) European countries according to their level of popularity in electromobility.

## 2 MATERIAL AND METHODS

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Cluster analysis (euclidean distance as a pairwise distance and Ward distance as a distance between clusters) is used for the purpose of dividing countries into groups. Using this method, groups of countries with similar characteristics will be created [2]. This analysis will be based on cross-sectional data (more precisely data from 2020) for individual European countries. A total of seven variables were selected:

battery electric vehicle sales per capita, number of charging stations per capita, sales of internal combustion engine vehicles per capita, CO<sub>2</sub> value per capita, average annual income, GDP per capita and happiness index. A total of 31 countries was included in the cluster analysis, based on the availability of data.

## 3 RESULTS

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Based on the cluster analysis, we identified five groups of countries, see Fig. 1. The first cluster (blue) of countries are less developed countries, especially in eastern Europe. These countries combine similar

level of macroeconomic indicators and sales of both internal combustion and electric cars; and the existing infrastructure of charging stations is at a similar level. The second cluster (red) consists of groups of

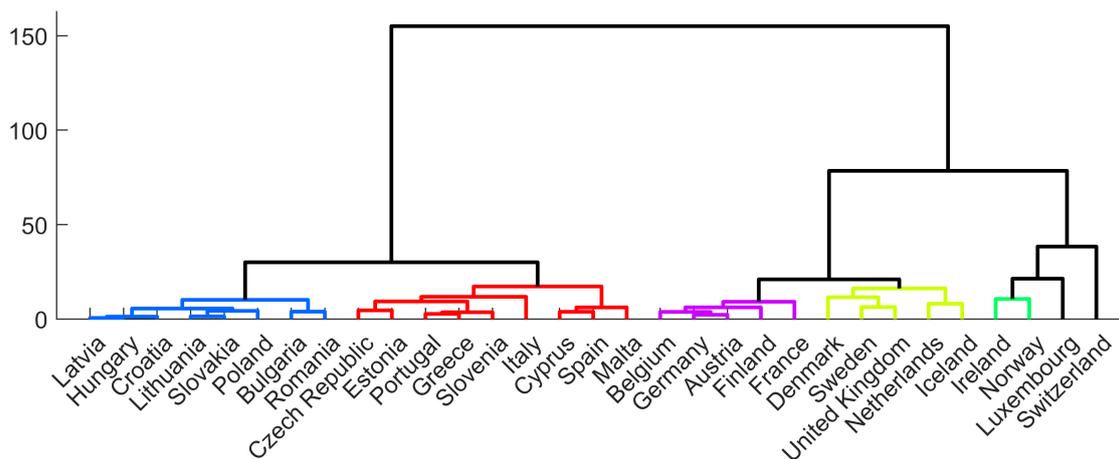


Fig. 1: Dendrogram

countries with a higher economic level than the first cluster. The average GDP per capita in these countries is € 19.640. These countries also have similarly developed charging station infrastructure, share of electric vehicles and level of air pollution. The third cluster (purple) of countries consists mainly of western European countries. These countries have already attained high economic levels and electromobility is already more established here. The share of electric vehicles within newly registered cars already exceeds 3% in all these countries and in some cases as much as 6%. The fourth cluster (yellow) consists of northern

and western Europe. The countries are again typified by high economic maturity, which reflects an average GDP per capita of € 40.676. In these countries, electromobility is already at a high level and the share of newly registered electric cars in the total number of vehicles ranges from 7% to 26%. The last group are the most economically developed countries in dataset (i.e. green cluster merged with Luxembourg and Switzerland), where the average value of GDP per capita exceeds € 65.000. Surprisingly, this cluster records the highest values of air pollution of all clusters.

## 4 CONCLUSIONS

The popularity differences are influenced by several factors, not all of which can be quantified or expressed in any way appropriate for econometric processing. These factors include the attitudes, opinions and personal preferences of each individual consumer when making purchasing decisions and

choosing between an electric vehicle and a conventional vehicle. On the other hand, like any other market, the electric vehicle market is to a large extent influenced by the economic level of a given country, i.e., by its population and by the macroeconomic indicators that reflect this level.

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## 6 ACKNOWLEDGEMENT

Supported by the grant No. PEF/TP/2021002 of the Grant Agency IGA PEF MENDELU.

# HOTEL GUESTS' PERCEPTIONS AND ATTITUDES IN COVID-19 PANDEMIC: CASE STUDY OF THE CZECH REPUBLIC

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## KEY WORDS

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tourism, hospitality, services, COVID-19

## JEL CODES

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Z31, M30, L83

## 1 INTRODUCTION

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At the beginning of March 2020, the situation in the tourism market and related industries changed due to the spread of the coronavirus. Tourism and the tourism associated services were suspended, and every operation and development thus stagnated. The hotel industry is generally vulnerable to these threats and is still affected by unexpected COVID-19 pandemic [1, 2]. Hence, the world has witnessed

changes in consumer behavior during the pandemic. Nevertheless, every change in consumer demand presents an opportunity for various industries. Especially, in the tourism industry and incorporated hospitality and hotel services [3]. Therefore, an increasing number of studies have focused on guests' attitudes during and after the pandemic [1, 3].

## 2 MATERIAL AND METHODS

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The aim of this paper is the evaluation of hotel guests' perceptions and their attitudes with regard to the COVID-19 pandemic, in the context of the Czech Republic. Primary data were collected during March 2021 among domestic tourists that stayed in the Czech hotel at least once in the last year (from March 2020 to March 2021). Furthermore, the quota sampling based on gender, age, and

respondent's residence, was applied. Overall, out of 210 respondents, 48.6% were female and 51.4% were male. Moreover, questions regarding the importance of the seven factors concerning the COVID-19 in the hotel industry were formulated on a five-point scale. To analyze the data in more detail, the contingency tables were used.

### 3 RESULTS

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The current pandemic situation didn't just bring various changes to our everyday lives, it also influenced tourists' perceptions and attitudes regarding their travelling habits. If we look closely at these changes among domestic hotel guests, we can see that the 50% of respondents stayed in a hotel only once, since the beginning of the pandemic. Compared to the 18% prior to the pandemic. Furthermore, more than 79% of respondents were willing to buy the accommodation just a few days ahead of their beginning of travel [4]. Juxtapose the pre-pandemic situation, where the majority of hotel guests were booking their stay two to four weeks ahead of the stay in the hotel.

### 4 CONCLUSIONS

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Even though there were a number of travel restrictions, 74% of respondents were planning to travel and stay in the hotel, once the situation would allow it. This claim can be confirmed by the substantial difference in the percentage of respondents' stays at the hotel during the summer months (July and August). The vast majority of respondents (65%) stayed at a hotel during these two months, where there were almost no travel restrictions for domestic

tourists. By looking at the most important factors regarding the COVID-19 pandemic, we can conclude that respondents consider, wearing a face mask, keeping the distance, availability of disinfection in a hotel room as well as the possibility to order a room service, as the main factors that can help to avoid spreading the virus in the hotel premises [4]. Furthermore, based on the contingency tables, the importance of researched factors regarding the COVID-19 in the hotel industry was highest among students and respondents younger than 25 years of age. On the other hand, the importance of keeping the distance was significantly higher for the older generation.

tourists. This study, therefore, provides a brief overview of hotel guests' perceptions and attitudes that can be used by various service providers in the hotel industry. Since this study is solely focusing on domestic tourists, further research should also take into consideration the international guests, as they are a vital clientele for a lot of the Czech regions and accommodation providers (considering no international travel restrictions).

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### 6 ACKNOWLEDGEMENT

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This paper was supported by the grant No. PEF\_DP\_2021011 and PEF\_DP\_2021015 of the Internal Grant Agency PEF MENDELU in 2021.

# COVID-19 PANDEMIC AND ITS IMPACT ON USAGE OF NETFLIX IN THE CZECH REPUBLIC

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## KEY WORDS

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COVID-19, Netflix, usage, subscribers

## JEL CODES

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M310, L820

## 1 INTRODUCTION

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Streaming services are in these days more and more common instrument when it comes to audiovisual content. During COVID-19 pandemic, streaming services got even more popular because of many contact restrictions. Streaming services were found as very comfortable solution for work and school purposes. Also during lockdown people started replacing their

usual activities (going to cinema, theatres) with these that could be done at home such as TikTok, Facebook and also watching streaming services like Netflix, see [1] or [2]. The main aim of this paper is to find out whether the pandemic had an impact on the popularity of Netflix services in the Czech Republic.

## 2 MATERIAL AND METHODS

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For the purpose whether growth in terms of number of subscribers in the Czech Republic corresponds with worldwide tendency there was conducted a questionnaire survey in two waves. The first wave of data collecting took place in January 2020, the second wave in January 2021. The questionnaire was distributed via social site Facebook, as it can be assumed that most users of Netflix are also active

users of Facebook. In the first wave it was collected 209 responses and in the second wave 250 responses. Questions are stated in Table 1.

According to [3] and [4] the statistical significance of change in use of Netflix will be verified by two-sample test of relative frequencies. Before using the two-sample test, it will be checked that the variance of the alternative distribution is greater than nine.

## 3 RESULTS

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The two-sample test was performed to investigate whether a relevant difference in use of Netflix and in use of streaming services in general between periods occurred, see Table 2. There is statistically significant difference in case of the third question

(Have you ever used Netflix?) but no difference in other questions between monitored periods. It could be assumed that during the pandemic more people in the Czech Republic signed up to Netflix but did not continue in using this service regarding to result

Tab. 1: Proportion of positive answers to individual questions

Question	Question No.	% of positive answers	
		1st period	2st period
Do you actually use streaming services in general?	1	94.8	92.8
Are you aware of streaming service Netflix?	2	93.5	96.1
Have you ever used Netflix?	3	81.8	92.8
Are you currently an active user of Netflix?	4	88.9	91.3

of the fourth question (Are you currently an active user of Netflix?). The difference in the first question remained insignificant which says that there is no change in use of streaming services in general.

## 4 CONCLUSIONS

It can be stated that the Czech Republic corresponds to the global trend in increasing awareness of Netflix services. The result in terms of usage also goes hand-in-hand with other research, that proved that people during pandemic started replacing their usual activities with in-home activities [2] and furthermore turned toward digital recreational activities like Netflix, Youtube, TikTok [1]. The change of usage was probably only short-term since the only statistically significant difference was in the case of question “Have you ever used Netflix?” but not

Tab. 2: Results of two-sample test of relative frequencies

Question No.	1	2	3	4
P-value	0.396	0.208	<0.001	0.420

in question “Are you currently an active user of Netflix?”. This result could be interpreted as in a short run the pandemic definitely supported and improved the situation of Netflix but not in a long run. These people were using Netflix probably only during restrictions like quarantine but once those restrictions were over (during summer in Czech Republic), they also cancelled their subscription, which means that Netflix was not able to keep these new viewers.

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## 6 ACKNOWLEDGEMENT

This article was supported by the grant No. PEF/TP/2021002 of the Grant Agency IGA PEF MENDELU.

# PROJECT CONTROLLING AND STEERING BY USING DIGITAL METHODS

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## KEY WORDS

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project controlling, project steering, digitalization, decision support system

## JEL CODES

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M15, M10, M41

## 1 INTRODUCTION

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“EDP systems process what they are fed with. If crap comes in, crap comes out.” (André Kostolany)

This is how the American financial expert André Kostolany described the use of information systems. In project controlling and management steering, in particular, the importance and timeliness of digitalization support can be classified as very high. Horváth comes to the conclusion that the controlling tasks can no longer be carried out without digitalization support (Horváth, 2015). As a result, the controlling and steering of projects cannot be carried out without suitable digitalization support. This harbors the risk that the dependency on information

technology processes and products will increase, since the processes in project controlling cannot be carried out without digitalization support. This is also confirmed by leading companies in their annual reports. Against this background, the question arises how and whether the project controlling and steering tasks can be implemented with digitalization support. It should also be borne in mind that implementation in IT and digitalization does not necessarily mean that it automatically has a supporting effect on the project controlling and steering tasks. This makes an analysis of IT and digitalization support inevitable.

## 2 MATERIAL AND METHODS

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The aim of this research paper is to work out the substantial tasks of project controlling and steering and the implementation of these tasks in information technology. In addition, the analysis of the possibilities of IT support in project controlling and steering is the focus of the work. In particular, it will be analyzed how digital support methods should be used in the context of project controlling and steering.

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 the project controlling and steering process.

First of all, all relevant studies and papers in this context are identified by means of a keyword-based literature search in the Scopus, Springer and ScienceDirect database. Second, all identified studies and papers 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 instruments for improving project controlling and steering, it is still necessary to illuminate

the process for project management in advance. This is relevant insofar as the methods and instruments for improving project controlling and steering are embedded in the process of project management.

### 3 RESULTS

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The evaluation and analysis of the materials shows that digitization basically affects all process steps of project controlling and steering (Güler, 2021). However, on closer examination it becomes clear that digital methods can unlock enormous potential, especially in budgeting, forecasting, reporting and cost accounting (Kirchberg and Müller, 2016; Finance CFO Panel, 2017). In addition, it can be concluded from the analysis that resource-intensive activities in particular are strongly supported and improved by digital methods and instruments (Langmann, 2019).

The following aspects are characteristic of potentials for digital project controlling and steering:

- Ad hoc availability of forecast information based on statistical methods.
- Automation of decisions based on quantitative methods.
- Event-oriented control and decision support in the course of the project.
- Changed requirements, qualifications and roles in project controlling and steering (Kieninger, 2017).

### 4 CONCLUSIONS

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With the new digital possibilities of supporting project controlling and steering, the information technology 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 project controlling and steering. The literary review and the analysis of studies and surveys are suitable for developing a deep understanding and better classifying the topic of project controlling and steering. It also provides the starting point for further research in the subject area.

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# THE LEVEL OF EFFICIENCY OF THE CZECH CONSTRUCTION SECTOR

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## KEY WORDS

construction, data envelopment analysis, efficiency, linear programming

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## JEL CODES

C44, D24

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## 1 INTRODUCTION

Efficiency is an important aspect of the success of every company in the construction sector. Because of the growing effort not to waste limited resources companies minimize the amount of their cost. The construction sector is an integral part of the economy. The main aim of this article is to evaluate

the efficiency of the whole construction sector in European Union (EU 28) and compare efficiencies between countries with focus on Czech republic. This is an attempt to follow up on the article [3] and verify their results there at the macro level perspective.

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## 2 MATERIAL AND METHODS

The dataset was formed from selected indicators of EU countries from the EU KLEMS database. The selected input variables are nominal gross fixed capital formation (GFCF) in millions of euros, and total hours worked by employees (HEMPE) in thousands. The output variables are gross value added at current basic prices (VA) and gross output in current prices (GO) (both in millions of euros). Due to the fact that the EU KLEMS database provides financial data in national currencies, all values have been converted to euros at current annual exchange rates in order to compare the efficiency of individual countries. Annual data are examined for year 2017. Unfortunately, it was not possible to

obtain the necessary data for all EU countries and therefore we are forced to omit Cyprus, Estonia, Latvia, Portugal, Romania, Spain, Sweden and UK. Because of missing variable values, we have had to remove countries like Croatia, Ireland, and Poland.

Data Envelopment Analysis (DEA) approach will be used to evaluate the efficiency. DEA method is based on Farrell's idea [2], which described in detail procedures for measuring productivity in another way than by using indices. DEA measures the efficiency of each decision-making unit (DMU) relatively to another DMUs. Calculation will be based on input-oriented CCR model (see [1]).

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## 3 RESULTS

The results of the efficiency of individual countries in 2017 are recorded in Fig. 1. Austria, Belgium, Denmark, Germany and Netherlands are among the

top countries (i.e. with 100% efficiency). Countries following right behind the top ones are: Finland, France and Malta. On the other hand Bulgaria is

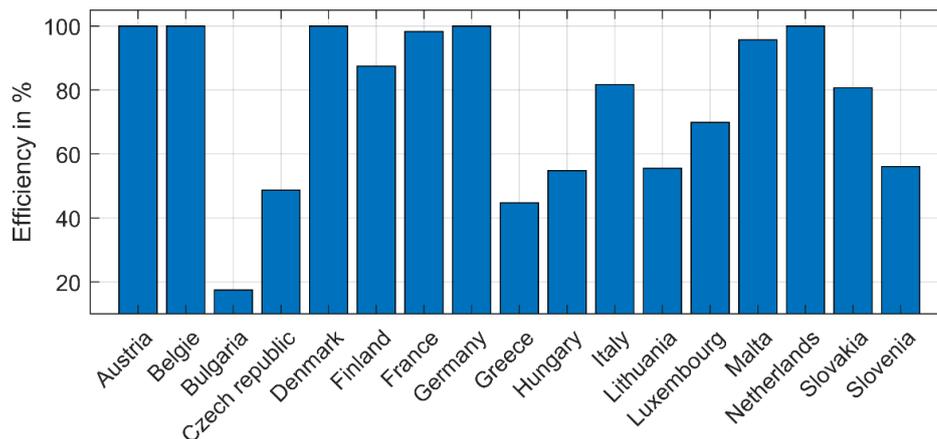


Fig. 1: Efficiency scores (in %) of individual countries in 2017

in the last position in terms of the order derived from the resulting efficiency. Greece took the second worst place in terms of efficiency. Other countries like Czech republic, Hungary, Lithuania, Luxembourg and Slovenia ranked in lowest place in terms of

resulting efficiency. The results show that the Czech republics place is between the worse states in EU. The efficiency of the Czech Republic is even below the average value (76%) and the median value (82%).

## 4 CONCLUSIONS

The results showed that Austria, Belgium, Denmark, Germany and Netherlands are fully efficient against other EU countries, by contrast Czech republic gained a low efficiency score. It can be stated that the result of this study are in agreement with analyzes performed on the microdata in the study [3]. Study [3] showed that companies within the Czech construction industry were not doing their best during 2013 to 2015. Even in the case of our evaluation at the

level of individual EU countries, the Czech Republic is still among the worst countries. Governments are striving for higher company competitiveness and sustainable and ecological development of the construction sector. Among other things, the pressure to invest in equipment innovation and modernization is increasing. However, the importance of construction in the economy is still overlooked from a research perspective.

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## 6 ACKNOWLEDGEMENT

Supported by the grant No. PEF/TP/2021002 of the Grant Agency IGA PEF MENDELU.

# VUCA-ORIENTED ORGANIZATION OF PRODUCT DEVELOPMENT – STATE OF THE ART

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## KEY WORDS

ambidexterity, digitalization, organization structure, physical product, product development, product engineering process, PEP, project management, SME, VUCA

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## JEL CODES

F14, L22, L25

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## 1 INTRODUCTION

The organization of product development departments and its project management is an ongoing task for management potentially lasting decades. During this time requirements change due to globalization, digitalization, automation, and fluctuating market conditions. In this volatile, uncertain, complex and ambiguities (VUCA) environment management must steer the organization through fuzzy situations. This paper focusses on small and medium sized enterprises (SME)<sup>1</sup> and a particular view is set on automotive project management as is represented a pioneering

role in industry. No particular focus is placed on large-sized enterprises. It is thus aimed at giving an overview of the current state of research and propose relevant research questions (RQs) which have not been issued in current research. In section 2 the research methodology, including the applied keywords and utilized search engines, is presented. Section 3 comprises the literature review before finally in section 4 the findings are worked out and relevant RQs are presented.

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## 2 MATERIAL AND METHODS

Aggregation of information was performed in a two-level procedure. On the first level the focus was set on the keyword “product development” combined with keywords that have a strong relation to product development: agility, automotive, key performance indicators (KPI), lean, management, digitalization, organization 4.0, agile project management and iterative product development. To ensure great data topicality, the evaluation was carried out based on findings obtained from “Google Scholar” results

published 2010 or later. On the second level, a specific view was set on the organization of product development in SMEs and in the VUCA world. Therefore, the search syntax “keyword AND sme AND vuca” was applied to the following fields of research which were also filtered by a publication date of 2010 or later: Product Development (Process), Project Management, Business Process Model, Cybernetic Systems. In contrast to the first level, this search was performed only via scientific search

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<sup>1</sup> < 250 employees, < 50 Mio. € turnover, < 43 Mio. € P+L (according to European Union No. L 124 2003, p. 36)

engines: EBESCOhost platform, ScienceDirect (Elsevier), SCOPUS, Springer and Web of Science. In total 164 sources were identified which are further filtered, first, via investigation of abstracts and, subsequently, through a full context analysis. As a result, 79 sources built the basis for this paper. The findings

were thematically structured and summarized in the following categories: (I) Organization of Product Development, (II) Principles of Project Management (PM), (III) External Influences & Trends and (VI) PM Methods.

### 3 RESULTS

Within category (I) Organization of Product Development the function-oriented [1], process-oriented [2] and hybrid organizations [3] are reviewed and the pros and cons are worked out. In (II) Principles of Project Management the product engineering process (PEP) is analyzed in classic project management and agile project management approaches [4]. Category (III) External Influences and Trends particularly fo-

cus on the requirements presented in a VUCA world [5] and the effects imposed on organizations through an increasing digitalization of work and workplaces [6]. Lastly, in (VI) Project Management Methods a summary of identified frameworks, methods and models is presented which are used to describe the configurations in product development context.

### 4 CONCLUSIONS

The provided state of the art review of VUCA-oriented product development delivers a comprehensive overview of the current state of research. It also considers current and future trends which already are and will become challenges for management. However, the research also revealed white spots in literature which are not comprehensively investigated up to this point. As a result, RQs are presented that will be further investigated by the author in future works.

- RQ1: How can management construct product development teams in SME-sized enterprises in VUCA environment in context of their company-specific requirements?
- RQ2: How can management determine the PM methodology for product development in SME-sized enterprises in VUCA environment in context of their company-specific requirements?
- RQ3: Which influencing factors in context of product development provide high leverage effect on increasing project resilience in SME-sized enterprises?

