



Ekonomická  
fakulta  
Faculty  
of Economics

Jihočeská univerzita  
v Českých Budějovicích  
University of South Bohemia  
in České Budějovice

# Complementary Papers and Book of Abstracts of the 12th International Scientific Conference INPROFORUM

Innovations, Enterprises, Regions and Management





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## Innovations, Enterprises, Regions and Management

2018



University of South Bohemia in České Budějovice

Faculty of Economics

## **Complementary Papers and Book of Abstracts of the 12th International Scientific Conference INPROFORUM 2018**

*Innovations, Enterprises, Regions and Management*

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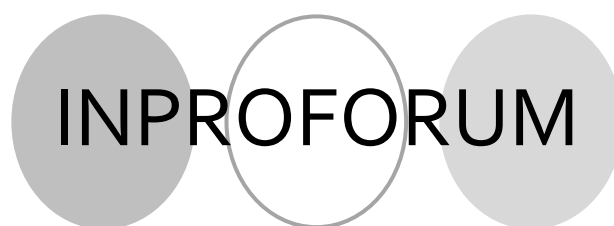
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*Innovations, Enterprises, Regions and Management*



*International  
Scientific Conference*



2018

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SESSION  
ECONOMIC IMPACTS OF CHANGES AND POLICIES IN THE FIELDS  
OF FINANCE, ACCOUNTING  
AND TAXATION

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## Fraud cases of the 21st century – a case study of Worldcom in the context of CFEBT approach

Zita Drábková, Pavel Šíma

**Abstract:** *The contribution aims to analyse aspects of the impact of manipulative accounting techniques on the selected case study of the worldwide known case Society of Worldcom, as subsequently identified by auditors and audit authorities after the fraud. The identified manipulations were subsequently subjected to an analysis of CFEBT approach. The contribution has detected the risk of the impact of accounting errors and frauds representing one of the peaks CFEBT risk triangle accounting errors and frauds. It also calculated CFEBT M-score at three levels and identifies risks at accounting areas of provisions and overvalued own funds outside the operational area.*

*The contribution presents the results of the CFEBT approach at three levels of the M-score and analyses significant discrepancies between the generation of earnings and an increase in cash flow during the observed periods. The CFEBT risk triangle was designed as a tool for detection, evaluation and management of the risk of accounting errors and frauds in circumstances of the Czech accounting standards and International Financial Reporting Standards (IFRS). The essential aim of the triangle is to reduce information asymmetry between authors and users of accounting records, or, in other words, to increase the quality of available information with respect to decision-making on the basis of available accounting information.*

**Key words:** Worldcom · CFEBT risk triangle of accounting errors and frauds · Information asymmetry · Manipulation of financial statements

**JEL Classification:** G32 · G33 · M41

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## Tax Mix Development in the Member States of the European Union

Jarmila Rybová, Hana Hlaváčková

**Abstract:** *The aim of the article is to identify changes in the share of revenues of taxes in total tax revenue in the European Union countries, and to identify groups of similar states in the years 1995 and 2016. The analysis of the tax mix of the member states uses cluster analysis and analysis of the variation coefficient. The cluster analysis confirms differences between Nordic, western and new members. The coefficient of variation shows a higher similarity of indirect taxes than in the case of direct taxes. The tax mixes of the member states do not significantly converge despite the efforts of the European Union to harmonize member states' tax systems. However, there is a difference among the first 15 member states of the European Union and a group of other states that joined the European Union later. The new member states prefer indirect taxes, which make up a large share of tax revenue. These tax mixes in the European Union did not change significantly between the years 1995 and 2016.*

**Key words:** Tax mix · European Union · Cluster analysis · Variation coefficient · Convergence

**JEL Classification:** H20

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## The risk and the cost of quality: The quality management case study

Jaroslava Pražáková, Dagmar Bednářová

**Abstract:** *The article deals with the issue of quality risks and costs in the area of quality management. The presented case study demonstrates the practical application of the risk register and the use of the PAF model to quantify the cost of quality. At present, enterprises are faced with the recertification necessary for the transition from ČSN ISO 9001: 2008 to ISO 9001: 2015 as ČSN ISO 9001: 2016. Audits that are part of the preparatory phase of recertification identify problems and set recommendations to address these problems. The most frequently mentioned recommendations include the need to set up the risk register and the associated risk assessment. The implementation of quality management also results in need for monitoring and managing the cost of quality.*

**Key words:** Quality management · Cost of quality · PAF model · Case study

**JEL Classification:** G32 · M11 · L60

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## The Impact of a new way to lease reporting in a retail sector

Alžběta Veverková, Patrik Svoboda, Hana Bohušová

**Abstract:** *Studies on the use of lease carried out have shown that operational leases are utilized in some sectors more than in others. In these sectors, operating leases represent an alternative to massive capital investment. One of these sectors was chosen to assess the expected impacts of IFRS 16. This is the retail sector. Retail is identified as the sector that should be most affected by the new lease reporting methodology. The most common leased asset is a real estate in this sector. It is either a store with equipment or a retail space. Majority of lease contracts take the form of a medium-term operating leases (3-9 years) with options to extend the lease term. Retail space rental is a fundamental part of the business model of these entities. The ratio of operating and finance leases for selected companies in the retail sector is 96%, the median is 95%. For this reason, significant impacts of the new IFRS 16 can be expected in this sector. An important factor influencing the magnitude of the changes is not only the percentage of the operating lease to the total lease, but also the volume of unrecognized assets and leasing liabilities. The financial statements of the twenty largest retail companies operating within the EU listed in the EU stock-exchange market, reporting according to IFRS were subject of the research. The study revealed that the amount of assets (rights to use) and unrecognized lease liabilities that corresponds to the operating lease is closely related to the type of leased asset and its carrying amount. The average increase in total assets is 37% and debts 55%. The decrease in equity of 4.5 % is due to the fact that the carrying amount of the leased asset usually decreases faster than the carrying amount of the lease liability.*

**Key words:** IAS17 · IFRS16 · Operating lease · Financial lease · Capitalization

**JEL Classification:** M41

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## Professional Traits of Experts as the Basic Determinants of Quality of Business Valuation Reports: Preliminary Research Results

Martin Červený

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**Abstract:** *The quality of business valuation reports in the Czech Republic has been criticized by numerous scholars and professionals. Some believe that the discrepancies in quality are caused primarily by differences in skillfulness of the experts. The goal of this paper is to identify and describe the relationship between selected professional traits of the experts and the quality of their valuation reports. Namely, this paper will investigate whether expert institutions generally produce more quality reports than individuals, and whether there is a relationship between the years of practice of the expert, the length of the report, and its respective quality.*

*The empirical study is based on a sample of 122 business valuation reports published during the year 2017 and uses a set of predetermined binary criteria to assess the valuations. Based on the results, we cannot confirm that institutions produce more quality valuations than individuals, or vice versa. Surprisingly enough, there seems to be a negative relationship between the number of years experts are active and the score of the work they produce. Finally, longer and more elaborated reports tend to imply a better quality overall.*

**Key words:** Business Valuation · Expert Witness · Valuation Assessment · Quality of Valuation

**JEL Classification:** G30

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## **Hybrid Mismatches, CFC Rules and Interest Deduction Rules as stated in the OECD and EU standards and their Reflection in the Czech and Slovak Law – a Comparative Study**

Kristýna Bělušová

**Abstract:** *The aim of this paper is to compare the way the rules for Hybrid mismatches, CFCs and the Interest Deduction rules are/will be reflected in the Slovak law and the way the rules should be reflected in the Czech law. Following aim is to compare these rules as stated in the OECD Action Plan on Base Erosion and Profit Shifting, specifically Actions 2, 3 and 4, and in ATAD Directive. The paper is based on a qualitative research, specifically on a multiple case study. The subject of the research was the above-mentioned OECD and EU standards, texts of legal regulations, document of the Chamber and technical texts dealing with implementation these standards in the national legislations.*

*On the basis of research made, one can conclude that the BEPS and the ATAD Directive lay down very similar rules in relation to the categories in question. According to the document of the Chamber the Czech Republic intends to define CFC revenues exhaustively, while the Slovak Republic defines them in a general manner. None of these States will impose any exemptions in relation to the CFC. Compared to the Czech Republic, the Slovak Republic has already established and introduced rules on Hybrid mismatches. As for the interest deduction rules, the Czech Republic intends to adopt the upper limit for the deductibility of interest and the de minimis threshold exemption with a lower threshold than it is stipulated in the ATAD Directive. The Slovak Republic, however, will take advantage of the Article 11 and retains the current rules on the limitation of the deduction of interest, the so-called low capitalization rules.*

**Key words:** ATAD Directive · BEPS · CFC rules · Interest Deduction · Hybrid Mismatches

**JEL Classification:** H25 · H26 · H34

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## The Reserve Fund - Creation and Use in Contributory Organizations set up by Local Government Units

Marie Vejsadová Dryjová

**Abstract:** *The reserve fund of the contributory organizations combines a source fund (generated from an economic result) and a monetary fund (generated from received gifts and unused balances of operating subsidies granted from the budget of the European union). If an entity wants to ensure a full financial coverage of the reserve fund, the entity should not allocate the profit to the fund, for which there is no certainty of the financial coverage. However, as stated in Act No. 250/2000 Coll., On Budgetary Rules of Territorial Budgets, as amended, in § 30, the reserve fund is formed from the profit of the contributory organization on the basis of an approval of its amount by a founder of the organization after the end of the year, reduced by possibly transfers to the reward fund.*

*The unused balances of the operating subsidies as the source of the reserve fund give rise to further accounting problems. These unused balances are clearly a liability of the contributory organization to the grant provider, however, accounting rules consider them to be the own source. Czech Accounting Standard No. 704 – Funds clearly defines the accounting rules for the creation of the reserve fund on the basis of the unused balances of the operating subsidies, however, these accounting procedures are difficult to apply in practice. This problem is not closer methodically regulated by the Ministry of Finance. In the Czech Republic, therefore, accounting practices are differentiated.*

**Key words:** Reserve fund · Contributory organization · Economic result · Equity

**JEL Classification:** H71 · M41

## Application of detection methods on controlled transactions of concerns „Transfer pricing“

Marcela Hradecká

**Abstract:** *Controlled transactions of concerns and multi-national groups of business corporations transfer pricing are conducted intentionally. The primary purpose of concern transactions is to use the capital power of the concern for the backup of the concern transactions that lead to increased profits and the economic value of the concern. Due to imperfect and unsatisfactory regulatory legislation of the accounting concerns and multi-national corporations use the loopholes in legislation for the transfer of profits to areas with lower tax legislation for optimize their net profit which is the basis for the payment of dividends and for the pecuniary transfer flow between the mother company and its daughter companies. The mother company should choose such methods for setting the transfer pricing that lead to higher profits of the concern group of corporations and to the maximization of the value of the owners. Methodology of the transfer pricing of concerns must be controlled not only from the tax perspective to prevent tax avoidance by moving money to countries with lower tax burden but also from the accounting perspective so that the controlled transactions were not overpriced by fictitious service costs that distort the economic result and decrease the value for the owners.*

*This paper deals with the practical application of detection methods aimed at revealing fictitious services included into transfer prices of concerns and suggests possible solution through accounting based on value forming activities and modification of the profit and loss account.*

---

**Key words:** Transfer pricing · Fictitious service · Reporting · Detection methods · Value-creating activities · Shareholder value

**JEL Classification:** M2 · M41 · M42



SESSION  
MATHEMATICAL-STATISTICAL MODELLING AND OPTIMIZATION  
IN PRACTICE

## European Insurance Market Analysis: A Multivariate Clustering approach

Stavros Athanasiadis, Tomáš Mrkvička

**Abstract:** *Clustering has been proved to extract valuable information resided in complex and massive data sets. Motivated by this evidence, this paper is aimed to provide a multivariate clustering of European insurance market in terms of the insurance penetration curves of European countries. Yet, at the same time, this clustering is provided through two different cases, where the first case considers only the magnitude (size) of these curves, and the second considers only their shape. In this paper, two partitional clustering methods are utilized, k-means and Gaussian mixture model, with two distance measures, the Euclidean and Mahalanobis distance, respectively. Both clustering methods form clusters within a sample of 34 European countries observed between 2004 and 2016; that is before, during and post-financial and sovereign debt crises. The clustering solutions also reveal the extent to which the employed clustering methods and distance measures are being able to capture the distinctive properties of the original curves as depicted during the period under examination.*

**Key words:** Insurance · Insurance penetration · Partitional clustering methods · Distance measures

**JEL Classification:** C38 · G22 · O16

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## Implementation of SAF-T into ERP Systems in the Country of Czech Crown

Petr Hanzal

**Abstract:** *The aim of this paper is to compare the state of implementation of SAF-T into ERP systems in individual OECD countries and explaining the purpose of SAF-T use. Particular emphasis is then placed on the Czech Republic, where the current state of e-reporting in the area of audit and state control of legal entities is currently represented by the VAT audit report and the electronic cash record system (EET). The paper should be considered as a contribution to the application and development of Enterprise Resource Planning Information Systems in the Czech Republic.*

**Key words:** Enterprise Resource Planning · Accounting Data · Standard Audit File Tax

**JEL Classification:** M41 · C88

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## The mental models of novice programmers for the assignment statement

Radim Remeš, Ladislav Beránek

**Abstract:** *The art of programming is a complex cognitive skill that is not easy to master. This article reports about the use of the SOLO taxonomy to study the understanding of the assignment statement by students. The students of tertiary education are trained and studied within the introductory course of programming in the third week. The study is focused on the observation and examination of students' mental models of the assignment statement and the ways students use these models to design and program the solutions to six assigned tasks. The data in the study was obtained from students' written answers to the short code tasks related to assignment statement. Responses were mapped to individual levels using the SOLO taxonomy.*

*The results show that for more complex tasks with assignment statements, approximately only one third of students reached a relational level of understanding the subject.*

**Key words:** Program design · Novice programmers · SOLO taxonomy · Mental models · Assignment statement

**JEL Classification:** C89 · C99

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## Model of e-commerce network with price comparison sites

Ladislav Beránek, Radim Remeš

**Abstract:** *In general, relationships within e-commerce can be modeled using a bipartite graph (network). One part of this graph is made up of customers and the second part is formed by e-shops (sellers). Edges show customer activities as they visit websites of different e-shops. However, online price comparison sites (PCSs, comparators, shopbots), such as Heureka, enter into these relationships. PCSs allow easily to compare the prices of desired product in different e-shops. These price comparators do not only show the price in different e-shops, but also the rating of the relevant e-shop made by customers. The questions addressed by this contribution are what strategy was chosen by the price comparator for market entry, when it is worth to terminate services of online price comparator, etc. In this paper, we use network analysis and simulation methods to model network dynamics to address these issues.*

**Key words:** E-commerce · Network-based inference · Simulation · Price comparison site

**JEL Classification:** D85 · L81

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# Does a more sophisticated model lead to a better description and solution of a real portfolio selection problem?

