

Proceedings of the  
19<sup>th</sup> International Conference

# Current Trends in Public Sector Research

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Masaryk University  
Faculty of Economics and Administration  
Department of Public Economics

Brno 2015

Proceedings of the 19<sup>th</sup> International Conference  
Current Trends in Public Sector Research



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19<sup>th</sup> International Conference

# Current Trends in Public Sector Research

Šlapanice, 22–23 January 2015

Masaryk University  
Faculty of Economics and Administration  
Department of Public Economics

Brno 2015



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## CONTENTS

<b>PROLOGUE (Geert Bouckaert)</b> .....	9
<b>SESSION I: PUBLIC ADMINISTRATION AND PUBLIC SECTOR</b>	
KOMÁRKOVÁ JITKA, JONÁŠOVÁ HANA, FRANKOVÁ PETRA: Evaluation of Spatial Distribution of Criminality in the Czech Republic.....	12
KUBÁK MATUŠ, BOSÁKOVÁ LUCIA, FIŠAR MILOŠ, HAJDUOVÁ ZUZANA, TIMUROVÁ EVA: Dependence of Unemployment Change on Selected Economic Factors: Panel Data Evidence.....	21
LNĚNIČKA MARTIN, MÁCHOVÁ RENÁTA, KOMÁRKOVÁ JITKA: Cloud E-government Index as a New Benchmarking Framework for the Public Sector.....	29
MANDYS JAN, KŘUPKA JIŘÍ, PROVAZNÍKOVÁ ROMANA: Use of the Quality of Life Concept for Decision-making Processes in Public Administration.....	38
OCHRANA FRANTIŠEK, STEHLÍK PETR: The Effect of Transparency in Public Procurement in Terms of Traceability of the Beneficial Owner .....	46
SIČÁKOVÁ-BEBLAVÁ EMÍLIA: Civil Service Education: Basic Concepts, Typology and the Example of the Slovak Practice .....	54
STAŇOVÁ LUDMILA: All Roads Lead to Rome: How Informal Staffing Can Find its Way through Formal Institutions.....	61
STAROŇOVÁ KATARÍNA: Senior Civil Service in Slovakia.....	68
ŠAGÁT VLADIMÍR, JURAJ NEMEC, KLIMOVSKÝ DANIEL: What Kind of Control is Delivered by Regional Self-government in Slovakia? .....	78
ŠTEMBERKOVÁ RŮŽENA, ZDŘÁLEK PETR, MATULOVÁ PAVLA, MAREŠOVÁ PETRA, KUČA KAMIL: Evaluation of R&D Results in German-speaking Countries .....	84
<b>SESSION II: PUBLIC FINANCE</b>	
BAKOŠ EDUARD, SOUKOPOVÁ JANA, ŠELEŠOVSKÝ JAN: Local Government in Czechoslovakia 1918-1938 and its Impact on Economy of Municipalities in the Czech and Slovak Republics.....	94
BERNÁ ZUZANA, ŠPALEK JIŘÍ: Factors Influencing Compliance Behavior in a Tax Laboratory Experiment.....	103
FISCHER JAKUB, LIPOVSKÁ HANA: Novel Government Debt Indicator: Government Debt to Net Wealth of Households .....	110
JIRAVA PAVEL, KAŠPAROVÁ MILOSLAVA, KŘUPKA JIŘÍ: Modelling of Municipal Debt in the Pardubice Region .....	117
JURČÍK RADEK: New Trends in the Evaluation of Public Contracts. The Lowest Tender Price or Economic Advantageousness of the Tender? .....	125

MALÝ IVAN: Are Fiscal Illusions Real or Are They Just an Illusion? A Review of Contemporary State of Art .....	134
MATĚJOVÁ LENKA, PLÁČEK MICHAL, OCHRANA FRANTIŠEK, PŮČEK MILAN, KRÁPEK MILAN: Political Business Cycle in Local Government. Case Study of Czech Municipalities .....	142
ROSENBERG ZDENĚK: Aging, Public Pensions and Productivity of Labour: A Simulation of What the Czech Republic Can Afford .....	149
SEDMIHRADSKÁ LUCIE: Evaluation of Draft Budgets: A View of Local Politicians.....	157
SEMERÁD PAVEL, DAVID PETR: Fraud Risks in Indirect Taxes on Mineral Oils .....	163
TEPPEROVÁ JANA, ŽÍDKOVÁ HANA: Potential Revenues from Inclusion of Migrants from the Third Countries into Czech Public Health Insurance System .....	172
VOSTATEK JAROSLAV: Czech Pension System and Ways of its Rationalization .....	180
ZIMMERMANNOVÁ JARMILA, ČERMÁK PETR: The Comparison of Particular Characteristics of the Environmental Taxation and the Emission Tradable Allowances in the Czech Republic.....	188
<b>SESSION III: PUBLIC SERVICES</b>	
FÓNADOVÁ LAURA, KATRŇÁK TOMÁŠ: Empirical Evidence on the Unequal Chances to Education in the Czech Republic.....	198
HALÁSKOVÁ MARTINA, HALÁSKOVÁ RENÁTA: Quality and Availability Assessment of Public Services Using the Example of Social and Health Services .....	205
HEDIJA VERONIKA: Gender Wage Differences in Czech Public Healthcare: Results from the Selected Hospital .....	214
KUCHAŘOVÁ DARIA: Student Satisfaction with Higher Education Service Quality: Dimensions and Antecedents .....	223
KUNCOVÁ MARTINA, BÍZA BISOVÁ SÁRA, MULAČ PETR: Public Universities in the Czech Republic: Analysis of Efficiency .....	232
LANGHAMROVÁ JANA, CSÉFALVAIOVÁ KORNÉLIA, FUČÍKOVÁ SIMONA: Ageing in the Countries of the Visegrad Group after 1960 .....	241
MAREŠOVÁ PETRA, KACETL JAROSLAV, ŠTEBERKOVÁ RŮŽENA, KUČA KAMIL: Care for Czech Republic's Ageing Population .....	250
MERTL JAN: The Transformation of Czech Public Health Insurance to Earmarked Health Tax .....	258
MUŽIK ROMAN: Shortening Waiting Times in Slovakia for Total Hip Replacement and Cataract Surgery: Development of Waiting Times in 5 Years .....	266