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# THE IMPACT OF THE CLIMATE CHANGE ON THE TRANSPORTATION INDUSTRY AND VICE VERSA

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## KEY WORDS

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climate change, transportation industry, economic impact

## JEL CODES

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Q50, Q54

## 1 INTRODUCTION

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The climate judgment against Shell in May 2021, which obliges the company to reduce CO<sub>2</sub> emissions by a net 45% by 2030 compared to 2019, shows that climate change mitigation and its consequences are gaining importance [1]. Furthermore, it is deductible that other courts will follow this ruling, and climate rulings of this kind will increase [6].

Other companies from different industries, such as the transportation industry, may face judgments like this. The transportation industry is a relevant industry that significantly impacts climate [2, 3, 4]. Furthermore, the transportation industry is also one of the industries strongly affected by climate change and its consequences.

## 2 MATERIAL AND METHODS

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A systematic literature analysis is used to examine the influence of the transportation industry on the climate and the climate on the business activities of companies in the transportation industry. The primary and secondary literature analysis aims to collect, summarise, and critically evaluate the knowledge regarding the influences on climate by the transport industry and the transport industry by climate.

In the first step, so-called inclusion and exclusion criteria were defined based on the PICO scheme [5]. The analysis includes publications from 1990-2021 and consists of German- and English-language papers. There is no restriction in the study type. The study design is a meta-analysis. Studies were included in the analysis that, firstly, investigated the influence of climate on companies in the transport

industry. Secondly, publications that analysed the general influence of climate on the transport industry and thirdly, publications that analysed the influence of the transport industry on climate.

Furthermore, the analysis includes studies that examined the economic impact of climate on the transportation industry and vice versa. There is no country-specific restriction. Exclusion criteria included studies that investigated climate impacts on industries other than the transport industry and the impact of these industries on climate. The second step refers to the selection of the search criteria and operators. The search criteria consist, for example, of “Climate Impact | Climate Effects | Klimaeinfluss | Klimaeffekte | Transportation Industry | Transport Industry | Transportindustrie” and others. The operators “AND/UND | NOT/NICHT | OR/ODER”

were used here. The third step refers to the selection of literature. The selection of the relevant literature for this study bases on the following order: First,

review of the title, second, review of the abstract, third, reading of the complete text, and fourth, inclusion in the analysis.

### 3 RESULTS

The results of the systematic literature analysis show that in the 30 years studied (1990–2021), the number of published scientific papers on the influence of the transport industry on climate and vice versa has increased, especially in the last 20 years (from 2000). Furthermore, an increase in publications from 2012 onwards is visible. Based on the findings, the publications focus primarily on the influence of the climate on the transport industry. Only a few publications deal with the transportation industry's economic consequences due to the climate

impact. The published studies on the influence of the transport industry on the climate focus primarily on CO<sub>2</sub> emissions and the associated effects.

In conclusion, there is only a small number of publications on this topic under investigation. According to the developing number of publications since 2012 and the increasing importance of climate, the number of publications regarding the transportation industry may increase. As well, the transportation industry is necessary for our economy and the mitigation of climate change.

### 4 CONCLUSIONS

The results of the systematic literature analysis show that the climate impact on the transport industry and the associated effects on business activity and, above all, the associated economic consequences are not enough. Consequently, there is a need for further

research on this issue. Furthermore, there is a need for research into the influence of the transport industry on the climate, as the emission of CO<sub>2</sub> can cause further climate change, which in turn influences the transport industry.

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# IMPACT OF BANK REGULATION ON BANKS' PROFITABILITY: CROSS-COUNTRY EVIDENCE

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## KEY WORDS

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regulation, profitability, reforms

## JEL CODES

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E52

## 1 INTRODUCTION

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The global financial melt-down of 2007–2009 generated so much debate among academicians, policy makers and industry players with regards to how best the whole industry should be regulated to ensure sound and efficient financial system across the globe to prevent future occurrence of that magnitude. The financial crisis was generally attributable to structural problems in the industry as well as the

subprime mortgage crisis in the US and other major financial hubs around the globe. The purpose of this paper is to contribute to the assessment of types of bank regulations and supervision reforms that helps sound and efficient banking system across the globe. In other words we seek to contribute to assessing which bank regulation reforms ensure a well-functioning and efficient banking system.

## 2 MATERIAL AND METHODS

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An unbalanced panel data in 114 countries across the globe was used for the purpose of this study and the period covered is 2011–2018. To achieve the objective of this paper, the following mathematical model was used and applied and the model is a modified version of Cross-sectional model used by J. R. Barth et al. (2013). But unlike the above studies, we specifically use a pooled regression time series for this study as in (Wheelock & Neely, 1997), (Goddard et al.,

2004) and (Staikouras & Wood, 2011). The pooled regression model as used here assumes the same effect for profit and so therefore cross sectional variation (among banks) in any of the independent variables as well as variation overtime in that variable for an individual bank (Goddard et al., 2004). Yearly dummy is included in the model to make up for time impact.

## 3 RESULTS

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The study presents the findings on the impact of bank regulation on banks profitability and the model

introduces the bank regulation variables gradually until all the variables are included simultaneously.

Three bank regulation and supervision measures (brss1, brss3 and brss4) have very significant and positive impact on bank profitability. BRSS1 represents regulation on capital requirement and the result suggests that stringent capital requirement has very significant positive (at 1%) impact on bank profitability where it increases bank profitability by almost 30% and this is consistent with (Fethi and Pasiouras 2010; Barth et al. 2013; Yang et al. 2019). Accounting/Information disclosure represents BRSS3 and it has very significant and positive impact on bank profitability. This regulation led to an increase in profit of banks by approximately 22%.

The result implies that a very stringent requirement for banks to provide vital accounting information leads to strong confidence in the banking industry which eventually leads to positive investor decisions and favorable market performance. BRSS4 which is a proxy for regulation on discipline/Problem institutions/exit however has very significant and negative impact on bank profitability in sharp contrast to the findings of (Yang et al., 2019) where the regulation reduces banks profitability by 25%. Restriction on banking activities (BRSS2) has positive impact on bank profitability at 7% though not significant just as found in (Barth et al. 2004; Yang et al. 2019).

## 4 CONCLUSIONS

This research examines the impact of bank regulation and supervision on bank profitability and further check through sensitivity analysis whether bank size and countries income level impacts differently from main model estimation. Based on the analysis of the impact of bank regulation on bank profitability, the results show through our main model and robustness check that bank regulation and supervision has very much significance on the profitability of banks. We

find in particular from the estimation results that stringent capital requirement has some level of impact on bank profitability. Accounting/Information disclosure also exerts some level of significant and impact on bank profitability. The results also show regulation on discipline/Problem institutions/exit having some marginal impact and reduction on bank profitability.

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# THE IMPACT OF M-COMMERCE IN THE WINE CONSUMPTION IN CHINA

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## KEY WORDS

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m-commerce, wine consumption, China, e-commerce

## JEL CODES

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M30

## 1 INTRODUCTION

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This paper has the ambition to certain extend describe the wine consumption trends in China regarding the wine business situation for wine producers via modern means of marketing and sales while implementing in M-commerce channel tied with E-commerce.

China became the world's largest consumer of red wine in 2013 and its red wine consumption is expected to increase in the long term. Young

and wealthy Chinese consumers in urban areas are believed to be the major source of the increased wine consumption [1]. For a long time, Chinese preference for grape wine was as a symbol of Western-sophistication and wealth. However, much has changed in China in the last few years with the result that wine is starting to become a middle-class beverage enjoyed for a variety of reasons and occasions [2].

## 2 MATERIAL AND METHODS

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The research design for conducting this analysis is an online survey distributed to Chinese consumers in mainland China. This study applied quantitative method using an online survey with a self-administered questionnaire. The survey was conducted within the WeChat-supported online social

group. We designed an online questionnaire in a Chinese online survey designer called "TengXunWen-Juan". We acquired 337 responses in mainland China from various cities like ShangHai, Zhejiang, Hunan, Wuhan etc., include first, second and third-tier cities, rural place as well.

## 3 RESULTS

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Results show that in general the drinking of wine is most probably not the first preference among the consumption of any kind of alcohol, where only 6% of the respondents declared their habit to drink wine every day. The segments of occasional wine drinkers

(62%) could be step-by-step moved to the segment of semi-frequent or even frequent drinkers.

Almost three quarters are willing to pay from 13 up to 65 Euro per bottle, which seems to be really motivating result.

Generally 71% of the respondents drink wine during their meeting with friends and/or for their own enjoyment. 40% is buying wine in specialized wine store.

Only 6% of respondents have ever downloaded or used wine applications. The most several downloaded wine applications are JiuXian, JD, Vivino and TaoBao. JD.com is a platform with 35% of wine drinkers using it to buy imported wine.

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## 4 CONCLUSIONS

Although with the rapid development of domestic wine E-business, there are still many worries on consumer side. Consumer trust is the biggest factor that impact on the development of wine business on E-commerce. Even if Chinese people tend to purchase a lot with their mobile phones, wine business suffers of the fraud problem which slows down the expansion of the wine online purchase.

Multi-choice and convenience is more important for the Chinese customers, than the promotion and cheap prices.

The fear of buying a fake bottle of quality wine remains the biggest obstacle to overcome when purchasing wine in China, with 59% of imported wine drinkers saying that it has discouraged them from buying a bottle of wine.

Working on the reputation of mobile wine application and online platform is crucial.

Chinese wine market is completely different compared to traditional western markets. It can be characterized by its non-maturity. Chinese wine customers are not price sensitive, they are willing to pay high price for the quality wines.

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# FOREIGN DIRECT INVESTMENTS ATTRACTION INTO THE MANUFACTURING SECTORS IN WEST AFRICA REGION – A SYSTEMATIC LITERATURE REVIEW

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## KEY WORDS

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Foreign Direct Investment, manufacturing, West Africa

## JEL CODES

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F21, L60, N67

## 1 INTRODUCTION

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Manufacturing is key to economic development in many countries – due to the fact it accelerates production of higher added value products, generating higher employment for the host country; low and higher skilled people, strengthens currency due to exports of higher value-added products, overall gives a major boost to the GDP through higher value products exports as against imports. To achieve sustainable development there is the need to attract FDI into manufacturing; because, local savings/investment are short term, while FDI is long term hence manufacturing returns are able to mature over a period of time for payback (Zandile & Phiri, 2019). FDI also attracts the necessary know how in terms of technology and innovation transfer, brand leverage, marketing advantages and easy access to foreign markets. Innovation found in manufacturing industry helps to boost economic productivity in other sectors of the economy: agriculture, natural resource exploration, etc. Manufacturing requires

long term capital injection which is guaranteed by FDI instead of locally generated financing which has short term goals and return goals. Mostly for portfolio investors since domestic investors are usually not long-term thinking.

FDI into manufacturing helps countries to generate enough revenue from manufactured higher value products compared to raw materials for exports. However, FDI flows into manufacturing in some specific African economies have been rising steadily. In Ghana for instance, between the period of 2013–2019, there have been a steady rise in FDI into manufacturing by 15% increase every year (MoF, 2020). The availability of highly skilled and technical labor force, policy incentives through tax cuts, natural resources to feed the industries as well as the exchange rate regime to guarantee that financial investments uphold their value over time. This study fills the gap of relatively little data concerning FDI into manufacturing in West African countries.

## 2 MATERIAL AND METHODS

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The study used 4 theories to help shape the research. The Neo-Classical theories, the core factors come from cheap labor (Osorio, 2016). Thus, countries with

large scale cheap labor are able to attract enough FDI (Forsgren, 2014). However, current situation has shifted the proposition from cheap abundant labor to

skilled and technical labor force of a specific country to attract FDI (Doytch and Uctum, 2016). West African countries have approximately 65% of the population which are youthful and in their young age to be productive (UNCTAD, 2019). The need for skilled and technical labor is far below expectation (Zandile & Phiri, 2019). As a result of the latter fact, FDI into manufacturing have been taken to countries like China, Taiwan and Vietnam (UNCTAD, 2019). Since these countries have proven to have enough well trained and skilled labor to support various industries and manufacturing activities.

However, the market imperfections theory looks at the competitive advantage of companies to utilize FDI to countries with lower cost of production relative to their home countries. This theory has been adopted by modern businesses and corporate organizations. Cost of production plays a vital role in

business manufacturing. As noted by (Diouf & Hai, 2017).

The international trade theory which was adopted by the research envisage the need for companies to leverage on production in other countries as form of security (Zandile & Phiri, 2019). The theory builds on the Adam Smith theory of international trade which envisage the need for countries to maximize their strengths and export excesses as well as make profits form abundance. Thus, using the profits into other countries that have competitive advantage. This theory helped Nertherlands to extend world dominance in the 1880s. The eclectic theory which was enhanced by Dunning (1977) dealing with the OLI framework of international trade and investment. Companies look at investing in countries that have the right framework to support the idea of Ownership, Location, and Internalization paradigm.

### 3 RESULTS

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The hypothesis drawn for the study takes into consideration 8 parameters; Market Size, Macroeconomic Instability, Natural Resources Availability, Infrastructure facilities, Policy incentives, Exchange rate regime, Human capital and Institutional stability.

The conceptual framework has been modeled along these parameters to evaluate which of them have the highest impact on FDI inflow into manufacturing in West African.

### 4 CONCLUSIONS

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FDI into Manufacturing has enormous advantages for sustainable development in West African countries. FDI into manufacturing is but not limited to financing, but also technological resources, production know-how and improving on the GDP of respective countries. FDI attraction is most desirable to West

African countries with the right incentivized policies to attract investors, skilled labor force, efficient macroeconomic environment among a few. This study is crucial to help fill the knowledge gap which exists on influencing FDI into manufacturing in the West Africa sub-region.

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# EVALUATING THE EFFICIENCY OF THE EUROPEAN TERTIARY EDUCATION

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## KEY WORDS

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data envelopment analysis, efficiency, education, competitiveness

## JEL CODES

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C44, H52, I21

## 1 INTRODUCTION

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Currently, the higher education sector is experiencing significant changes, because on the one hand the number of higher education institutions has increased dramatically, but on the other hand there have been significant demographic changes (decrease) [5]. Due to the large expansion of tertiary education, care should be taken to avoid reducing the quality of such education. This is possible due to the increase in

expenditure on education [2]. Given that universities are still struggling for students and at the same time have limited possibilities of financing their activities, it is necessary to evaluate the efficiency of this sector. The main aim of the article is to evaluate the efficiency of individual EU countries in the field of tertiary education with emphasis on the situation in the Czech and Slovak Republics.

## 2 MATERIAL AND METHODS

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In this article, the data envelopment analysis method was used to evaluate the efficiency of tertiary education. It is very popular method for evaluating efficiency, which has found its use in many areas. To evaluate the efficiency in the field of education was used for example in [3] and [4]. All technical procedures of the DEA method are given in [1].

Our model was based on four variables. The two output variables used in the model are the

employment rate of graduates of tertiary education and the number of graduates in tertiary education. Public expenditure on tertiary education and the number of teachers in tertiary education are used as inputs variables. Efficiency is monitored for the period 2016 to 2018. The necessary calculations were performed in computational system DEA SolverPro, Version 15.

## 3 RESULTS

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In 2016, the average efficiency score in the EU was 74%, but the median value was higher, around 77%. The Czech Republic had this year full effi-

ciency, along with Ireland, Lithuania, Luxembourg and Romania. Slovakia achieved a slightly above-average efficiency score, around 77%, which was also

the median value. In 2017, the average efficiency score within the EU was 77% and the median value was also 77%. The Czech Republic again achieved an above-average score, or full efficiency. With its efficiency score of 76%, Slovakia almost reached the average and median value. In 2018, the efficiency score for the EU countries was the same as in the previous year, i.e. 77%, but the median value was significantly higher, around 83 %. The Czech Republic achieved an above-average efficiency score this year, 91%. Slovakia again adhered to approximately the average value, namely 78%. In all three years, Germany achieved the lowest efficiency score together with Austria.

Furthermore, efficiency changes in individual years were evaluated. The efficiency changes between 2016 and 2017 were generally minimal, only Denmark showed a significant change in efficiency, namely a 90% increase. The Czech Republic had a zero efficiency change, because in both years there was a full efficiency. In Slovakia there was a slight decrease in efficiency by 1.5%. In the EU, there were again no significant changes in efficiency between 2017 and 2018. The biggest change in this period was the decrease in efficiency in Denmark by 33%. There was also a decrease in the Czech Republic, but only by 4%. In Slovakia, on the other hand, there was a slight improvement of almost 1%.

## 4 CONCLUSIONS

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It was found that some economically advanced countries, such as Germany and Austria, do not achieve such a high efficiency of tertiary education as some economically weaker countries, such as the Czech Republic or Romania. Another finding

was that there were no significant changes in the efficiency of tertiary education in 2016–2018. Only in case of Denmark, we observed a significant increase in efficiency in 2017 due to changes in education.

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## 6 ACKNOWLEDGEMENT

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Supported by the grant No. PEF/TP/2021003 of the Grant Agency IGA PEF MENDELU.

# DEVELOPMENT AND TRANSFORMATION OF THE GERMAN AND INTERNATIONAL AUTOMOTIVE INDUSTRY

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## KEY WORDS

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automotive, global markets, economic development, pandemic, game changer, transformation

## JEL CODES

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L11, L62, O50

## 1 INTRODUCTION

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The automotive industry is in the midst of a structural change that poses considerable challenges for the future. However, the question of future drive technologies is only one aspect of the technical change process. Concepts for autonomous, guided and connected driving open up potentials that could influence the mobility of the future at least to

the same extent as alternatives in drive technology. Furthermore, they open up the market for future potential “players” on the world market such as large technology corporations. In addition, the automobile as the “ultima ratio” of individual locomotion is losing importance, at least in the so-called Western world, in favour of alternative mobility concepts.

## 2 MATERIAL AND METHODS

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The study is based on a qualitative, systematic analysis of available data on the production and sale of vehicles (Passenger Cars) at global and regional level, supplemented by literature research on market developments. The primary data sources are primarily the German Association of the Automotive Industry (VDA) and the Organisation Internationale des Constructeurs d’Automobiles (OICA). The aim is, on the one hand, to analyse and evaluate regional

and international market developments and shifts in recent years and, in a further step, to draw a line under current and future technological and market policy challenges and upcoming transformations. Could global market developments of the last year be redefined by structural and technical transformations or, if necessary, newly formed? What are the opportunities and risks?

## 3 RESULTS

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The long-term development in the automotive sector shows clear global shifts in the automotive market, without technical transformations in alternative drive technologies already having played a major

role. According to OICA, after a continuous growth phase from 2010 to 2017 to almost 73.5 million vehicles produced worldwide, the economy partially collapsed in 2018 and 2019 in total of 8.6% fewer

vehicles in the two years. In the pandemic-driven recession year 2020, global production declined on 55,8 million cars. The clear growth regions over the last few years are Asia (China) and the Eastern European countries, where car production grew by 25.5% and 31.8% respectively in the period 2010 to 2019, while the American economic area saw significant declines in the same period and the rest of Europe stagnated at best. In Eastern Europe, there is also a clear shift between production and sales, while this ratio remains more or less constant in most other world regions. Eastern Europe had also become an increasingly attractive sales market for the automotive industry by 2017, but the slumps from 2018 onwards are also having a significant impact here. The economic challenges described above are hitting the automotive industry in a phase of transformation and longer-term structural change. The political and social goal of significantly reducing emissions of climate-damaging substances, especially CO<sub>2</sub> emissions, in the coming years and decades has led to a large number of different objectives, measures and initiatives at national and international level. Particularly in Europe discussions and decisions are being made about accelerating and tightening per-

missible emissions. Furthermore, in various Member States, such as Germany, discussions are taking place on which national, additional bundles of measures can be used to achieve the set climate targets. Due to these political framework conditions, everything points to a gradual shift away from the combustion engine towards alternative drives. German industry is particularly affected by this development. The brand policy of German manufacturers has long been based on large-volume drives, which now have to be converted to alternative, electric drives in the short term. On a global scale, for example, Deutsche Bank's team of automotive experts assumes a 30% share of purely battery-electric drive systems by 2035 and a 60% share of hybrid solutions. Other forecasts assume a significantly higher share of all-electric drives in the future. In addition to the political framework conditions, factors such as cost and technology developments in battery production and disposal, resource availability and infrastructure issues are important factors influencing electrification. These framework conditions will have a significant influence on the global automotive market and will have a say in the success and failure of individual manufacturers and regions.

## 4 CONCLUSIONS

No matter how one assesses the accuracy of individual forecasts, all the forecasts used and researched in the context of this work come to one conclusion: the share of electrification in the powertrain of automobiles, especially in the passenger car sector, will increase significantly over the next 10 years and will take at least a significant market share after the end of such a decade. The need and desire for

growing mobility, however it is shaped, continues to rise worldwide. The automotive industry as a whole will certainly continue to play an important role in the future as a provider of individual mobility, but structurally changed and associated with consequences for individual regions or national economic areas.

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# WHAT EFFECT DOES AGILE WORKING HAVE ON HEALTH, MOTIVATION AND PERFORMANCE?

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## KEY WORDS

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agile, motivation, performance, generation conflict

## JEL CODES

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O15, O35

## 1 INTRODUCTION

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In the dictionary, agility is explained as flexibility and vitality. And that is exactly what the business world needs now. The pace has increased, digitalisation is changing industries and customers are changing their needs quickly. Self-organised teams that are connected like a network and have a high degree of customer centricity usually prevail. [1] Agile organisations are learning organisations, invest in Experiments and create knowledge out of these. [2] Agile organisations demand a high degree of independence and team competence. But there are

also negative aspects possible such as high time pressure, high workload or conflicts in the team and thus also in efficient cooperation. However, lack of clarity in the way of working, incomplete and overhasty implementation of agile approaches can also have negative effects on the motivation and performance of employees. [3] Based on this line of thought, the article by Pia Barth et seq. poses the research question “What effect does agile working have on health, motivation and performance?” [3], which is the origin and title of this paper.