Adam Borovička, Matouš Jandek

*Abstract: The investment decision making, or investment portfolio selection, is not an elementary process because of namely an unstable, vague elements on the capital market. One of them is a return. This element can be expressed in a simple form as mean or in advanced form as (triangular) fuzzy number which could represent better its instability. To make a portfolio, a well-known Markowitz model (with some appropriate modifications) can be applied. The main and interesting research question is whether the portfolios (with crisp and fuzzy returns) are the same or not. If yes, then a use of more complex (more sophisticated) fuzzy approach is unnecessary and the decision making process may become easier. Otherwise, the levels of the main monitored characteristics of the portfolios are compared to clearly declare which model provides a better solution. To make a comprehensive analysis, a few investment situations (with various groups of open unit trusts in terms of two time periods) are studied. The empirical analysis is carried out on the open unit trusts that are still more popular in the Czech Republic. The portfolios are made for each investment situation via both models. Their composition is analysed and compared. It turns out that a more sophisticated (fuzzy) model may not always be the most appropriate tool for making a portfolio.*

**Key words:** (Modified) Markowitz model · Open unit trust · Portfolio selection · (Triangular) fuzzy number · Vague element

**JEL Classification:** C61 · G11

## 1 Introduction

The investment decision making, or investment portfolio selection, is usually exacting process namely due to the unstable (vague) elements on the capital market. To make a comprehensive decision, the effort is to consider all these aspects. On the other hand, the process then become more complicated. A typical unstable element on the capital market is return of the investment instrument. It can be expressed as a crisp number (usually average return for some specified period) or (more precisely) by fuzzy number which can consider its instability.

To make an investment portfolio, a well-known mean-variance model from Harry Markowitz (Markowitz, 1952; 1959) can be applied. Of course, we know a few other concepts for a portfolio making (fundamental, technical or psychological analysis). These approaches mostly take into account only one view of the investment, or only one decisional characteristic (e.g. asset return, company profit or market value, investor behaviour). Moreover, to make a portfolio some additional rather intuitive approach must be applied. Compared to these concepts, Markowitz optimization model allows both most important investment characteristics (risk and return) and make a portfolio based on the quantitative process. This approach is user-friendly. The optimization model is not so complicated. Its another benefit is that it can be easily modified according to the needs of a real-life investment problem. It means that additional conditions (e.g. limit for a share of one asset in the portfolio) can be included, or some elements are fuzzified (e.g. return of the investment instruments). Of course, these adjustments mostly make the process more complicated (also compared to other approaches). On the other hand, the investment decision making using such a supporting tool can then be more closely to the reality. Perhaps the most limiting aspect of the model is a quite complicated explicit expression of a qualitative (psychological) point of view. However, this can be remedied by an additional decision-making procedure based on the pre-selection of investment instruments, a timing of the investment decision, etc.

However, the main question remains whether such modifications are worthwhile. Is not a price for getting closer to the reality too high? Is not then a quantitative approach (fuzzy modified mean-variance model) too complicated? Does such a model really better reflect a real investment decision making? These are very interesting and important questions

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**Ing. Adam Borovička, Ph.D.**, Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Department of Software Engineering, Trojanova 13, Prague 2, 120 00, Czech Republic, e-mail: adam.borovicka@jfifi.cvut.cz

**Ing. Matouš Jandek**, Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Department of Software Engineering, Trojanova 13, Prague 2, 120 00, Czech Republic, e-mail: jandemat@jfifi.cvut.cz

which should be answered to maintain an effective portfolio selection process. Answering these questions is a significant contribution because these issues are unconsciously overlooked in research. To fulfill this main aim of this article, the following methodological approach is proposed. In the first stage, various groups of the investment instruments (according to the investor preferences) are selected that can potentially participate in the portfolio. Then crisp and fuzzy modified mean-variance (for inclusion of a typical instability of the returns) model is formulated and solved by appropriate mathematical method. The results (portfolios) for all investment situations are compared and analysed. To empirically answer the aforementioned questions, the analysis is focused on a composition of the portfolios and values of the most important characteristics (namely risk and return). The analysis is carried out on open unit trusts data. Recently, these investment instruments are more and more popular in the Czech Republic. Thus, namely bond and stock and mixed funds offered by Česká spořitelna are included in the analysis.

The structure of the article is as follows. After the introduction, namely crisp and fuzzy modified mean-variance model is described. Subsequently, the empirical analysis is performed on the open unit trusts from Česká spořitelna. The results are analysed, and some statements are declared. The article is summarized and some ideas for a future research are outlined.

## 2 Process of the analysis

After selecting the suitable investment instruments (open unit trusts), crisp and fuzzy modified Markowitz models are formulated. Then the portfolios made by both models are compared over all investment situations to make a statement about a contribution of more sophisticated model.

### 2.1 Crisp modified Markowitz model

The Markowitz model can have the following form (Markowitz, 1952)

$$\begin{aligned}
 z(x_1, x_2, \dots, x_m) &= \sum_{j=1}^m v_j x_j \rightarrow \max \\
 \sum_{j=1}^m \sum_{k=1}^m x_j x_k \sigma_{jk} &\leq R \\
 \sum_{j=1}^m x_j &= 1 \\
 x_j &\geq 0 \quad j = 1, 2, \dots, m
 \end{aligned} \tag{1}$$

where:

$x_j$ ( $j = 1, 2, \dots, m$ )	share of the $j$ -th investment instrument (open unit trust)
$v_j$ ( $j = 1, 2, \dots, m$ )	return of the $j$ -th investment instrument (open unit trust)
$\sigma_{jk}$ ( $j, k = 1, 2, \dots, m$ )	covariance of a return of the $j$ -th and $k$ -th investment instrument
$R$	upper limit for a possible level of a portfolio risk

The model maximizes the return under some limit for a risk level because a return of the portfolio is mostly comprehended as the most important criterion. Of course, the second way is a model minimizing risk under the lower limit for the portfolio return. Even both criteria may be associated with a particular one with a “risk tolerance” factor. All three models are nonlinear. But only first one has not a nonlinearity in the objective function. However, it may not be easy to find the optimal solution. In the collective investment market, a development of prices of the open unit trusts are often similar. Then the covariances could be excluded which would make the risk function linear. Its form can be simplified to the

weighted sum  $\sum_{j=1}^m \sigma_j^2 x_j$ , where  $\sigma_j^2$  is a (constant) variance of return of the  $j$ -th investment instrument,  $x_j$  can be in

a non-quadratic form. The optimal solution of such a model can be easily found by a simplex method. Of course, the basic diversification idea of Harry Markowitz is gone because the relationships of returns of the investment instruments are not considered in the portfolio. However, it does not matter because the character of the development of open unit trusts returns on the “Czech” market are very similar. In such an environment, the idea of diversification is difficult to fulfil. Such a model is still working to make an investment portfolio taking into account the investor's preferences (see more below).

Subsequently, the model can be further modified (extended) by additional necessary conditions for a portfolio selection (e.g. maximum possible share of one asset in the portfolio). A final form of the crisp modified Markowitz model can be formulated as follows

$$\begin{aligned}
z(x_1, x_2, \dots, x_m) &= \sum_{j=1}^m v_j x_j \rightarrow \max \\
\sum_{j=1}^m r_j x_j &\leq R \\
\mathbf{x} &\in X
\end{aligned} \tag{2}$$

where:

$r_j$  ( $j = 1, 2, \dots, m$ ) risk of the  $j$ -th investment instrument measured through the variance  
 $\mathbf{x} = (x_1, x_2, \dots, x_m)^T$  vector of shares of the investment instrument (open unit trusts) in the portfolio  
 $X$  set containing all needed conditions (including portfolio condition, excluding condition for maximum possible portfolio risk)

Upper limit for a portfolio risk  $R$  could be calculated according to the proposed formula

$$R = r_{min}^* + p(r_{max}^* - r_{min}^*) \tag{3}$$

where:

$p \in \langle 0, 1 \rangle$  parameter  $p$  and its domain  
 $r_{min}^*$  minimum possible level of a portfolio risk  
 $r_{max}^*$  maximum possible level of a portfolio risk

The upper limit for a portfolio risk is based on the minimum possible risk extended by some part of the difference in both extreme values. These extremes can be determined by the following two one-objective mathematical models

$$\begin{aligned}
\mathbf{x}_{rmin}^* &= \arg \min_{\mathbf{x} \in X} z_r(\mathbf{x}) & \mathbf{x}_{rmax}^* &= \arg \max_{\mathbf{x} \in X} z_r(\mathbf{x})
\end{aligned} \tag{4}$$

where:

$$z_r(\mathbf{x}) = \sum_{j=1}^m r_j x_j \quad \text{portfolio risk function}$$

Further, it holds the following  $r_{min}^* = z_r(\mathbf{x}_{rmin}^*)$  and  $r_{max}^* = z_r(\mathbf{x}_{rmax}^*)$ .

## 2.2 Fuzzy modified Markowitz model

As we know, the return of the investment instrument, or investment portfolio, is unstable indicator in time. In order to include such an instability/uncertainty, the return (based on its usual distribution) can be represented (approximated) by a (triangular) fuzzy number. This type of fuzzy number is a very convenient tool with which can satisfactorily quantified the return instability. Moreover, this form of fuzzy number is user-friendly, because its membership function is partly linear, the basic computational operations with them are easy. Then the fuzzy modified “mean-risk” model is formulated as follows

$$\begin{aligned}
z(x_1, x_2, \dots, x_m) &= \sum_{j=1}^m \tilde{v}_j x_j = \left( \sum_{j=1}^m v_j^l x_j, \sum_{j=1}^m v_j^m x_j, \sum_{j=1}^m v_j^u x_j \right) \rightarrow \max \\
\sum_{j=1}^m r_j x_j &\leq R \\
\mathbf{x} &\in X
\end{aligned} \tag{5}$$

where:

$\tilde{v}_j = (v_j^l, v_j^m, v_j^u)$ ,  $j = 1, 2, \dots, m$ , return of the  $j$ -th investment instrument (open unit trust) expressed as a triangular fuzzy number

Parameters of the triangular fuzzy numbers are calculated from the historical returns in some selected period.  $v_j^l$ , or  $v_j^u$  is the minimum, or maximum from historical returns,  $v_j^m$  is their mean. Model (5) can be easily transformed to the crisp form by means of the fuzzy goal principle (Bellman and Zadeh, 1970) through the maximin optimization approach (Zimmermann, 1978). Such a defuzzified model can be formulated as follows

$$\begin{aligned}
z = \alpha &\rightarrow \max \\
\frac{\sum_{j=1}^9 v_j^l x_j - v_{min}^{l*}}{v_{max}^{l*} - v_{min}^{l*}} &\geq \alpha & \frac{\sum_{j=1}^9 v_j^m x_j - v_{min}^{m*}}{v_{max}^{m*} - v_{min}^{m*}} &\geq \alpha & \frac{\sum_{j=1}^9 v_j^u x_j - v_{min}^{u*}}{v_{max}^{u*} - v_{min}^{u*}} &\geq \alpha \\
\sum_{j=1}^9 r_j x_j &\leq R \\
0 &\leq \alpha \leq 1 \\
\mathbf{x} &\in X
\end{aligned} \tag{6}$$

where:

$v_{min}^{l*}, v_{min}^{m*}, v_{min}^{u*}$  minimum possible portfolio return for each parameter of the triangular fuzzy number representing a vague portfolio return

$v_{max}^{l*}, v_{max}^{m*}, v_{max}^{u*}$  maximum possible portfolio return for each parameter of the triangular fuzzy number representing a vague portfolio return

These extreme values of functions  $\sum_{j=1}^9 v_j^l x_j$ ,  $\sum_{j=1}^9 v_j^m x_j$  and  $\sum_{j=1}^9 v_j^u x_j$  are searched similarly to the model (4). Mathematical models (2), (4) and (6) are easily solvable due to the linearity of all functions and a limited set of feasible solutions by a simplex method.

### 2.3 Comparison of the investment portfolios

Both models (2, 6) provide the investment portfolio for various investment situations. If all (or the most) portfolios are the same from both models, a selection of the model does not influence the results. Then it is meaningful to apply a crisp model to make a portfolio making process easier. But ultimately, it depends on the investor. If all (or the most) portfolios are different then the effect of the applied model is strong. The results can be compared due to the monitored characteristics – risk and return. Risk is crisp in both models, so it is easily comparable. More complicated situation occurs with return because it is in crisp and fuzzy form. To compare them, the fuzzy/vague return must be defuzzified. For this purpose, the defuzzified portfolio return  $v_{def}$  can be expressed as a following simple average

$$v_{def} = \frac{1}{3} \sum_{j=1}^m (v_j^l x_j + v_j^m x_j + v_j^u x_j).$$

If fuzzy model provides all (or the most) investment portfolios with better return and risk levels, then an application of a more sophisticated (complex) model is worth. In the opposite situation, the crisp (easier) model is even better. When the results are mixed, it is not possible to generally declare which model is better. Then a selection of the applied model is rather based on the user's preferences.

## 3 Analysis of the portfolio of open unit trusts

This section deals with an empirical analysis of the effect of a more sophisticated model on the portfolio composition and its characteristics. Open unit trusts are chosen because they become more popular in the Czech Republic. Due to my personal investment experiences, the open unit trusts offered by Česká spořitelna are considered.

### 3.1 Investment situations

We select five bond funds (*Trendbond*, *Sporinvest*, *Sporobond*, *High Yield dluhopisový*, *Korporátní dluhopisový*) and three stock funds (*Top Stocks*, *Sporotrend*, *Global Stocks*). On the basis of my personal investment experiences, I let say that the most important investment characteristics are return and risk. Return is strictly measured via a simple average from the historical returns on an annual basis. To cover its instability, it can be also expressed by a triangular fuzzy number with the parameters derived from historical returns (see more above). Risk is calculated as a variance of the historical returns. In general, the open unit trusts are more suitable for a longer-time investment. For this analysis, the period 2008-2018 (as a source of historical data) is selected. This period satisfactorily represents a longer-time price development because contains several partial periods of falls, rises and also “calm” periods. For a comprehensive analysis, another (special) investment time period should be determined. Such a period is from May to October which is derived from *Sell in May and go away effect* (Investopedia, 2018). This effect warns investors to sell their stock holdings in May to avoid a seasonal decline on the capital market. The historical returns (prices) of the investment instruments for both time investment periods are from the aforementioned period 2008-2018. For both time periods, three investment portfolios are made. Two portfolios contain separately only one type of open unit trusts. The third portfolio can be potentially

composed by any selected funds. All six portfolios are compared to analyse the effect and ability of a more sophisticated model.

### 3.2 Longer-time period

For a longer-time period, the data about all open unit trusts are in the following table (Table 1).