NEMEC JURAJ, MIKUŠOVÁ MERIČKOVÁ BEÁTA, SVIDROŇOVÁ MÁRIA: Social Innovations in Public Services: Co-creation in Slovakia .....	273
PAVLÍK MAREK, ŠPAČEK DAVID: Sport Grants and their Transparency: The Case of Information Available on Web Pages of Czech Regions .....	282
PLAČEK MICHAL: Benchmarking in Higher Education .....	291
SLABÁ MARIE: Stakeholders and Corporate Social Responsibility in Tertiary Education: The University's Perspective .....	299
SLAVÍKOVÁ LENKA, VOJÁČEK ONDŘEJ: Challenges of the Mixed-Method Ecosystem Service Research .....	309
SOUKOPOVÁ JANA, FICEK VOJTĚCH: The Municipal Choice of Waste Collection Companies .....	316
STRUK MICHAL: Estimating Municipal Solid Waste Expenditures: The Case of South Moravian Region .....	324
TÓTHOVÁ DOMINIKA, PAŘIL VILÉM: Assessment of Population Air Pollution Burden in the Surroundings of D1 Motorway .....	332
VALENČÍK RADIM, WAWROSZ PETR: How to Design Human Capital Contracts and Where They Can Be Used .....	341
VAŇKOVÁ IVANA, VRABKOVÁ IVETA: Modelling of Spatial Accessibility of Acute Bed Care in Terms of the Czech Republic .....	350
WILDMANNOVÁ MIRKA: Day Care: What to Do with This Tool of Elderly Care? .....	359
<b>SESSION IV: NON-PROFIT SECTOR</b>	
CURTISS JARMILA, ŠKARABELOVÁ SIMONA: Rural Non-profit Organizations and their Functions in Communities and Local Governance: Survey Results from Vysočina and South Moravia Regions .....	368
FÓNADOVÁ LAURA, HYÁNEK VLADIMÍR: How to Measure the Effect of Public Income on the Structure of Resources and Production of Non-profit Organizations .....	377
GODAROVÁ JANA, PAVLÍK MAREK: Fundraising of Major Czech Political Parties .....	385
HLADKÁ MARIE: Why Do People Give: Motives for Charitable Giving in the Czech Republic .....	394
NAVRÁTIL JIŘÍ, VACEKOVÁ GABRIELA: Determinants of the Success of NGOs' Accession to EU Funds in the Czech Republic .....	402
PROUZOVÁ ZUZANA, VACEKOVÁ GABRIELA, SOUKOPOVÁ JANA: Public Funding of Czech Agricultural NGOs in Times of Financial and Economic Crisis .....	409
VYSKOČIL MAREK, PEJCAL JAKUB: Publicly Funded Social Innovations .....	416



## Prologue

It is my great pleasure to be invited as a keynote speaker to the Conference on “Current Trends in Public Sector Research”, which is organised by the Department of Public Economics at Masaryk University, Czech Republic. I am delighted to have been asked to provide a prologue to these proceedings.

Current public sector reforms have many dimensions. Within the public sector of OECD countries, trust has increasingly become a crucial element of performance, especially after the financial crisis. Reform strategies have been driven by agendas to increase trust in the public sector. Three clusters of trust are defined: from society in the public sector (T1), from the public sector in society (T2), and within the public sector (T3). However, there are some paradoxes in these strategies. For example, New Public Management is partly based on distrust, and the public sector expects to be trusted but does not necessarily trust its citizens or other public sector agents. Trust levels are culturally determined and differ significantly within the OECD. This has implications for public sector reform policies, which are linked to trust regimes. Taking trust regimes into account should contribute to trust building and to trust keeping.

When the OECD took stock of public sector reforms in 2005 for its ministerial conference, it summarised six shifts in the practices of its member countries (OECD, 2005), and it put trust on its agenda. Governments became open governments, enhanced public sector performance, and modernised accountability and control. They also reallocated and restructured tasks and organisations, using market-type-mechanisms (MTM), and they organised and motivated public servants as part of modernising the public employment function. There was an awareness that trust was a key driver and an objective of public sector reform policies, even if the causal linkages were not clear and rather indirect.

The current economic and financial crisis has pushed Western OECD countries to cut back management and increase savings. It also created an awareness that trust in the capacity of governments and the public sector to implement effective policies is a crucial element in a performing society and economy. At the 2010 OECD ministerial conference, a key starting point was that “trust, built on openness, integrity, and transparency, remains an overarching goal to foster an effective and performance-driven public sector, delivering better public services more efficiently, and promoting open and transparent government”. Building and keeping trust remains an objective in a period of crises where the public sector needs to be a stronghold in the economy and in society (Van de Walle et al., 2005).

Three major models seem to emerge in this reality of public sector reforms: New Public Management (NPM), the Neo Weberian State (NWS), and New Public Governance (NPG) (Pollitt and Bouckaert, 2011). The diversity of the three models, which is the result of path dependencies and different choices of political systems, includes a diverse approach towards trust as a component, a driver, and an objective.

Geert Bouckaert  
*President of the International Institute of Administrative Sciences*



**SESSION I:  
PUBLIC ADMINISTRATION  
AND PUBLIC SECTOR**



# Evaluation of Spatial Distribution of Criminality in the Czech Republic

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## Abstract

Evaluation of criminality and its spatial distribution belong to important issues which can be solved by means of geographic information systems. It is a very sensitive topic because it is connected to everyday life and perception of particular areas. Authors propose a procedure of evaluation of criminality at the district level in the terms of the Czech Republic. Consequently, demographical and economic data are taken into account to evaluate circumstances. The proposed procedure is based only on data which are publicly available. In the case of this study, Census 2011 data, data from the Czech Statistical Office and the Police of the Czech Republic for year 2011 are used. It is focused both on visualization of selected phenomena and evaluation of their spatial distribution. Several aspects of visualization are discussed in the end of the article.

*Keywords:* criminality; GIS; spatial analyses; spatial distribution

JEL Classification: C88, R59, Y91

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## 1 Introduction

Criminality belongs to serious social phenomena. It is often tendentiously described by the mass media which can significantly influence public opinion. It is connected to other pathological phenomena and along with the level of poverty, health, housing, education and rights it represents an important show of social deprivation which influences everyday life of human beings. Spatial distribution of criminality influences perception of particular places and it can often cause a negative perception of particular places in the eyes of the public.

Opinions on reasons and conditions of criminality undergo a long-lasting research. They are not clearly defined because criminal activities belong to social phenomena influenced by a high number of various social, economic and demographic factors. A sufficient amount of relevant information is required for their recognition. Investigation of criminality is a significant topic for both scientific research and practical utilization. [2], [20]

Criminology investigates criminality as a real phenomenon. It is focused on identification of knowledge about criminality and connected conditions, i.e. on summary of crimes committed in the particular area in the given time [15].

Within this work, the following basic division of crimes is used (the same division is used in official statistics of the Police of the Czech Republic):

- General violent crime (theft, robbery, rape, murder)
- Economic crime

Crimes represent spatially and temporally distributed phenomena within an area of interest, i.e. they are primarily characterized by their location and time they happened. Alongside, crimes are characterized by several non-spatial attributes (e.g. offender, type of crime, damage, victim, etc.). Geographic information systems (GIS) represent a suitable tool for visualization and analyses of available data as far as GIS can show development (changes in time), spatial patterns, correlations, etc. and it can provide predictive analyses and modelling. Analyses should be followed by an appropriate visualization of obtained results.