## 2 MATERIAL AND METHODS

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One of the first places to look for literature on this topic is the study “Status Quo (Scaled) Agile 2019/20” from Komus Ayelt and Kuberg Moritz. [4] In this study they ask 473 Participants about how their work fulfills, motivates and inspires them. They select the answers to different “work-mode” types between if they work: Consistently agile; Hybride; selective and consistently classic project management. For the research approach presented here, only consistently agile will be compared with consistently classic project management. Here is an excerpt from the study [4] below in Figure 1.

The graph and thus the study clearly show that agile working significantly increases motivation and inspiration among employees. Is that the end of the matter? Not quite. Although the study asked about

factors such as hierarchy position, company size etc. of the participants, the age of the participants does not seem to be relevant. This cannot be understood. Therefore, the hypothesis is put forward that the degree of motivation; and consequently the performance and health of agile working is dependent on the age of the respective employees.

To investigate this hypothesis, an online questionnaire will be used. The target group is senior workers who actively work agile on a daily basis. In parallel, the literature was used to analyse the workload felt by different generations in general. Generations X, Y, and Z cover a span from 1965 to 2009 and will be examined in more detail here. An initial overview is provided here by the generation researcher Simon Schnetzer. He has researched the similarities and dif-

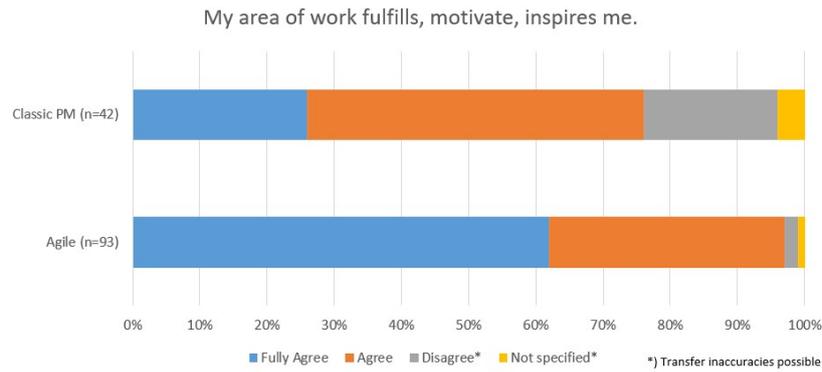


Fig. 1: Motivation of agile vs. Classical PM Work (Source: Komus; Kuberg)

ferences between the three generations. For example, the areas of communication, commitment, respect and ecology represent the greatest changes between the generations. [5]

Apart from the value “ecology”, the remaining values fit well into the notch of agility. Agility changes communication with boards; slips of paper

and systems. What used to be on paper is now in chats, fast, direct, ... Fast-pacedness reduces commitment, ... Everything seems possible and boundaries are shifting. The question here is how quickly the generations were able to adapt to the new agility, who learned faster, adapted and consequently had less stress.

### 3 RESULTS

After putting the values of the three generations into the agile context, the approach that agile working has an impact on motivation, health and performance

becomes more solid. Unfortunately the questionnaire is currently still online in order to generate as many responses as possible.

### 4 CONCLUSIONS

As the survey has not yet been finalised, only assumptions/assumed tendencies can be reflected here. It is assumed that agile working is a challenge for the older generations (everything before generation

$x \rightarrow$  born before 1980). To what extent this affects their motivation, health and performance must be answered by the survey.

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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

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## KEY WORDS

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small and medium scale enterprises, loan, default, debt capital, factors, repayment

## JEL CODES

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G21

## 1 INTRODUCTION

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Presently, SMEs are the most adopted forms of entrepreneurial ventures in all countries across the globe and has successfully dominated business markets all over the world in addition to providing an array of outstanding benefits irrespective of their income or developmental levels. Bouri et al. (2011) admonish that SMEs are the driving force of high-

income countries. Ayyagari et al. (2007) provided that an estimated 50% of GDP of high-income countries are contributed by formal SMEs. World Bank (2018) asserts that 90% of firms throughout the world are SMEs and create employment for over 50% of the global workforce. Yet the industry faces serious challenges.

## 2 MATERIAL AND METHODS

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This study was conducted using the mixed research design. The decision to adopt the mixed research design was a deliberate strategy to enhance the effectiveness, efficiency and relevance of the study results by not only discovering the factors that are responsible for the rate of default in payment of debt finance that is identified among SMEs but also to understand the “why” and “how” that are influencing the situation in the selected settings.

A cluster sampling method was adopted in acquiring respondents for this study. Data gathered included both objective (experimental) and subjective (explanatory) information so that a comprehensive meaning of the research topic may be brought to

light to catalyse a deeper understanding. In view of this, data was gathered using a self-constructed and administered questionnaire as the principal data collection tool.

The data analysis was characterised by a mix of both manual (inferential analysis of the qualitative data) and automated analysis approaches (Regression and ANOVA for the quantitative data using STATA). The variables for the quantitative analysis were Loan default as the Dependent variable and collateral, supervision, purpose of the loan, interest rate and repayment period as the independent variables.

### 3 RESULTS

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The study examined the factors that are responsible for the default in repayment of debt finance by SMEs in the case of developed and developing countries.

- The findings of the study show that default in the repayment of debt finance increases when lending-borrowing conditions are not favourable to the SMEs.
- There is a negative relationship between loan default and supervision, length of repayment period and amount of loan since any increase these independent variables are beneficial to borrowing SMEs.
- There is an unusual negative relationship between interest rate and default on repayment.

### 4 CONCLUSIONS

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The study was a success in providing needful information that has the capacity to assist firms and governments in steering resources and efforts to

ensure a significant reduction in the rate of default in repayment of debt finance in the future.

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# THE COST OF THE CREDIT FINANCING IN THE CONTEXT OF THE RELATIONSHIP BETWEEN THE BANK AND THE COMPANY

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## KEY WORDS

banks, companies, costs, bank specifics, company specifics, interest rates, loans, loan financing, loan costs

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## JEL CODES

G18, G21, G28, G32, G38

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## 1 INTRODUCTION

The paper deals with the effects of selected factors of the company, the banking market and the macroeconomic environment, which have an impact on the company's credit financing, specifically on the company's credit costs (implicit interest rate). The thesis addresses the question of whether the specifics of the company, the specifics of the banking market of the country's economy play a greater role in the company's credit behavior in terms of selected macroeconomic shocks (inflation, GDP per capita index and economic and political uncertainty).

The paper is based on several theories and scientific studies (Carbo Valverde, 2009; Fungáčová et al., 2017 or De Grauwe, 2009), which are based on the results of their empirical analyzes. The greatest attention is paid to the study (Shamshur, 2009) which pays attention to the relationship between bank efficiency and the cost of credit for borrowing companies because it is this study that is most closely related. However, other scientific papers and studies include, for example (Wang, 2020; Ziolo et al., 2020, Kirschenmann, 2016), etc.

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## 2 MATERIAL AND METHODS

The thesis deals with whether specific factors of the company or, conversely, specific factors on the side of the banking market play a greater role in credit behavior. Thus, the influence of both supply and demand factors on the interest costs of the company, ie the implicit interest rate on the loan, is examined.

An "OLS fixed effect" estimator will be used to estimate and determine the effects of the company-bank relationship in the context of the company's credit financing, as it is assumed that each company is in a way slightly different from all other companies.

The microeconomic data of industrial companies are drawn primarily from the Orbis database from Bureau van Dijk and the world Eurostat database. Other source data are drawn from the IMF of ECB world database. As consolidated company statements are provided only by large companies and there are also small and medium-sized companies in the selected data set, non-consolidated financial statements are used. The reason is to avoid double counting of companies and subsidiaries or operations abroad. Therefore, companies with consolidated financial

statements were excluded from the data selection at the outset. In addition, companies operating in either the financial intermediation or the insurance sectors were excluded.

Data were extracted from the period of time from 2009 to 2018. The investigation focuses on the 28 countries of the European Union in the specified period of 2009–2018 (during this period, the United

Kingdom of Great Britain was still part of the EU). However, this selection includes an inconsistent pattern of developed countries, as the newer EU countries are former or emerging economies. For this reason, individual EU countries may have a specific population of companies and special features of the banking system.

### 3 RESULTS

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The study noted that the costs of a company's loan definitely and always influence the chosen specifics of the company, which provide constant results in all regression estimates. The size of the company, its profitability, profitability and indebtedness indicate, in addition to the company's liquidity, a positive relationship with the interest rate on the loan. This is different for the determinants of the macroeconomic environment, where some results changed during the regression estimates, but still remained significant in all tested specifications. These are mainly the infla-

tion rate and the GDP per capita index. However, the final results are in line with the claim that these two macroeconomic factors have a positive effect on the interest rate on the loan.

As for the area of the banking market, the interest costs on the loan are influenced by all selected factors. It is most positively influenced by the specifics of the company and factors of the macroeconomic environment, while the determinants of the banking market show the greatest negative influence.

### 4 CONCLUSIONS

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Based on the obtained results, it is identified that the implicit interest rate is influenced in some way by all selected variables – at the level of the company, the banking market or the macroeconomic level. Both positively and negatively. In addition, it was observed that the size of the company is positively related to

the interest rate of the company, which is contrary to the opinion that a larger size of the company has a lower interest rate on the loan. The impact of individual variables at specific levels, therefore, differs according to the size of the company.

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# A LITTLE HISTORY OF FINANCIAL CRISES: POOR POLITICAL KNOWLEDGE MANAGEMENT AS A COMMON CAUSE

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## KEY WORDS

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financial crises, knowledge management, policy failure, policymaking

## JEL CODES

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G01, N20

## 1 INTRODUCTION

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Throughout history crises were always part of our economic and financial system. While the first reports even go back to the Roman Empire in 66 BC (Frank, 1935), the first financial crisis of modern age occurred in 1720 in England with the bursting of the South Sea Bubble and Mississippi Bubble in 1720 (Hoppit, 2002). A global dimension was reached first with the panic of 1809 (Browning, 2019).

Despite all the individual differences, it should be assumed that there is sufficient experience in dealing politically with such events. And yet, in the aftermath of every financial crisis, politicians never get tired of emphasizing that something like may not happen again (Bryan et al., 2012). Nevertheless, one

of the “most severe economic crisis of modern history occurred in 2008, only comparable to the Great Depression of 1929” (Eigner und Umlauf, 2015, p. 5). It caused considerable distortions in the financial markets, enflaming world-wide economic decline.

Much has been written about the technical reasons for its development and literature agrees that the crisis could have been prevented as “much was known long before the crisis regarding how bank intermediation and risk management worked and about problems with these mechanisms” (Holland, 2010, p. 4). Therefore, many authors argue it “was a crisis of politics, not economics” (Friedman, 2009, p. 127).

## 2 MATERIAL AND METHODS

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The present study examined the question of the extent to which insufficient political knowledge was a cause of the financial crises of the past. For reasons of capacity and to ensure comparability, I have concentrated on the 20th and 21st centuries and here again on the four of the largest financial crises within this period (Vague, 2019).

In terms of method, the approach of qualitative literature analysis was chosen. With the help of the MAXQDA software, 1.000 secondary sources, which were selected using several criterias from a german database, were systematically searched for 15 terms such as knowledge, policy failure and government failure.

### 3 RESULTS

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My preliminary results show that the vast majority of the literature deals primarily with the technical and/or psychological reasons for the financial crises under study. Inadequate knowledge of the politically responsible is discussed again and again, but this is more of a marginal aspect. For example, the term “knowledge management” was never used.

The chosen approach can thus be used as an indication, but is in itself insufficient to confirm the underlying thesis. For my future research, various quantitative data sets should therefore be used in addition.

### 4 CONCLUSIONS

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A historical analysis shows that across countries and over the centuries, economic crises of all type follow similar patterns (Reinhart, 2012). The frequently encountered “this-time-is-different syndrome” contradicts this (Bryan et al., 2012, p. 312).

The 2008 financial crisis was the “unintended result of inadequate institutional framework con-

ditions” as Hähnel (2016) called his excellent and award-winning doctoral thesis, and I would even postulate the thesis, that this applies to a large part of the financial crises in the 20th and 21st century. This paper can be seen as a tentative confirmation of the assumption, but needs to be substantiated by further research and other methodological approaches.

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# PLATFORM BUSINESS MODELS FROM A TAX PERSPECTIVE

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## KEY WORDS

digital economy, platform business model, corporate taxation

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## JEL CODES

H21, H25, F68

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## 1 INTRODUCTION

Digitalisation as a global trend and growth factor of the modern economy is the most important engine of innovation, competitiveness, and economic growth in the world (Kenney and Zysman, 2016; Afonasoova et al., 2019; Olbert and Spengel, 2019). At the same time, digitalisation has imposed new regulatory challenges, such as the protection of security and privacy, and especially challenges in the area of corporate taxation such as a growing phenomenon of profit shifting, big differentials in effective corporate tax rates, new business models based on platforms, dependence on hard-to-value intangible assets, and the difficulty of qualifying assets, activities, and types of income in the digital

economy (e.g.: Olber and Spengel, 2017; Auerbach et al. 2017; Devereux and Vella, 2017). It is evident that digitalisation influences all economic sectors and thus circumscribing the digital economy is neither possible nor desired. The research aims to shed a light on the platform business models, as they represent a fast-increasing proportion of the overall total market capitalization. By surveying the existing literature on platform business models, this paper represents the first attempt in order to explore the contribution that the rich research already done on the implications of the emergence of platform business models for tax policy.

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## 2 MATERIAL AND METHODS

The research questions addressed in this paper are RQ1: What are the main attributes of platform business models? RQ2: What is the corporate effective tax burden borne by platform business models? The objective of this paper is to provide a solid starting point for further research in the area of platform business models addressing the overall research question RQ: What are the implications of platform business models for tax policy; and does the platform business model warrants special tax treatment? The basis of the paper is an analysis of the results and approaches discussed in the literature. System-

atic literature research was performed using the following databases: Springer Link, SSRN, EBSCO, Google Scholar, ResearchGate, and Science Direct. Descriptive statistics are based on: Orbis database of Bureau van Dijk, Statista, OECD.Stat and Eurostat. The paper proceeds as follows: Section 2 coins the definition of platform business models, elaborates on main attributes, typology, market capitalisation and presents descriptive statistics. Section 3 focuses on network effects, digital data and value creation. Section 4 discusses the disparities between effective corporate tax burden borne by platform business

models and by traditional business models, and the implications for tax policy. Section 5 summarizes the

main reform proposals and developments addressing the tax challenges arising. Section 6 concludes.

### 3 RESULTS

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The platform business models have been suggested to be simply understood as a technology-driven business model based on platforms that create value, and provide an institutional and regulatory framework enabling the previously unmatched demand-side and supply-side participants for interactions. The paper further identifies two main attributes of platform business models. Firstly, the value-creating users' activities and interconnected relationships between users amplified by network effects. Network effects are further identified as the main difference between the traditional and digital economy, and as the main driver of the demand-side economies of scale.

Secondly, the reliance of platform business models on hard-to-value intangible assets, particularly in the form of digital data. Furthermore, data mining, as the process of acquisition meaningful information from raw data, was identified as the main part of a platform business model that creates value. The value creation arises once the data are collected, stored, analyzed, and transformed into digital intelligence, subsequently monetized through commercial use. Further, it has been claimed that platform business models borne relatively lower corporate effective tax burden in comparison to traditional business models.

### 4 CONCLUSIONS

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The paper concludes, that the platform business models fully exploit the power of digital technologies and capture the value created by interaction between external participants. The existing rules designed for the traditional economy may need to be reviewed in light of new digital business models, exploiting the existing international tax system and reducing the tax liabilities. In a nutshell, the existing corporate

taxation rules are outdated and do not capture the digital transformation of the economy. Even though, the regulatory challenges in the area of corporate taxation were discussed by policymakers, industry, media, and academia, on both the EU level as well as globally, there is still need for discussion. The research will further focus on the implications of platform business models for tax policy.

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### 6 ACKNOWLEDGEMENT

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Supported by the Internal Grant Schemes of Mendel University in Brno project, CZ.02.2.69/0.0/0.0/19\_073/0016670, registration No. SGC-2021-015

# HOW DO PEOPLE DESCRIBE A LOCATION: TOWARDS AUTOMATICALLY GENERATED LOCATIONS DESCRIPTION

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## KEY WORDS

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location description, human centered place identification, NLP

## JEL CODES

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C88, C89

## 1 INTRODUCTION

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Working with places described by latitudes and longitudes is easy for computers. However, this is not the way people would choose to describe or define a location. People are not able easily comprehend a place described only by coordinates or similar kind of computer oriented identification (e.g. geohash, plus code, etc.). Even human made place identifications (address, street name, house number) require prior knowledge and don't provide much useful information about a place, especially in unfamiliar areas. People prefer to talk about places using a complex natural language. The most natural

way to describe a place is by using references to different kinds of urban landmarks, POI or even by involving personal perceptions and memories [1].

Text and voice oriented human-computer interfaces such as virtual assistants, chatbots, and conversational systems have become increasingly popular in recent years [2]. Many existing systems are adapting to this new type of human-computer interaction. In many cases, these systems need to convey a specific location to the user. It would be beneficial, not only from a UX perspective, to convey location in a more human centered way.

## 2 MATERIAL AND METHODS

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Our goal is to design a method which would be able to automatically generate place descriptions. This method should mimic the way humans are used to describe a place as closely as possible. The first necessary step, which is the main focus of this contribution, is to analyse how people describe places. We aim to find out which type of urban landmarks, POI and possibly other features are commonly used by humans when describing a place.

These findings will be later used in the method for automatic place descriptions generation.

Currently, several papers exploring the way people describe places exist. [1] identifies predominant types and styles of place description and commonly used spatial relationships. [3] and [4] describe how different levels of hierarchy and granularity influence place descriptions i.e how description differs when describing municipality vs. street etc. [5] explore the different factors influencing place descriptions

Tab. 1: Frequency of different types of locations which were used as a reference to describe the place. Only references with highest relative frequency are shown

Reference type	Relative frequency	Reference type	Relative frequency
city name	11.36%	municipal district	6.82%
greenery	9.09%	university, school	6.82%
type of building	9.09%	grocery	6.82%
street feature	9.09%	city park	6.82%

i.e. how description differs when describing place to different people and in different situations.

Unlike previous research, we solely focus on finding out which type of urban landmarks and POI people prefer when describing a place. For this reason we

have developed a data gathering application available at <http://popis-misto.web.app>. The data gathering application presents a user with a location marked on the map. The user's task is to describe this location using a natural language.

### 3 RESULTS

Data collected from our application are not yet available. However, we do have data from our preliminary study. The preliminary study was performed in person on five people and contains 14 descriptions of different places. Table 1 shows different types of

places and urban landmarks which people used as references when describing a place. For each reference type, we provide the relative frequency i.e. how often was a particular reference type used in a place description.

### 4 CONCLUSIONS

Knowing which particular features people use to describe places in real world scenarios will help us when designing a technique for automatic place descriptions generation. The preliminary study shows

promising results, so we can expect that the findings gained from our data gathering application could contribute to the place description research.

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# PARKING MANAGEMENT AND PROPOSAL OF PARAMETERS FOR DYNAMIC PARKING REGULATION IN PRAGUE

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## KEY WORDS

parking, smart city, dynamic parking regulation, dynamic pricing

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## JEL CODES

O30, R41, R42

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## 1 INTRODUCTION

Almost every city deals with the problem of lack of parking spaces. Vehicles looking for a place to park cause noise and pollution. Appropriate parking regulation can increase safety for all residents, save drivers time and money, save the City funds, and have a positive impact on air quality in the City. There are many different approaches to parking management, one of the simplest is to adjust the amount of parking fees.

This paper deals with a general proposal for dynamic parking regulation based on variable pricing and what it should be based on. The aim of real-time dynamic parking regulation is to evenly distribute vehicles. The main idea of the research is to propose the use of financial motivation of drivers to optimize parking. The aim of this paper is to present a proposal for real-time variable-price parking regulation.

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## 2 MATERIAL AND METHODS

The primary data source was freely available information on parking regulations in cities around the world. There are many studies that look at parking management – approaches to regulation. For example the study [1] describes 21 Parking Management Strategies with descriptions and their impacts. The dynamic pricing of parking and how to set it is the subject of many research papers. The paper [2] deals with the development of a dynamic demand-based system. The concepts of smart parking are discussed in [3], the possibility of parking space reservation and dynamic pricing are among the latest trends in smart parking. The paper also describes

the implementation of a smart parking system in Oakland, California.

Initially, an exhaustive research study – Detailed analysis of available means of regulating on-street parking – was prepared. This study looks at the methods of parking management and describes the existing approaches to parking regulation in selected cities. On the basis of the initial research, 25 cities around the world were selected for a closer examination of (on-street) parking regulation. Furthermore, the study analyses the legislation concerning the establishment of parking spaces in the Czech Republic

and in the capital city of Prague, and analyses in detail the parking regulation of the capital city. [4]

The purpose of the analysis was to determine what aspects can and should influence the price of parking.

### 3 RESULTS

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On the basis of the findings of the study, a proposal for the parameters of an algorithm for determining dynamic parking prices was developed. The dynamic price is primarily intended for short-term parking – visitors, and does not include prepaid cards and long-term parking permits (for residents and abonents). The general design of the algorithm represents a solution transferable between cities, the specific solution must always be tailored to the city.

A simpler version of the algorithm can be presented using the example of P+R parking lots in the capital of the Czech Republic. Currently there are 20 parking lots in Prague divided into 3 zones according to the distance to the city centre and the level of security.