**Table 1** Data about open unit trusts

Open unit trusts data			
	Strict return [%]	Fuzzy return [%]	Risk [%]
Trendbond	0.93	(-5.03,0.93,15.37)	0.39
Sporoinvest	0.25	(-2.97,0.25,3.56)	0.03
Sporobond	3.00	(-2.22; 3.00, 10.72)	0.15
High Yield dluhopisový	6.42	(-34.14,6.42,65.97)	6.02
ČS korporátní dluhopisový	3.91	(-21.06,3.91,38.43)	3.91
Top Stocks	15.30	(-56.75,15.30,86.58)	12.14
Sporotrend	6.77	(-67.47,6.77,153.92)	29.92
Global Stocks	6.24	(-39.90,6.24,28.03)	3.4

Source: Own processing based on Investment Centre (2018)

On the basis of my personal investment preferences, the investor usually wants a portfolio from more investment instruments (open unit trusts). On the other side, a portfolio composition would be basically controllable for the investor. Therefore, the maximum level of share of one open unit trust in the portfolio is determined as 30 % (40 % for stock funds due to small number of offered funds). For a longer-time investment, a portfolio risk is also important criterion. The purpose of such an investment is mostly long-term preservation of the value of free funds (at least with moderate return) that will be used either in unproductive age or as a "start-up" for children to their "edult" life. Therefore, the maximum acceptable level of risk  $R$  in (3) is determined lower ( $p = 0.15$ ). Models (2) and (6) are formulated for two groups of the open unit trusts separately, as well as for all 8 funds that is designed as follows

$$\begin{aligned}
 z(x_1, x_2, \dots, x_8) &= \sum_{j=1}^8 v_j x_j \rightarrow \max & z = \alpha \rightarrow \max & \sum_{j=1}^8 v_j^l x_j - v_{min}^{l*} & \sum_{j=1}^8 v_j^m x_j - v_{min}^{m*} & \sum_{j=1}^8 v_j^u x_j - v_{min}^{u*} \\
 & & & \frac{\sum_{j=1}^8 v_j^l x_j - v_{min}^{l*}}{v_{max}^{l*} - v_{min}^{l*}} \geq \alpha & \frac{\sum_{j=1}^8 v_j^m x_j - v_{min}^{m*}}{v_{max}^{m*} - v_{min}^{m*}} \geq \alpha & \frac{\sum_{j=1}^8 v_j^u x_j - v_{min}^{u*}}{v_{max}^{u*} - v_{min}^{u*}} \geq \alpha \\
 \sum_{j=1}^8 r_j x_j &\leq r_{min}^* + 0.15(r_{max}^* - r_{min}^*) & \sum_{j=1}^8 r_j x_j &\leq r_{min}^* + 0.15(r_{max}^* - r_{min}^*) & & \\
 0 \leq x_i &\leq 0.3 \quad i = 1, 2, \dots, 8 & 0 \leq x_i &\leq 0.3 \quad i = 1, 2, \dots, 8 & & \\
 & & 0 \leq \alpha &\leq 1 & & 
 \end{aligned} \tag{7}$$

where:

$x_i$  ( $i = 1, 2, \dots, 8$ ) share of the  $i$ -th open unit trusts in the order from Table 1

The extreme values of risk and return are determined via models (4) solved by simplex method. The same method is able to solve both models (7). The results for the situation with all open unit trusts for a typical longer-time investment period are displayed in the following table (Table 2).



**Table 2** Investment portfolios for a longer-time period from both models

Portfolios from strict and fuzzy model for a longer-time period				
	All funds		Bond funds	Stock funds
	<i>Strict model</i>	<i>Fuzzy model</i>	<i>Strict/fuzzy model</i>	<i>Strict/fuzzy model</i>
Trendbond	3.22%	20.70%	30%	
Sporoinvest	x	x	14.32%	
Sporobond	30%	19.56%	30%	
High Yield dluhopisový	x	29.74%	x	
ČS korporátní dluhopisový	30%	30%	25.68%	
Top Stocks	6.78%	x		40%
Sporotrend	x	x		23%
Global Stocks	30%	x		37%
Risk	2.55%	2.55%	0.72%/0.72%	13%/13%
(Defuzzified) return	5.01%	7.45%	2.22%/4.14%	9.99%/12.47%

Source: Own processing based on Investment Centre (2018)

As we can see in Table 2, the portfolios composed from one type of open unit trusts (bond or stock) are the same. Moreover, if the value of “risk” parameter  $p$  increases (changes), the portfolios are still the same. The form of the optimization model does not affect the results (portfolio composition). Different situation occurs with the portfolios composed from both types of funds. Portfolios are different in the number of open unit trusts and, of course, their shares. The exception is the fund ČS korporátní dluhopisový, which holds the largest share in both portfolios. As expected, the risk is the same (at the highest possible level) for both portfolios. It is caused by the fact that a higher risk can usually provide a higher return (as the data in Table 1 show). It is obvious that the investment portfolio made by the fuzzy model is better because its return, which could be better described, is higher (at the same level of risk). However, “strict”, or “fuzzy” solution is non-dominated due to the strict, or fuzzy return. Thus, a more sophisticated model has proven itself in making a suitable “2-type fund” portfolio. This result is confirmed by making a portfolio from 3 types of funds (beyond the described analysis, mixed open unit trusts included). However, what happens when parameter  $p$  increases (i.e. a higher acceptable risk)? If the parameter is higher, the portfolio composed by the strict model will be better (with higher return at the same level of risk). The main reason is a distribution of the return values. We can see that an absolute difference between maximum and average return is significantly higher than a difference between minimum and average return. This return “asymmetry” may not be quite satisfactorily affected by the triangular fuzzy number. Then, a higher value of parameter  $p$  enables a rise of the strict portfolio return (from the strict model), while the fuzzy return does not grow. Moreover, the result can be also influenced by the defuzzification formula for the return. Due to a return distribution, the defuzzified return could be calculated as a weighted average with appropriate weight of three parameters.

### 3.3 May-October period

In this special time period, the results are different. Firstly, the “1-type fund” portfolios are not the same under the various values of the highest acceptable risk. The strict model provides the portfolios with a higher return regardless of the acceptable level of risk. The power of a more sophisticated model is not confirmed. For the “mixed” investment portfolio, the situation is actually opposite as in the previous case for a longer-time investment. The portfolio made by the strict model has a better return. The level of risk is not the same for both portfolios. However, the difference is very small. If the acceptable level of portfolios risk increases, the fuzzy model will start to provide a portfolio with a higher return. The relative relation between the risks of portfolios is the same. Different results compared to a longer-time time investment can be caused by a different distribution of the historical returns of bond and stock open unit trusts. It is quite symmetric. Then the differences between the extremes and average value are almost the same.

### 3.4 Summary of the results

It is obvious that a model type affects the composition of an investment portfolio in most cases. Only for a typical longer-time investment, the portfolios for a separate group of bond and stock open unit trusts are the same. However, in the period from May to October, these portfolios are different. Further, it is possible to declare that all portfolios made by fuzzy model, or strict model in terms of a longer-time period, or May-October period have a higher return (with the same or very similar risk level). But changes of the highest possible portfolio risk turn this situation.

As we can see, it is not possible to say that the fuzzy (more sophisticated) model is better to make a portfolio (with better characteristics). This result can be affected by several factors. The first one can be a type of fuzzy numbers which

enable represent more or less an instability (uncertainty) of the return. In some cases, another type of fuzzy number (with no partly linear membership function) would be more suitable. However, the triangular fuzzy number has several strong advantages. The membership function is partly linear which is very comfortable for elementary computational operations that are well-known (Chen and Hwang, 1992). The model with a more suitable fuzzy number can be hardly solvable. Setting the highest possible (acceptable) risk can also affect the result. This is based on the investor preferences. The defuzzification formula for return can also affect the results of the analysis. As needed, the average can be weighted.

For even greater relevance of the analysis, the number of types of the investment instruments and investment time periods could be higher. Then maybe some specific cases with a better result of a more sophisticated model could be revealed. However, it is not possible to expect that a fuzzy model will provide a better portfolio in all investment cases. This is not allowed by the specificity of the return data.

#### 4 Conclusions

This article deals with a very interesting question whether a more sophisticated model is able to describe and subsequently solve a real-life investment decision making problem better than an “ordinary” crisp model. The basis of the proposed methodological approach is Markowitz optimization model in the crisp and also fuzzy form which allows to express a return as a vague (uncertain, unstable) element. To make a comprehensive analysis, the investment portfolios are made (via these two models) from several groups of investment instruments and two time investment periods. The analysis is performed on more and more popular investment instruments in the Czech Republic – open unit trusts. The analysis shows that a more sophisticated model (using triangular fuzzy numbers) cannot always provides a better solution (portfolio with better characteristics). In future research, the analysis could be extended by another investment instruments or time periods to analysis the power of a more sophisticated model on a more general basis. Such an analysis could provide a more significant support for a potential investor/investment council who would decide on an optimization model type. The current analysis and its results tend to recommend using a strict optimization model (approach) because it is simpler and provides better results in many investment cases.

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## Relation of Size of Enterprise and Planned Robotization

Jaroslav Vrchota, Drahoš Vaněček, Martin Pech

**Abstract:** *The paper deals with the relation of enterprises and planned robotization, regarding the size and industry of the enterprises. Currently, the introduction of robots in the Czech Republic has been supported by low unemployment, and an increase of demand in the automotive industry and production. The number of robots increases by 10-20% each year, the most promoted by the automotive industry. The aim of the paper was to describe the relation of planned robotization in the manufacturing industry and size of the enterprises, defined by the number of employees. The statistic tests proved the difference of the enterprises planning robotization and the enterprises without robotization, regarding the size. The enterprises that are going to introduce robotization have more employees. The lack of the robots in the market is mostly seen by the small and micro-enterprises. The most common reason for the introduction of robots was related to the lack of employees.*

**Key words:** Industry 4.0 · Robotics · Small and Medium-sized enterprises · Robot

**JEL Classification:** M11 · O33

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## The Role of Corporate Social Responsibility in the Management of Small and Medium - Sized Enterprises (SMEs)

Ioannis Koukoumpliakos, Petr Řehoř, Labros Sdrolias, Dagmar Škodová Parmová

**Abstract:** *Objective of this proposal is to highlight the role of corporate social responsibility in the management of small and medium-sized enterprises. Corporate Social Responsibility is a continuous commitment of businesses to social and environmental issues. It concerns both the internal and external environment of the business and aims at their responsible development. It expresses an administration philosophy that focuses on values and principles that require trust, dialogue and collaboration with stakeholders.*

*The aim of the paper is to approach corporate social responsibility in business management, the specific features of this, the approach of the organization of the parties involved. The methodology used is based on bibliographic research, text analysis and the linking of findings from research to the current state of affairs.*

*The expected results of the survey are estimated to the need to take initiatives to improve the quality of corporate social responsibility for small and medium-sized enterprises and the need for changes in these organizational structures in order to gain more responsibility and effectiveness.*

*The above findings can help to inform the public about the current situation of small and medium-sized enterprises and identify the causes of delays in the development of better corporate social responsibility in the business environment.*

**Key words:** Management of Small and Medium Sized Enterprises

**JEL Classification:** M10 · M14

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## How to raise interest of generation Y, Z for entrepreneurship

Michaela Slabová

**Abstract:** *Considering that every 5th person in Central and Eastern Europe belongs to this group, it is almost 20% probable that you and Y will meet on the Y generation. This is a good reason for better knowledge, especially when you are one of them. The main factor determining the nature of our behavior is personal values. Recently, in Assessment Systems, we conducted a study on whether Generation Y really differs so much from previous generations? We used high-quality methodological tools to evaluate the main motivators and personality characteristics specific to the group.*

**Key words:** Generation Y · Generation Z · Motivation for entrepreneurship

**JEL Classification:** M12

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## Telework and Financial Indicators in Industry 4.0

Miroslava Vlčková, Jaroslav Vrchota, Zuzana Frantíková

**Abstract:** *Telework is defined as work that is carried out outside the central office. For more and more companies, it is an interesting alternative to set the way employees work. At present, telework is mainly benefit for employees. Flexible modification of work is created thanks to innovation and optimization of communication tools. As a result, considerable savings can be achieved. The indicators of financial analysis serve for the evaluation of the financial situation of companies. The source of information is mainly data from annual reports, i. e. financial statements, attachments and other supplementary information issued annually.*

*Industry 4.0, also known under the name “the fourth industrial revolution” comprises not only the trend of automation but also data exchange in manufacturing technologies. Furthermore, it includes cyber-physical systems, the Internet of things, cloud computing and cognitive computing. In this paper, a certain link between the introduction of telework in the company and the financial indicators within the industry 4.0. was identified. The indicators that were assessed within the analyzed enterprises were: total assets, total inventory, return on equity, return on assets, EBIT, cash flow and labour productivity.*

**Key words:** Telework · SME' s · Financial and Economic Indicators · Industry 4.0

**JEL Classification:** G30 · J53 · M12 · M41

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## Effective Communication of a Manager in Small and Medium-sized Enterprises - Personality Characteristics

Alena Čarvašová, Petr Řehoř

**Abstract** *The paper deals with communication of a manager in small and medium-sized enterprises (SMEs). In the SMEs, communication plays a very important role in many respects. Existing theory and psychology of the management offers a variety of ways to recognize workers' competencies, to appropriately occupy positions and to create the prerequisites for establishing effective managerial communication. However, these personality traits are difficult to measure. The paper aims to find easily measurable characteristics such as gender, age, education, child care, and the siblings of the*

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managers and their subordinates. Data was gathered in the framework of a pilot research that was conducted to find accurately measurable characteristics of managers and staff that imply effective management communication.