Strong attention has been paid to crime analyses at a very detailed level within small areas, like cities or smaller regions. Various methods were used and many various factors influencing criminality were studied, e.g. [3], [8], [9], [11], [12], [13], [16], [17]. There was found

practically no influence of location of residence on criminality of young males in Stockholm [8]. Predictive analyses and modelling to support intelligence-led policing in was proposed to better handle information about criminality in Lisbon [11]. Prospective hot-spot mapping was proposed to aggregate particular burglaries (i. e. events) into square grid cells [3]. Perception of criminality by citizens is another very important issue. Patterns of citizens' fear of burglary were studied by means of spatial analyses [17]. Integration of sketch maps with GIS to understand fear of criminality was discussed [5] pointing out flexibility of this approach but weaknesses of its implementation too. ArcGIS for Desktop 10 was used to analyse time and spatial spreading of crime events registered by police in Vilnius City [9]. Authors focused on spatial patterns (clusters) of crimes and they created several maps for particular years.

The main aim of the paper is to describe a case study proposing a suitable set of methods for processing and analyses of publicly available data describing crimes together with statistical 2011 Census data of the Czech Republic. Descriptive statistics, identification of possible correlations and outliers belong to expected outputs. Attention is paid to collection of available data, their processing and analyses. Consequently, attention is paid to suitable visualisation of analyses results so they can be subsequently used in decision-making. The whole procedure is proposed with respect to available data, their format, expected outputs and software limitations.

ArcGIS for Desktop 10.2 is used as a GIS software package to implement the proposed set of methods because it provides wide range of spatial analyses and wide range of outputs, including time series animations. Another reason is that it is the most widespread GIS package over the whole world. In the Czech Republic, ArcGIS is used within all regional authorities, almost all municipal authorities and several ministries. ArcGIS was the only GIS software included in the standardised project of informatization of regional authorities in the Czech Republic in 2001 [14] so its utilization is the only choice which is fully compatible with the Czech public administration authorities.

## **2 Material and Methods**

Spatial analyses are mostly represented by exploratory data analyses and modelling methods which results depend on geometric and attribute properties of analysed features (i.e. phenomena or objects). Their theoretical principles originated in mathematical methods with roots in 18<sup>th</sup> century. Next, map composition and map symbolisation is determined and controlled by the given cartographic methods. [18]

### *2.1 Used Methods*

All the basic spatial analyses, i.e. primarily data queries, are used many times to describe and analyse crimes and identify areas which meet given conditions and values. Next, spatial statistics are used, namely standard deviational ellipse, significant cluster identification spatial autocorrelation, mean centre calculation, median centre calculation and linear regression.

Suitable cartographic methods are used to visualise results of analyses and to visually present possible correlations, patterns and phenomena spreading and development in time. Time animation is used as a special type of output to more understandable represent time series.

More detailed description of all above mentioned methods can be found e.g. in [18].

### *2.2 Used Software*

The need for spatial-temporal analyses and explanations leads to utilization of geographic information systems. Various GIS software packages today exist; they are used to answer spatially-oriented questions and to support spatially-oriented decision making. A specific procedures of data processing and analyses which involve various spatial analyses, represent the core element of all GIS software packages which in general differ GIS from all other types of information systems [18]. Utilization of GIS together with spreadsheet allows joining spatial data and available statistical data from different sources and their consequent spatial-temporal

analyses as far as GIS software can answer questions on location, conditions, development trends, patterns and correlations and it provides what-if modelling tools as well [18].

Specifically, MS Excel 2010 by Microsoft and ArcGIS for Desktop 10.2 by Esri (hereinafter ArcGIS), licence level ArcEditor are used for data processing, analyses and visualisation. ArcGIS [10] is sophisticated GIS software. It provides many different spatial analyses, e.g. simple data queries and filtering, distance based analyses, path optimization and other network-based analyses, topological overlays, analyses based on digital terrain models (e.g. analysis of visibility, calculation of river catchment, etc.), spatial statistical methods (e.g. spatial patterns, clustering, correlations, randomness of distribution, etc.) and raster calculations.

ArcGIS belongs to widespread GIS packages. It keeps the largest market share, followed by MicroStation (Bentley), AutoCAD (Autodesk) and GeoMedia (Intergraph) [18]. GeoDa, QGIS and GRASS GIS can be given as examples of open source GIS packages. MicroStation, AutoCAD and GeoMedia are computer-aided design software packages in origin, so they are more focused on design. GIS software packages, including ArcGIS, are more focused on spatial analyses.

As it was mentioned before, ArcGIS is fully compatible with Czech public administration authorities. Next, utilization of ArcGIS 10.2 brings several benefits for time-series data analyses and visualisation in comparison to ArcGIS 10. Temporal data can be stored as an attribute in both vector and raster data formats. There can be inserted more fields for temporal data, namely one field for starting date and another one for ending date. There are available several tools for data transformation in the case temporal data are stored in unsuitable form or field. This is completely new set of tools available in ArcGIS 10.2 which allows easily visualise time-series and development trends in time and space.

Other GIS software, namely QGIS and GRASS GIS, provide similar tools to create output animations of time series. GRASS GIS is focused more on raster data and it is more command-line oriented user interface from its origin. QGIS provides less spatial analyses tools. GeoDa is an open source, cross-platform software package focused on exploratory spatial data analysis, e.g. spatial autocorrelation statistics and basic spatial regression functionality. Space-time data view is a new functionality of GeoDa. GeoDa is limited in map production (design of maps and symbolisation). AutoCAD, GeoMedia and MicroStation provide 3D animations but not animation based on time values in attributes of data. MicroStation provides schedule animation – based on a calendar but not on real time values stored in attributes. As far as each GIS software contains hundreds or even thousands of functions, detailed comparison is out of scope of this paper.

Because of available data, ArcGIS distribution over the world, importance of ArcGIS in Czech public administration [14], required spatial analyses, required quality of outputs and authors' experience, ArcGIS for Desktop is used within this case study.

### *2.3 Used Data and Area of Interest*

The whole Czech Republic (CR) is area of interest of the study. Area of the Czech Republic is 78 867 km<sup>2</sup>. Now, it is divided into 14 self-governing regions (NUTS 3). Simultaneously, it is divided into 8 territorial regions (NUTS2) and 77 districts (former NUTS 4). Prague is the capitol and it is one of the 14 self-governing regions and one of the 77 districts as well. There were approx. 10.5 mil citizens in the CR in 2011. [4]

Districts are statistical territorial units at the middle level and at the former NUTS 4 level, contemporary at the LAU 1 level (Local Administrative Units). Name of each district is unique. District level of public administration was cancelled by December 31, 2002. Since that day, districts are used as statistical unit for middle-level observation and comparison. [4]

Data about criminality and crimes used in this study originate from public resources, mainly from web page of the Czech Statistical Office (CSO) [6],[7] and the Police of the Czech Republic [20]. Numbers of policemen in particular districts originate from [19]. The most detailed available data are at the district level, more detailed data are not publicly available.