### 4 CONCLUSIONS

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The aim of the research is to provide a comprehensive overview of existing approaches to parking regulation using examples from specific cities. There are many different approaches to parking, and cities respond differently to the demand for parking spaces that exceeds supply. Dynamic parking regulation – real-time price changes – is not currently in use for the on-street parking. The most advanced smart parking system is in San Francisco, where the price changes

The conclusions of this analysis are the input for the determination of the parameters of an algorithm for real-time dynamic parking regulation based on price.

There is a fixed price set, however, the current occupancy of parking spaces is monitored and this information is transmitted to drivers. [4] The current occupancy would determine the price of parking and would allow for a more even spread of vehicles.

For on-street parking, setting the algorithm parameters is more complicated. The parameters can be divided into two basic sets according to their variability in time. The time-invariant parameters include, for example: location relative to the city centre, distance from public transport stops and other parking areas, time of day. The basic time-varying parameter is occupancy, then e.g. the price of parking in the vicinity, etc.

depending on the time of day and after a few weeks the parking fee is adjusted according to the data obtained from traffic detectors.

The algorithm will be further developed and a model implementation will be carried out on a selected area (Prague city district) and the possibilities of implementing the dynamic parking regulation system in real operation will be evaluated.

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### 6 ACKNOWLEDGEMENT

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This work was supported by the Grant Agency of the Czech Technical University in Prague, grant No. SGS21/079/OHK2/1T/16.

# PROGRESSION OF SUPPORT FOR COMPANIES EMPLOYING PEOPLE WITH DISABILITIES

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## KEY WORDS

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people with disabilities, social policy, disability, income

## JEL CODES

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J14, J71

## 1 INTRODUCTION

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The ever-decreasing unemployment in the Czech Republic contributes to economic growth and the support of various groups of people in the labor market, who would be less able to place themselves in a job shortage, but there is already the fact that people are all actively looking for work, work already found. Therefore, with 358,152 t. (thousand) vacancies on the labor market and 252,995 t. jobseekers, it is impossible to fulfill some jobs. But it is not impossible to fulfill them, if we look at the number of people with disabilities (425,788 t.). It can be seen that at least some people with disabilities, who are able to work, could be an opportunity for companies to fulfill their long vacancies. According to current articles (especially in the mass media), companies in the Czech environment are constantly increasing the number of workers with disabilities for many specific reasons [2].The state provides companies actively

employing workers with health disadvantages relief on health insurance contributions, financial support for the previous quarter for employing a disabled worker for full-time or part-time employment. Also czech and foreign non-profit organizations dealing with disabilities offer many other benefits for this companies.

The aim of the research is to map the development of support for companies employing workers with disabilities, to reveal which factors are influencing the profit of organizations (for example the growth of the minimum wage and the social policy of the Czech Republic) and also to prepare the ground for further research, when a methodology for determining the economic advantage of employing people with disabilities in companies in the Czech environment will be proposed.

## 2 MATERIAL AND METHODS

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Data from the CzSO (Czech Statistical Office), CZMLSA (Czech Ministry of Labor and Social Affairs) were used, describing the number of people with disabilities, the amount of support for companies employing workers with disabilities, the increase in the minimum wage for given periods and the

specific data of a company employing workers with disabilities. To confirm the correlation between the profits of companies resulting from hours worked by employees with disabilities and factors which could influenced the profit as state support and tax levies for compulsory contributions for workers with

disabilities was used the Pearson coefficient. Data was collected from 2013 to 2019. To analyze data program Statistica and Gretl were used. Other calculations

were solved by basic mathematical operations and supplemented by the average and mean values for the periods.

### 3 RESULTS

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Companies interest for employing people with disabilities is constantly increasing, even outside the legal minimum of 4% of workers with disabilities (when employing over 25 workers). The profit of organization is significantly connected with level of hourly wage of disabled employees, which are affected by several factors. Like the wage of all others, the wage of the disabled is affected by the minimum wage, as evidenced by the high positive correlation

between the minimum wage and the hourly rate of employees with disabilities obtained by averaging rates according to data obtained from the company. The amount of wages and companies interest in employing can also be influenced by government's social policy, specifically the benefit to companies for the employment of the disabled. The evaluation of the current situation shows that government support for companies has also increasing trend.

### 4 CONCLUSIONS

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As Hasegawa [3] mentions, the State must help by its interventions in employing people with disabilities, because the labour market alone would not be able to employ this mass of people and would not be able to make up the difference in working capacity, which is reduced in people with disabilities. Non-profit organisations must also help to integrate people with disabilities and set up a suitable working environment in companies. Currently, the company is struggling to increase the protectionism of the state in the employment of people with disabilities, the social policies of many advanced countries are already aware of the strong base of people with disabilities and are trying to promote flexibility, participation in the work process in domestic companies. During

the recession, companies that focused on employing people with disabilities fell, so there is a visible change in corporate behavior and state policies due to increasing interventions [1]. According to the results obtained and the global resonance in promoting the employment of people with disabilities, progress in employing people with disabilities is clear, but we see here the not-quite-exploited potential of this large mass of people in the labour market. The question is whether or not the state's high cost of supporting firms in their employment leads to an effective social policy. The problem with this issue is that it falls on both the social and economic sphere, which makes it difficult to identify whether it is a positive or negative phenomenon.

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# FORECAST AFTER POST FESTUM CORPORATE FINANCING BY MUNICIPALITIES DURING THE COVID-19 CRISIS

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## KEY WORDS

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financing, Covid-19, municipalities, corporate financing

## JEL CODES

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G32, F65, O16, P33

## 1 INTRODUCTION

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The global economy took a hard hit after the official pandemic announcement. In 2020, the Federal Statistical Office reports a number of 15,841 companies (including small businesses) insolvent (as of March 31, 2021). All are affected: retail, hotels, restaurants, event companies, travel agencies, etc. In order not to endanger existing businesses in the market, the federal and state governments have launched Corona assistance programs. Despite advancing infection numbers as of 2019, tradespeople significantly af-

ected by business closures or revenue declines as a result of the COVID-19 pandemic should have the opportunity to apply for Corona assistance. The goal is to provide extended basic services to citizens through economic assistance to beneficiaries. But what is the forecast after the business funding or even support in the next few years? Do companies manage to maintain their operations after a cash injection? What possibilities and opportunities are there for traders? Or is there a debt trap hiding behind it all?

## 2 MATERIAL AND METHODS

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In order to make a forecast after the business financing, an initial forecast is to be made with the help of several municipalities. As an example, the municipality of Haan lists an application form with special requirements on its website under the heading CORONA-HILFPROGRAMM DER STADT HAAN. Companies must fill out and sign a complete application form for the procedure. Provide the income tax or corporate income tax return or tax assessment from the year 2019. A statement of income and expenses for the years 2019 and 2020. A statement of Corona aid received to date and

a written presentation of a positive going concern forecast for the year 2021, 2022 and 2023. Companies must provide these requirements in the application fulfillment in the first step. This pipeline is interesting for the forecast. How many companies are eligible through the application fulfillment requirement? And how many companies will receive a grant as a result. Haans budget is a volume of 300,000 euros. If the application is fulfilled, a company will receive a one-time grant of up to 2,750 euros. If companies are not willing to participate in a survey, the Bundesanzeiger (Federal Gazette) can be used to list the listed

companies in the municipalities and either monitor their profit and loss over the next four years, or whether they are listed at all or go bankrupt. This comparison could be done in 16 federal states and compared at the end (possibly after the pandemic). Which state is most affected? How do the debts among the municipalities compare with the financial injections? From these forecast reports, one can then

analyze which companies have been helped by the aid programs and which have not. It might be possible to draw up a catalog of criteria. On the other hand, one could also draw up a scheme. What are the relationships between the companies that have been able to stay in the market and those that have not? What is the trend for the future?

### 3 RESULTS

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It is expected that the result will be different after corporate financing by the municipalities. Companies that have been in the market longer and have already built up a wide customer base are likely to stay in the

market better and show an improved profit and loss account than those that started as start-ups in 2017, 2018 and 2019, for example.

### 4 CONCLUSIONS

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The Corona pandemic has affected tradespeople very badly. Some businesses had to close due to a drop in revenue. Self-employed people who had taken out loans just before the pandemic to realize their dream of owning their own business had to close down and even the financial injections were not enough for some. The conclusion is starting, running and managing a business remains a risk. Not only because there is a high proportion of competitors in ever shrinking niches, but also because such collateral

damage has to be accepted and as external risks that are difficult to calculate. Risk management has failed here worldwide if it were not for the aid programs introduced by the federal and state governments. For such external influences, it is important to know one's customer. Its costs, the efficiency of the company and to build reserves in the long term. What innovative ideas can be formed in order to remain a stable company in competition in the future? Can cooperations be established if necessary?

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# STATUS AND PROVISIONS OF FOOD BANKING SERVICES IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

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## KEY WORDS

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food bank, food waste, Central and Eastern European countries

## JEL CODES

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O13, Q18

## 1 INTRODUCTION

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Food banks in their current form began to be established in Central and Eastern European Countries (CEE) in early 2000s. Although these banks are providing their services free of charge, these services cannot be provided without subsidy schemes. Specifically, these are operating and investment subsidies mainly from sources of public budgets,

NGOs, charities or similar public entities and also individual donations [1, 2, 3]. A tendency to change the current status within activities of food banks in Central and Eastern European countries is visible [4]. The aim of this article is to identify current situation, status and consequently system of food banking among selected CEE countries.

## 2 MATERIAL AND METHODS

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A review type article is based on the research of the current state of knowledge in the field of effective service provision of food banks and it is using methods of analysis and synthesis of both foreign and domestic information resources. Partial outputs of the ongoing

research of efficiency aspects of the activities of food banks in the Czech Republic were also included for elaboration of this article. A qualitative comparison of main characteristics on food banks settled in the sample of CEE countries is provided.

## 3 RESULTS

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Despite the fact that food banks as community interest companies are not intended to meet profitability goals of their stakeholders, this legal type of companies have to be managed similarly to business entities in some areas, regarding fulfilling of their functions. It was provided an overview of selected aspects on active food banks settled in the sample of CEE countries, covering both quantitative and qualitative attributes.

An important field of interest regarding food banks is their financial status for meeting their services' provision, especially then in the connection with operational expenditures' subsidies, which provide to food banks a stable financial position for recovering of short term payables for inputs needed to their services' provision.

## 4 CONCLUSIONS

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Services of food banks in the sample of CEE countries can be currently considered as established at regional level, with their networks for redistribution of donated food. Food banks provide assistance to people in material need through charitable and humanitarian organizations acting as cooperating organizations of respective food banks at a regional level [5, 6, 7]. Subsidy support schemes can be considered as indispensable for support of food banks' services. These are not only subsidies for the operational level of their activities, but also for investments to storage capacities in order to meet requirements

for handling and hygiene of foodstuff. Although the current schemes of financial support help ensuring the activities of food banks there can be identified an effort to change the scheme of financial support provision to food banks in the CEE countries. Our findings also prove a diverse types of networks within the provision of food banks' services. This article provides a partial output of an ongoing research within project of specific research aimed at corporate social responsibility as a supporting tool for changing the system of financing food banks in the conditions of the Czech Republic.

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## 6 ACKNOWLEDGEMENT

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Supported by the grant No. PEF\_TP\_2021004 of the Grant Agency FBE MENDELU.

# CONSUMERS' PREFERENCES AND THE EVENT-RELATED POTENTIALS: LITERATURE REVIEW

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## KEY WORDS

event-related potentials, ERP, consumer preference, electroencephalography, EEG, consumer neuroscience, neuromarketing

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## JEL CODES

D12, M31

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## 1 INTRODUCTION

In recent years, neuroscience methods have come to the fore in marketing and consumer behavior research and gave rise to a new research area – consumer neuroscience. The electroencephalography method (EEG) is one of the way how to relatively cheap study what is happening in the consumer's brain. The aim of this review is to provide a deeper insight into the study of consumer preference using the event-related potential (ERP) method – the specific method of EEG data analysis to monitor cognitive responses in time to external stimuli. 19 studies focused on this

topic were found, which were selected using search queries in the metasearch engine EBSCO Discovery Service. The review summarizes not only the findings that have an impact on marketing and consumer behavior field but also the experimental designs used in these studies and technical aspects of the data recording. This should help novice marketing researchers in their experiment designs, deciding on the purchase of this technology, or in the analysis of ERP data.

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## 2 MATERIAL AND METHODS

Studies (data) researched in this review were collected in September 2020 via discovery system metasearch engine EBSCO Discovery Service (EDS) containing documents available within Mendel University and Masaryk University. For the data collection were used three search queries. Advanced search with Boolean operators “AND” and wild card “\*” was used. These search queries with keywords were, “AB ERP AND AB consumer\* AND AB preference\*”, “AB event-related potential AND AB consumer\* AND AB preference\*” and “AB EEG AND AB consumer\* AND AB preference\*”. From the first

search query, 17 studies were selected. Sometimes a sequence of words in a search query found those words, but the article didn't match the topic at all. In addition, articles that were not in English were removed. From second were selected only one another study. There were all the articles that were selected from the first search query and also many others which were not related to this topic (sometimes ERP appeared in the abstract e.g. ERP – external reference price). From the third search query, the collection was supplemented by three more studies.

### 3 RESULTS

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Studies in which the ERP method is applied in consumer preference can be divided into two categories. (1) studies in which we have a specific consumers' preference problem and the ERP method is applied to this problem (Ali Nazari et al., 2019; Guo et al., 2016; Hu et al., 2020; Chen et al., 2019; Chen et al., 2010, ...) and (2) studies which do not solve the marketing problem in essence but use ERP to try to predict the product preferential order of subjects that they

are part of the study and try to answer the question of whether it is possible to predict this preference, or with what probability (Telpaz et al., 2015; Goto et al., 2019; Goto et al., 2017). The results section was thematically divided into three sections: (1) Experiment designs and ERP analysis; (2) Technical aspects of EEG recording and (3) Implication to marketing and consumers' behavior.

### 4 CONCLUSIONS

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The event-related potentials technique is an ideal tool to examine the temporal sequence of information processing. Neuroimaging electroencephalography methods such as event-related potentials studies have their place in marketing research. It is a gradually evolving field that will gain in importance. The

measuring brain potentials reflect the consumers' direct responses to marketing stimuli more objectively and accurately. The results show that ERP is an effective method to study consumer motivation with emotionally or non-emotionally colored marketing stimuli.

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### 6 ACKNOWLEDGEMENT

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Supported by the grant No. PEF\_DP\_2021017 of the Grant Agency IGA Faculty of Business and Economics; and by the project CZ.02.1.01/0.0/0.0/16\_017/0002334 Research Infrastructure for Young Scientists, co-financed by Operational Programme Research, Development and Education.

# DIGITAL LOGISTICS IN THE LIGHT OF THE COVID 19 CRISIS

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## KEY WORDS

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supply chain, risk management, covid crisis, supply chain risk

## JEL CODES

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D24, L70

## 1 INTRODUCTION

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In construction logistics, technological changes are mainly triggered by digitization, which is also playing an increasingly important role in its ecosystem, as recent studies make clear [1]. However, depending on the state of digitalization, there are major differences between companies in the industry. Against this background, it seems useful to distinguish different levels of digitization with implications for strategies and practices in construction logistics. In particular, industries such as construction are generally considered to be less advanced in terms of the level of digitization [2] although recent developments such as the advancement of Building Information Management (BIM) as a method of strategic planning in the industry are becoming increasingly important and may have a corresponding impact on the ecosystem.

Despite the generally criticized technological backlog in the industry, the question of what a technologically adequately equipped construction logistics system could look like in the near future is of course not without relevance. Since construction logistics is considered an important partner of the increasingly

digitizing construction industry and has to operate in close networking with it, corresponding technologies are also becoming increasingly important here [3]. This seems to be particularly relevant against the background of increasingly complex processes and emerging risks and crises: In this context, particular reference can be made to the Covid 19 crisis, which presented the logistics industry per se with new challenges [4].

Not only has the continuing epidemic had a significant impact on general economic growth and social life, but also on supply chain [5, 6]. Global supply chains, in particular, were badly harmed during the early phases of the economic and social lock-down, which proved to be a critical issue for a diverse range of sectors [7]. While new methods to supply chain management and risk management have been developed [8], even in a modern context less influenced by the impacts of full lockdowns, supply chain management continues to face a number of COVID-19-specific problems.

## 2 MATERIAL AND METHODS

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In order to approach the research problem described above, a qualitative research approach is utilised. While the article expands on early results on the COVID-19 pandemic and its effect on supply chains,

it also acknowledges current research in the area on risk management [9].

In particular, the empirical research approaches the digitization of supply chain logistics in the

context of an ongoing crisis – with the accompanying difficulties for field managers – by assessing the construction industry’s present challenges in the context of the COVID-19 crisis.

### 3 RESULTS

The results of the empirical study reveal, that experts in the field (thus, experienced managers involved with risk management of their respective supply chains on the one hand and with digitalization strategies in the field on the other hand) do perceive digitalization as a potential response to the changing ecosystem of the industry. However, it also becomes

Standardized expert interviews with industry thought and business leaders will be used to evaluate both the perceived magnitude of the problem and the supply chain risk management methods already in use, as well as their assessed viability.

### 4 CONCLUSIONS

The findings shown within the paper itself indicate, that while first strategies are undertaken to address the rising challenges for contemporary logistics strategies in the field of construction, the on-

evident, that the contemporary state of affairs in the field does not allow sustainable approaches towards digitalization, as the experts agree to be mostly due to a lack of financial and personnel resources in the industry. Potential solutions and strategies to utilize the disruptive energy of the current crisis are presented.

going struggle with digitalization still seems to be a valid problem. Managerial implications are critically discussed and presented.

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# THE INFLUENCE OF ECONOMIC DISPARITIES OF REGIONS ON POLITICAL POLARIZATION

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## KEY WORDS

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polarisation, politics, economic well-being, Czech republic, gross domestic product, disposable income, unemployment, political economics

## JEL CODES

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D72, E61, P16

## 1 INTRODUCTION

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The presented text deals with the correlation between the political polarisation and economic well-being, thus whether regions with lower economic prosperity are more prone to the choice of more extremist, po-

larized, political establishment. The work proves the effect, while focusing on Czech Republic Parliament elections from 1992 to 2017.

## 2 MATERIAL AND METHODS

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The issue of the definition of polarization is addressed mainly in paper of DiMaggio et. al (1996) [1], that provides insight into its determinants. Whether polarization is a positive or a negative phenomenon and its effects on the political process are examined, for example, by Jones (2001) [2], the effects on the composition and decision-making process of a political set are further examined by Lidqvist and Östling (2010) [3]. From an economic point of view, Han (2015) [4] is one of the main authors dealing with the causality of economic well-being and polarization. The subsequent effects of high levels of polarization on the performance of the economy are examined, for example, by Woo (2009) [5].

The hypothesis states that the dependence of political polarization on the economic well-being of the studied regions of the Czech Republic exists, more precisely on the regional level. Data from the ParlGov (University of Bremen, 2021) [6] project are used, concerning the determination of given parties on the left-right ideological spectrum – the

extreme left-wing parties are given the value of  $-5$  by the experts of the project, and the extreme right-wing parties of  $+5$  and divided into individual groups according to the spectrum. The data are then transformed into a polarization index by the author, separately for each region, where for each year the voting results of the group (of the Parliament elections) are multiplied by the polarization value (on the ideological spectrum) of the group in absolute value, which represents the “weight of polarization”. Thus, for example, if in given election the voting preferences of parties of exact centre of the spectrum are 20% of the votes, these results are multiplied by zero. Based on this, a polarization index is created for the given region and the given election year. These data will then be analysed with the OLS method together with selected indicators of economic well-being.

The economic data are adjusted as follows. Data are selected only from election years to the Parliament. The paper uses a regression model for all the

studied regions of Czech Republic of the following form:  $\text{Polarisation}_{i,t}$  as an explained variable where  $i = 1, 2, \dots, 14$  for the regions of the Czech Republic,  $t = 1992, 1996, \dots, 2017$  for the election years (8 observations). The background of polarisation is explained before.  $\alpha_i$  is the constant,  $\beta_{j,i,t}$  the regression coefficients and  $\epsilon_i$  the random component.  $\text{GDP}_i$  represents gross domestic product per capita in

CZK according to the Czech Statistical Office data (same as the following two).  $\text{Unemp}_i$ , representing unemployment values, and  $\text{disp\_income}_i$ , representing household disposable income per capita in CZK.

$$\begin{aligned} \text{polarisation}_{i,t} = & \alpha_i - \beta_{1,i,t}\text{GDP}_i + \beta_{2,i,t}\text{unemp}_i - \\ & - \beta_{3,i,t}\text{disp\_income}_i + \epsilon_i \end{aligned}$$

### 3 RESULTS

According to the results of all the models, the correlation between political polarisation and economic well-being can be confirmed without any doubt; different regions are best described by different types of models. The correlation is confirmed using the definition of well-being mainly by household disposable income (plays a role in 12 out of 14 models used). The results for economic well-being defined by gross domestic product are also confirming, but with lower levels of explained polarisation variability. Unemployment values are an important part of 8 models of regions and should be included in the definition of economic well-being. The variability of the polarization index data is always explained by a

minimum of 59.96% (Pilsen region), and a maximum of 84.88% of the polarization data is explained in the case of the Central Bohemia region. In most regions at least 70% of the polarization variability is explained, which is a convincing result.

It could also be said that economic well-being has not been adequately defined, as can be seen in the potential problems with multicollinearity and in the three cases of regression models that do not fit the other explanatory models. The problem is found in the fact that disposable income is partially contained in the gross domestic product of the country and only one of these variables should have been used.

### 4 CONCLUSIONS

The tested hypothesis, i.e. the confirmation of the connection between political polarization and economic well-being of regions of the Czech Republic since its formation in 1993 can not be rejected. Each region exhibits its own specificities based on socio-historical development.

Voters in the Czech Republic are strongly influenced by the current economic situation of the state. The findings corresponds to the political cycle theory, as it is possible that the political establishment will seek to stimulate the economy in order to get re-elected.