**Key words:** Managerial communication · Small and Medium-sized enterprises · Typology theories · Psychology · Personality characteristics

**JEL Classification:** M10 · L20

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## Innovation management in a selected organization

Ladislav Uhlíř, Petr Řehoř

**Abstract** *At present, human society is at a time when the world around us is changing at the fastest pace in the history of humanity. Innovation is not only an opportunity for business but is becoming a necessity without which organizations would be condemned to disappear. It should be remembered that only a good idea is not enough. For businesses, it is essential that ideas are matched by successful innovations. In other words, it depends on the quality management of innovation processes. The paper is about managing innovation. The object of the survey was a medium-sized manufacturing enterprise. This article evaluates the innovation management in the sample enterprise and, at the same time, is suggests particular improvements in this area.*

**Key words:** Innovation management · Innovation process · Innovation · Improvement proposals · Innovation evaluation

**JEL Classification:** M10 · L20

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## Innovation Literacy Quantification in Social Enterprises

Petra Krejčí

**Abstract:** *The main goal of the paper is to set competencies for the evaluation of the innovation literacy rate in social enterprises in the field of innovation creation. A literature review will be made in order to determine literacy types and competencies for the narrower definition of innovation literacy. Based on these findings, theoretically set competencies in social enterprises in the field of innovation creation in the Czech Republic will be defined. The added value of this paper will be the focus on entrepreneurs' opinions on the creations of social innovation in social enterprises in the Czech Republic from the point of view of superiority and subordination. Furthermore, competencies are allocated to three types of innovation in a social enterprise. These three types of innovation include employee-focused innovation, product-oriented innovation and enterprise-wide innovation. The final evaluation is based on secondary research on the literacy rate in enterprises by using pre-set competencies. In the conclusion part of the paper we will highlight the possibilities of further primary research following on from this research. Competencies should help in the development of future primary research focusing on innovation literacy in social enterprises in the Czech Republic.*

**Key words:** Literacy · Social enterprise · Innovation · Literacy rate · Competencies

**JEL Classification:** L31 · O35

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## Effect of Customer Orientation on Business Performance - Case of Slovakia

Simona Budinská, Janka Táborecká-Petrovičová

**Abstract:** *In current situation on the market, one of the key capabilities of business in order to achieve competitive advantage is the ability to satisfy needs of the customers better than competitors. The culture or behaviour whose essence is to place customer needs into the centre of attention of business is called market orientation. Market orientation originates from the marketing concept and it seems to be the key for increasing business performance. There are various ways of market orientation measurements that involve a lot of aspects and dimensions but one of them emphasizes especially focus on customers, resp. customer orientation. Based on previous studies we expect that the level businesses achieve in this orientation is directly reflected in their performance. It means the higher customer orientation businesses achieve, the better they will perform. Based on that we formulated the main aim of our paper as: to examine customer orientation of businesses operating in Slovakia through CUSTOR measurement method with the respect to business performance represented by financial and non-financial indicators. We studied 230 companies of various sizes, scopes of business and from various regions in online survey to confirm our hypothesis. The results will serve for managers as a base for enhancement of customer-oriented culture in their companies that could result in better performance in both financial and non-financial field.*

**Key words:** Customer orientation · Business performance · Market orientation · Indicators

**JEL Classification:** M1 · M3

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## Business Environment Versus Entrepreneurial Reaction: Are Competencies Needed?

Jarmila Šebestová, Monika Lejková

**Abstract:** *Entrepreneurial competencies and reaction to solve business problems are closely linked together. Their relationship affects the final export activity success, which was supported by literature review. The aim of the paper is to suggest a model, which covers entrepreneurial reaction and hard competencies to support export activities – a primary research was used with statistical data evaluation. Those findings are supported by the results, presented in form of three models, with more than 60% of variance explained. The results are based on the results an empirical study (210 respondents, omnibus survey) in the Czech Republic. Moreover, the study concludes that the competence basis in businesses must be internally strong to meet decision on export and would be negative related to business age, business cycle and company branch.*

**Key words:** Business · Business environment · Competencies · Export

**JEL Classification:** L26 · O44 · R58

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## Motivation and development of the manager's personality

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Růžena Krninská, Markéta Adamová, Nikola Soukupová, Ondřej Skopec

**Abstract:** *Contemporary societal changes are bringing the fourth industrial revolution. Industry 4.0 is not just a revolution of modern technologies linked to digitization and automation but also to innovation processes. These processes are associated with a new knowledge-based economy. Strongly motivated people are able to develop their knowledge, skills, and experience much more strongly. On the studied sample of EF JU students in České Budějovice, innovation can be related to the right hemisphere which has intuitive and creative qualities.*

*Development of functionality of the right hemisphere should be supported if the students (future employees and managers) are to be more innovative. In order to develop the personality of the manager, it is necessary to motivate the individual internally to ensure high level of motivation in the long term and preferably through his own internal self-motivation related to the self-learning process. Motivation to cultivate and develop human potential leads to innovative approaches and thus to building a competitive advantage within the global world.*

**Key words:** Motivation · Self-motivation · Self-development · Manager's personality

**JEL Classification:** M10 · M12

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## Duties and Options of Employer During Employee's Temporary Incapacity for Work

Jana Martiníková

**Abstract:** *Temporary incapacity for work is a topic involving legal, economic, social and medical aspects. The paper deals with a Czech legal regulation of this topic aiming at pointing to its social aspects. If the law is generally understood as one of the tools to realize social policy of the state, then legal regulation of some labour-law institutes is the tool to realize social policy at the level of employer in the frame of his personnel agenda. When analysing selected duties and options given to employer by the law (as it comes to employee's temporary incapacity for work) and pointing out some problems in practical application, such hypothesis can be proved that legal regulation of this topic has social aspects. Based on this paper elaboration, the following results have occurred: 1) employers have to respect given duties determined by the law, 2) employers can use options given them by the law, and 3) employers can also use an absence of some questions being not regulated by the law and arrange their own social benefits for the employees. The legal regulation thus significantly influences employer's decision-making in both the question of temporary incapacity for work and his entire social policy concept.*

**Keywords:** Temporary incapacity for work · Compensatory wage · Protection period · Sick days

**JEL Classification:** K31 · J89

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## Labour productivity of SME confectionary manufacturers as a financial performance influencing factor

Jan Vavřina, Josef Polák



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**Abstract:** *Food manufacturing industry is considered to be a labour intensive industry. The way for increasing competitive advantage of food processing companies is then interconnected with both intensive and extensive growth of labour productivity based on rising export potential, mainly within the single European market. This paper aims at identification of factors influencing labour productivity of small and medium-sized food processors and consequently their overall economic performance within the industry Manufacture of other food products - cocoa, chocolate and sugar confectionery (NACE category 10.8). It was explored period of years 2007 – 2015 using financial secondary data of SME food processing businesses, active in the aforementioned industry and settled in Visegrad four member countries.*

**Key words:** Labour productivity · Food processing industry · Competitiveness

**JEL Classification:** M21

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## Ethics in Human Resources Management

Darja Holátová, Miroslav Němec

**Abstract:** *Ethics is an indispensable part of managerial practice which influences the human resources management, business climate, corporate culture and good reputation of a controlled object. In decision-making processes managers often encounter conflicting interests of different groups in a company or different values and ambiguous rules. Ethics is often underestimated by some individuals because unethical behaviour may bring a short-time advantage. In a long-term perspective, unethical behaviour may damage the company's reputation. The price companies pay for unethical behaviour is considerable. This phenomenon relates to occupational health and safety issues, costs and effectiveness of the company. An enterprise has a necessary prerequisite to participate in the development of entrepreneurial environment.*

**Key words:** Ethics · Unethical behaviour · Communication · Human resources management

**JEL Classification:** L20 · M12 · M14

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## New Economy

Markéta Adamová, Nikola Soukupová, Růžena Krninská

**Abstract:** *The concept of New economy is really broad and covers rapidly changes. These changes are related to the processes of globalization and the deep uses of information and communication technologies in all sectors. Last decades different adjectives can be added to the term economy, they should highlight changes within economy - for example new, knowledge-based, innovative, digital. The aim of the paper is the review of New economy and finding out possible benefit from it. New economy can help with facing recession and create new jobs. To conclude scientists, businesses and nations will have to face many challenges within New economy - especially those related to energy security and the limited fossil fuels, to the impact of robotization and transformation into Industry 4.0, which will be associated with extensive digitalization in enterprises, but certainly also in the public sphere.*

**Key words:** New economy · Knowledge-based economy · Innovation · Knowledge · Digital economy

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**JEL Classification:** O10 · O30 · O49

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## **Alternatives of the ABC analysis application for warehouse optimization**

Radek Toušek

**Abstract:** *This article focuses on the specifics of the ABC analysis for logistic purposes explained on an example of a wholesale warehouse which focuses on the distribution of medical material on the market in the Czech Republic. The business belongs to the segment of small and medium-sized companies. The article is based on the results of applied research that was conducted at the particular entity in 2017 and 2018 aiming to optimize inventory storage in order to increase storage capacity.*

**Key words:** Logistics · ABC analysis · Warehouse optimization

**JEL Classification:** M11

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## **Analysis of Remuneration in Small and Medium-sized Enterprises in the Form of Intangible Benefits from the Employees' Point of View Regarding Their Work Position**

Petr Řehoř, Marek Šulista, Klára Vocetková, Jaroslav Vrchota

**Abstract:** *This paper presents results of an analysis focused on a comparison of remuneration in the form of intangible benefits such as extra days off, lunch vouchers, laptops etc., from the employees' points of view regarding their work position in their company. The research is based on the analysis of the data obtained from questionnaires distributed among 97 employers and 272 employees working in small and medium-sized enterprises in several economic sectors in the Czech Republic*

**Key words:** Remuneration · Intangible benefits · SMEs

**JEL Classification:** M1 · M5

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## **Drivers and Barriers of Entrepreneurship of Students**

Monika Maříková, Martina Novotná, Antonín Šmejkal, Dagmar Bednářová

**Abstract:** *The decision to start a business is influenced by a number of factors both economic and personal ideas of future life. The best business ideas come naturally and the time of study can be very favourable for coming up of an*

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*original entrepreneurial idea. The paper focuses on the identification of the factors directly influencing the students of economic fields of study in starting their entrepreneurial activities and what are the limits of doing business.*

*The results show that about 40% of the students in the survey they are really thinking about running a business or already doing so. Based on the statistical test, the hypothesis was confirmed that respondents with at least one of the parents being an entrepreneur are more interested in doing business (the parents are motivators). The students, on the contrary, are limited in starting a business by insufficient funds and lack of knowledge and experience. The most common barriers are seen in foreign languages (27%) and accounting and finance (18%). The students of a part-time study see different barriers, such as technical knowledge (19%) and legislation knowledge (17%).*

**Key words:** Entrepreneurship · Barriers · Skills · Start of business

**JEL Classification:** L26 · D91 · A22

SESSION  
REGIONAL AND GLOBAL ASPECTS OF SUSTAINABILITY, BIOECONOMY

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## Is a low carbon emission agriculture possible?

Jiří Sedlák, Nikola Sagapova

**Abstract:** *We have been currently experiencing significant increase in global average temperatures which are very likely linked to increases of anthropogenic greenhouse gas emissions. Such increases and continuing global warming poses fundamental threat to global natural systems. Although agriculture is usually perceived as relatively „clean sector“ in comparison with other industries, often perceived as the victim of global climate change, it is the agriculture sector, that accounts for almost one third of anthropogenic greenhouse gases emissions, and therefore an important contributor to global warming. The agricultural greenhouse gases emissions are related both to the crop production and livestock breeding. The need for transition towards low-carbon economy is presented as the driver for future choices within economic development, and transition towards low-carbon agriculture is inherently a part of this shift. However, the question is if a low carbon emission agriculture is possible.*

**Key words:** Agriculture · Greenhouse gases · Emissions · Climate change · Low carbon

**JEL Classification:** O13 · Q15 · Q54

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## Evaluation of LAGs in the Czech Republic

Dagmar Škodová Parmová, Zuzana Dvořáková Lišková, Labros Sdrolias, George Aspridis

**Abstract:** *The aim of the paper is to analyse and evaluate the activities of the selected local action groups (LAGs) within the Czech Republic. This paper does not evaluate only the current effectiveness of the LAG's work, but also its impact on regional development and strategic development of the country. On the bases of the EU regional policy, rural development policy, municipal cooperation it explains the particular concepts such as LEADER method or local action group actions. It also describes both the basic characteristics of the LAG's functioning and outlines the evaluation processes in the strategy formulation and implementation, explaining the principle and possibilities of financial support. According to the findings and results, possible improvements of the state policies will be proposed.*

**Key words:** Local action groups · Leader method · Evaluation · Cooperation

**JEL Classification:** R11 · O18 · O20

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## Evaluation of Selected Indicators in the Social Dimension of Sustainable Development

Magdaléna Drastichová

**Abstract:** *The social dimension and those aspects of it related to human health are crucial for sustainable development (SD). By means of a Hierarchical Cluster Analysis (HCA), the European Union countries and another four developed European countries were assessed firstly according to their performance achieved in Life expectancy at birth and Death rate due to chronic diseases, and secondly according to these two indicators along with Current health care expenditure (HCE) (Percentage of Gross Domestic Product (GDP)). The first cluster analysis was carried out for 32 countries (the*

EU countries plus Iceland, Lichtenstein, Norway and Switzerland) and the second one for 30 countries (apart from Malta and Switzerland). Within each of them three partial analyses were conducted, i.e. for 2014, 2015 and both years together. In the analysis based on the first two indicators, four clusters were constructed and in the analysis based on all three indicators, five clusters were constructed. Switzerland and Lichtenstein, showing both low death rates and high life expectancies, can be regarded as the best performing countries. Cluster 2, consisting of Bulgaria, Romania, Latvia, Lithuania and Hungary in both analyses is the worst performing cluster. These countries showed the lowest life expectancies and the highest death rates, while the HCE ratios of Romania and Latvia were lowest in the sample as well.

**Key words:** Hierarchical Cluster Analysis · Sustainable Development (SD) · Life expectancy at birth · Current health care expenditure

**JEL Classification:** I10 · I15 · Q01

## Cooperation between municipalities and financial instruments for regional economic development

Jiří Dušek

**Abstract:** *On a European scale the Czech Republic is typical of its disintegrated structure and a high number of municipalities, which is typical of other European countries as well, such as France, Italy, Germany and Spain. Nevertheless, the settlement structure is different compared to other EU member states because there are the least populated municipalities on average in the Czech Republic, which is reflected in their economic situation, autonomy and self-sufficiency. The analysis working with 623 municipalities of the South Bohemian Region is based on this very premise. It studies the correlation between the involvement of municipalities in cooperation structures and their success/ability to get grants and subsidies. The research into the involvement of municipalities in different ways and forms of cooperation between municipalities was carried out in 2007-2015. The results were subsequently tested in a correlation and regression analysis, supplemented by descriptive statistics. The analysis showed a clear link between the cooperation level and more success in obtaining grants and subsidies, which also proved a positive effect for regional economic development, because higher involvement of municipalities in the different cooperation patterns means higher absorption ability and regional capacity.*

**Key words:** Cooperation of municipalities · Municipality · Public administration · Region · South Bohemian Region

**JEL Classification:** O18 · R11 · R51

## Institutional Limits of Local Development in the Czech Republic

Jaroslav Čmejrek, Jan Čopík

**Abstract:** *The aim of this paper is to reveal factors limiting the development of Czech municipalities. The subject of interest are the limits related to the municipal establishment and the position of the local self-government in the public administration system of the Czech Republic. There are limits resulting from the specific features of the local democratic process in the Czech Republic, in particular in small towns and rural municipalities. The paper is also focussing on the specifics of decision-making mechanisms in local governments, particularly with regard to investment decision making and the creation and implementation of regional development programmes.*

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**Key words:** Municipality · Local government · Regional development · Decision-making · Municipal budget

**JEL Classification:** H7 · R1

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## **Financial and Economic Indicators of Sustainability and Viability of State and Regional Organizations of Property Administration and Maintenance of Highways and Class I, II and III Roads**

Miroslav Němec, Darja Holátová

**Abstract:** *Maintenance of low class roads has numerous aspects to consider. Among the essential ones lists the limited amount of finance allocated to investment activities and a long-term financial limit for these roads maintenance, which is much below the amount required for the essential conservation of the existing situation.*