Next, social, economic and demographic data from CSO are used as far as they represent aspects which can influence criminality and crimes. All the aspects are chosen because they can

cause crime, make it easier or support it. All the used data describe state in the year 2011, i.e. they are connected to the year of the last Census.

An average salary is available at regional level only. There was not found any other relevant and reliable resource of this attribute so it was replaced by several other attributes.

Number of policemen in each district represents another important attribute.

Database ArcCR 500 is used as the main spatial data source. It is a vector digital database providing topographic description and administrative units of the Czech Republic. It is provided in the scale 1 : 500 000 and coordinate systems S-JTSK [1]. Data layer describing districts is used as the basic spatial data layer. Abbreviations of districts and an information whether district is a boundary one or not were added into this data layer in the beginning of the study.

The final input data set was created by linking of data about criminality and data about population and data about the area of interest. This data set allows analysing crimes and possible relations between crimes and social-economic characteristics. It is possible to use it for identification of structure and intensity of particular phenomena and their correlations too.

### **3 Results and Discussion**

Main aim of the paper is to propose a suitable set of spatial analyses for publicly available data. The proposed procedure is implemented in ArcGIS for Desktop. As far as ArcGIS implements all chosen spatial analyses methods, they are more detailed described in chap 3.2. The most significant importance and benefit of the implementation of the proposed procedure in ArcGIS is its repeatability because the used software environment is widespread.

#### *3.1 Spatial Analyses Methods*

At first, all entries are checked from the point of view of their factual and formal correctness. All entries are recalculated to values per 1 000 citizens. Next, the basic descriptive statistical analysis is run and outliers and extremes are identified. All identified outliers and extremes are verified in older or newer official statistics if they were similar. Next, there is identified a correlation with age categories. These correlated attributes are not excluded but during next analyses their possible influence are observed.

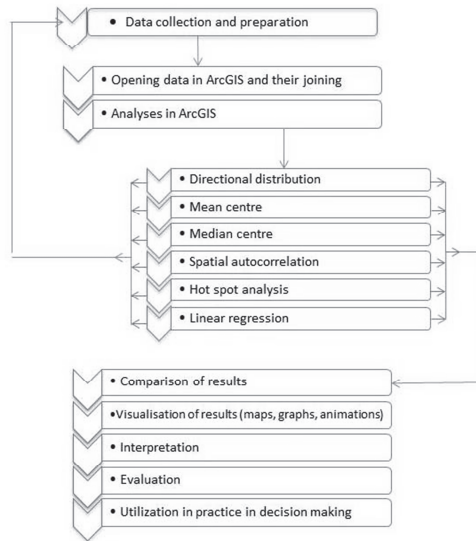
Namely, the following set of exploratory methods is proposed: a) distribution in cardinal directions; b) mean and median centre of the phenomena; c) spatial correlation; d) identification of outliers; e) linear regression.

#### *3.2 Implementation of the Proposed Procedure*

The implementation of the proposed procedure in ArcGIS is shown in the following Figure 1. It begins with data collection from original resources and their processing. There can be seen the first limitation – only publicly available data could be used. Spatial resolution of available data sets is at former district levels. Set of analyses is the core part of the proposed procedure. Names of particular analytical tools or toolboxes from ArcGIS are used because they describe the used analytical principle as well. Set of particular spatial analyses is proposed directly for the study. Utilization of adequate cartographic symbolisation rules represents the next step. Creation of final animations of time series is the last step. The most important steps are described in the text below.

Stepwise, 45 particular new data layers for each type of crime, each demographic, economic and social phenomenon, all related to the year 2011 were created. At first, all phenomena have to be visualised. Then, all analyses are conducted. At last, all results are finally visualised by means of appropriate symbols and methods.

**Figure 1. Implementation of proposed procedure in ArcGIS**



Source: Authors

### **Directional Distribution**

Directional distribution, i.e. spatial spreading is calculated by means of *Directional Distribution (Standard Deviational Ellipse)* tool. It can be observed that all types of crimes are shifted more to the north-west of the country in comparison to the reference ellipse which is not weighted by any values (see Figure 2). The centre follows this spreading and is shifted to the border of Kutná Hora and Kolín districts. Murders are shifted more to south-west and centre of this phenomenon is located in Kutná Hora district. Total criminality and general crimes are shifted more to the north-west than economic crimes. A high unemployment rate can be observed in Ústecký region which can cause worse economic situation. On the other side (direction), there are higher values connected to number of believers, Moravian nationality, economical active in finance and citizens with a university degree. To the south, there predominate citizens working for public administration and in agriculture. Other phenomena do not demonstrate any significant changes in the directional distribution in comparison to the reference ellipse.

Coordinates of median centre are not identical to coordinates of standard deviational ellipses. Median centres of total criminality and general crimes are shifted more to the north-west because they are not so influenced by outliers.

Figure 2. Directional distribution of particular types of crimes (2011)



Source: Authors

### Hot Spot Analysis

There are two significant clusters of high values of the total criminality identified by means of *Hot Spot Analysis* tool. The first one is begins near to Prague and continues to north-west part of the CR. The second one is located on the north of Moravia.

There are two significant clusters of low values identified as well. The first one is located in the south-west of Moravia, the second one consists of Jihlava, Žďár nad Sázavou, Svitavy a Ústí nad Orlicí districts. All other districts are statistically insignificant. There is a very similar distribution of statistically significant districts with number of policemen and partially divorces. Concerning spatial distribution of number of policemen, there should be a small improvement in Prague and Ostrava districts.

General criminality provides very similar spatial spreading of statistically significant areas as a total criminality. Spreading of statistically significant areas of economic criminality follows the total criminality but in a smaller extent.

### Graphs

There can be concluded from the particular graphs, that general criminality follows total criminality but economic criminality provides different progress. The highest values of economic criminality can be observed in Prague which is followed by Brno district. The lowest values can be observed in Blansko district. Concerning the particular types of crimes, robbery is the most often occurring type, followed by thefts. Occurrence of murders and rapes is significantly lower in comparison to economic criminality. In 2011, the highest number of robberies is recorded for Teplice district; the highest number of thefts for Kolín district. The highest number of murders is recorded for Česká Lípa, Český Krumlov and Zlín districts; the highest number of rapes for Kolín district. Comparison of robbery and unemployment rate demonstrates that there are

opposite trends as it is confirmed by directional distribution, mean and median centres and hot spot analyses.