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# THEORETICAL APPROACH IN DISTRIBUTION OF EFFORT AND INCOME BETWEEN THE DIFFERENT VALUE-ADDED PARTNERS ALONG THE SUPPLY CHAIN: FINANCIAL INFORMATION SHARING AND COLLABORATIVE BEHAVIOURS IN SUPPLY CHAINS

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## KEY WORDS

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supply chain management, financial information sharing, collaborative behaviour in supply chains

## JEL CODES

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F10, G00, M10.

## 1 INTRODUCTION

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Globalization and the increased development of relationships between different companies during the last years increased the importance of supply chain management as a concept to help a focal company to manage its supply chain partners [1]. Supply Chain Management can be seen and defined as the effective management on the three complementary flows in a network: material, information, and finance between a focal company and its partner organizations [2]. The flow of material as well as the flow of finance

between companies in a supply network is well researched, why this paper will put the focus on information sharing between the partners in a value chain. In supply chains it is clearly recommended to share so-called daily information about logistics activities such as delivery time, order status, inventory levels and delivery schedules on the operational level [3], but is there any information sharing along supply chains on the financial level and what could be the benefits for the entire supply chain?

## 2 MATERIAL AND METHODS

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The literature review is based on analysis of primary sources mainly conducted via the databases “EB-

SCOhost”, “ScienceDirect”, “Google Scholar” and “ProQuest” using the above mentioned keywords.

## 3 RESULTS

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In common businesses with globalization and the well-researched trend of outsourcing in parallel with a focus on the company’s own core competencies

competition in future will take place more and more between whole supply chains and no longer between single companies. The most competitive

supply chain in a business-area will survive. Thus, the way of looking at competitiveness currently changed from a single company view to a broad supply chain view, where the competitiveness of the whole supply chain is necessary to survive in a global market. To achieve this, it is – as a supply chain – necessary to introduce an inter-organizational cost management between all value-added partners involved in the product creation, production and delivery process. Financial information sharing and collaborative behaviours in supply chains becomes a major concept for the involved companies to achieve competitive advantages. Following the marketing scholars Morgan and Hunt [4], operations management scholars argue that relational factors such as trust, power and relationship commitment are key for supply chain information sharing. Missing these

factors will negatively affect the willingness to share information in a supply chain.

“In a similar vein, there is also a risk that shared information may negatively affect the competitive position of the buyer or supplier in relation to their competitors” [5]. Cost data is a very sensitive area of information for every company and often restricted for internal use. “There is a risk that only one partner reaps the benefits created by increased information sharing” [5]. Cost data information from the supplier side is often used by the buyer to strengthen his negotiation power and to lower the prices during order placement phase. In addition to that other studies stated, that the companies seem to limit information-sharing initiatives and restrict them mainly to the operational level.

## 4 CONCLUSIONS

The results of this study by taking all these arguments into account and the mentioned and well acknowledged role of supply chain information sharing in the discipline of operations management and on the operational level, but less in the field of financial information sharing, further research activities need to investigate on financial information sharing and collaborative behaviours in supply chain management as well as in the distribution of effort and income between the different value-added partners along the supply chain. Is there any relation between the company’s position in the supply chain (point of origin, point of consumption) and the amount of profit for the company? One major obstacle in financial information sharing along a supply chain is the fact that no customer wants to

have suppliers in his supply chain that earn more money or gain greater profit than the customer itself. Financial information sharing between all companies in a supply chain reveals the gain and profit situation of each and every company. Further research activities should focus on whether there is a single best vertical supply chain position for a supplier in the automotive industry in terms of profitability and is there a link between that and the openness and willingness to share cost information with the supply chain. Who makes the most profit in a supply chain, is it tier 1, is it tier 2, is it the OEM itself or is it the raw material supplier? Is there a relation between the company’s vertical position in a supply chain and the company’s profit?

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# THE DETERMINANTS OF HOTEL EFFICIENCY: EVIDENCE FROM THE UNITED STATES

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## KEY WORDS

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efficiency, DEA analysis, hotel performance management, US hotel market

## JEL CODES

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D21, L83, M10

## 1 INTRODUCTION

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Efficiency is a major determinant for the competitiveness [4] and the success of any company [6], the measurement of which is needed to implement improvements after having recognised the areas of weaknesses. Improvements in service quality, ameliorations of operations and the development of a successful strategy are crucial to hotel properties due to the competitive landscape of the industry initiated by globalization [3]. In order to achieve this goal, managers have to understand the gap between observed and optimised values of their input and output variables, considering the potentially achievable output by calculating a theoretical minimum of inputs [5]. In order to conclude on the efficiency of a hotel, the reasons behind an efficient operation have to be understood. These determinants include location with urban properties exhibiting a positive

effect [1], hotel size, where a small size has a negative influence due to the lack of scale efficiencies [8], hotel age, having a positive effect due to a larger experience of properties being present on the market [7] as well as hotel category and brand affiliation both implying a positive relationship initiated by better reputation and accumulated customer relationship [2]. This paper concentrates on the Travel and Tourism industry of the United States with the clear purpose to conclude on the driving factors behind an efficient hotel operation. The significant contribution of the travel and tourism (T&T) sector cannot be overlooked when considering the economy of the United States, since this represents a critically important segment of the national economy, making up 8.6% of the GDP of the United States in 2019, amounting to a total of USD 1,839.08 billion [9].

## 2 MATERIAL AND METHODS

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The analysis will be conducted as a coherent two-step approach, using a non-parametric frontier technique as the first step to calculate the efficiency scores through an input-oriented data envelopment analysis method (DEA), based on the BCC model by Banker, Charnes and Cooper. Independent variables were defined as total room related expenses, total

labour costs, total food & total beverage cost, while dependent variables are as follows: total sales, accommodation revenue, food & beverage revenues. As the second step, a Tobit regression analysis will be performed to understand the driving factors behind efficiency. Longitudinal data was collected over a period of 9 years, between 2011 and 2019, avoiding

irregularities caused by the Covid-19 pandemic that started to unfold in March 2020. The sample size

of 176 hotels totaled in 1584 observations, data was provided by Smith Travel Research (STR).

### 3 RESULTS

The research concluded on an overall efficiency score in the USA of 71.90%, with a low dispersion in average scores amongst the cities analysed. The most efficient service class is the economy segment with efficiency scores of 85.64%. The research computed a significant relationship between efficiency and all service classes with the exception of the midscale and upscale segment. The Tobit regression has shown that the luxury sector exhibits a potential improvement in efficiency scores of 0.124 when compared to the upper midscale category, while the upper upscale segment shows similarly positive results of 0.111, the highest improvement is displayed by the economy sector of 0.255. The most efficient hotel size is con-

cluded to be the category with more than 500 rooms nationwide (79.74%), for which the Tobit regression shows statistically significant results with a  $p$ -value of less than 0.001. Considering the age category, properties younger than 10 years of operation reveal highest efficiency levels (75.58%), worst efficiency is shown by hotels between 21 to 30 years (67.42%). In terms of location, resort hotels (74.06%), closely followed by urban properties (72.23%) exhibit highest scores. As for ownership structure, affiliated hotels show a clear advantage over independent hotels (60.33%) as observed through their efficiency scores (72.88%).

### 4 CONCLUSIONS

The paper concludes on the main determinants of the hotel efficiency in the USA. Significant service categories have a positive effect on efficiency. Large-sized (more than 500 rooms) hotels display the highest efficiency with a significant  $p$ -value. Additionally,

a non-significant relationship between location and efficiency was shown. The study also recorded a negative significant relationship between efficiency and age ( $p = 0.002$ ), while brand affiliation also exhibits a significant positive impact.

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# REVENUE LOSSES IN SPORTS: WHY PROFESSIONAL SPORT ORGANIZATIONS IN EUROPE DO NOT MAXIMISE ON TICKETING REVENUES

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## KEY WORDS

ticket pricing, fans, sports organization, revenue maximising

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## JEL CODES

M21, M31

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## 1 INTRODUCTION

Professional sports has become a multi-million dollar business and with ever increasing expenses on the sporting side for players, coaches, stadiums etc. maximising revenues has become crucial for professional sports organizations.

The most important streams of revenues in professional sports identified in academic literature are broadcasting rights, sponsorship and ticketing. While the first two streams have been growing significantly

over the last years according to Deloitte Football Money League reports, revenues from ticketing are growing the least and this paper aims to understand the reasoning behind this phenomenon. As the situation in the North American sports markets is quite different, this paper focuses on Europe where the more modern ticketing approaches are hardly taken advantage of.

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## 2 MATERIAL AND METHODS

Examining the existing papers on this topic we will start with a literature review. A few authors have already started to look into this topic and some come up with a theoretic model to identify whether or not ticket revenues could be increased by adapting pricing models like variable or dynamic ticket pricing. “The main goal of variable and dynamic ticket pricing strategies is to set optimal prices to maximise revenues. In some cases, prices are lowered to increase the number of tickets sold which results in larger revenue than empty seats with higher prices. In other

cases, market demand indicates that the market will bear higher prices due to the characteristics of the game, and fans’ demand and willingness to pay” (Fried and Mumcu, 2016). While variable ticket pricing takes more factors into account compared to the more traditional pricing approach when setting the ticket prices, i.e. day of the week, opponent etc., “dynamic pricing refers to a ticket sales approach in which sport teams make ‘real time’ adjustments to ticket prices based on factors such as actual consumer/market demand, win/loss record for home

team and opponent, injuries to star player(s), day of week of the game, other local entertainment options on game day, and anticipated weather conditions” (Harrison and Bukstein, 2016).

Further, a interview was conducted with Premier League champion Manchester City FC to understand their approach and strategy when it comes to

ticketing revenue generation. Ticketing revenue data from 2003–2019 on Manchester City was derived from the Deloitte Football Money League report. The results of the existing papers will be summarized and compared to the findings of the interview to understand if indeed, sport organizations accept revenue losses when it comes to ticketing prices.

### 3 RESULTS

Nufer and Fischer published the first paper to analyse ticket prices in the German Bundesliga in 2013. The authors find that despite having the highest attendance in European football with long waiting list at certain clubs, the German Bundesliga teams do not exploit ticketing revenues. Kemper and Breuer published the first study to apply a mathematical theory of dynamic ticket pricing (DTP) in 2016 in order to design a dynamic pricing model for a football club in a country where this pricing approach has not been applied thus far. The authors were able to demonstrate that applying DTP would lead to

increased revenues from ticketing thereby supporting findings of previous studies from the US sports market.

Also the expert interview came to the same conclusion: fans are the lifeblood of any sport organization and crucial for the atmosphere during the game. While almost every home match in the Etihad Stadium is sold out early in advance, Manchester City FC is not considering increasing ticket prices. Fan satisfaction is a high priority and full stadiums lead to incremental revenues as well as a positive impact on broadcasting and sponsorship revenues.

### 4 CONCLUSIONS

Despite increasing financial pressure, professional sports organizations in Europe are very reluctant to increase ticket prices. High stadium occupancy create a better match day experience which is also transferred to television. Further, full stadiums send a positive signal to sponsors showing the high demand and popularity of the club which helps to increase

revenues from the sponsorship stream. Hence not to upset fans is more important to sport organizations than maximised revenues. The contribution from ticketing to the overall club revenues is marginal compared to the revenues delivered by sponsorship and broadcast and therefore not worth the risk of upsetting fans and having less occupied stadiums.

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# THE IMPACT OF INCREASING PROPERTY PRICES ON LOAN-TO-VALUE RATIOS IN GERMANY – A CRITICAL LITERATURE REVIEW

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## KEY WORDS

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property prices, loan-to-value, low interest rates, household debt

## JEL CODES

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E43, G21, R31

## 1 INTRODUCTION

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Property prices in Germany have increased significantly over the past decade. The rise occurred in parallel with falling long-term interest rates. There is a causal relationship between interest and property value by using a discounted earnings method. Thus the development is not implausible intrinsically. Nevertheless it can be stated that the debt of property financiers has increased significantly in the observation period. When analyzing the risks, the increased debt must be assessed in the context of

the increased property prices. Therefore, the loan-to-value ratio comes into focus.

In principle, increased household debts lead to greater risks for banks. This creates indirect risks for the entire financial system. Some economies have already implemented limits for loan-to-value ratios. Consequently, the effectiveness of a limitation of the loan-to-value ratio in Germany is to be examined in order to be able to control the development of real estate prices and the indebtedness of private households.

## 2 MATERIAL AND METHODS

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Based on the described initial situation the research intends to answer the following research questions:

- Have risks for the banks and indirectly for the financial system increased as a result of property booms?
- Conversely, is the loan-to-value ratio a useful macroprudential tool to control the property price increase in Germany?

To work out the current state of research on the topic of increasing property prices on loan-to-value ratios and to answer the proposed research question a

scientific literature research was conducted. This literature research covered the period after the financial crisis from January 2010 to December 2020 and the languages were limited to English and German. The search terms used were “property prices” combined with “increasing” as well as “loan-to-value ratio” combined with “property prices” and “risk”. To finally answer the research question a structural content analysis according to Mayring 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.

Particularly in the property area, the quality of the publications is important. Often the publications come from research departments of companies in

the real estate sector or from institutes that do not belong to any university. A scientific structure or quality standard may therefore not be sufficient. Therefore, sources are only quoted from the journals of SCOPUS or Web of Science.

### 3 RESULTS

The critical literature review has shown that in comparable economic environments in a period of rising property prices risks for banks increased [2] [3]. In general two main price indicators are used to measure loan-to-value ratios for property at the time of purchase: the transaction price and the appraisal value [4]. Volatility associated with boom-and-bust cycles in property markets lead to more transaction price elasticity. For this reason properties can transact at prices well above their collateral values in a housing boom [3]. Commercial banks have set the initial loan-to-value ratio for long-term credit products not at the appraisal value, but partly at the transaction price [7].

Empirical evidence suggests that loan-to-value policy is effective in reducing risk associated with property boom-and-bust cycles. Furthermore there is clear evidence that tightening loan-to-value ratios would reduce household debt and credit growth. This lower debt plays a major role in strengthening banks' resilience to property price shocks [2]. The effect of implementing a loan-to-value ratio policy has a average two percentage point negative impact on property loan growth a half year after implementation. A loan-to-value ratio policy is also effective at reducing house price inflation by limiting the credit-fuelled housing demand channel [1; 5; 6; 8].

### 4 CONCLUSIONS

The rise in property prices has increased the risk for banks. In order to control the risks, banks should implement a loan-to-value ratio based on the appraisal value. This should be done with the focus on reducing

the credit risk, but not restricting the attractiveness and access to long-term financing. The loan-to-value ratio policy is also suitable as a macroprudential tool to control the rise in real estate prices.

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# BUSINESS MODEL PATTERNS: A SMART WAY OF INNOVATION

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## KEY WORDS

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business model pattern, business model innovation, digitalization, innovation management

## JEL CODES

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O33, O31, M19

## 1 INTRODUCTION

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The digitalization enables numerous opportunities for growth and prosperity to companies, showcased by the rise of the Silicon Valley start-ups. But it also bears the seed of decline for established companies like, Kodak or Quelle. Business models as main success factor in the context of the digitalization play an important role in this game of rise and fall, but established companies face harsh difficulties trying to adapt. One of the key factors here is the “dominant logic”. Business model patterns enable existing companies to overcome these burdens in

order to stay competitive and enable business model innovations. Patterns are collected in databases like “the St. Gallen Business Model Navigator” but they lack a direct link to the digitalization and arise mainly from well established companies. But business model innovation is mainly driven through start-ups, so the aim of this paper is to identify the existing business model patterns and their key dimensions, which occurred in start-ups and have the digitalization as enabler.

## 2 MATERIAL AND METHODS

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Business models are one of the most important success factors for companies, but the dominant logic, as the collective mindset of a company, which has emerged in the course of past successes and which makes a company blind to necessary changes (Csik, 2014), affects the business model disproportionately strong (Cavalcante, Kesting & Ulhøi, 2011). To break these chains, business model patterns are one of the most relevant ways since it directly highlights the “proof of concept”. Conducting research in publicly available databases to find start-ups in the first place, their business model was afterwards evaluated based on the business model canvas. The construction of

new patterns was conducted based on the Grounded Theory and ended after a theoretical saturation, meaning, after 2000 evaluated start-ups, no new patterns were discovered. Given that 90 percent of all new business models are combinations of already existing business models pattern-based innovation, drawing on Baden-Fuller and Morgan’s (2010), the new patterns were evaluated based on their newness in regard to the “THE BUSINESS MODEL PATTERN DATABASE – A TOOL FOR SYSTEMATIC BUSINESS MODEL INNOVATION” by Remane et al. (2017).

### 3 RESULTS

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Based on understanding of the “recombination school” (St. Gallen point of view) the business model is a combination of constant basic dimensions, which are designed individually for each company. It is therefore a kind of blueprint for corporate activity (Gassmann et al., 2016). The business model is thus both a reality-describing and reality-creating construct. According to Nemeth (2011), the following four dimensions and their design are decisive for this dual function. The first is the recipe function of the business model (“business models as recipes”) according to Baden-Fuller and Morgan (2010), meaning that a company’s current business model can be used to guide business model innovations in other companies. The second performative dimension is that of structuring, as a representation of the key similarities and differences between two or more business models (Baden-Fuller & Morgan, 2010). The third dimension is the identification

function, whereby a company feels it belongs to a group of companies with similar business models based on their structure. The fourth dimension is the communication function of the business model, which considers a business model a narrative representation of the company’s activities and, above all, of the value generation. Based on these dimensions, business model patterns are a variable way, but they need to be described precisely to be understandable and therefore to be replicable. The result of the desk research are the following patterns, which are determined by at least two dominant business model dimensions: Gig Economy, Fast lane, Robot Texter, E-Health, Target the State, 3D printing, Blockchain, Cashback, Anonymity, Early Access, De-taboo, E-Sport, Cloud Computing, Human-Machine Interaction, Augmented Reality, artificial intelligence, Track and Trace, Sharing, Big Data, Influencer, virtual reality, Agriculture 4.0 and Browser extension.

### 4 CONCLUSIONS

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Business model patterns are a suitable way of coping with factors, which limit the capacity to develop new business model and enable companies to establish them. The narrative dimension of the business model for example persuades doubting employees by

referencing well known and successful role-models. The new patterns could therefore be a relevant help for well established companies to adapt their business model too the needs of digitalization.

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# DIGITAL READINESS ASSESSMENT IN NEED OF BUSINESS MODELL INNOVATION

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## KEY WORDS

---

digitalization, digital readiness, innovation, business model innovation

## JEL CODES

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O31, O32, M19

## 1 INTRODUCTION

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Digitalization is changing the entire economy and therefore it also affects all stages of the value chain. Exemplary fields of action are the service portfolio, business models, the value chain, the change management, technologies, or processes, but the problem is that not every dimension could be the field of action at the same time. The resulting complexity must therefore be managed through a holistic transformation. The assessment of the digital readiness offers the needed guidance by offering significant information about the current situation.

Maturity models are the most relevant method for obtaining this, as they both make the status quo visible and are an instrument for further development by mapping the current state of the company (Back & Berghaus, 2016). The main objective of the paper is to propose a maturity assessment framework for established companies. To make something like this possible, the focus will be on the manufacturing industry as a clearly defined area, which has a high relevance for Central Europe, as it provides a relevant part of the GDP.

## 2 MATERIAL AND METHODS

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Maturity models are generally used to show the status quo of a certain process with regard to the achievement of a goal. There is no widely accepted model for creation of a maturity model in science (García-Mireles et al. 2012). The lack of scientific consensus could be overcome by focusing on generally accepted process steps that following García-Mireles et al. (2012) occur in most of the relevant publications. These are the dimensions: inception, elaboration, construction, deployment and maintenance. However, this is a minimum consensus, which narrows the full breadth of the discourse to such an extent that omissions can potentially occur.

To fill this gap, the publication refers to subordinate elaboration aids, such as the “A framework of general design principles for maturity models” by Röglinger and Pöppelbuß (2011) or “Understanding the Main Phases of Developing a Maturity Assessment Model” by De Bruin et al. (2005). Moreover, a top-down procedure is used, as it is recommended for less developed topics. As far as no suitable maturity assessment model has been identified in the literature, so far, the foundation of the model can come from the work of Lichtenthaler and Lichtenthaler (2009). It contains six dimensions: inventive capacity, transformative capacity, innovative capacity, absorptive

capacity, connective capacity, desorptive capacity, which are the sum of knowledge exploration, retention and exploitation based on an intrafirm, as well as interfirm evaluation. As the Lichtenthalers' model is not 100% relevant to maturity assessment, its components have been evaluated by a three steps approach. First the comparison to existing

maturity models, second a inclusion of frameworks in the context of digitalization. Finally the assessments of business model compnend based on relevant literature. Weaknesses have been identified and based on them a relevant structure of a business model maturity assessment has been proposed.

### 3 RESULTS

Evaluation of the Lichtenthalers' model (2009) showed that the weaknesses include missing internal connections between the maturity model dimensions, and their incompleteness (missing business model innovations assessment). As a result, a new maturity model is proposed, which focuses on the manufacturing industry and brings a new main emphasis on the business model innovation as relevant dimension. The other main dimensions are strategy, as the combination of the current and long-term adaptation of the corporate strategy to digitization, the "digital commitment", i.e. the seriousness and determination with which these adaptations are implemented and the adaptation of the innovation process. The maturity criteria of the organization are the clear allo-

cation of responsibilities and budgets for the digital projects, as well as an organization that can work with external, but also internal, cross-departmental cooperation. Thirdly, modern working methods and the necessary resources, such as spatial concepts, must be taken into account. Transformation management is operationalized by supporting the top management, as well as appropriate "performance measurement" of the transformation and as final dimension a stringent communication with stakeholders. The cooperation is based on the existence of a network of partners, as well as the possibility to use internal knowledge externally. Finally, a well-developed IT infrastructure is important.