*The notions of “sustainable development” or “sustainability” thus reflect the requirements for public finance, which is limited in a long-term perspective.*

*Financial management of a subsidized organization established primarily for roads administration and maintenance has many specifics and faces numerous risks. Besides management as such, financial flow management, communication with road users, with construction works suppliers, involved authorities, with municipalities and institutions and with the political representation, it is inevitable to develop marketing activities functioning as information resources and, at the same time, provide the public with a real picture of the situation in the specific field of road administration and maintenance.*

*The role of managers is, among others, to concentrate management as such, while integrating the issues of financial management, marketing, social aspects of its activities and positive lobbying in the formation of media picture of the relevant organization, and much more.*

*Effective management of a subsidized organization in the given field must use the standard management methods and involve certain specifics indicated in the presented article.*

**Key words:** Financing infrastructure · Investment · Property administration · Management · Road maintenance · Sustainability

**JEL Classification:** L20 · M12

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## **Agriculture in the Terms of Bioeconomy**

Eva Ďurišová, Dominika Čeryová, Natália Turčeková, Peter Bielik, Mária Urbánová

**Abstract:** *Global population faces various obstacles in the economic, environmental and social spheres and there are many solutions in order to improve the life of society and make it more sustainable. One of the main issues nowadays is an increased exploitation of the natural resources of our planet. Bioeconomy introduces a new approach of the production and consumption of the natural resources without the harm to the environment and with significant economical benefits. Significant part of the bioeconomy is presented by biofuels, which are considered as a renewable source of energy.*

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*Thus the aim of the paper is to analyze the production and final consumption of the top producers and consumers of the primary solid biofuels in the European Union and the comparison of the results of production and final consumption of primary solid biofuels in Slovak Republic. The first part of the paper describes the current state of bioeconomic development in the European Union. The next part of the research presents the findings of the production and consumption of primary solid biofuels in Germany, France, Sweden, Finland, Italy and Slovakia and its comparison with each other. Also this section determines the impacts of biofuels on the environment. Finally, the last section proposes the recommendations for the utilization of the biofuels. In general, this paper presents the results of the findings about biofuel production and consumption in the European Union. And the aim is to find out which countries are in the top of production and consumption. Last but not least other goals are to find out in which energy sectors biofuels are used more.*

**Key words:** Bioeconomy · Sustainability · Biofuels · Renewable Sources of Energy · European Union

**JEL Classification:** Q15 · Q18 · Q42 · Q57



SESSION  
ECONOMICS OF AGRICULTURE

## Assessment of Role and Efficiency of Subsidies Using an Example of Livestock Breeding and Selected Predator Type

Jana Lososová, Jindřiška Kouřilová, Andrea Dohnalová

**Abstract:** *The paper is aimed to point out the main impacts of the progressive spreading of the wild predator in the cultivated landscape. Increase in compensations and aids of protective measures result only in the expenditure spill-over and not in solving the problems, while the target situation is not quite clear from the conservation institutions' viewpoint. In mid-November 2017, the European Parliament warned that certain species have already achieved the good degree of protection in some European regions and may currently pose a threat for both the other wild species and the livestock. The coexistence of people and large carnivores, especially the wolves, may have in some regions an adverse impact on the sustainable development of ecosystems and populated rural areas, especially in terms of the traditional farming and the sustainable tourism and other social and economic activities. The livestock farmers insist that the wolves no longer need this degree of protection that is currently applied and ask for the establishment of areas where their presence will be tolerated.*

**Key words:** Subsidies · Sheep breeding · Wolves protection · Regions

**JEL Classification:** Q1 · Q14 · Q18

## Comparison of farms focusing on dairy production in the production and economic conditions of the Czech and Slovak Republic

Patrik Rovný, Dušan Dobák

**Abstract:** *The endeavor to encourage competitiveness of family farms in the EU in the current programming period of years 2014–2020 is anchored and implemented via its Common Agricultural Policy. The agricultural sector in the Czech and Slovak Republic has negative economical results in animal production. These problems are in big and also in small farms. That is reason why the aim of paper is to compare the production and economic risks in dairy farming in the economic and production conditions of the Czech and Slovak Republic. The paper is based on the assumption of the family farm algorithm, which is focused on the dairy cows. A family farm is represented by two adults and two children. The aim is to calculate the minimum size of the farm and the minimum number of animals needed to achieve the average income (in the national economy) of the 4-member family in Czech Republic and in Slovakia.*

*The algorithms for determining the size of a family farm focused on dairy farming in the mountain production area in the economic and production conditions of the Czech Republic and the Slovak Republic were given the following inputs: the average annual income of a 4 member family, own costs for individual categories of cattle according to accounting legislation, own costs for meadows and pastures, prices for milk and meat, subsidies in mountain areas for animals and agricultural land, average annual utility of individual categories of livestock average annual harvests of meadows and pastures and volumes requirements of feed and other mineral ingredients. Data were obtained from the ministries of agriculture and statistical offices from both states.*

*We calculate the average 4 member family in Slovakia needs to earn minimum 16 77.44 Euro per year and in the Czech Republic 18 322.08 Euro per year. The results of the paper proved that, according to the model of an average farm focused on dairy production, the acreage of 92.29 ha in Slovakia and 57.14 ha in the Czech Republic of agricultural land needs to have one family farm. From the point of view on number of animals one Slovak family farm needs to have minimum 11 dairy cows and farm cows in the Czech Republic need to have 15.5. This option assumes that the family farm will not hire another employee and will not calculate with burden costs and administrative costs.*

*Nowadays in Slovakia, Ministry of Agriculture and Rural Development Program of the SR state that size of sustainable farms has to be 28 ha of agricultural land. The article shows that the minimum farm size should be 92.29 ha of agricultural land, and 11 dairy cows. In case of Czech republic is different situation were minimum farm size should be 57.14 ha of agricultural land (3/5 of the Slovak value), and 15.5 dairy cows (4 cows more in comparison with Slovakia).*

**Key words:** Farm size · Agricultural land · Milk production · Dairy cows · Costs · Prices · Subsidies

**JEL Classification:** Q12

## Development of Purchase Prices for Cow's Milk in the Slovak Republic and Comparison with the Czech Republic

Ivana Váryová, Iveta Košovská

**Abstract:** *Over the period of the last years, the Slovak dairy market has been characterized by an unfavorable situation. The abolition of milk quotas, the Russian food embargo and the weak demand from China have caused surpluses of milk on the European market, which have led to the decrease of milk purchase prices. The article's task is to assess and present the development of purchase prices of raw cow's milk at processors in the Slovak Republic in the observed period of years 2008 – 2017 and to compare it with the development in the Czech Republic. The essential information sources for the processing of before mentioned issues are presented by monthly reports on purchase of milk and cream and production of milk products acquired from the Ministry of Agriculture and Rural Development of the Slovak Republic and data from Eurostat database.*

*It can be stated that the purchase prices of raw cow's milk in the observed period of the years 2008 - 2017 show high volatility. As in the Slovak Republic, three crisis periods can be also identified in the Czech Republic during which the purchase price of raw cow's milk at processors dropped below 30 eurocents per kilogram. The biggest differences in milk prices between the Slovak and Czech Republic are observed during the "great dairy crisis". The milk crisis in the years 2008 – 2009 and 2015 – 2016 affected the Slovak and Czech primary producers and led to liquidation in this area of animal production.*

**Key words:** Cow's milk · Milk Crisis · Purchase Price · Processor

**JEL Classification:** Q10 · Q11 · Q13

## Slovak Households and Their Demand for Cheese

Lucia Vargová, Martin Jamrich

**Abstract:** *The dairy production has a longstanding tradition in Slovakia. Cheese represents a wide range of product variations and in recent years the consumption of this commodity has increased together with the consumption of other dairy products. To estimate demand for cheese, we applied Cragg's double hurdle model, using HBS dataset for years 2006 – 2012 in Slovakia. The findings show that cheese is price inelastic (-0.48). The econometric model also implies that prices of products e.g. the whole, skimmed and dried milk, yogurt, and other dairy products have none or very small effect on the consumption but on the other hand, the income has a significant and positive impact on purchasing activity of consumers. An increase in income by 10 percent leads to an increase in consumption of cheese by 3.4 percent. The*

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study also presents the influence of other socio-demographic characteristics like region, household size or economic status of the household head.

**Key words:** Cheese · Price elasticity · Income elasticity · Double hurdle model

**JEL Classification:** C01 · E21 · Q11

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## The current situation within the soil market and the land price in V4 countries

Jana Ladvenicová, Zuzana Bajusová, Ľubomír Gurčík

**Abstract:** Soil is a basic production factor for agriculture, it represents national wealth and belongs to non-renewable natural resources. The problem of the land market development is in very fragmented ownership structure, which means that many owners do not want to sell their land because this situation also affects the market price and if they want to sell it they have to go below the market price. The purchase price of land is a factor that is depended on the creditworthiness and quality of the land, but also on the attractiveness of the locality where it is located. The pace of agricultural land market development depends on the economic situation in the country. The price of land in the V4 countries is different. At present, the land price is increasing in all V4 countries. In Slovakia, the rental market is more developed than the agricultural land market. Approximately 90% of the land is leased. The average market price of agricultural land was 7,600 €/ha in 2015. In the Czech Republic, the average market price of agricultural land is growing year-on-year, reaching a level roughly twice as high as in 2011 in 2017. The average market price of land in Poland had growing tendency until 2015, but in 2016 was recorded a fall of 120 €/ha. Hungary has a favorable geographical location, it is an agricultural landscape. According to the participants in the agrarian market, the price of agricultural land increased in the period 2010-2014 to double. In 2016, the price of agricultural land climbed to 4,182 €/ha.

**Key words:** Soil · Soil price · V4 countries · Soil market

**JEL Classification:** Q13 · Q21 · Q24

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## What is the Relationship between Alcohol Use and Cigarette Smoking?

Martin Jamrich, Ján Pokrivčák

**Abstract:** Taxation on alcohol and cigarettes is mainly used to reduce consumption and rise revenue. Many studies examine price elasticity of these goods to find out how consumers respond to price change, but there are only few of them focused on cross-price effects in alcohol and cigarette consumption. If there is some mutual effect, it must be analysed, otherwise estimations of alcohol and cigarette demand separately can lead to biased coefficients. It means that effect of higher prices in reducing alcohol and tobacco consumption may be overestimated and possible additional revenue underestimated. This paper uses data from Household Budget Survey in Slovakia for period 2006 – 2012 to estimate price sensitivity of alcohol and cigarette using. We mainly focused on cross-price elasticities between different alcoholic beverages and cigarettes. Results suggest that alcohol taxation can decrease both, the alcohol and the cigarette using, while taxation of cigarettes can increase consumption of some alcoholic beverages.

**Key words:** Alcohol · Smoking · Cross-price elasticity · Double hurdle model

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**JEL Classification:** C24 · E21 · Q11

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## **Consumer Behaviour on the Market with Milk and Dairy Products in the Slovak Republic**

Veronika Svetlíková, Zuzana Poláková, Alexandra Ferenczi Vaňová, Renáta Krajčírová

**Abstract:** *The consumer basket is dependent on many factors. One of the key determinants is income. The paper is aimed at detecting dependence between household incomes and consumption and expenditures on milk and dairy products in the Slovak Republic. The method of regression and correlation analysis, nonlinear models - power and parabolic model was used to solve the problem. The analysis was conducted over the period 2004 to 2016. Despite the fact that the monetary income of the population increased over the period under review, the consumption of milk and dairy products and expenditures on this commodity did not increase significantly. The paper is a part of the research project APVV-16-0244 "Qualitative factors affecting the production and consumption of milk and cheese", solved at the Department of Marketing and Trade, Faculty of Economics and Management, Slovak University of Agriculture in Nitra.*

**Key words:** Milk · Dairy products · Regression and correlation analysis · Nonlinear models

**JEL Classification:** C10 · Q10

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## **Assessment of demand for multiple agricultural public goods in the evaluation of rural development projects**

Simona Miškolci

**Abstract:** *The aim of the paper is to discuss the main issues involved in building an evaluation framework for changes in multiple agricultural public goods and policy-relevant trade-offs of rural development projects. In particular, the valuation of multiple public goods delivered by rural development projects requires careful consideration of empirical demand-side issues. The holistic top-down valuation approach (combination of Analytic Hierarchy Process and Contingent Valuation methods) to explore more general (stable) public preferences for basic attributes of multiple public goods of agriculture in the Czech Republic was employed to overcome the main methodological and practical drawback regarding existing valuation studies. The existence of social demand for a defined complex of non-commodity outputs whose production is to be supported has been demonstrated by the results of the questionnaire survey (n=835). The proposed valuation framework may enable policymakers to address the public preference trade-offs that are required to assess different policy options for the provision of multiple public goods of agriculture in rural development.*

**Key words:** Rural development policy · Agriculture · Public goods · Public demand

**JEL Classification:** Q01 · Q51 · Q18

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## Development of employment within agro-sector in V4 countries

Zuzana Bajusová, Jana Ladvenicová, Daniela Hupková, Ľudmila Dobošová, Veronika Mihálová

**Abstract:** *Employment as a concept is used in many ways. It plays an important role in the agricultural sector, which has irreplaceable importance in raw material production, settlement of rural areas and rural development. Employment in agro-sector from a global viewpoint, accounts for up to 39% of total world employment. The number of employees within this sector is decreasing from year to year not only in Slovakia but also in other V4 countries. The bulk of the agro-resourced workers are low-skilled and, after dismissal, have not found adequate work, thus increasing the unemployment rate in the country as new job creation is increasingly challenging for workers' qualifications. The agricultural sector is not an attractive sector for young people who are looking for jobs in other segments. An important role plays the wage, which lags behind the average wage in the national economy. From the point of view of education, citizens with secondary education predominate in agro-sector. The most people are employed by legal entities - business companies. In terms of employment, expressed as a percentage of total employment, the highest average employment for the period 2008-2017 was reached in Poland, where it represented 11.2%. The Czech Republic achieved the lowest employment rate at 2.99%. In terms of the number of persons employed in the agro-sector, Poland is the highest among the V4 countries, which employed an average of 1,731,000 people in the whole analyzed period. Slovakia has the lowest number of employed among the V4 countries.*

**Key words:** Agriculture · Employment · Wage · V4 countries

**JEL Classification:** J21 · J31 · J43

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## Structural Changes in Agrarian Trade Specialization Patterns of the Czech Republic with member states of the European Union

Ivo Zdráhal, Barbora Daňková, Kristina Somerlíková, Francois Lategan, Věra Bečvářová

**Abstract:** *The aim of the paper is to evaluate changes in agrarian trade specialization patterns of the Czech Republic with member states of the European Union in the last 5 years (period 2013 and 2017). Since Czech Republic became member state of European Union, its agri-food trade changed significantly. The process of restructuring is still ongoing (mainly in relation to traditional trade partners), but it seems that this structure is gradually approaching its final form. In this article the agri-food trade of the Czech Republic with other European Union member states using SITC 3-digit data is analysed. Balassa's (BI) and Lafay's (LI) indices were calculated to analyse the revealed comparative advantage score amongst the different product groups in the Czech/EU28 agrarian trade relationships. Following this analyses, the Galtonian regression was calculated and implemented as a quantitative technique to assess changes in trade specialization patterns. The results suggest that trade specialization patterns are stable with regard to product groups with revealed comparative advantage or disadvantage. Results also suggest that there is a process of (weak) divergence in the trade specialization pattern, meaning the pattern of trade specialization is considered to be strengthened because industries with initial comparative advantage became more pronounced, while those with initial comparative disadvantages became more subdued.*

**Key words:** Agrarian Trade · Specialization · Revealed comparative advantage · Galtonian regressions · Czech Republic

**JEL Classification:** Q14 · C1 · F14

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## Modelling Relationship Between Sale and Consumer Prices of Curd Cheese in Slovakia

Daniela Hupková, Veronika Mihálová, Ľudmila Dobošová, Zuzana Bajusová, Jana Ladvenicová

**Abstract:** Paper examines the relationship between sale and consumer prices in supply chain of the dairy product - curd cheese in the Slovak Republic. Estimation is based on the monthly price data of curd cheese for the period 2000-2017 obtained from the Statistical Office of the Slovak Republic and the Agricultural Paying Agency. We applied the correlation analysis, which confirms that there is a statistically significant dependence between the sale and consumer prices. The regression analysis quantifies scale of changes in consumer prices due to the sale prices change. The paper also shows the development of prices during analysed period, which showed increasing trend, with exception of significant decline in 2009 after the food crisis and also with declines in years 2015 and 2016. In the paper we calculate the average monthly growth of the curd cheese prices confirming increasing price scissors in the food supply chain and the power of subjects on the supply level of the curd cheese supply chain, thereby refuting the curd cheese market perfection in the Slovak Republic.