### Cartograms

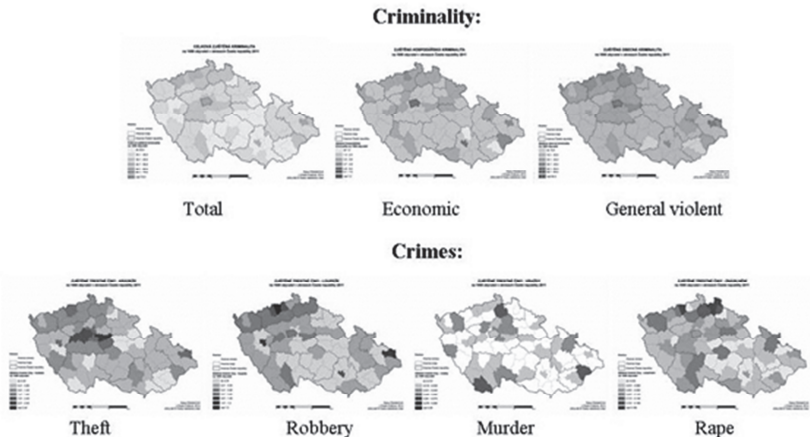
Cartograms provide easily visible and understandable demonstration of phenomena spreading. In the case of this study, spreading of both types of criminality and all basic types of crimes is shown by means of cartograms (see Figure 3).

General and economic criminalities demonstrate very similar spatial distribution. Higher values are present in the case of districts of Středočeský kraj. It may be caused by closeness of Prague and more opportunities for committing crimes.

Murders and rapes do not occur significantly in any specific area. On the other side, spatial spreading of thefts and robberies shows significant centres which correspond to spatial spreading of economic and general criminality (mostly big agglomerations like Prague, Brno, Ostrava, Plzeň, districts located in the north-west part of the CR and districts located in the central part of the CR).

Cartograms describing state in particular years or state of particular phenomena can be finally visualised by means of animations to better demonstrate changes in time and/or location. This approach is easier to use in comparison with large set of static maps.

Figure 3. Example of cartograms



Source: Authors

## 4 Conclusion

Public administration authorities provide increasing amount of data describing crimes, although spatial resolution of publicly available data is still limited to the level of former districts. Despite the spatial resolution, available data can be analysed to identify possible spatial patterns, spatial distribution rules, outliers and to identify changes in time.

The main aim of the paper is to describe a case study proposing a suitable set of spatial analytical methods for data processing to obtain the above listed results. The case study is focused on analyses of publicly available data describing crimes together with statistical 2011 Census data of the Czech Republic. Finally, the case study is focused on suitable visualisation methods of obtained results. The procedure itself is not focused on particular activities how to stop committing particular crimes but how to describe the existing situation.

The case study describes implementation of the proposed set of analyses in ArcGIS for Desktop. This software is chosen because of its wide functionality, worldwide utilization and utilization within the Czech public administration authorities. AutoCAD, GeoMedia, MicroStation, QGIS, GRASS GIS and GeoDa can be given as examples of other GIS software packages which can be used to solve particular steps of the proposed procedure. GeoDa does not provide so good quality of map outputs; AutoCAD, GeoMedia, MicroStation do not provide time animation (they provide only 3D animation; MicroStation furthermore provides schedule animation) and are limited in cartographic functions. QGIS is limited in all functions (analytical and cartographic).

The proposed procedure of collected input data pre-processing and consequent processing by means of spatial analyses available in ArcGIS for Desktop can be repeatedly used – it is proposed as a technological procedure although not all the details and parameters are described in the paper. Particular analytical steps follow each other but the proposed procedure can be modified to involve additional analyses and tools or to involve additional attributes or to use more detailed data when they are available. Especially, more detailed data (with better spatial resolution) would provide more detailed outputs with higher information value.

Obtained results are not in opposite, they complement each other. It can be observed that there are several areas in the Czech Republic with higher criminality rate. These areas correspond to industrial localities with high density of population, namely districts in the north-west of the CR, districts next to Prague and Ostrava. On the opposite, low criminality rate is observed in districts with higher rate of believers and with predominant agriculture (south Moravia). All these conclusions can be easily observed in maps. But only a few map outputs are provided within this paper because this kind of visualisation of many different phenomena is highly dependent on utilization of different colours in maps.

It is impossible to conclude that criminality is caused just by one particular phenomenon. Mostly, it is caused by a set of different phenomena which influence each other and cause decrease or increase of criminality. Results can be significantly influenced by the fact that criminality is highly committed in richer areas, e.g. Prague and its surrounding. Offenders can arrive into richer areas and commit crimes there. Data in this study are based on location of crime, not on residence of offenders. Knowledge of residence of offenders could bring some more interesting results but this type of data is not publicly available.

As it was mentioned before, the paper does not want to directly point out to particular problematic places. It is aimed at data processing and analyses procedure to provide a suitable framework how to use and analyse publicly available data to check the contemporary state of criminality and its development.

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# Dependence of Unemployment Change on Selected Economic Factors: Panel Data Evidence

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## Abstract

Unemployment, serious macroeconomic problem, varies depending on a multitude of different factors. Politicians and economists try to boost economic activity and fight unemployment using state employment aid and various policies. This study aims to investigate efficiency of choosing policies and to analyse unemployment trends in EU28, Norway, Japan and USA for years 2001-2010. The paper focuses on the relation of unemployment and selected economic factors (foreign direct investment flows as % of GDP, public expenditure on education as % of GDP, public expenditure on labour market policies as % of GDP and inflation rate). Thus, our panel data consist of 30 countries and 5 variables for 2001-2010. Our regression analysis revealed that foreign direct investment had no impact on unemployment, while public expenditure on education and inflation had a negative influence on employment. Public expenditure on labour market had a positive impact on employment after three to four years after its realization.

*Keywords:* global unemployment; panel data analysis; Fixed Effects Model (FEM)

JEL Classification: E24, C01, C23

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## 1 Introduction

Unemployment presents a serious macroeconomic problem. Economic theories as well as previous empirical studies have identified a number of various determinants of unemployment, which include for example employment protection legislation, unemployment benefits, taxes, trade union bargaining power and the structure of collective bargaining, anti-competitive product market regulation, minimum wages and housing policies [2], [3], [4].

There probably exist many others factors in relation or having impact on the unemployment. Relying on some studies, it can be concluded there also exist certain association between unemployment and foreign direct investments (FDI) [4], [8], [15]. Last two studies found a positive relationship between unemployment rates and FDI, thus suggest that high unemployment attracts these investments. The question is if it works also to the contrary. Does the inflow of FDI to the country reduce also the unemployment? Schmerer [15] tested the hypothesis that FDI-receiving countries tend to have lower rates of unemployment, whereas an increase in FDI-outflows increases equilibrium unemployment. The results of this study support the model where net-FDI (difference between FDI inflows and outflows) is robustly associated with lower rates of aggregate unemployment.

According to Lauer [12], the level of educational attainment is expected to be a strong determinant of the individuals' employability in so far as it constitutes an essential part of their human capital. There is also evidence that having more education helps people to keep or change their jobs during the recession [13]. For example, between the start of the downturn in 2008 and 2010, overall unemployment rates increased from 8.8% to 12.5% for people without an upper secondary education, and from 4.9% to 7.6% for people with an upper secondary education (on average across the OECD countries), but for people with higher education remained much lower, rising from 3.3% to 4.7% during this same period. Moreover, there exists

a certain presumption that the most educated people tend to be in countries where spending on all levels of education is among the highest.