### 4 CONCLUSIONS

In conclusion, the proposed maturity model combines a focus on the manufacturing industry, with an inclusive approach to business models. The model

is designed to be used in practice and therefore to generate valuable insights, which could lead to more and earlier adaptations to the digitalization.

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# LEVERAGED BUYOUTS OF PRIVATE EQUITY FIRMS IN THE HEALTHCARE SECTOR – ARE “BUY-AND-BUILD” STRATEGIES POSSIBLE?

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## KEY WORDS

leveraged buyouts, financing, private equity, healthcare, buy and build

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## JEL CODES

G30, G32, G34

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## 1 INTRODUCTION

Appelbaum and Batt raised the question how and to what extent private equity firms can use their classic business model of leveraged buyouts (also) in the healthcare sector (Appelbaum and Batt 2020). In a leveraged buyout the private equity firm uses an above-normal amount of debt, as opposed to equity or cash, to finance the purchase for the target company (Kaplan and Stromberg 2009) in order to enhance its investment's internal rate of return (so called “leverage effect”). This question is of particular interest in the healthcare sector, as private equity firms are extensively using so called “buy-and-build” strategies in this sector (Scheuplein,

Evans and Merkel 2019). In such strategy a private equity firm buys an additional company and then builds on that platform through add-on acquisitions. This strategy somewhat conflicts with the interest of third party lenders. This is why facilities agreements documenting leveraged buyouts basically prohibit add-on acquisition. Thus, the aim of this article is to answer the question if facilities agreements documenting leveraged buyouts in the healthcare sector anticipate/allow for add-on acquisitions and/or buy-and-build strategies of private equity firms and if so, under what conditions.

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## 2 MATERIAL AND METHODS

The principal data source for this article are forty eight facilities agreements relating to leveraged buy out transactions in the healthcare sector. These facilities agreements have been examined by using the method of qualitative document analysis (QDA) adapted from Altheide's Process of Document Analysis (Altheide 1996). One part of the analysed facilities agreements have been collected from transactions in which the author was personally engaged and has advised the lender(s) or the private equity firms. Another part of the documentation has been obtained from EDGAR, the Electronic Data Gath-

ering, Analysis, and Retrieval database operated by the U.S. Securities and Exchange Commission (SEC). Facilities agreements filed with the SEC are freely available to the public via the internet. Facilities agreements documenting leveraged buyouts are often based on standard facilities agreements. In the US the loan market is dominated by the standard documentations of the Loan Syndication and Trading Association (LSTA), in Europe market participants are widely using the standard documentation provided by the Loan Market Association (LMA) (Borowicz 2021). All such standard facil-

ities agreements contain comprehensive catalogues of so called covenants obligating the borrowers and guarantors to refrain from doing certain things (so called “negative undertakings”), including add-on acquisitions. Negative undertakings are mostly structured based on rules and exception, whereby a general prohibition is initially stated, which is then limited by subsequent exceptions from this general

prohibition. These exceptions are mostly contained in the so called “permitted”-definitions at the beginning of the respective facilities agreement. Thus, key areas of the analysis were the negative undertakings relating to acquisitions and the related “permitted acquisitions” (or similar) definitions in the forty eight analysed facilities agreements.

### 3 RESULTS

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The analysis has shown that buy-and-build strategies, which are key to private equity firms in the healthcare sector, are possible and standardly anticipated in facilities agreements documenting leveraged buyouts. The analysis of the definitions of “permitted acquisitions” has revealed that the conditions imposed by third party lenders on add-on acquisitions are often less strict than the standard facilities agreements for leveraged buyouts foresee. This applies in particular with regard to the requirement as to what percentage of shares in the target company must be acquired. However, the analysis has also shown

that in the healthcare sector third party lenders are stricter when it comes to the conditions dealing with the countries in which target companies are incorporated and if the target company is engaged in a business substantially the same as that carried on by the target group. This is mainly driven by the fact that acquisitions in the healthcare sector are subject to different regulatory environments in different countries. Thus, third party lenders are somewhat forcing private equity firms to focus on certain countries and certain areas of the healthcare sector in which they have already gained experience.

### 4 CONCLUSIONS

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Leveraged buyouts and buy-and-build strategies of private equity firms in the healthcare sector are not mutually exclusive. Also in the healthcare sector private equity firms are able to take advantage of the economic benefits of a buy-and-build strategy as well as the leverage effect. In case private equity firms would like to rely on leveraged buyouts to acquire ownership of add-on companies, the conditions of permitted acquisitions stipulated by the respective facilities agreement have to be taken into account and negotiated with the third party lenders in connection

with the facilities agreements. These conditions for permitted add-on acquisitions are often based on the conditions suggested by the LSTA and the LMA in their respective standard facilities agreements for leveraged buyouts. However, those conditions only act as a starting point for negotiations and private equity firms can regularly negotiate less strict conditions with third party lenders and more flexibility to pursue their buy-and-build strategies in the healthcare sector.

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# THE MEANING OF CULTURE AND COLOUR IN USER INTERFACE DESIGN

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## KEY WORDS

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colour, culture, GUI, interface, design

## JEL CODES

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C88, L86

## 1 INTRODUCTION

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In general, a user interface can be described as the component of software facing the user. It conveys information and represents actions that a user can perform. Companies with a global presence need to consider their target countries' cultures to ensure international success. Additionally, companies with a global presence must also pay close attention

to cultural influences by customising their website designs and application designs, e.g., adapting websites to right-to-left writing & reading for Arabic languages. This research paper will investigate the cultural implications of colour and examine the colour preference of Chinese and Western cultures and their usage in GUI (graphical user interface).

## 2 MATERIAL AND METHODS

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To better understand the current state of research and the real-world experience, the author looked at available literature and compared typical applications that are widely used in China and Germany. Typical user interfaces have been analysed in terms

of usage of colour and the usage of common design approaches. Additionally, design practices have been compared. A common factor underlying this research was to take into account cultural frameworks such as the cultural dimension framework by Hofstede.

## 3 RESULTS

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Over the past decades, the Chinese-specific user interfaces often developed differently from Western practices and standards. Chinese user interfaces take the form of 'one-size-fits-all' patterns, which can be seen in voice messaging usage and the 'cute' mascot, animation, and mascot popularity of Wechat (Marcus, 2003). Traditional Chinese values dictate the Chinese application model and colouring as

opposed to western-style standards. In China, people set up and preserve social relationships by creating a persona and particularistic ties with other parties (Plocher et al., 2012). The colour elements in Chinese GUI have to mirror a relationship with the culture and tradition, beginning with identifying universal grounds that can be strengthened by favour reciprocation. Chinese mobile money transfer applications

have used the red colour as a digital version of the Chinese Lunar Year traditions, the so-called hong bao. Mobile and web applications have different functions with different colours, mirroring a relevant Chinese traditional practice. WeChat, for example, uses the red-coloured packet function for money transfer to contacts (Marcus & Gould, 2010). Not only for its matching colour scheme also due to its meaning, but the red colour is also often accompanied by yellow elements. The Chinese word for yellow has the same pronunciation as the word “Emporer” and is therefore considered to symbolise power and status (Yu, 2017). It should also be noted that Chinese applications generally have more functionalities than Western applications, which have relatively fewer functionalities as apps are more function-specific (Russo & Boor, 2013). Most Chinese applications tend to have more functions than western ones, and the colour of each functionality is differentiated by

culture and tradition. On the other hand, western users are not as colour sensitive and access similar services through separate, task-specific apps. All these affect colour choice in GUI designs as each app differentiates its different functionalities depending on the role and relation to culture and societal values. The Chinese culture associates the good and bad image with colour choices as they depict trust and societal judgment within the concept of keeping ‘face.’ The western culture is less concerned with colour choice except for black, which is more associated with poor reputation mistrust. Additionally, the right choice of colour may also benefit the usability in terms of storage, retrieval, and display of information (McCool, 2008). How subtle the differences of colour perception and interpretation are was also shown in a study by Jiang et al., which revealed that Hong Kong Chinese and Mainland Chinese interpret red and green in the opposite way (Jiang et al., 2014).

## 4 CONCLUSIONS

The users of web and mobile applications in China prefer a general, all-inclusive user experience design over a task-oriented design focusing on usability and overlooking expediency. Due to this enamour for practicality in the Chinese app market, it is recommendable to incorporate different services and functionalities into one app differentiated by different colours reflecting Chinese traditions and cultures, especially red and yellow, which are widely considered

to convey a positive character as they symbolise good fortune and wealth and happiness in general whilst yellow symbolises royalty and prosperity. Western app users are more lenient in attitude towards colour choice as opposed to the Chinese app users. It is imperative to incorporate Chinese traditional colour choices in GUI design if an app or website should be successful in China.

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# PRODUCTION PROCESSES IN THE TRUCK BODY BUILDER INDUSTRY AND THEIR DISTINGUISHING CRITERIA

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## KEY WORDS

---

production process, market survey, truck body builder industry

## JEL CODES

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L23, M21, O14

## 1 INTRODUCTION

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In almost all manufacturing companies, organizational and technical workflows are modeled via so-called production processes. They reflect the method of product transformation along the value chain. Especially in industry such processes are mainly differentiated based on given or targeted parameters in the areas of capacity, flexibility, reliability and stability. Also the measurability of different efficiencies and key performance indicators is an essential part of such production processes. Through them different types can be benchmarked against each other in order to find the best one for the production of the given

product. While the best production processes are already known and established for large industrial sectors such as textiles, furniture or the automotive industry, there is no clear literature on this subject for less focused segments. One of these segments is the truck body builder industry. This work tries to identify applicable production processes for this industry and to make them distinguishable from each other by means of quantifiable parameters. The aim is to define a framework that allows a survey of the actual state in the real economy.

## 2 MATERIAL AND METHODS

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To achieve this goal, the first step is to analyze potentially process models. For those measurable indicators to classify production processes in real companies must then be defined. The analysis of the process systems is mainly carried out by using literature research. Thereby the focus is on already existing models in the manufacturing areas around the automotive industry. In addition literary references to possible variations of individual models for similar industries are also monitored. The resulting

collection of methods will be compared at the end with specific requirements of the truck body building industry. This will answer the question of which production processes are basically thinkable in this kind of industry. After identifying the potentially applicable methods, it is necessary to define measurable parameters that allow the methods to be differentiated from each other. For this purpose, a team of experts compares the characteristic basics, differences, advantages and disadvantages of

the individual systems. This creates an first rough framework of criteria, which is further refined by adding industry-specific key points. At the end, a catalog of measurable criteria is provided, by which

it is possible to classify the current process situation of a company to one of the predefined process groups by means of a survey.

### 3 RESULTS

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Despite the above-mentioned limitations, there exists a lot of literature on the subjects of production methods and workflow processes. Many of them deal with classical approaches such as lean production or flow-oriented systems such as the push/pull principle. These approaches can best be summarized by the term “series production”. Further research is investigating the impact of digitization and data management on production processes and the opportunities for integrating them into customer-oriented business process models. In the context used here, the term “make-to-order production” comes closest to the desired flexibility and individuality. But there are also research approaches that try to provide solutions between these two extremes. For example,

portfolio-based production systems already influence the product in a early development stage and steer in this way the subsequent production in direction of a modular design. This “modular production” is a hybrid between make-to-order and series production. But without a definition of the degree of modularization it cannot be clearly positioned between them. In order to be able to classify the respective process situation of the companies and to determine the prevailing degree of modularization, the questionnaire includes also value scales on the topics of flexibility, lead time, vertical range of manufacture, buffer zones, pre-assembly stations and cost sensitivity.

### 4 CONCLUSIONS

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From a large number of existing process models, the three most suitable process systems could be selected. By using devined parameters, it is possible to clearly delimit these systems from each other, or to make mixed forms of them visible. Based on these defined measurement criteria, the current situation can now be evaluated in the course of a market survey. The result of such a survey should primarily provide information about the current distribution

of use of the preselected process systems in the truck body builder industry. Additionally, these interviews should also draw the individual preferred process by means of an advantage/disadvantage comparison of each system. The difference between the current situation and the preferred situation should make it possible to deduce trends in the field of such production processes.

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# EFFICIENCY OF MIXED FARMING COMPANIES IN THE VYSOČINA REGION (CZECH REPUBLIC)

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## KEY WORDS

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efficiency, data envelopment analysis, mixed farming sector, Vysočina region

## JEL CODES

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C44, D24

## 1 INTRODUCTION

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The area of research are companies based in Vysočina region (Czech Republic). In this region, the agriculture, fishery, and forestry sector has long employed the highest number of people. At the same time, roughly twice as much gross value added is created in this sector as the regional average of the Czech Republic. A detailed focus is given to the evaluation of efficiency within the very specific sector of mixed

farming (NACE code 0150). Efficiency is one of the most important factors in any successful business, as it generally says how successfully a company manages its resources. For this reason, more and more companies are focusing on efficiency. The main aim of this article was to estimate the efficiency of companies in the selected sector located in the Vysočina region.

## 2 MATERIAL AND METHODS

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The dataset was a set of selected financial indicators of companies performing economic activity within the framework of mixed farming in the Vysočina region in 2016. These data were obtained from the Orbis database. A total of 117 companies with information available in the database were examined. A total of four inputs (total assets, capital, costs of employees, and material costs) and two outputs (turnover, and value added) were used. All variables are expressed in thousands of EUR.

Efficiency was estimated based on nonparametric data envelopment analysis. This method is widely used in evaluating efficiency in various sectors, see

for example [2], [3], and [4]. In order to estimate efficiency, the input-oriented CCR and BCC models were used. A combination of the results of these two models makes it possible to analyse scale efficiency. Scale efficiency helps to identify units that can improve based on internal changes. It is calculated as the ratio of the efficiency rate of the unit determined by the CCR model to the efficiency rate obtained by the BCC model. Technical details regarding data envelopment analysis can be found in [1]. DEA SOLVER PRO software was used to estimate the efficiency of the individual companies.

### 3 RESULTS

Based on the estimates obtained using the CCR model, it was found that the largest group included companies with an efficiency of between 80% and 85%. Out of the 117 examined companies, a total of 23 were placed in this group. According to the estimates of the CCR model, the average company should reduce the size of its inputs 0.863 times, while maintaining the same size of output, in order to achieve greater efficiency. A total of 19 companies (i.e., approximately 16%) were classified as fully efficient. Ten companies did not reach a 75% level of efficiency. The worst rated unit needs to reduce the size of its inputs by 37 pp to achieve full efficiency.

According to our prior expectations, the BCC model identified more fully efficient units than in the previous model. This is due to the fact that the group of fully efficient units was the largest. In total,

over 30% of all the units were in this group. At the same time, there were only 6 units in the group of companies below the 75% efficiency limit. The overall average efficiency increased by 3.7 pp compared to the estimates of the CCR model. Furthermore, it was found that the unit with the worst rating must reduce its inputs by at least 32.1%, while maintaining the size of the outputs in order to achieve full efficiency.

Scale efficiency was calculated using the ratio between the estimated CCR value and the BCC value. The best rated 25% of units achieved a scale efficiency higher than 99.9%. More than half of the examined companies had a scale efficiency higher than 97.3%. A total of 19 units were fully scale effective in 2016. A quarter of companies had a scale efficiency of less than 93.7%. The average unit had a scale efficiency of 96%.

### 4 CONCLUSIONS

The results show that in the case of the models used, most companies showed a high level of efficiency in the period under review. According to each of the models, the average estimated efficiency was around 90%; the best 25% of companies achieved an efficiency of at least 94%; and the remaining 75% of companies were above 79% efficiency. Unfortunately, there are currently no other studies assessing the

efficiency of individual companies in this sector, so it is not possible to make a comparison with previous results. However, it is possible to build on this analysis in the future and evaluate efficiency in the years to come, and also compare the efficiency over time. Such an assessment would also be helpful in analysing the impact of the COVID-19 pandemic on companies in the sector.

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# THE POSITION OF THE CZECH REPUBLIC WITHIN THE ACCOMMODATION, FOOD, AND HOSPITALITY SECTOR

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## KEY WORDS

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efficiency, data envelopment analysis, scale-efficiency

## JEL CODES

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C44, D24

## 1 INTRODUCTION

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Tourism is an integral part of the economy of all EU countries, even in today's uncertainty over the Covid-19 pandemic. This article focuses on one specific sub-sector of tourism, namely the Accommodation, Food and Hospitality sector, which is influenced by many factors not only at the internal, but also at the national and international level. The key to success of enterprises within the selected sector and also an important factor in competitive markets in general,

can be to streamline processes. A high efficiency level for individual enterprises contributes to the competitiveness of the whole country. The main aim of this paper is to estimate the efficiency of enterprises within the Accommodation, Food and Hospitality sector in the Czech Republic and compare the efficiency level of the Czech Republic with the EU average.

## 2 MATERIAL AND METHODS

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The annual data used was obtained from the EU KLEMS database in a range from 2013 to 2015. To calculate the value of the efficiency level, the non-parametric method of data envelopment analysis (DEA) was used. For our purposes, standard DEA models, such as the CCR model assuming constant returns to scale (CRS) and the BCC model assuming variable returns to scale (VRS), were applied. The reason for using both models is the possibility of quantifying the scale-efficiency, as in [3].

Due to the requirement for maximum representativeness of variables, the number of hours worked by employees and the gross value added at current prices

are selected as input variables. Gross production at current prices and nominal gross fixed capital formation are selected as output variables. Except for the former, all others are presented in financial terms (national currencies have been converted into millions of euros at the average exchange rate in a given year) as in [2]. 25 countries (including the Czech Republic) are included in the EU average. Input orientation of all the DEA models was selected as in [1], since it is assumed that individual enterprises are able to influence mainly the input side of transformation processes. The efficiency score is calculated by DEA SolverPro.

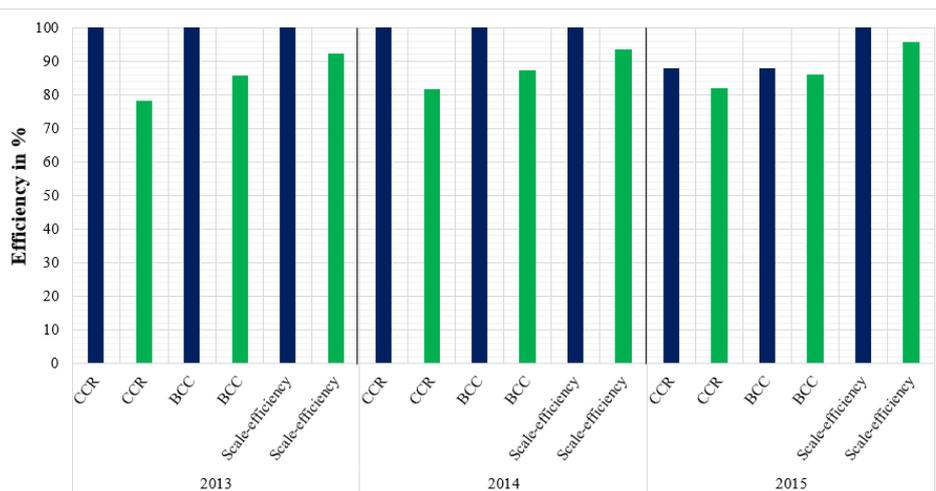


Fig. 1: CCR-, BCC- and scale-efficiency of the Czech Republic (blue) and the EU average (green) in all periods

### 3 RESULTS

Fig. 1 shows the efficiency of the Accommodation, Food and Hospitality sector in the Czech Republic (blue) and the average of selected EU countries (green). At first sight, it might be a surprise to see that efficiency values are relatively high, although most other sectors are still recovering from the Great Depression of the 2008 at that time. The main reason for such a high score in the case of the Czech Republic might be the increasing number of newly established enterprises with more qualified employees in this sector. There is also a year-on-year increase of 4.5% in the number of guests staying in accommodation establishments.

The Czech Republic reach the limit of 100% efficiency in the model with CRS and also VRS during 2013 and 2014, so it is also fully scale-efficient. In 2015, the value of efficiency in the Czech Republic reaches 87%, probably due to the decline in investment and weak demand for gross fixed capital formation. Although the efficiency score is lower than in the previous periods, the Czech Republic is still above the EU average. Because the values are almost identical for the CCR and BCC models, the scale-efficiency remains 100%.

### 4 CONCLUSIONS

The results of this article show that the average efficiency of EU countries in the Accommodation, Food and Hospitality sector is at a relatively high level. The Czech Republic is itself above this average in terms of efficiency throughout the period under

review. This statement is valid not only for all the periods, but also for different types of efficiency (i.e. efficiencies derived from CRS, VRS and also scale-efficiency).

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# DETERMINANTS OF CAPITAL OUTFLOW

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## KEY WORDS

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foreign direct investments, capital outflow, profit repatriation, panel data

## JEL CODES

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C33, E22, F38

## 1 INTRODUCTION

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After The Velvet Revolution, there was a significant inflow of foreign direct investments (FDI) to the Czech Republic which had peak in 2005. Since then, there is increase of capital outflow in the form of profit from FDI. This outflow in the Czech Republic

is the biggest one among The Visegrád countries. The main aim of this paper is to evaluate which factors have impact on the size of the capital outflow in the form of profits from domestic companies in the foreign ownership.

## 2 MATERIAL AND METHODS

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For evaluation of determinants will be used panel data model with fixed effects in the following form:

$$\text{outflow}_{it} = \alpha_i + \beta_1 x_{it1} + \beta_2 x_{it2} + \dots + \beta_k x_{itk} + \epsilon_{it}$$

In the model will be tested data from ten Central and Eastern European countries and Baltic states, namely Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia, in the period from 2004 to 2019. Main sources of data are databases of institutions like UN, IMF, OECD, WB and Eurostat. Potential determinants are chosen according to available papers concerning capital outflow and flow of FDI. Among tested factors are inflow and stock of FDI in percent of GDP, GDP on purchasing power parity in

USD millions, financial compensation for employees on GDP, ratio of people with at least secondary education, unemployment rate, corporate tax rate and World Bank's indexes Ease of doing business index and Worldwide Governance Indicators. The basic model contains all potential determinants. Afterwards are remove less significant factors according to p-value. From the model are subsequently remove countries with extreme values in dataset to confirm statistical significance of identified determinants. In another model is tested only inflow of FDI in logarithm form with different lags from 1 to 6 periods according to [1]. All the described procedures will be performed in the Gretl software.