**Key words:** Food supply chain · Prices · Curd cheese · Regression and correlation analysis

**JEL Classification:** Q02 · Q21

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## The impact of subsidies on the agricultural primary production structure in the Czech Republic

Marie Prášilová, Radka Procházková, Anna Žovincová

**Abstract:** Agriculture is a multifunctional sector and is of great importance for the whole of society and has cross-overs to other sectors. Thanks to its primary function – production of foodstuffs - it occupies a strategic position among other sectors of national economy. More than a half of the Czech Republic area serves the agricultural purposes. The area really employed in growing agricultural crops (without permanent crops) has in the CR been significantly reduced. The species diversity of crops is changing. This results from a decrease in the total area and changes in the structure of crop areas. Czech agriculture is supported from the EU funds and by domestic support granted from national sources. The EU has not established equal conditions for all the member states. According to some experts hence in an extreme case even a paradox can arise that, structure of subsidies by the type of agriculture will lead to such a situation when the production of products currently restrained will be stimulated. The article is analyzing impacts of subsidies on the agricultural primary production in the Czech Republic. The solution is based on available data sources of the CR Ministry of Agriculture, State Agricultural Intervention Fund, Czech Statistical Office and Czech Office for Surveying and Cadastre. Based on time series correlation of selected agricultural primary production indicators, the impacts of the EU Common Agricultural Policy over the 2005-2017 period upon the specific dimensions of sensitive sectors of Czech agriculture have been specified.

**Key words:** Agriculture · Subsidies · Common Agricultural Policy · Correlation

**JEL Classification:** C22 · E27 · Q14 · Q18 · Q24

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## Agricultural performance of the Visegrad countries in relation to the Common Agricultural Policy

Katarína Baráthová, Artan Qineti

**Abstract:** *Accession of the Visegrad countries to the EU in 2004 has brought many possibilities but also challenges for all economic sectors, including the agricultural sector, which has been strongly impacted by adoption of the Common Agricultural Policy. Besides their location, Visegrad countries share similar history and traditions, but on the other hand they also show important differences in initial conditions and the paths they chose to follow. This makes them a natural subject for comparative research. The objective of the paper is to assess the status of the agriculture in these countries after their accession to EU and adoption of the CAP. Using the latest available data, the paper analyses the importance of agriculture in economies of these countries, structure of agricultural holdings and the role of direct payments after the accession in 2004.*

**Key words:** Agriculture · EU accession · Visegrad countries · CAP · Direct payments

**JEL Classification:** Q10 · Q13 · Q18

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## Economic productivity of the small and medium-sized food industry enterprises in the South Moravia and the South Bohemia Regions

Eliška Svobodová, Iva Živělová

**Abstract:** *The small and medium-sized enterprises have an important place in the regional development. They contribute to the competitive environment; to the gross domestic product creation; they have a share on the creation of added value and increase the employment rate. The aim of this thesis is to compare the efficiency of the small and medium-sized food industry enterprises in the South Moravia and South Bohemia Regions, to evaluate economic efficiency of these enterprises and their benefits to the economic productivity of the mentioned regions.*

**Key words:** Economic productivity · Small and medium-sized enterprises · Food industry · South Moravian and South Bohemian Regions

**JEL Classification:** O14 · O18 · Q18

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## The Structure of Organic Farms' Financial Sources - Is It Sustainable?

Radka Redlichová, Gabriela Chmelíková, Karel Vinohradský

**Abstract:** *The paper presents a part of results of the organic farming economic performance research, focused on the development of financial sources between years 2001 – 2016. In this paper the special attention is paid to the regions with less favorable areas (LFA). The method of the research is based on the comparison with conventional farms using the FADN CZ database. The total financial revenues for 1 hectare of organic (OF), as well as conventional farms (CoF) have been increasing in the period from 2001 to 2016. The revenues of OF were half compared to CoF in the last year. The*



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*financial sources structure development of OF and CoF differed more substantially. The revenues from production contribute to the total revenues of CoF by 80 % and less than 50 % of OF in the second half of the period. In the LFA, where the most OF are located, the contribution of production revenues to the total revenues was only 45 – 50 %.*

*The paper aims to contribute to the knowledge about the development of financial sources structure of OF, taking into account the higher contribution of OF to the environment (declared by OF), the development of productivity of OF, organic products market and share of state subsidies' ingerency.*

**Key words:** Organic Farming · Financial Sources · Less Favourable Areas · Regional Differences · State Ingerency

**JEL Classification:** O13 · Q11 · Q12 · Q13

SESSION

MARKET RESEARCH AND SUSTAINABLE MARKETING IN TRADE  
AND TOURISM

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## Integrated Marketing Communications of an Independent Pharmacy

Jaroslav Písek

**Abstract:** *Seasonal leaflets are the leading and dominant form of the communication mix in the promotion of pharmaceuticals, from which the various types of sales promotion are derived. Independent pharmacies compete with chain pharmacies and e-shops. There are two ways how to revive their integrated marketing communications. They can either follow an example of successful chains or strengthen their competitive advantages given by their independence and flexibility. As it is not economically feasible to compete on a flat-rate basis in patient participation payments and over-the-counter assortment prices, it is not smart to imitate marketing communication. A community pharmacy can utilise knowledge of its customers and concentrate on the medicines most burden their patients. We recommend focusing on a few essential products (one to three) and making these offerings more visible in the pharmacy's retail space. We would follow the principle of "less is sometimes more" and focus on the quality of personal sales and expert advice.*

**Key words:** Independent pharmacy · Communication mix · Czech Republic

**JEL Classification:** H51 · I11 · M31

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## Geomarketing as a Tool for Market Size Estimation

Radim Dušek, Viktor Vojtko

**Abstract:** *This paper deals with a market size estimation tool that is based on a combination of geomarketing methods and consumer spending datasets. The analyzed data were drawn from publicly available sources, mainly collected by the Czech Statistical Office over the period 2011-2016. With the use of QGIS software, the method allows to estimate the local market size and its annual growth rate at the level of municipalities, districts and various consumption categories such as food and non-alcoholic drinks, alcoholic drinks and tobacco or clothing and footwear. These kind of results can be used as an assumption for marketing decision-making process as well as guidance about where the biggest opportunities and threats in the local market size and growth are.*

**Key words:** Consumer spending · Geomarketing · Market Share · GIS Software

**JEL Classification:** M31 · D10 · L11

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## Social network Facebook and customer engagement: A pilot case study from the Czech Republic

Ludvík Eger, Dana Egerová

**Abstract:** *In recent years social media has provided new ways for companies to communicate with the public. Companies need to interact with current and potential customers using social media such as Facebook, which is very popular with target groups. The purpose of this study is to explore the communication of selected hotels with the public focusing on*

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*company communication that facilitates consumer sociability behavior on Facebook. This pilot study uses a mixed methods research approach and integrates quantitative data analysis in the first phase, using tools such as Power BI and Netvizz, with qualitative content analysis of company messages using Atlas.ti software. The data were obtained from six four-star hotels on Facebook in September 2018. The findings provide evidence of how hotels use Facebook for company–customer communication. The findings also indicate that different message features generated different customer behavior. The study contributes to a better understanding of marketing on social media in the hotel industry.*

**Key words:** Hotel · Social media · Facebook · Engagement

**JEL Classification:** M31 · Z39

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## **Cross-Border Purchasing Behavior – Studies in the Czech-German Border Region**

Dita Hommerová, Jan Tluchoř, Petr Janeček, David Kouba

**Abstract:** *European integration is increasingly becoming the current subject of a number of research studies. Much attention is devoted to the socio-economic aspects of integration. Even after a lengthy integration process, we can still find differences between the two sides of the border. The focus of this research paper is on the current state of knowledge of research into the cross-border region and cross-border activities, particularly in the Bohemia-Bavaria border region. Several research studies dealing with cross-border purchasing behavior have been conducted in recent years. This article attempts to summarize these research activities and studies. In terms of methodology, it is based on the desk research of secondary data sources. For example, this paper examines the methodology used, the methods in which the data were acquired (if relevant), the number of respondents, regional focus, the primary purpose and the focus of the study. Most research studies dealt with shoppers' motives for traveling across the border to do their shopping; some of them attempted to estimate the average length of travel, and several studies also took into consideration the expenses. Also worth mentioning is the fact that the majority of the research studies came into existence with the involvement of various chambers of commerce. This paper also contains selected research results.*

**Key words:** The Czech Republic · Purchasing behavior · Germany · Border region · Cross-border · Region

**JEL Classification:** D12 · F15 · M39

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## **Consumer preferences for local products**

Kamil Pícha, Martina Vališová

**Abstract:** *Consumption of local sources by local population is widely discussed in last two decades. The aim of the paper is to assess some elements of the consumers' attitudes to inland ("national") and local products and the relations within preferences of certain origin of food products.*

*A questionnaire survey has been done to collect data for this paper. The survey was realised in front of selected food stores in České Budějovice. This survey confirmed relation between consumers' preference to inland products and their decision on purchase according to the price. It confirmed also a relation with attitudes to the quality labels and labels confirming the product originated from the region where it is sold. A smaller but still significant difference was revealed*

*when comparing the importance of the taste of the product between the group without any preference to the country of origin and the groups seeking for inland or local products.*

**Key words:** Local product · Inland product · Food · Consumer · Attitude · Preference

**JEL Classification:** D10 · D91 · M31

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SESSION  
MICROECONOMIC AND MACROECONOMIC ASPECTS OF SOCIAL  
AND ECONOMIC DEVELOPMENT

## Impact of R&D Expenditures on Labour Productivity Growth

Tomáš Volek, Martina Novotná, Martina Kaňková

**Abstract:** *The expenditures of research and development is nowadays key determinant of economic growth and productivity. The aim of the paper is to assess impact of research and development expenditures on labour productivity growth. The article is focused on the EU countries and the observed data are from the period 2004-2016. The results of the analysis show that the highest expenditure of R&D (% GDP) have the old member states EU. The new member states EU have the highest growth rate of expenditures on R&D. The share of R&D expenditures is different across the EU Member States, ranging from 3.25% of GDP to 0.44% of GDP in 2016. The convergence ( $\sigma$ -convergence,  $\beta$ -convergence) of R&D expenditures in the EU countries has not been confirmed in period 2004 and 2017. A significant relationship was found between R&D and labour productivity only in some countries. Many factors influence this relationship as a time lag or R&D orientation.*

**Key words:** R&D · Labour Productivity · European Union · Convergence

**JEL Classification:** O30 · J24 · E24

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## The Ageing Challenges for Agriculture

Gintarė Vazonienė, Vilma Atkočiūnienė

**Abstract:** *This article is intended to analyse the ageing issue in agricultural sector as a significant factor influencing the future of development of rural areas and agricultural activity. The main focus is placed on the fact that farmers' rotation involves a certain age conflict. Current situation in agriculture shows that young generation is not willing to be workers in agricultural sector, while elderly farmers, due to their age, are retiring or quitting this activity. Slow change of generations in agriculture, difficult engagement and maintenance of youth in agriculture as well as increasing number of elderly farmers reveal that this age conflict between different generations determines intergenerational tension which has emerged in agricultural sector of the European Union in the recent decade. Analysis of the secondary data in the selected countries highlights the deepening and developing issue of farmers' ageing. The authors consider that the local and national authorities are responsible for the society welfare issues and should further encourage socially innovative solutions by finding unconventional ideas for obtaining multidimensional support, including assistance provided by policy-makers and involving local agents to enhance inclusion of the aged and young population in the labour market and creation of local food systems.*

**Key words:** Ageing · Farmers · Agriculture · Policy Making

**JEL Classification:** I3 · J18 · Q18

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## The Impact of Population Ageing on National Economy

Ilona Kiausiene

**Abstract:** *XXI century has fiercely entered our lives, setting new requirements. Europe has been undergoing demographic changes of an unprecedented scope, bringing the respective challenges with it. The increasingly longer life expectancy is a great achievement for humanity, nonetheless, if viewed from social and economic perspectives, population ageing is construed as negative changes in demographic factors. Reducing population and ageing population structure influence various areas of life of the society, even reduce the possibilities for economic growth. The aim of the research – having summarized demographic trends to determine the impact of population ageing on the national economy. To reach the research aim such research tasks were formulated: 1) to identify factors influencing ageing of population; 2) to identify the interdependence between ageing population and economic indicators. The implemented research revealed that in recent decades, the structure and profile of the EU's population has changed considerably. The EU's population grows progressively older: the proportion of older persons is growing at a faster rate than the general population. In many countries, including Lithuania, the population is getting older, the median residents' age is increasing quickly. According to economic and social approaches ageing of society and decrease of population become significant problems and influence various spheres of society life, warn about possible challenges and concerns to the state. The results of the research showed that demographic changes and economic indicators are related on strong, statistically significant relationships. Implementing the research there were used analysis and synthesis of scientific literature, comparison, summary, statistical data analysis.*

**Key words:** Ageing · Population · Demographic changes · Economic indicators

**JEL Classification:** J11 · J14 · O10

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## Privatization in theoretical concepts and the reality of economic policy on the example of the Czech Republic