In the context of unemployment, also the labour market policies are often discussed. Many countries try to get unemployed back into work through various forms of assistance which are generally called active labour market policies, even though the general view is that such policies can on balance be helpful, but need to be carefully designed and very often do not provide a very good return on the money spent [10]. Moreover, passive labour market policies, such as unemployment benefits, may affect the behaviour of the unemployed and in particular their intensity of job search and how selective they are over the jobs they are willing to accept, as there is an evidence that higher levels of benefits are associated with higher unemployment and in particular that countries with long duration benefit entitlement tend to have longer durations of unemployment [10].

The relationship between the unemployment and inflation rate is well known through the Phillips curve which says that inflation tends to be low when unemployment is high and vice versa. According to Fitzgerald et al. [7] if this relationship is stable it holds regardless of changes in the economic environment and policymakers might be able to trade off increases in inflation to achieve lower unemployment, or the inverse. The results of this study suggest that a 1-percentage-point-lower unemployment rate is associated with higher inflation of 0.3 percentage points over the next year, and the stability of the relationship suggests that it might provide a viable tool for policymakers.

Flaig and Rottmann [6] showed that the magnitude of the effects of institutions on unemployment differs considerably between countries and that higher centralization of wage negotiations decreases unemployment. Aurangzeb and Asif [1] found out that unemployment rate is affected by inflation, gross domestic product, exchange rate and the increasing rate of population. Boršič and Kavkler [5] study influence of age, gender, level of education, and region on unemployment. They suggest that it takes longer for female and older unemployed persons to find a job and on average the duration of unemployment decreases with increasing level of education. Moreover unemployed persons with a professional college degree or a bachelor's degree are better off than unemployed persons with a master's degree. Lalive [11] targeted program that extends the maximum duration of unemployment benefits from 30 weeks to 209 weeks in Austria. His results indicate that the duration of job search is prolonged by at least 0.09 weeks per additional week of benefits among men, whereas unemployment duration increases by at least 0.32 weeks per additional week of benefits for women. His findings are consistent with a lower early retirement age applying to women. Gabrisch and Buscher [9] demonstrated that a high trend rate of productivity and a high unemployment intensity of output growth have been observable since 1998 in post-communist countries. Authors conclude that labor market rigidities do not play an important role in explaining high unemployment rates. Özel et al. [14] showed that while the productivity and economic growth variables have significant and strong effects on the reduction of unemployment in the pre-crisis period, this effect of productivity becomes insignificant and small after the crisis whereas the effect of economic growth as a decreasing effect over unemployment continues and its impact level rises.

The present paper investigates unemployment trend in EU28, Norway, Japan and USA for a period 2001-2010 and analyzes association between unemployment and selected economic factors, such as foreign direct investment, public expenditure on education, public expenditure on labour market policies and inflation rate. The aim of this study is to examine the relationship between unemployment and particular factors and thus to better understand the joblessness in the developed world. Data and methodology are described in following section, empirical results in section three and its subsections, conclusion and discussion are in final section.

## 2 Material and Methods

The data in this paper cover 30 countries and the 10 years period from 2001 to 2010. Data source was Eurostat and OECD. We use panel data regression with five variables. Dependent variable is unemployment rate (*UN*) and independent variables are: foreign direct investment flows as a % of GDP (*FDI*), public expenditure on education as a % of GDP (*EDUC*), public

expenditure on labour market policies as a % of GDP (*LMP*), harmonized indices of consumer prices (*HICP*). All data were collected on the annual basis for EU28, plus Norway, USA and Japan. In total, we run five consecutive regressions. First regression aims to study direction and degree of influence of explanatory variables on variable in given year [see equation (1)] and four other regressions [see equations (2), (3), (4), and (5)] aim to study also lagged effects.

In our analysis, we apply a fixed effect model, because of various reasons. Firstly, we assume that each country is autonomous, therefore the entity's error term and the constant (which captures individual characteristics) shouldn't be correlated with the others. Another argument for fixed effect model is that values in our data set are not stochastic. Finally, a number of observations for a time component of our panel data is wide enough and there is not a lot of objects in the cross sectional component of data panel. Based on the above, we are likely to get a small difference between values of the parameters, which we estimated using a fixed effect model and random effect model. In this case, it is preferable to use the fixed effect model. Our model has the following equation:

$$UN_{it} = \alpha_0 + \beta_1 FDI_{it} + \beta_2 EDUC_{it} + \beta_3 LMP_{it} + \beta_4 HICP_{it} + \mu_i \quad (1)$$

where:

*UN* = unemployment rate measured in %

*FDI* = direct foreign investment flows as % of GDP

*EDUC* = public expenditure on education as a % of GDP

*LMP* = public expenditure on labour market policies as a % of GDP

*HICP* = harmonized indices of consumer prices

$\alpha_0$  is unobserved heterogeneity

$\mu_i$  is the error term

In equation (1) subscript *i* stands for countries and subscript *t* stands for time.

### 3 Results

Table 1 shows results of fixed effects regression, already without statistically insignificant variable FDI.

**Table 1. Fixed model effect**

	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-ratio</b>	<b>p-value</b>	
Const	0.312597	1.92729	0.1622	0.87127	
EDUC	0.677397	0.375876	1.8022	0.07261	*
LMP	3.09956	0.396156	7.8241	<0.00001	***
HICP	-0.173554	0.0514883	-3.3707	0.00086	***
Mean dependent var	7.812903		S.D. dependent var	3.714847	
Sum squared resid	1147.805		S.E. of regression	2.039292	
R-squared	0.730829		Adjusted R-squared	0.698646	
F(33, 276)	22.70825		P-value(F)	1.24e-60	
Log-likelihood	-642.7713		Akaike criterion	1353.543	
Schwarz criterion	1480.586		Hannan-Quinn	1404.329	
rho	0.740026		Durbin-Watson	0.401303	

Source: Authors

A quick glance at the results reveals that increase in inflation (HICP) by 1% results in decrease of unemployment by 0.17% and the rise of public expenditure on education (EDUC) induces growth of unemployment rate. A crucial variable in this analysis is public expenditure on labour market policies (LMP), which causes unemployment increase by 3.09% in the given year.

### 3.1 One Year Lag

In this subchapter we present regression analysis with lagged explanatory variables to examine delays in employment policies. Regression model has following equation:

$$UN_{it} = \alpha_0 + \beta_1 FDI_{it-1} + \beta_2 EDUC_{it-1} + \beta_3 LMP_{it-1} + \beta_4 HICP_{it-1} + \mu_i \quad (2)$$

where:

*UN* = unemployment rate measured in %  
*FDI* = direct foreign investment flows as % of GDP  
*EDUC* = public expenditure on education as a % of GDP  
*LMP* = public expenditure on labour market policies as a % of GDP  
*HICP* = harmonized indices of consumer prices  
 $\alpha_0$  is unobserved heterogeneity  
 $\mu_i$  is the error term

In equation (2) subscript *i* stands for countries, subscript *t* stands for the present year and subscript *t-1* for the yesteryear. Table 2 depicts the results of regression, where statistically non-significant variables are not present.