Tab. 1: Final specification of the model

<b>Dependent variable: OutflowGDP</b>			
	coefficient	p-value	
const	-0,01335	0,975781	
FDIstockGDP	0,050227	0,000175	***
95% confidence interval			
	coefficient	lower limit	upper limit
FDIstockGDP	0,050227	0,031657	0,068798

### 3 RESULTS

According to results of this paper, the only statistical significant variables are stock and inflow of FDI (see Table 1). Moreover, significance of inflow is not as stable as stock in different specification of model and in contrast to other papers the coefficient has always negative sign in the model. This could be caused by descending trend in inflow of FDI during observed period which correspond to decreasing volume of privatization transactions and business opportunities. On the other hand, FDI stock has stable coefficient and statistical significance on the lowest level 1% across different specifications of model, even in model with less countries. This result is in compliance with findings with [2]

From the confidence interval of the model is calculated optimal zone of outflow and it is compared to real data from each observed country. The Czech

Republic has just the first three periods in which is real outflow in the calculated zone, in other years outflow was above the zone. It is at least from the observed countries. On the opposite side, Poland and Romania have fifteen periods in the zone.

In the model with logarithm form of variables there is statistical significant variable FDI stock with lower p-value and better criterions than inflow of FDI. Delayed variable is most significant (1%) with one and two lags and less significant (5%) with five and six lags which is in compliance with [1]

There are a few distortions which can have an impact on the results of this paper. There is relatively short testing period in compare with similarly researches. Also there are differences among observed countries caused by various ways in process of privatization in each country.

### 4 CONCLUSIONS

In this paper has not been proved any significant determinant instead of FDI stock. According to comparison between values from model and real data it could indicated that in the Czech Republic is slightly higher outflow than it would be proportionately to

other observed countries. On the other hand, in the case of the Czech Republic it also could be caused by other factors connected to unique economic position among transitive economies and for clearly statement is necessary further research.

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# CHANGE OF LEADERSHIP BEHAVIOR OF MANAGERS AFTER BECOMING FATHERS

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## KEY WORDS

management behavior, leadership, fatherhood, parenthood, work-life enrichment, multiple roles

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## JEL CODES

M12, M51, M54

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## 1 INTRODUCTION

The amount of research on the linkages between family and work has grown significantly in recent years. Also, interdisciplinary collaboration between family research and management research evolves steadily. Building on the theory of work-family enrichment (Greenhaus and Powell, 2006) and its antecedents, various scholars have shown positive relations between parenthood and leadership performance (Ruderman et al., 2002; Graves et al., 2007; Dumas and Stanko, 2017; Grau Grau, 2017; Nunes-

Costa et al., 2020). Parenthood makes managers collect experiences and resources in the family role that can be transferred to the work role and lead to improved performance there. However, the emphasis was put on the influence of parenthood on female managers so far (Grau Grau, 2017). Moreover, previous studies used general, non-granular definitions of leadership and had no focus on Central Europe. Our research attempts to close these gaps.

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## 2 MATERIAL AND METHODS

We conducted an online survey among 157 male managers with children and collected data on role conflict, role enrichment, parental role commitment and perception of leadership changes at work with fatherhood (Likert scale ranging from strongly improved “1” to strongly worsened “5”). Leadership behaviors were assessed with Yukl’s 15 definition of transformational leadership behavior (TLB) (Yukl,

2012). Technically, all responses were compared to a scenario of no behavioral changes (“3”) with a Wilcoxon signed rank test to assess significance levels. For other analyses we used linear regression and Pearson correlation. The participants were on average 42 years old, held a master’s degree, had two children and 61 subordinates. Data was processed using IBM SPSS Statistics 27.

### 3 RESULTS

Levels of role conflict and enrichment significantly differ from each other ( $p < .001$ ), resulting in a net enrichment caused by fatherhood. Net enrichment correlates with improvement in aggregated TLB ( $r = .35, p < 0.001$ ). Moreover, we find that also parental role commitment correlates with improvement in aggregated TLB ( $r = .20, p = 0.01$ ). Most leadership behaviors (14 out of 15) improve significantly with fatherhood. The strongest improvements occur in the behaviors supporting, recognizing, and developing. We explain this by an increased orientation towards others. Networking remains almost unchanged. Possible explanations are lack of time and shifting priorities. No individual behavior worsened with fatherhood – see Figure 1 for details. Improvement in leadership behaviors is perceived stronger, the higher current position ( $p = 0.01$ ) and number of subordinates ( $p = 0.04$ ). Overall, we see clear evidence that fatherhood enriches male managers in their leadership behaviors. Nevertheless, the regression model also shows that improvement of

TLB is reduced with increasing number of children ( $p = 0.02$ ) and therefore countervails the intuition “the more, the better”.

Variable	Responses
Aggregated TLB	2.41 ***
Planning	2.26 ***
Clarifying	2.29 ***
Monitoring	2.54 ***
Problem-Solving	2.28 ***
Supporting	2.00 ***
Recognizing	2.15 ***
Developing	2.22 ***
Empowering	2.24 ***
Advocating Change	2.38 ***
Envisioning Change	2.52 ***
Encouraging	2.36 ***
Innovation	
Facilitating Collective Learning	2.52 ***
Networking	3.07
External Monitoring	2.77 **
Representing	2.58 ***

Fig. 1: Perceived Changes in Transformational Leadership Behavior (TLB)

Note. \*\*  $p < .01$ , \*\*\*  $p < .001$

### 4 CONCLUSIONS

Previous quantitative and qualitative research has argued that parenthood positively influences leadership behavior. Our data suggest following this path but show that specific behaviors evolve differently. We find that role enrichment outweighs role conflict and that the overall effect (net enrichment) leads to improvements in leadership behavior. Future research

on the topic should consider the perspective of subordinates and follow longitudinal research designs. Managerial and organizational practice should consider fatherhood a highly relevant leadership training and encourage male managers to be active in multiple roles.

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# UNEMPLOYMENT, IMPACT OF GOVERNMENT MEASURES AND EMPLOYMENT EFFECTS DURING THE CORONA CRISIS IN GERMANY

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## KEY WORDS

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unemployment, state measures, short-time work, female unemployment

## JEL CODES

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J64, H12, E63

## 1 INTRODUCTION

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This article focuses on the development of unemployment during the Corona pandemic. In order to avoid mass unemployment and a total economic loss, the federal government financed numerous measures. This article shows that the short-time work scheme has preserved many jobs to this day. Nevertheless, an

increase in unemployment could not be prevented. The increased risk of entering unemployment is followed by a higher risk of remaining unemployed for longer. Studies show that in contrast to previous recessions, women are significantly more affected by this risk.

## 2 MATERIAL AND METHODS

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Based on theoretic approaches to the onset of unemployment, the Research institution of the Federal Employment Agency (IAB) use data provided by the Federal Employment Agency.

The IAB currently takes unemployment notifications into account until 14.4.2020. Companies wishing to take advantage of short-time work must notify an employment agency.

Another method used is the survey of those affected, both by the IAB and by the repeatedly cited research of Moehring et al. (2020) Currently, many surveys of employees are conducted on their current work situation.

The results presented on those affected by short-time work have been weighted by the IAB and can be transferred to the basic population of all employees subject to social security contributions who a) use

digital information and communication technologies during their work and b) work in private sector companies with at least 50 employees subject to social security contributions. According to the IAB, this applies to approximately 40 per cent of employees subject to social security contributions in Germany.

Moehring et al. (2020) uses data from the GIP. The GIP initiated a special survey on 20 March 2020 to collect data on COVID-19. In the descriptive analysis, Moehring et al. (2020) use weights to extrapolate the participants' characteristics to those of the German general. In further research, Moehring et al. (2020) use logit random-effects growth curve models to estimate the average of the trajectories' risks of entering each state short-term work or unemployment between 20 March (week 1) and 9 July (week 16).

### 3 RESULTS

Bauer and Weber (2020) find that the increase in unemployment is due to the lockdown. Furthermore, both find that the hiring margin accounts for more than 80% of the unemployment effect. Although the federal government provided massive financial support, this could not prevent the labour market collapse.

Möhring et al. (2020) can show that in January 2020, 42.0 per cent of employed women worked part-time, compared to 6.4 per cent and 1.9 per cent of men (excluding those in vocational training). They also found that 21.2 per cent of employed women had a net personal income below 1,000 euros. Möhring et al. (2020) also recorded gender differences in the field of work: 40.0 per cent of workers were in manufacturing, only 15.4 per cent of women. They found the highest proportion of women in the private service sector (84.5 per cent in “other services”, mainly household-related services such as cleaning). By analysing the survey results, Möhring et al. (2020) found that between the end of March and the beginning of July 2020, 14.2 percent of women and 24.1

percent of men were on short-time work for at least one week. Weber and Bauer (2020) analysed that on average the contractual working time of employees on short-time work was reduced by a good fifth. Möhring et al. (2020) find in connection with the reduction in working hours that 7.6 percent of women and 8.7 percent of men stayed at home without pay for at least one week. To this end, the authors describe that women’s shares of unemployment and unpaid leave are almost always slightly higher than those of men.

Möhring et al. (2020) state that employees in the low-wage segment of the service sector were particularly negatively affected by the work stoppage and job loss. They found, however, that short-time work was distributed more diversely, not only in the middle segment of production as initially assumed by them. Furthermore, the authors summarise that women had a lower probability of short-time work and a higher probability of being unemployed during the first lockdown. Neither Möhring et al. (2020) nor Bauer and Weber (2020) see Allmendinger’s thesis on retradition confirmed.

### 4 CONCLUSIONS

Despite ongoing lock-up periods, the labour market is in robust shape overall. Short-time work has prevented worse. Overall, companies are somewhat more positive about the future in the first half of March 2021 than in previous months (Bellmann et al., 2021). They are tending to hire more and lay off less. Nevertheless, almost every second company is

still negatively affected by the crisis. The economic situation and development differs considerably from sector to sector as well as between companies in the same sectors.

This paper shows that employment risks are increasing in different sectors and for several people, especially women.

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# INTERNATIONALISATION OF GHANAIAN AGRICULTURAL SMES IN THE CONTEXT OF STRATEGIC ORIENTATION: LITERATURE REVIEW

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## KEY WORDS

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internationalization, strategic orientation, Ghana agriculture, SMEs

## JEL CODES

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L10, M16, M20

## 1 INTRODUCTION

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Research has proven that the role of SMEs in international markets has received growing attention. Increased liberalization of markets, technology advancement, promote the rapid spread of companies to other countries (Cavusgil & Knight, 2015; Lu & Beamish, 2001; Bamfo & Kraa, 2019). SME internationalization is stimulating and demonstrating the relevance of SMEs to local and global economies at large (Ajayi, 2016). To gain competitive edge in this environment, a company must make a strategic decision (internationalization). Some studies have conceptualized different approaches to strategic orientations, including entrepreneurial orientation, which suggests that a firm explores new market opportunities. Market orientation - customer value orientation, which uses information from customers and competitors to create value for consumers

and learning orientation (Lumpkin & Dess, 2001). Despite the valuable contributions that SMEs make to global economic growth. Little is known about how strategic orientation influences the internationalization process of SMEs in the emerging market context, particularly in the agricultural sector in Ghana. This paper seeks to review literature within the study to investigate the internationalization process of agricultural SMEs in Ghana, focusing on their two dimensions of strategic orientation (Entrepreneurial, Market Orientation) competitive intensity. According to the Institute of Statistical, Social and Economic Research (ISSER) (2014), the agriculture sector contributes to Ghana's export earnings and is a major source of inputs for the manufacturing sector. Thus, it is essential to Ghana's economic growth and development process.

## 2 MATERIAL AND METHODS

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The main sources of data for the study is secondary data from Scopus and Web of Science databases to find journal papers and other related publications keys of words of this survey. Data will be obtained

from institutions governing SMEs and exports such as The National Board for Small Scale (NBSSI), Ghana Export and Promotion Authority (GEPA), Ghana Investment Promotion Agency (GIPA) and

the Ghana Statistical Services (GSS). This paper employs a systematic literature review approach to reduce biasness through a comprehensive literature search (Saunders, Lewis, & Thornhill, 2003). To select the appropriate articles used in the study develops a conceptual framework and propositions for future studies. The proposed model uses three

dimensions of entrepreneurial, Market orientation: innovativeness, proactiveness, risk-taking, and market orientation: customer orientation, competitor orientation, and cost orientation. Further, the model incorporates competitive intensity as a moderating variable.

### 3 RESULTS

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The study will develop and presents a conceptual model and propositions to identify the impact of strategic orientation (entrepreneur and market) of

Ghanaian agricultural SMEs and formulate recommendations to managers of these businesses in their internationalization process.

### 4 CONCLUSIONS

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Based on the literature study, a concise model and propositions will be reached, and appropriate

recommendations and suggestions will be presented to the required quarters.

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# CORRELATION BETWEEN EMPLOYER-FUNDED HEALTH BENEFITS FOR EMPLOYEES AND LENGTH OF SERVICE IN SMALL AND MEDIUM-SIZED ENTERPRISES IN GERMANY

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## KEY WORDS

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employer attractiveness, length of service, costs of health measure, Employee satisfaction, staff turnover

## JEL CODES

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M52, M14, G3

## 1 INTRODUCTION

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The basis of steady corporate development is a stable, calculable internal and external framework for action. In the overwhelming majority of cases, the employees of a company are a decisive, internal factor for the long-term success of the company. The level of staff turnover therefore has a lasting influence on the prosperity of companies. The purpose of this paper is

to investigate the extent to which employer-financed health benefits influence the length of service of employees in companies. The following study looks at the most widespread measure for company health benefits in medium-sized companies in Germany, the so-called company health insurance.

## 2 MATERIAL AND METHODS

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Many surveys and analyses have been carried out in the area of M52, M14 and G3 according to the JEL classification. The theory, implementation, financing and effectiveness of occupational pension and health insurance methods were considered. The secondary literature consulted on this topic includes studies, academic papers and publications, manuals for practical implementation by employers, financing and coverage concepts as well as studies concerning the employee side (acceptance, satisfaction, sense of belonging / corporate identity).

Studies have shown that the loyalty of employees to the company is generally positively influenced

by employer benefits; in this work, those relating to health care, promotion and provision (healthcare / health insurance) are considered in particular. Results and conclusions from studies on occupational pension provision can often be transferred to the area of occupational healthcare and health insurance. This paper looks at the findings from the secondary literature and puts them in context with results from studies on employee turnover. The question of a quantifiable / measurable correlation is discussed and presented in an attempt at a cost-benefit at three case studies analysis.

### 3 RESULTS

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An analysis of the secondary literature has shown that there is a correlation between occupational pension/health care measures and employee satisfaction, which has a direct, positive impact on the length of time an employee stays with the company. The results from the three case studies support the conclusions of the correlations derived from the secondary literature. The influence of occupational health care measures is similarly sig-

nificant for employee retention as other employer benefits. A quantifiability of the correlations for the preparation of a cost-benefit analysis requires the specific examination of individual cases in each case. Particularly in small and medium-sized enterprises in Germany, occupational health care has not yet become widespread, and not all possibilities are used despite governmental support measures.

### 4 CONCLUSIONS

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This study concludes that there is a significant correlation between the provision of employer-financed company health benefits and the length of service. Nevertheless, it was found in the context of this work that despite the effectiveness and state support of the measures described, only a low level of dissemination of this employee retention measure in

small and medium-sized enterprises in Germany can be ascertained. In this context, the question arises as to which framework conditions must be in place for the above-mentioned measures to experience a higher degree of application and which circumstances currently have an inhibiting effect.

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# CAUSES OF “BRAIN DRAIN” PROBLEM IN SELECTED WESTERN BALKAN COUNTRIES

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## KEY WORDS

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brain drain, cluster analysis, migration, regression analysis, Western Balkans

## JEL CODES

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C10, J50

## 1 INTRODUCTION

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The Western Balkan (WB) is characterized by its long history of emigration. Poverty and unemployment, political instability, but also the war environment and the transition from a centralized to an open economy [1] caused a wave of emigration from this region in the 90s. However, according to Horvat [2], the change that occurred at the end of the last century is that the emigration of unskilled workers has mostly turned into the emigration of highly skilled workers. This could be partly due to the backward education system and partly because of the high unemployment rates that students face after graduation. This fact further affects the socio-economic development of society, since the progress of a country requires an educated, highly qualified population.

In general, main causes of high emigration rates are high unemployment [1], political instability in the country and low level of human capital [3], higher wages in other, more developed countries [4], but also

historical-geographical backgrounds such as colonial relations, similar languages or physical distances between countries [5]. Unemployment rates are high in all WB countries, especially when it comes to young people (aged 15 to 24), among which unemployment reaches 30% in most WB countries, and in some countries this rate is even higher (SEE Jobs Gateway Database). Minimum and average wages are in most WB countries lower than minimum and average consumer basket. Average earnings as well as GDP per capita in the most popular destination countries are several times higher than in WB countries from which people decide to emigrate.

The goal of this paper is to identify the factors influencing the emigration, especially of young and highly educated people from WB countries, and to compare these countries with the EU Member States, which are the main destination countries for WB emigrants, in terms of indicators affecting emigration.

## 2 MATERIAL AND METHODS

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Regression analysis was used to determine which indicators of the economic, political and educational system have an impact on emigration. The potential regressors used can be divided into three groups:

economic indicators (gross domestic product, statutory nominal gross monthly minimum wage, total unemployment rate, unemployment rate of highly educated people and Share of youth not in em-

ployment, education or training (NEET)), indicators of political stability (political stability and absence of violence/terrorism and government effectiveness) and indicators of the quality of the education system (PISA test results). For a dependent variable, several measures of emigration were used: emigration rate, emigration rate of highly educated population, net

migration rate and public opinion, which describes the attitude of citizens towards leaving the country. To classify countries based on the selected indicators, hierarchical cluster analysis was employed. Using this analysis, we will get insight into positions of WB countries in relation to EU countries in all the selected areas together.

### 3 RESULTS

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Based on regression analysis, it was shown that there is a statistically significant relationship between the indicators of emigration and the indicators of the economic, political and educational system. The results of the cluster analysis showed us that all WB countries achieve similar results in the examined

areas, as well as that all of them achieve far worse results than all other groups made up of EU countries only. The cluster made up of WB countries also reaches the lowest net migration rate and almost the highest emigration rates.

### 4 CONCLUSIONS

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The attractiveness of certain countries for migrants, but also the repulsion of other countries, are influenced by indicators of the economic and political situation in the country, as well as the quality of the education system. High unemployment rate and

poor political and education system system can be seen as strong push factors for emigrants to leave their country, while higher economic activity, higher earnings and education system of better quality in target countries are considered to be pull factors.

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### 6 ACKNOWLEDGEMENT

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Supported by the grant PEF\_TP\_2021007 of the Internal Grant Agency of FBE MENDELU.

# COMPARISON OF TRADITIONAL AND ENVIRONMENTAL PRINCIPLES OF HOTEL EVALUATION

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## KEY WORDS

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tourism, environment, hotel evaluation, environmental criteria

## JEL CODES

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M14, Q56

## 1 INTRODUCTION

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Sustainability and environmental protection are no longer embedded in individual sectors just for the sake of promotion, but mainly because of customer requirements, economic benefits and the overall perception of stakeholders. (Tóth, 2007) These benefits are also strongly perceived by the tourism sector, which has many negative environmental and social consequences, which it is gradually trying to repair. (Puczkó and Ratzi 2002). Therefore, there is also a strong belief that the classification of hotels Hotel-

stars Union should integrate not only the quality of offered services, but also environmental principles (Hensens, 2016). There are many standards and norms that address environmental principles, but their implementation is complicated towards the requirements of the Hotelstars Union. The aim of the research is therefore to compare traditional and environmental principles of hotel evaluation and to propose criteria of quality that consider environmental principles.

## 2 MATERIAL AND METHODS

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The research compared the traditional and environmental principles of hotel evaluation. Today, customers choose accommodation primarily on the basis of positive and negative reviews, but this traditional principle is often seen as subjective. That is why the number of stars and the price are still considered as key selection criteria (El-Said, 2020). Within Europe, the quality of hotels is assessed using the already mentioned stars by the well-known Hotelstars Union classification, which has been used in this research for comparison as the most common way of assessing traditional criteria (Buka and Kalniņš, 2015; Hotelstars.eu, 2020).

There are also several ways to apply environmental principles to hotel strategies. They are even dealt

with by the European Commission itself within the European Union or by major international organizations. The European Commission appeals for the use of its own established best practices covering aspects of the greening of hotels and restaurants (European Commission, 2019). Organizations such as UNWTO and UNEP, in turn, prefer the Green Key international environmental label, under which the non-profit organization FEE sets environmental criteria (Greenkey.global, 2019). These mentioned and proven environmental practices and criteria of these trusted institutions were used in the comparison as the most frequently applied and recognized.