Jaroslav Šetek, Jiří Alina, Veronika Plachá

**Abstract:** *The paper focuses on the essence and genesis of a completely new form of structural change called privatization. It was started in the Czech Republic as part of the transformation process since the early 1990s. The Czech economy was accompanied, in particular, by the theoretical concepts and real economic policy practices of prominent personalities of the liberal current of the last third of the twentieth century. Emphasis is also placed on the potential risks that may arise from the turn of the 20th and 21st centuries in the privatization of major strategic societies in the context of geopolitical interests, the incidence of non-transparent economic entities in the world economy and the interconnectedness of Smart technologies in cities and regions.*

**Key words:** Privatization · Structural changes · Transformation of the economy

**JEL Classification:** A12 · B41 · E00 · H11

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## The Historical Comparison of Housing Affordability in Czech Republic

David Slavata

**Abstract:** *The Czech Republic is a country with the highest growth of real estate's prices in Europe. The paper is focused on the analysis of this long-term growth of real estate's prices and its influences to the availability of housing. There will be presented Czech historical data describing housing affordability as well. The housing affordability in Czech Republic will be compared using the basic indicators of housing affordability such as P/I ratio and P/R ratio. The aim of the paper is to find out (with the help of mentioned ratios), if the present price level of the Czech real estate market is overvalued or undervalued. To evaluate the results the sum of P/I and P/R ratios will be used. For that purpose in the article there will be presented the results of my long term research which one of the outputs the average wages and average prices of one flat family houses are. There will be presented the collected data from the year 1861 to 1943. The data were from daily newspapers taken.*

**Key words:** Housing price · P/I ratio · Housing Affordability · Overvaluation

**JEL Classification:** R30 · P50

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## The Quality of Life Trends in Area of Health in V4 Countries

Elena Hošková, Martin Richter, Iveta Zentková

**Abstract:** *The quality of life is a multidimensional problem. Objective and subjective evaluating indicators are used for measuring the quality of life. Among objective indicators belong indicators in area of material living conditions, in area of health of inhabitants, safety, education, living environment etc. The aim of this paper is to investigate the quality of life in area of health in V4 Countries. The focus is put on the objective indicators of quality of life such as the life expectancy and healthy life years at birth. The methodology is based on the tools of regression analysis. Inputs used for regression are from the database Eurostat in the periode of years 2005-2017. Analysis shows that females perform higher life expectancy and higher healthy life years compare to the males in all V4 Countries. The highest life expectancy and healthy life years at birth perform females in Czech Republic (2017 the life expectancy 82,1 years, healthy life years 64) and in Poland (2017 the life expectancy 82 years, healthy life years 64,6). According to estimated trend functions the life expectancy of females increased yearly by value 0,23 on average in both countries.*

**Key words:** Quality of Life · Life Expectancy · Healthy Life · Years at Birth

**JEL Classification:** A13 · C20

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## Competitiveness of V4 countries at regional level NUTS 2

Eva Richterová, Martin Richter

**Abstract:** *In the globalizing economy, the concept of regional competitiveness has become a current issue, not only among academic and scientific circles, but also among political circles. There are still many definitions of this concept, leading to a different way of assessing competitiveness at regional level. Evaluation and comparison of V4 countries`*

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regional competitiveness at NUTS2 level is the aim of this paper. The Regional competitiveness index (RCI) is comprised of 15 indicators covering different fields such as economy, education, health, science, social life etc. The competitiveness of V4 regions is compared not only with each other but also with the average of European Union in four different years 2006, 2009, 2012 and 2015. There are considerable differences in a competitiveness of individual V4 regions. The most competitive regions are Czech region: Praha on a first place and Slovak region: Bratislava on a second place, both with higher RCI than EU average. All other V4 regions have RCI below the EU average. In terms of competitiveness, measured by RCI, there are huge disparities inside of each analysed country. In all V4 countries, the most competitive regions are those in which the capital city is situated.

**Key words:** V4 · Competitiveness · Regions · Regional competitiveness index · Disparities

**JEL Classification:** A1 · A10 · C01

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## The Engel expenditure curve and consumer behaviour

Ivana Faltová Leitmanová, Filip Petrách, Václav Beran

**Abstract:** Consumer behaviour is analysed in context of expenditures, that consumer (household) spends for buying of goods and services in most easiest and theoretical most often mentioned point of view. One of the instruments, which is suitable for using in this context, it is Engel's expenditure curve. Although Engel's curve has many constraints, it can be used as a partial indicator of well-being. The analysis of the relationship between expenditure and consumer incomes between years 1993 and 2017 is focused on the application part of the contribution. In the case of the transition of the economy from the current phase of the business cycle to the next one, it is also possible to expect an able change in household expenditures and consumer habits, where recession usually leads to a reduction in incomes and to a restructuring of household consumption expenditure.

**Key words:** Consumption · Income · Expenditures · Engel's curve

**JEL Classification:** D11 · D12 · I32

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## Impact of the CAP subsidies on the family farm economy: Case study of the selected countries' data

Neringa Stonciuviene, Ilona Kiausiene

**Abstract:** European Union Common Agricultural Policy (CAP) has evolved considerably to help farmers face some challenges. This paper investigates the impact of subsidies from the CAP on the family farm economy in the selected countries: Lithuania, Hungary, Slovakia and Czech Republic. Different targets of the farm subsidising determined the choice of countries. In Lithuania, the key priorities consisted of ensuring a certain level of farmers' income, maintaining the current production level, revitalising the livestock sector, and uncovering new markets for domestic products. The most important priority in Hungary, as well, as in Czech Republic, was subsidising of 'viable food production'. Slovakia's main priorities include enhancing productivity and reducing unemployment in rural areas.

The study used the Farm Accountancy Data Network (FADN) database information about the farms received subsidies, broken down into six economic size classes. The paper investigates the links between subsidies and output, between subsidies and net income, between subsidies and average farm capital.

**Key words:** Common Agricultural Policy · Subsidies · Farm Size · Productivity.

**JEL Classification:** H25 · Q18

## Fundamentals of the Tensor Theory of Utility upon the Riemann Manifolds

Tomáš R. Zeithamer, Jiří Pospíšil

**Abstract:** *The paper deals with the fundamentals of tensor theory of utility in Riemann's spaces. Using the Riemann tensor field of curvature, the occurrence criterion of retail gravitation is formulated. The method of measuring utility in  $N$  - dimensional Riemann spaces, which was first used in Einstein 's 4 - dimensional general theory of relativity, is described including motion of image point of consumer along the utility hill.*

**Keywords:** Consumer economics · Differential geometry · Economics of Sun–Earth relationships · Physical economics · Space economics

**JEL Classification:** A12 · B41 · C02 · D11

## The Governance of the State Debt of the Czech Republic by operating the state bonds with high share of non-residential holders

Robert Zeman

**Abstrakt:** *Státní dluh samostatné České republiky od jejího vzniku v roce 1993 neustále rostl a to jak absolutně, tak i ve vztahu k hrubému domácímu produktu. Počínaje rokem 2013 dochází k jeho stabilizaci, kdy se hodnoty pohybují v rozmezí 1,68-1,62 bilionů českých korun v roce 2017. Vzhledem k tomu, že hrubý domácí produkt roste, dochází tedy ke snižování relativní hodnoty zadlužení. Převážná část dluhu je financována střednědobými a dlouhodobými státními dluhopisy a v menší míře se využívají státní pokladniční poukázky emitované na začátku kalendářního roku a ke konci roku většinou splacené. I tato strategie vede ke zvyšování ratingu České republiky, který je nejlepší v roce 2018 ze všech postkomunistických zemí. Jedním z nežádoucích vlivů z dlouhodobého hlediska a v případě nějaké větší finanční krize je fakt, že se zvyšuje procento zastoupení nerezidentů na držení státních dluhopisů a patří v posledních letech k nejvyšším v Evropě.*

**Klíčová slova:** Státní dluh · rating · dluhopis · státní pokladniční poukázka · nerezidenti

**JEL Classification:** E43 · H62 · H63 · H68

### 1 Úvod

Státní dluh představuje sumu nesplacených půjček, které si stát (vláda) musel vypůjčit na krytí deficitů svých rozpočtů a nesplacených úroků z těchto půjček. Zatímco deficit státního rozpočtu je tokovou veličinou (vzniká v rámci jednoho

roku), je státní dluh veličinou stavovou (vzniká kumulací deficitů a úroků) a zjišťuje se k určitému datu. Jurečka a kol. (2010)

Vnitřní státní dluh je rozložen mezi tuzemské držitele. Vzhledem k obvykle dobrému úročení, nízké míře rizika a častému daňovému zvýhodnění drží značnou část veřejného dluhu kapitálově silné a dostatečně likvidní instituce. To může při jeho větším objemu způsobovat výrazný vytlačovací efekt, který je zmenšován, drží-li státní dluhopisy nerezidenti, tzn. v případě zahraničního státního dluhu. Úroky ze státního dluhu však v tomto případě odplývají do zahraničí. Významné makroekonomické i veřejné finanční důsledky má také rozhodnutí o měně, ve které budou státní dluhopisy denominovány. Nespornou ekonomickou výhodou ekonomicky silných zemí je možnost emitovat státní dluhopisy v domácí měně Dvořák (2008).

Ratingové hodnocení České republiky v oblasti domácích dlouhodobých závazků a zahraničních dlouhodobých závazků se zvyšuje. Udílení ratingů provádějí nejrenomovanější ratingové agentury světa jako je Moody's, Standard & Poor's, Fitch Ratings a méně známé, ale v mezinárodním měřítku také uznávané JCR, R&I, Scope Ratings, Dragon Global Credit Rating. U prvních třech jmenovaných je hodnocení následující: Domácí dlouhodobé závazky Moody's A1 s výhledem Stabilní údaj z roku 2017, Standard & Poor's AA s výhledem Stabilní údaj z roku 2018 a Fitch Ratings A+ s výhledem Pozitivní údaj z roku 2018. V oblasti Zahraničních dlouhodobých závazků Moody's A1 s výhledem Stabilní údaj z roku 2017, Standard & Poor's AA- s výhledem Stabilní údaj z roku 2018 a Fitch Ratings A+ s výhledem Pozitivní údaj z roku 2018. Uvedené ratingy s ohledem na nízkou míru zadlužení ve vztahu k hrubému domácímu produktu umožňují Českému státu si půjčovat peníze na kapitálových trzích za jedny z nejnižších úroků v Evropě. Bohužel tato situace, která je v posledních letech velmi příznivá není využívána ke splacení dluhu, ale v podstatě dochází k jeho „zakonzervování“ na hodnotách uvedených v abstraktu tohoto článku. Výše dluhu se téměř nemění, dochází ke splacení státních dluhopisů, kterým končí jejich splatnost a jsou nahrazovány téměř ve stejné výši dluhopisy, které jsou méně úročené. To má pozitivní dopad na tzv. obsluhu státního dluhu, která se snižuje, ale bohužel pouze v jednotkách miliard korun, což je vzhledem k výši dluhu téměř zanedbatelné.

## 2 Metodika

Při zpracování dat byl autor odkázán na publikace s názvem Zprávy o řízení státního dluhu České republiky v letech 2014 až 2017, kde jsou uvedeny data použitá ke zpracování výsledků a závěru. Všechny uváděné údaje v článku jsou k datu 31. 12. příslušného roku. Zároveň také na data, která jsou uveřejněna na webových stránkách Ministerstva financí. Analýza vývoj státního dluhu České republiky v letech 2012 -2017 se soustředila na rozbor z hlediska jeho absolutní výše, meziročních změn a jeho poměru ve vztahu k hrubému domácímu produktu vyjádřeného procenty. Další analýza se soustředila na Hrubou výpůjční potřebu a Čistou výpůjční potřebu.

Hrubá výpůjční potřeba určuje tu část zdrojů pokrytí potřeby financování, které jsou zajišťovány výpůjčními operacemi státu, tj. stanovuje celkovou výši peněžních prostředků, kterou si musí vláda opatřit zejména prostřednictvím vydávání a prodeje státních dluhopisů a přijímání zápůjček a úvěrů. Ministerstvo financí (2015).

Čistá výpůjční potřeba je hlavním faktorem změny nominální korunové hodnoty hrubého státního dluhu a je určena rozdílem hrubé výpůjční potřeby a celkových splátek jmenovitých hodnot (jistin) státního dluhu, včetně souvisejících derivátů. V případě nulové čisté změny státních finančních aktiv odpovídá čistá výpůjční potřeba součtu schodku státního rozpočtu a případné mimorozpočtové potřeby financování. Čistá výpůjční potřeba tedy ukazuje výši peněžních prostředků, které si bude muset vláda nově vypůjčit nad rámec již vypůjčených prostředků v předchozích letech splatných v běžném roce. Čistá výpůjční potřeba je financována stejnými instrumenty jako hrubá výpůjční potřeba. Při financování čisté výpůjční potřeby je ale nutné zohlednit výši celkových splátek jmenovitých hodnot (jistin) daných instrumentů dluhového portfolia, včetně souvisejících derivátů. Ministerstvo financí (2015).

Stav a struktura dluhového portfolia je dána především v případě České republiky státními pokladničními poukázkami (dále SPP), Státními střednědobými a dlouhodobými dluhopisy (dále SDD) vydanými na domácím trhu a Státními střednědobými a dlouhodobými dluhopisy (dále SDD) vydanými na zahraničních trzích, státních spořicí dluhopisů (dále SSD) a přijatých zápůjček a úvěru. Další možné instrumenty jako např. směnky a další se využívají minimálně. Dalším součástí výzkumu byl průměrný výnos a doba do splatnosti SDD na primárním trhu. Součástí analýzy také byla struktura korunových státních dluhopisů dle typu držitele v %. Poslední analýza se týkala struktury nerezidentů držících korunové státní dluhopisy v letech 2014-2017.

## 3 Výzkum a výsledky

**Tabulka č. 1** Státní dluh České republiky v letech 2012-2017

Rok	2012	2013	2014	2015	2016	2017
Celkem v mld. Kč	1 667,6	1 683,3	1 663,7	1 673,0	1 613,4	1 624,7
Meziroční změna v mld. Kč	168,2	15,7	-19,6	9,3	-59,6	11,3
Podíl státního dluhu na HDP v %	41,1	41,1	38,6	36,4	33,8	32,2

**Zdroj:** MF ČR, ČSÚ upraveno autorem

K největšímu růstu státního dluhu docházelo v letech 2008 až 2012 a mělo to souvislost se světovou finanční krizí. Česká vláda, byla nucena si půjčovat velké množství peněz. Státní rozpočet byl koncipován jako deficitní a podíl státního dluhu na HDP v % se zvýšil z 24,8 % v roce 2008 na konečných 41,1% v roce 2012. Počínaje rokem 2013 dochází ke stabilizaci státního dluhu jak je patrné z tabulky č. 1 a absolutní hodnoty (přebytku nebo deficitu) se pohybují rámcově v desítkách miliard korun. V porovnání s ostatními státy EU nebo Eurozóny se jedná o dobrý výsledek.