One can see that lagging variables by one year brings the same impact of explanatory variables on unemployment, thus employment policies (LMP) are not efficient after one year of its adoption.

**Table 2. Fixed model effect – one year lag**

	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-ratio</b>	<b>p-value</b>	
Const	-5.67414	1.94223	-2.9215	0.00381	***
EDUC_1	1.90431	0.395609	4.8136	<0.00001	***
LMP_1	2.45304	0.461939	5.3103	<0.00001	***
Mean dependent var	7.773118		S.D. dependent var	3.561135	
Sum squared resid	1058.659		S.E. of regression	2.074486	
R-squared	0.699715		Adjusted R-squared	0.660653	
F(32, 246)	17.91314		P-value(F)	1.18e-47	
Log-likelihood	-581.9136		Akaike criterion	1229.827	
Schwarz criterion	1349.657		Hannan-Quinn	1277.897	
rho	0.647353		Durbin-Watson	0.583851	

Source: Authors

### 3.2 Two Years Lag

Here we present an analysis of two years lags of explanatory variables. Regression model has following equation:

$$UN_{it} = \alpha_0 + \beta_1 FDI_{it-2} + \beta_2 EDUC_{it-2} + \beta_3 LMP_{it-2} + \beta_4 HICP_{it-2} + \mu_i \quad (3)$$

where:

*UN* = unemployment rate measured in %  
*FDI* = direct foreign investment flows as % of GDP  
*EDUC* = public expenditure on education as a % of GDP  
*LMP* = public expenditure on labour market policies as a % of GDP  
*HICP* = harmonized indices of consumer prices  
 $\alpha_0$  is unobserved heterogeneity  
 $\mu_i$  is the error term

In equation (3) subscript  $i$  stands for countries, subscript  $t$  stands for the present year and subscript  $t-2$  for the year before yesteryear. Table 3 depicts the results of regression.

**Table 3. Fixed model effect – two years lag**

	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-ratio</b>	<b>p-value</b>	
const	-0.996583	2.49674	-0.3992	0.69018	
HICP_2	0.288695	0.0628411	4.5940	<0.00001	***
EDUC_2	1.48954	0.473598	3.1452	0.00189	***
Mean dependent var	7.720161		S.D. dependent var	3.426982	
Sum squared resid	1080.292		S.E. of regression	2.241566	
R-squared	0.627591		Adjusted R-squared	0.572162	
F(32, 215)	11.32255		P-value(F)	5.06e-31	
Log-likelihood	-534.3700		Akaike criterion	1134.740	
Schwarz criterion	1250.683		Hannan-Quinn	1181.414	
rho	0.690944		Durbin-Watson	0.589060	

Source: Authors

Inspecting Table 3 reveals new facts. Increase of inflation (HICP) induces slight rise of unemployment and public expenditure on education (EDUC) cause increase of unemployment.

### 3.3 Three Years Lag

In this subsection, regression with three years lags is presented. There is a following equation for the regression model:

$$UN_{it} = \alpha_0 + \beta_1 FDI_{it-3} + \beta_2 EDUC_{it-3} + \beta_3 LMP_{it-3} + \beta_4 HICP_{it-3} + \mu_i \quad (4)$$

where:

- $UN$  = unemployment rate measured in %
- $FDI$  = direct foreign investment flows as % of GDP
- $EDUC$  = public expenditure on education as a % of GDP
- $LMP$  = public expenditure on labor market policies as a % of GDP
- $HICP$  = harmonized indices of consumer prices
- $\alpha_0$  is unobserved heterogeneity
- $\mu_i$  is the error term

In equation (4) subscript  $i$  stands for countries, subscript  $t$  stands for the present year and subscript  $t-3$  for the time period three years ago. Table 4 depicts the results of regression. Only variables with the statistical significance of a regressive model are presented in Table 4.

**Table 4. Fixed model effect – three years lag**

	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-ratio</b>	<b>p-value</b>	
const	10.0338	1.11861	8.9698	<0.00001	***
LMP_3	-2.19877	0.770202	-2.8548	0.00480	***
HICP_3	0.227729	0.0756461	3.0105	0.00297	***
Mean dependent var	7.654378		S.D. dependent var	3.361849	
Sum squared resid	1006.662		S.E. of regression	2.339014	
R-squared	0.587643		Adjusted R-squared	0.515929	
F(32, 184)	8.194229		P-value(F)	1.18e-21	
Log-likelihood	-474.4026		Akaike criterion	1014.805	
Schwarz criterion	1126.342		Hannan-Quinn	1059.861	
rho	0.687648		Durbin-Watson	0.635402	

Source: Authors

A quick glance at the results leads to an interesting discovery. Although inflation (HICP) has a negative impact on employment, public expenditures on labour market policies (LMP) start to have a positive impact on employment after three years of its application, thus we can conclude that employment policies start to be efficient.

### 3.4 Four Years Lag

In this analysis, we lag explanatory variables by four years. Equation of regression model takes the following form:

$$UN_{it} = \alpha_0 + \beta_1 FDI_{it-4} + \beta_2 EDUC_{it-4} + \beta_3 LMP_{it-4} + \beta_4 HICP_{it-4} + \mu_i \quad (5)$$

where:

- UN* = unemployment rate measured in %
- FDI* = direct foreign investment flows as % of GDP
- EDUC* = public expenditure on education as a % of GDP
- LMP* = public expenditure on labor market policies as a % of GDP
- HICP* = harmonized indices of consumer prices
- $\alpha_0$  is unobserved heterogeneity
- $\mu_i$  is the error term

In equation (4), subscript *i* stands for countries, subscript *t* stands for the present year and subscript *t-4* for four years ago. Table 5 shows the results of regression. Not statistically significant variables are omitted in Table 5.

**Table 5. Fixed model effect - four years lag**

	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-ratio</b>	<b>p-value</b>	
const	15.1498	1.58134	9.5804	<0.00001	***
LMP_4	-5.65188	1.06934	-5.2854	<0.00001	***
HICP_4	0.187725	0.0826515	2.2713	0.02452	**
Mean dependent var	7.546774		S.D. dependent var	3.307112	
Sum squared resid	793.2096		S.E. of regression	2.276923	
R-squared	0.607971		Adjusted R-squared	0.525978	
F(32, 153)	7.414908		P-value(F)	3.03e-18	
Log-likelihood	-398.8043		Akaike criterion	863.6085	
Schwarz criterion	970.0582		Hannan-Quinn	906.7460	
rho	0.595770		Durbin-Watson	0.776281	

Source: Authors

Here the direction of influence of explanatory variables is the same as in the case before, but public expenditure on labour market policies starts to have a significant positive impact on employment. Namely, the increase in public expenditures on LMP by one percent induces a decrease of unemployment by 5.65%.