Tab. 1: Environmental criteria of quality

1. Use of the environmental management system	11. Ensuring wastewater treatment
2. Environmental management of supply chains for products and services used by the accommodation facility	12. Management of common areas of the facility and green areas on the premises
3. Addressing mobility and climate protection	13. Managing an energy monitoring and using alternative energy
4. Addressing access for people with disabilities	14. Minimizing and optimizing energy consumption from heating, ventilation and air conditioning systems
5. Water system management and water reuse	15. Use of ecological variants of heat pumps and geothermal heating or cooling
6. Use of ecological variants of water accessories	16. Use of ecological variants of electrical or electronic equipment
7. Use of more environmentally friendly variants of linen and towels, optimization of their exchange, cleaning and washing	17. Use of more environmentally friendly variants of food and beverages
8. Pool management	18. Organic waste management
9. Waste prevention by ecological procurement of products	19. Use of more ecological variants of kitchen equipment for washing, cleaning and food preparation
10. Waste management	20. Use of more environmentally friendly variants of kitchen equipment for cooking, ventilation and cooling

### 3 RESULTS

The comparison of traditional and environmental principles led to the establishment of 20 hotel evaluation criteria considering the environmental principles appointed in the table below, which were divided by the authors into 5 following areas: hotel

approach (criteria 1–4), water management (criteria 5–8), energy management (criteria 9–12), waste management (criteria 13–16), operation of hotel kitchens and restaurants (criteria 17–20).

### 4 CONCLUSIONS

The research focused on the evaluation of hotels by traditional and environmental principles. These have been compared and from the result of their comparison 20 criteria were set, taking into account environ-

mental principles. Thus, the goal of the research was met. However, it would be appropriate to supplement this result with the view of guests and hotel managers on these criteria by conducting further research.

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### 6 ACKNOWLEDGEMENT

Supported by the grant No. PEF\_TP\_2021006 of the Grant Agency (IGA) of Mendel University in Brno.

# SENTIMENT ANALYSIS OF FINANCIAL NEWS

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## KEY WORDS

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stock market, machine learning, sentiment analysis, NLP, Bert

## JEL CODES

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C83, C88

## 1 INTRODUCTION

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Sentiment analysis (Sentiment analysis or also opinion mining) is one of the research processes in the field of word processing. The goal is to analyze and identify people's attitudes and emotions toward entities. Today, this is an active area of research [1], and we can examine the mood in different domains of the text – such as customer product reviews [2], satisfaction with services or the classification of financial news from the stock market. According to [3], modern financial theorists notice the investor's

mood in the market and grow to predict and quantify its effect. Every day, a number of reports are published that directly support investors' decisions. In such a flood, manual evaluation of the sentiment of each article is almost impossible, moreover due to factors such as reader's bias, fatigue or emotions even can't be objective. Hence, an automatic labelling approach would be desirable. For this purpose we used BERT as a current state-of-art language model for various NLP tasks.

## 2 MATERIAL AND METHODS

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We used BERT (Bi-Directional Encoder Representations from Transformers), designed by [4]. The usage of this bidirectional multilayer transformer causes a breakthrough in the approaches used so far, which dealt with the sequence of text from left to right or a combination of training from left to right and from right to left. These approaches predicted the following word in a text only depending on the previous words. BERT takes a whole sentence at once

which allows to reveal and model a deeper meaning between words in a sentence. BERT comes with 2 pre-trained models on Wikipedia and BookCorpus with 110 million parameters (Bert Case) or 340 million parameters (Bert Large). For a task of sentiment classification we fine-tuned BERT on a Financial Phrasebank dataset<sup>1</sup>, consisting of 4846 manually labeled examples of a stock news.

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<sup>1</sup>[https://www.researchgate.net/publication/251231364\\_FinancialPhraseBank-v10](https://www.researchgate.net/publication/251231364_FinancialPhraseBank-v10)

### 3 RESULTS

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With a 80/20 split to a training and validation data we achieved 86% weighted F1 score in a sentiment classification task. With 80/20 data splitting into training and verification data, we achieved 86% of

weighted F1 score with learning rate set to 2e-5 in just a single epoch. This shows us that BERT is able to solve classification tasks even with just a few training examples.

### 4 CONCLUSIONS

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The proposed model is handy in situations when there is a complete lack of labeled data needed for training of some commonly used classifier, such as SVC, DCT or Naive Bayes. However, the model is very complex and requires powerful computational resources. In our applied research we tried to predict sentiment on real world articles crawled from seekingalpha website<sup>2</sup>. The proposed model is useful in situations when there is a lack of labeled data needed for training of some commonly used classifier, such as SVC, DCT or Naive Bayes. However,

the model is very complex and requires powerful computational resources. In our applied research we tried to predict sentiment on articles crawled from seekingalpha website, where unfortunately the model desperately fails. The average length of a single article in the training dataset is 128 characters. On the other hand, the same statistics on real data says that is 6200 characters. Therefore we had to apply a summarization technique in order to shrink articles into length that BERT is able to process.

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<sup>2</sup><https://seekingalpha.com/market-news>

# THE INDUSTRY LIFE CYCLE OF THE WORLD'S LARGEST CORPORATIONS

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## KEY WORDS

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corporate demographics, industry life cycle, multinational companies

## JEL CODES

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F23, L16

## 1 INTRODUCTION

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Life cycle models are not just a phenomenon of the life sciences. Products and therefore as well industries experience a similar cycle of life. Just as a person is born, grows, matures, and eventually experiences decline and ultimately death, so do products and industries. Even though phases are similar for all of them, every sector and industry experience them differently timewise — for some they last longer, for others they pass quickly. Those phases can be different at their length and as well the life cycle can experience waves. As the industry moves from one phase to the next, firms face very different

challenges [1]. This long-term theory of evolution of industries is referred to as the Industry Life Cycle (ILC) and it aims to explain changes in technological development and industry structure over the period that the industry ages [2].

The aim of this work is therefore to find out whether the ILC is observable within the largest world's corporations. Moreover, it is expected to find what phase individual sectors and industries are in, what is their average age and to understand the level of competitiveness of each industry.

## 2 MATERIAL AND METHODS

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Empirical data have been collected from different sources. The list of companies was created based on Fortune Global 500 and Forbes Global 2000 rankings between 1995 and 2020. From those rankings, the information on sales, profits, assets, and market values was obtained and aggregate values were used to represent industry and sector. To study ILC, information on the sector and industry was based on the Global Industry Classification Standard (GICS) method. The reason behind this is that GICS provides broad classification which can be used for a deeper understanding of the development.

Furthermore, this classification was developed for the monitoring of companies at stock exchanges therefore it contains similar companies together. The information about the GICS for each company was obtained from various sources, mainly websites providing financial information such as MarketWatch and Datahub.

Data were included in one table and a basic analysis of the development in time was performed in software Excel by Microsoft. The study focused not only on the development of the numbers of companies in the industry but also their aggregated

values mentioned earlier. This way the ILC of each industry could be interpreted. Moreover, the data of establishment of companies can be used to calculate the average age of individual industries, thus indicating which of them are young and dynamic and which are older and more traditional.

The follow-up analysis is expected to be performed in statistical software such as Gretl or Stata to study

the existence of a statistically significant difference between individual ILCs. Individual ILCs could be mathematically interpreted and projected. Lastly, using the software it should be possible to determine whether there are any industries linked based on their ILC.

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## 3 RESULTS

The initial analysis showed that based on the obtained data it is possible to examine ILC in time. Not surprisingly, the Information Technology and Consumer Discretionary sectors are the fastest-growing, compared to Energy, Utilities, Materials

and Real Estate sectors which are matured and slowly declining in their relative importance. Especially the growth of the market value of Information Technology sector in last years is impressive.

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## 4 CONCLUSIONS

The most important step was to decide what ratings should be used to decide what companies should be studied and which sector classification to use, as there is no worldwide standard. Since only the largest companies are included, the study cannot describe ILCs in general. Yet the result should be suitable for deciding which industries will be important for the future competitiveness of the EU in the international market. It is important to know what stage industries

are in for targeting future investment initiatives. As well this study could be used to evaluate comparative advantages and key areas of the EU economy.

For example, Tavassoli argues that the importance of the determinants of innovation propensity and intensity are not equal over the phases of the ILC [3]. Based on the results of this work and his findings it would be possible to better target the policy for large companies to promote their innovative process.

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## 6 ACKNOWLEDGEMENT

Supported by the project CZ.02.2.69/0.0/0.0/19\_073/001660 Internal Grant Schemes of Mendel University in Brno, funded by Operational Programme Research, Development and Education.

# THE IMPACT OF BIG DATA AND ARTIFICIAL INTELLIGENCE ON COMPANIES, THE CUSTOMERS AND THE SOCIETY

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## KEY WORDS

customer relationship changes, big data, management paths, finance, opportunities, challenges, financial services, economic models, artificial intelligence

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## JEL CODES

M1, M15, O31, O33

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## 1 INTRODUCTION

The world is changing day by day due to the impact of BigData and Artificial Intelligence. Having a closer look at the markets we can say, that a huge amount of data is processed by the financial companies for decision making [1]. For example BigData has transformed the financial services, increased the rate of automation, risk analysis can easily performed [2]. By using all digital marketing tools the interaction will occur everywhere and anytime. Due to this fact

it will be necessary that the customer relationship has to be accurate, scientific and on time. Nevertheless we can say that the impact of BigData and Artificial Intelligence (AI) on the society has been creeping. AI is now almost everywhere in daily life so you do not recognize AI anymore as it got common. A good example in this case is SIRI as an extra search function for information [3].

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## 2 MATERIAL AND METHODS

The main purpose of the current study was to identify the challenges, the opportunities and the implications of BigData and Artificial Intelligence in three fields for the exploration: a. companies, b. the customers, c. the society. Another question which had to be answered was, whether AI is really needed in human society. Therefore, the most prominent databases were used like Scopus, Google Scholar and Web of Science. I was searching for the following

keywords: Customer relationship changes; BigData; Management paths; Finance; Opportunities; Challenges; Financial services, Economic models; Artificial Intelligence. I mainly focused on highly-quality peer-review journals, but I did not ignore articles on the topic available on different websites. I also made use of common search engines to enhance the understanding of the topic.

### 3 RESULTS

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The integration of the Internet of Things (IoT) can be seen as one of the latest involvements of BigData. A connection is established amongst people, devices, machines, and sensors, by considering the alliance involving the notion of the Internet of Things [4]. The utilization of predictive analytics and data visualization is another major utility of BigData in the financial area [5]. The process of decision making is achieved from objective facts and figures when finance practices are dependent on the predictive analysis. The management of the customer

relationship refers to the mechanism that can connect the enterprise and the customer and can make them effectively communicate in time in the direction of the concerned marketing philosophy [6]. AI gives computers the capacity to learn, reason, and apply logic. Medical researchers endeavor to find new and efficient ways of treating diseases, not only the digital computer can assist in analyzing, robotic systems can also be created to do some delicate medical procedures with precision. So in the field of medicine we see the contribution of AI [7, 8].

### 4 CONCLUSIONS

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The usage of BigData and Artificial Intelligence is only particularly useful when it is used with the right set of minds. How the enterprise is going to enhance the performance is primarily dependent on the way the enterprise and its analysts use this important opportunity. With the usage of automated methods and the right reforms being taken at the right time, along with the integration of BigData analysis, the revenue of the company can be increased significantly [9]. The fierce competition in the market forces the enterprise to find out the outlets by effectively managing the customer's relationship. The successful

business relies mostly on the effective management of customer relationship. Therefore it will be important to establish and maintain the customer's relationship by integrating BigData into its business to catch up with the changing demands in the market. If we have a closer glance on AI we figure out, that AI is a reality of the world. We must take note what one of the AI pioneers, Mr Joseph Weizenbaum said, that we must not let computers make important decisions for us because AI as a machine will never possess human qualities such as compassion and wisdom to morally discern and judge [10].

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# GENDER PAY GAP STATISTICS IN THE CZECH REPUBLIC

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## KEY WORDS

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gender pay gap, Czech Republic, description, earnings

## JEL CODES

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J70, J71

## 1 INTRODUCTION

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The disproportion in remuneration between men and women is referred to in foreign as well as in Czech literature as Gender Pay Gap (GPG). Gender pay gaps can be found in every area, at all economic levels, in all political systems, in different religious, social and cultural backgrounds. Wage inequality,

despite the ongoing gender wage convergence in recent decades, persists in the Czech Republic. Fair pay and job opportunities stimulate economic growth and macroeconomic stability and have an impact on higher tax revenues (Smith & Bettio, 2008; de Haan, 2017).

## 2 MATERIAL AND METHODS

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The literature on gender pay gaps is very extensive. In our article, we limit ourselves only to literature of Czech provenance and our overview is indicative rather than exhaustive. In the Czech Republic, the gender pay gap was examined in detail by the structural composition of the pay gap, either due to different characteristics of human capital, type of industry/sector and occupation, discrimination or

other factors (Jurajda 2005; Křížková et al. 2018). Further research has focused on international comparisons (Mysíková, 2012; Hedija, 2015). Estimates of the gender pay gap vary considerably depending on the data, the specific sample and the method used. As a result, there are large differences in results over time and even between country-specific studies.

## 3 RESULTS

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Gender pay gap is not a modern problem in the Czech Republic. In 1962, the average wage for women was only 64% of men's wages, with a pay gap of 36%. In the 1960s, women entered the administration and services to a greater extent, until then they had held low-status positions in industry

and agriculture. The Czech economy and society have a characteristic division of labor and wage levels between men and women. Men occupied preferred industries (mining of raw materials, metallurgy, heavy engineering, construction), including leading positions in these and other industries. Women were

concentrated in the manufacturing industry (food, textiles, clothing, etc.) and in middle and lower positions in administration and services with lower wages (Fischlová, 2002). In the following years the difference decrease. In the 1970s enters jobs a larger share of a generation of middle and highly educated women, who asserted themselves in positions that correspond to their achieved qualifications. In the 1980s, the share of women in employment culminated (1980: 45.6%; 1985: 46.2%) and the occupation in the

education sector (1980: 71.4%) and health care sector by women increased (80.0% ; Fischlová, 2002). In 2019, the average wage of men in the Czech Republic was 39.699 CZK, women earned 32.237 CZK, the difference in the average wage of women and men was 18.8%. The difference in the median wage was 14.71% (CZSO, 2020). In the last decade, the GPG has decreased only very slightly, currently the average wages of women are at the level of 81.2%, which is a decrease of 1.9 percentage points since 2010.

## 4 CONCLUSIONS

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Gender inequalities are a permanent feature of labor markets in both developed and developing economies. This descriptive overview provides information on the extent and evolution of the pay gap, while highlighting important issues that need to be further explored. These can be both labor market demand factors and supply-side factors. Indeed, the effects and range of factors affecting the earnings gap,

together with structural effects, can be influenced, strengthened or reduced by labor market or family policies. Forms of social security and taxation also affect the continuity or interruption of careers, the type of work and compensation for such work (and thus allowances based on income, tax rates, parental allowances).

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## 6 ACKNOWLEDGEMENT

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Supported by the grant No. PEF\_DP\_2021004 of the Grant Agency IGA PEF MENDELU.

# ASPECTS OF DEROGATORY WORD-OF-MOUTH INTERACTION THROUGH SOCIAL MEDIA NETWORKS

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## KEY WORDS

---

social media, WOM, derogatory interaction, SNS, NWOM

## JEL CODES

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M31

## 1 INTRODUCTION

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The emergence of social media has radically changed the way that customers share word-of-mouth (WOM) information. Previously, consumers exchanged personal experiences with a small range of social contacts; however, social networking sites (SNS) currently encourage them to share their impressions with more people (Ahmad, 2015). As such, WOM connectivity affects the preference of goods and services of channel members (Alexandrov et al., 2013). SNS has become a cultural movement and a prevalent form of communication for young adults. These channels encourage engagement, cultivate

cooperation, and enable group training among users (Bailey, 2010). More than 2 billion people, or around 29 per cent of the world's inhabitants, use SNS. Of these, 936, 300, and 302 million daily users are active on Facebook, Google+, and Twitter. Over half of these users provided SNS customer reviews or classified products (Ahmad, 2015). Consequently, this study evaluates the impact of contextual, human, and social networking influences the consumer's intent to transmit NWOM information to the SNS. This research strengthens our comprehension of NWOM connectivity by addressing various variables.

## 2 MATERIAL AND METHODS

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The research subjects were real online shoppers with recent negative feedback. Two factors inspired the choice of online shopping as the subject of this analysis. First, there is a growing consumer concern about service delays during online shopping (van Noort & Willemsen, 2012). Second, online shopping is distinguished by lower prices, and consumers can quickly switch online stores when they encounter a service failure (Veloutsou & Moutinho, 2009). It

also offers an effective environment for reviewing customer reaction to service loss experiences.

The Chain Reference Sampling Procedure was used to pick the participants for this analysis. An initial set of seed people surveyed who met the study criteria (e.g., recent negative online shopping experience and active SNS users) were selected through the SNS and asked to suggest other prospective respondents.

### 3 RESULTS

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The findings indicate a substantial gap between the two classes of respondents. Experienced customers paid much attention to face concern and tie strength. At the same time, those in the other category emphasized the reassessment of emotion control in

their plan to participate in NWOM conversation on SNS. In this research, tie intensity was a significant determinant of NWOM interaction for respondents with previous WOM communication experience.

### 4 CONCLUSIONS

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Within that report, we intended to analyze the perceptions of NWOM connectivity on SNS following a service failure in the context of online purchasing. The findings of the empiric analysis showed that contextual, individual and social networking influences had an effect on the customer's decision

to include NWOM information on SNS. In specific, FI, firm attribution, firm image, face concern, the reappraisal of emotions, SNS usage intensity and tie strength were found to have a substantial effect on the intentions of transmitting NWOM data to the SNS.

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### 6 ACKNOWLEDGEMENT

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This work is supported by the Internal Grant Agency of FaME through TBU in Zlín No. IGA/FaME/2020/002; Project title: The impact of digital transformation on customer behaviour and firm's sustainable development.

# OBJECT RECOGNITION BASED ON POINT CLOUDS OBTAINED BY LASER SCANNERS ON MOBILE DEVICES

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## KEY WORDS

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augmented reality, object recognition, laser scanning, mobile devices

## JEL CODES

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C88

## 1 INTRODUCTION

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Professional laser scanning is used in a large number of industries such as medicine, manufacturing, architecture, agriculture. Thanks to the integration of laser scanners (LiDARs) into common mobile devices, the possibility of applications expands. The quality of laser scanners integrated into smartphones or tablets is significantly less accurate, however, their availability creates a completely different domain of application than professional scanners.

In the case of mobile applications, LiDAR is mainly used to reconstruct the shape of rooms and their equipment. Users can i.e. place a new painting on the wall or create a sketch of a new kitchen drawers directly over existing cabinets [1]. However, the subject of our interest is the recognition of natural objects. Most applications that perform object recognition work on the basis of computer vision in a

2D image. Our aim is to extend object recognition to the 3rd dimension to recognize objects using their 3D representation. Such 3D object recognition, either alone or in combination with 2D recognition could have significantly higher reliability, similarly to autonomous cars [2]. This paper focuses on methods of point cloud registration. This is the first part of object recognition. Different scans obtained by the LiDAR must be aligned into one single set of 3D points called point cloud. In practice, the Iterative Closest Point method is most frequently used. It is based on the search for a rigid transformation consisting of a rotation matrix and a transformation vector, which describes the relationship between two point clouds. This method is not scale-invariant, but this is not a problem. The size of measured objects do not change with various distances. [3]

## 2 MATERIAL AND METHODS

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In the case of scanning a specific object from a mobile device, we must proceed in the same way as in standard scanning [4]. In the scene, we must indicate the area of interest where the object is located. Postprocessing methods will need to be applied to the scanned point cloud to remove errors and noise. These scanned point clouds describing objects, can be

used as patterns for further real-time identification of real-time scanned data.

To scan a point cloud, we use application [5], which scans the users' surroundings and plots individual 3D points into a scene. We use this application to obtain the test outputs. It is necessary to find out what raw outputs the LiDAR device can provide

and on this basis to choose suitable modifications of real-time processing and post-processing methods. In order to evaluate the quality of obtained raw data, it is necessary to test the widely used ICP

method which provides very stable and robust results [6]. The resulting registration error can be used to identify an object in a point cloud, however, with high computational complexity.

### 3 RESULTS

The application [5] generates point clouds of adjustable density. The maximum scanning distance is up to about 5 meters. The application uses a low-level graphics API called Metal [7] for point cloud visualization, which is simplified using the MetalKit iOS framework. The application also uses the ARKit framework [8], which enables laser scanning and processes a 2D image of the camera, which colours individual points in the cloud.

We extended this application with a method that saves the currently scanned cloud in Polygon File Format (.ply). The distance of the mobile device from

the scanned object does not affect the dimensions of its representation in the form of a point cloud, but the accuracy of the measurement increases with a shorter distance. In the case of scanning from a distance of about one meter, the size of the object can be determined to approx. a centimetre. It is possible to scan both outdoors and indoors, even in poor lighting conditions. The application generates a large amount of noise during movement, mainly at the edges of the scanner field of view and at the edges of objects during movement.

### 4 CONCLUSIONS

The sample application shows that the raw output data is not ready for ICP processing, and the scanning process needs to be improved to avoid generating large amounts of errors and noise. However, the LiDAR used in the current generation of iOS devices

such as iPhone Pro or iPad can be successfully used for creation of a model that is used as a template for object recognition. Even the object recognition can be performed in real-time using hardware acceleration that is provided by iOS SDK tools.

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### 6 ACKNOWLEDGEMENT

Supported by the grant Detection of machine part for information visualizations in augmented reality (IGA PEF\_DP\_2021026), and Support of multidisciplinary research study programmes for young scientists (CZ.02.2.69/0.0/0.0/16\_018/0002333) and Research Infrastructure for Young Scientists (CZ.02.1.01/0.0/0.0/16\_017/0002334) projects, co-financed by the EU under the OP RDE program.



Title: PEFnet 2021 – European Scientific Conference of Doctoral Students  
Editors: David Hampel, Hana Vránová  
Publisher: Mendel University in Brno, Zemědělská 1, 613 00 Brno  
Press: Mendel University in Brno Publishers, Zemědělská 1, 613 00 Brno  
Edition: 1st, 2021  
Number of pages: 150  
Number of prints: 140  
ISBN 978-80-7509-811-5