**Tabulka č. 2** Hrubá a čistá výpůjční potřeba v mld. Kč

Rok	2012	2013	2014	2015	2016	2017
Hrubá výpůjční potřeba	472	309,9	265,6	268,1	216,9	257,7
Čistá výpůjční potřeba	172,8	2,3	-21,9	19,6	-59,4	22,2

Zdroj: MF ČR, Zpráva o řízení státního dluhu ČR v roce 2017 str. 20 a 22, upraveno autorem

Potřeba financování, která ovlivňuje hrubou výpůjční potřebu (dále HVP) je dána především primárním saldem státního rozpočtu, kde podstatnější vliv byl především v letech 2012 a pozitivní v roce 2016. Dále čistými výdaji na obsluhu státního dluhu, které v roce 2013 dosáhly nejvyšší historické hodnoty od vzniku ČR a to 50,9 mld. Kč od tohoto roku dochází k jejich snižování na hodnotu 39,8 mld. v roce 2017. Dále jsou to splátky SDD, SSD, SPP a přijatých zápůjček a úvěrů. Zastavením deficitního financování státního rozpočtu zaznamenala HVP pozitivní trend a její hodnota se v letech 2014-2017 snížila do pásma 216,9 mld. Kč až 268,1 mld. Kč, což pro Českou republiku nepředstavovalo žádný problém. Čistá výpůjční potřeba, která ukazuje výši peněžních prostředků, které si musela vláda nově vypůjčit nad rámec již vypůjčených prostředků v předchozích letech splatných v běžném roce, byla po roce 2013 mírně negativní a kumulativně za období 2013-2017 dosáhla hodnoty -37,2 mld. Kč. V porovnání s většinou států EU velmi dobrá hodnota.

**Tabulka č. 3** Stav a struktura dluhového portfolia v mld. Kč

Rok	2012	2013	2014	2015	2016	2017
Hrubý státní dluh	1 667,6	1 683,3	1 663,7	1 673,0	1 613,4	1 624,7
SPP	189,1	120,9	107,6	84,4	4,2	44,0
SDD vydané na domácím trhu	1042,0	1079,7	1175,7	1235,2	1301,6	1305,4
SDD vydané na zahraničních trzích	310,3	323,7	239,6	225,6	213,5	202,6
SSD	56,2	87,6	77,8	66,9	37,8	21,5
Přijaté zápůjčky a úvěry	70,0	71,5	60,4	58	56,3	51,2
Ostatní instrumenty peněžního trhu	0,0	0,0	2,5	2,9	0,0	0,0

Zdroj: MF ČR, Zpráva o řízení státního dluhu ČR v roce 2017 str. 24, upraveno autorem

Z tabulky č. 3 je patrné, že struktura dluhového portfolia dle instrumentů se ve sledovaných letech změnila a změny lze označit za pozitivní. Především došlo k růstu střednědobých a dlouhodobých státních dluhopisů (dále SDD) vydaných na domácím trhu a to z hodnoty 62,5% v roce 2012 na hodnotu 80,3 % v roce 2017. SDD vydané na domácím trhu, představují dominující instrument zastoupený v portfoliu a vzhledem k tomu, že emise každého dluhopisu je levnější než emise SDD vydaných na zahraničních trzích má to i pozitivní dopad na obsluhu státního dluhu. Za pozitivní lze považovat i snížení podílu státních pokladničních poukázek (dále SPP) a to z 11,3% v roce 2012 na hodnotu 2,7% v roce 2017. SPP

je instrument s krátkou dobou splatnosti a to většinou několik měsíců a jeho větší zastoupení v portfoliu znamená, že ukazatel splatnosti dluhu v krátkém období vzroste a to nelze považovat za pozitivní. Státní spořicí dluhopisy určené pro občany České republiky (dále SSD), zavedené ministrem financí panem Kalouskem zaznamenaly naopak pokles a to z hodnoty 3,4% v roce 2012 na hodnotu 1,3% v roce 2017. Celkové zastoupení SSD v portfoliu lze považovat za nízké. Pro stabilizaci státního dluhu je vždy dobré pokud ho drží domácí investoři byť jejich ochota investovat do dluhopisů se splatností 5 let a vyšší je zatím malá. Česká vláda by se měla snažit o to využít maximální možný potenciál tohoto segmentu trhu. Nízké zastoupení je způsobeno i tím, že při financování státního dluhu se počítalo spíše s velkými investory, jako jsou banky, pojišťovny a penzijní fondy. SDD vydané na zahraničních trzích, tento instrument se používal především v letech finanční krize jako dostupný prostředek pro zajištění deficitního financování státního rozpočtu v tomto období. Kromě jedné emise jsou SDD vydané na zahraničních trzích v Eurech. V průběhu sledovaných let podíl v portfoliu klesal a to z 18,6 % v roce 2012 na 12,5% v roce 2017. Posledním významnějším instrumentem jsou přijaté zápůjčky a úvěry, jedná se především o peníze z Evropské investiční banky (dále EIB). Úvěry jsou většinou dlouhodobě splatné a mívají nízké úročení. Ve sledovaném období došlo k jejich splácení z minulých let a žádný větší úvěr se nerealizoval. Výsledná hodnota je tedy pokles ze 4,2% v roce 2012 na 3,2 % v roce 2017. Ostatní nástroje jako směnky, ostatní instrumenty peněžního trhu nebo přijatý kolaterál v peněžních prostředcích byly využívány minimálně nebo vůbec, proto zde nejsou dále analyzovány.

**Tabulka č. 4** Průměrný výnos a doba do splatnosti SDD v aukcích na primárním trhu

Rok	2012	2013	2014	2015	2016	2017
Průměrná doba do splatnosti (roky)	7,2	8,2	9,1	6,2	5,6	7,4
Průměrný výnos do splatnosti (% p.a.)	2,45	1,73	1,68	0,24	0,05	0,51

Zdroj: MF ČR, Zpráva o řízení státního dluhu ČR v roce 2017 str. 29, upraveno autorem

Za pozitivní trend ve sledovaném období, lze jednoznačně považovat snížení průměrného výnosu do splatnosti u nově emitovaných SDD. Tím je do budoucna zajištěna výplata nižších úroků z těchto emisí, což má pozitivní dopad na obsluhu státního dluhu. Snížení průměrného výnosu do splatnosti nebylo dáno jen zlepšeným ratingem ČR, ale i několika lety trvajících intervencemi za slabší korunu ze strany České národní banky, které byly ukončeny v dubnu 2017. Tyto intervence způsobily zvýšený zájem o Českou korunu ze strany zahraničních investorů a tím se zvýšila poptávka po SDD, která způsobila snížení průměrného výnosu do splatnosti až na minimální hodnotu 0,05 % p.a. v roce 2016. Takovýto pozitivní vývoj nelze do budoucna očekávat, protože intervence již neprobíhají a opět se zvýší úloha ratingu ČR a schopnost nevytvářet výrazně deficitní rozpočty. Cenou bylo, že průměrná doba do splatnosti se snížila až na minimální hodnotu 5,6 roku v roce 2016. V roce 2017 se začala opět prodlužovat a hodnota byla 7,4 roků.

**Tabulka č. 5** Struktura korunových státních dluhopisů dle typu držitele v %

Rok	2012	2013	2014	2015	2016	2017
Domácí banky	50,7	44,6	44,9	39,9	29,1	23,6
Ostatní finanční držitelé	30,2	30,0	31,6	29,8	32,4	29,6
Nerezidenti	12,4	15,0	14,5	21,3	31,6	41,6
Domácnosti	4,4	6,4	5,4	4,6	2,6	1,5
Ostatní domácí držitelé	2,4	4,0	3,6	4,5	4,4	3,6

Zdroj: MF ČR, Centrální depozitář cenných papírů, upraveno autorem

V tabulce č. 5 jsou vidět dva trendy, které z pohledu stability státního dluhu nemají pozitivní vývoj. Jedná se především o pokles zájmu ze strany domácích bank nakupovat a držet korunové státní dluhopisy do splatnosti a jejich podíl se snížil za sledované období více jak o polovinu a to z 50,7 % v roce 2012 na 23,6 % v roce 2017. Uvedený negativní vývoj souvisel s poklesem průměrného výnosu do splatnosti a tím ze strany domácích bank došlo k vyhledávání jiných příležitostí kam volně peněžní prostředky investovat. U ostatních finančních držitelů kam patří především pojišťovací společnosti a penzijní fondy zůstal poměr téměř nezměněn z 30,2 % v roce 2012 na 29,6 % v roce 2017. Zmiňované společnosti mají ze zákonů ČR povinnost tyto dluhopisy kupovat bez ohledu na to, jaký lze z nich získat výnos. Pouze

nemohou kupovat dluhopisy se záporným výnosem. K největším změnám došlo právě u nerezidentů, kde se počet držitelů ve sledovaném období více jak ztrojnásobil. A to z hodnoty 12,4% v roce 2012 na hodnotu 41,6% v roce 2017. Za takto vysokým podílem stojí především prováděné intervence České národní banky na oslabování české koruny. Nerezidenti v době intervencí počítali s tím, že Česká koruna vůči zahraničním měnám posílí, jakmile intervence skončí, proto byly ochotni kupovat i dluhopisy s nulovým výnosem. Veškerý výnos měl být zajištěn očekáváním zhodnocení koruny vůči zahraničním měnám. Podobný trend jako u domácích bank byl zaznamenán i u domácností, kde se od roku 2013 snižoval podíl z 6,4% na 1,5% v roce 2017. Vláda na rok 2019 počítá s emisí Dluhopisu republiky určeného pro domácnosti a tím by se měl negativní trend v této oblasti změnit. Zastoupení ostatních domácích držitelů bylo v roce 2012 nízké a za sledované období se jejich podíl zvýšil o 1,2%, na výše uvedené trendy to nemělo žádný vliv.

**Tabulka č. 6** Struktura nerezidentů držících korunové státní dluhopisy v %

Rok	2014	2015	2016	2017
Spojené království	17,6	35,4	44,7	44,4
Lucembursko	25,9	25,7	23,1	25,6
Rakousko	9,9	6,1	12,3	11,6
Spojené státy americké	4,9	3,9	3,7	2,7
Ostatní	41,7	28,9	16,2	15,7

Zdroj: MF ČR, Centrální depozitář cenných papírů, upraveno autorem

Tabulka č. 6 je upravena tak, že jsou zde uváděny státy, které měly v průběhu let 2014-2017 větší zastoupení než 10 % na držení korunových státních dluhopisů a zároveň je zde uveden ekonomicky nejsilnější stát USA. V položce ostatní jsou uvedeny státy, u kterých držení v uvedených letech nepřesáhlo hodnotu 10% a v roce 2017 jejich hodnota nebyla vyšší než 3%. Z takto zpracované tabulky je zřejmé, že hlavními investory do korunových státních dluhopisů se stali nerezidenti ze Spojeného království a to v souvislosti s Brexitem. Brexit -proces ukončení členství Spojeného království Velké Británie a Severního Irsku v Evropské unii je bohužel náročný a s nejistým výsledkem, což se projevuje na zvýšených investicích ze strany investorů Spojeného království v kontinentální Evropě.

#### 4 Závěr

Smyslem článku bylo poukázat na potencionální nebezpečí, které představuje vysoké zastoupení nerezidentů držících korunové státní dluhopisy a na vysoké procento držitelů z jednoho státu a to Spojeného království Velké Británie a Severního Irsku. Situace, která byla pro Českou republiku z pohledu řízení státního dluhu, v analyzovaných letech příznivá se bude měnit. Byly ukončeny intervence České národní banky za slabší korunu, které trvaly většinu sledovaného období. Dojde dříve či později k dohodě o Brexitu mezi Spojeným královstvím a EU a tím ke snížení nejistoty na kapitálových trzích. V dalších letech v souvislosti s nevyřešenou důchodovou reformou lze očekávat deficitní státní rozpočty. To vše bude mít vliv na ochotu a zájem ze strany zahraničních investorů nakupovat státní dluhopisy ČR. V případě jejich nezájmu může dojít k tomu, že v krátkém období jednoho roku bude na trhu nadbytek českých státních dluhopisů. Zájem ze zahraničí bude malý. Domácí investoři nejsou buď schopni, nebo ochotni tento dluh vlastnit a mohlo by dojít k problémům s jeho financováním. Bez ohledu na přidělený rating by muselo dojít ke zvýšení úrokových sazeb emitovaných dluhopisů nebo ke zvýšení podílu státních dluhopisů emitovaných v jiné měně a tím i ke zvýšení obsluhy státního dluhu.

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SESSION

CRIMINAL ASPECTS OF ENTREPRENEURSHIP IN THE EUROPEAN  
CONTEXT AND INSOLVENCY PROCEEDINGS



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## Consumer protection in case of discrimination

Zuzana Frantíková

**Abstract:** *The article will deal with the consumer protection in case of discrimination. Equality and freedom from discrimination are outlined as basic human rights that may be protected by private and public law which brings different legal means of protection. Discrimination may link to dignity if discrimination is based on reasons such as race, ethnicity, nationality, gender, sexual orientation, age, disability, religion, belief, and worldview or it also may be connected to nationality, place of residence and disadvantages citizens of other EU Member States. Discrimination is regulated by many laws still it is not enough because in cross border transactions they were many unjustified discriminatory behaviour where businessmen were not willing to enter transactions with foreign customers. In this connection, on 28 February 2018, the Council adopted Regulation (EU) 2018/302 of the European Parliament and of the Council on addressing unjustified geo-blocking and other forms of discrimination based on customers' nationality, place of residence or place of establishment within the internal market and amending Regulation (EC) 2006/2004 and (EU) 2017/2394 and 2009/22 / EC, effective from 3. 12. 2018. This paper describes public consumer protection in case of discrimination using public data.*

**Key words:** Consumer protection · Freedom from discrimination · Equality

**JEL Classification:** K1 · K13

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## The significance of economic knowledge in the environmental sustainability discourse

Karl Bruckmeier

**Abstract:** *Environmental sustainability gained significance in the past three decades in science and in politics, in many countries, indicating increasing problems with environmental pollution and limited availability of natural resources. Yet, the success of sustainable development in terms of environmental improvements is limited, as the Millennium Ecosystem Assessment and further global assessments showed. This analysis of the significance of economic knowledge in the sustainability discourse is part of a discussion of potential improvements of the sustainability process. Economics is only one of many disciplines providing knowledge for the sustainability process, and it is not a paradigmatically unified science. Sustainable development depends on broader knowledge from the natural and social sciences and interdisciplinary syntheses. Interdisciplinary knowledge integration evokes questions of knowledge selection in environmental research and governance. The search for possible improvements of sustainability governance requires analyses of the main deficits: policy, market and community failures, and failures through inadequate knowledge practices, the latter rather neglected up to now.*

**Key words:** Economic knowledge · Environmental sustainability · Interdisciplinarity · Knowledge synthesis

**JEL Classification:** Q5

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