## 4 Discussion and Conclusion

The findings of the presented study bring some insights into the employment policy issue. We ran a panel data regression with EU28 countries, Norway, USA and Japan. Summary results of the regressions are in Table 5, where only statistically significant regressors for given model are presented.

As indicated in Table 5, explanatory variables we have considered fairly describe unemployment evolution in countries with 1 billion inhabitants. Interesting fact about the results is that among all considered independent variables, only public expenditures on

employment (LMP) have the desired effect on unemployment and only after three to four years. Striking finding is that foreign direct investment (FDI) has no impact on the unemployment rate, and thus all state support and tax holidays for foreign companies are not efficient instruments in terms of employment. This result is not in conflict with Schmerers' study [15], described in introduction. Another remarkable fact is that public expenditure on education (EDUC) raises unemployment by 0.67 to 1.9 %. In case of EDUC, we expected the reverse to be the case, especially for regression with four year lag, when students with a first university degree enter the labour market and should be more efficient in finding a job. This result is in line with phenomena we observe nowadays; budgets designed to finance education are from year to year larger and larger and unemployment of young people is real socio-economic problem in most economies - especially in EU countries. Changes in the price level (HICP) are in line with the theory which suggests that, in the short term, increases in price level cause decreases in unemployment. Slope of HICP in regression without lags is - 0.17, thus the higher the inflation is, the lower unemployment. This finding is also in line with conclusions of Fitzgerald et al. [7]. The limit of this study is that we have not incorporated dummies into regression, thus we are not able to control for structural breaks within economies, such as economic crisis, economic cycles and other possible phenomena.

**Table 6. Summary table**

	EDUC	HICP	LMP	FDI
Regression without lags	0.677397 %	- 0.173554 %	3,09956 %	
Regression with one year lags	1.90431%		2,45304 %	
Regression with two year lags	1.48954 %	0.288695 %		
Regression with three year lags		0.227729 %	- 2,19877 %	
Regression with four year lags		0.187725 %	- 5,65188 %	

Source: Authors

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# Cloud E-Government Index as a New Benchmarking Framework for the Public Sector

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## Abstract

E-government benchmarking and ranking indices are often used by central and local public sector policy makers to develop information and communication policies and allocating resources to implement these strategies. With the decrease of importance of basic information society indicators in the past and use of new technologies and trends like cloud computing, open big data, new criteria and approaches needed to be introduced in measuring e-government development. Thus, the existing indices should be updated and reframed. Therefore, this paper proposes a new benchmarking framework to evaluate e-government development using cloud computing and open big data. It also examines and compares a basic background on e-government, benefits and risks of cloud computing and open big data in the public sector focusing on the European Union level. Concrete values of the new index are then compared with the existing indices.

*Keywords:* cloud e-government index; benchmarking framework; Cloud Computing; Open Big Data; e-government

*JEL Classification:* C43, H11, H83, L86

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## 1 Introduction

Fast moving modern Information and Communication Technologies (ICT) change the way that government develops, acquires and manages technology and create another challenge for governments to implement multichannel platforms and online services. Cloud computing as well as open data should be an option to improve governmental services, transparency and deliver more interactive services to citizens and businesses. There are also growing numbers of available devices, especially mobile ones such as smartphones and tablets that citizens are using. Opening data may allow citizens and businesses to analyse various datasets and understand what governments are spending public resources on. Big data then create usable insight and value from large amounts of structured and unstructured data coming from many different sources and with differing dynamics. The intersection of big and open data (open big data) is as much about integrating multiple data sources, e.g. on the local, national or international level of the public sector [9], [13]. The combination of size, multiple sources and unstructured data then presents the problem of having sufficient computing power to process the data. This problem may be then solved using cloud computing technologies [2], [6], [7] or [17].

An effective e-government development based on the various international, national or local initiatives requires information about the organizational and technical infrastructures, as well as information about citizens and businesses and their needs. Finding the right balance between these information and needs, together with technologies, applications and devices and investing wisely on organizational and technical platforms is a difficult task that governments have to face. This paper offers a solution to deal with these challenges through the comparison of the e-government development on the international level as well as on the national. This is represented by the e-government development reports, initiatives, indices and various rankings. The main aim of this paper is to propose a new cloud e-government benchmarking framework focusing on the Member States of the European Union (EU). It is followed by the calculation of the proposed index and the comparison of the EU Member States against the existing indices.

## 1.1 E-government Indices and Rankings

E-government is the use of ICT and its application by the government for the provision of information and public services to the people. E-government can be referred to as the use and application of ICT in the public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance online public service delivery, as well as expand communication channels for engagement and empowerment of people [14]. Basically, research on e-government can be classified into three broad streams: evolution and development, adoption and implementation, and impact on stakeholders, mostly citizens [8].

Al-Khouri [1] studied many of the leading e-government initiatives around the world, and showed that very few of them have succeeded in achieving the outcomes they initially hoped to deliver. The main reason found was that the most e-government programs focused only on automatization and digitization of some existing processes rather than on transformation of government services. Through the last 15 years, several e-government development frameworks have been introduced to help assess the opportunities and challenges facing e-government initiatives. Some frameworks are based on measurable characteristics of the entities, others use one or more subjective measures, a few employ a combination of both. To maximize the acceptability of results, rankings should be based on well understood frameworks and indices, and sound computational procedures [11]. The output is mostly a rank or weighted index. Each index measures how ready a society or economy is to benefit from ICT. There are a number of these indices. However, the range of tools uses widely varying definitions and different methods for measurement of the e-government development. Furthermore, there are some differences in the indicators and their weights from index to another depending on the importance of that indicator from the point view of the organization, that construct the model. However, in general most of the reviewed models tend to measure the readiness and development of a country according to deal with infrastructure and technology, people and human skills, accessibility and connectivity [10], [11]. Some other similarities applicable to all measurements are economic strength, security or the overall level of education and citizens / businesses sophistication.

Some of them have become frequently cited and used as benchmarks, guiding the debate as well as governments' investments in e-government [5]. In the EU, there is a series of the EU E-government Benchmarking reports (EUBR). This annual exercise started in 2001 and the 2014 report [4] is the eleventh measurement. The number of the countries participating in the report evolved from 17 (EU15, Iceland, Norway) in the first report from 2001 (Web-based Survey on Electronic Public Services) to 33 (EU28, Iceland, Serbia, Norway, Switzerland and Turkey). These reports are mostly focused on the best performing countries that have implemented the most mature e-government services. The weights or even indicators in the same model may change over the time for different reasons, the most important, emerging new technology or paradigm. The last report is then based on the E-government Benchmark Framework 2012–2015 [4]. In the global perspective, frequently cited indices include the United Nations (UN) E-government rankings, the Economist's E-government readiness and digital economy rankings, Brown university's global e-government report, Waseda E-government ranking, World Economic Forum's (WEF) index and International Telecommunication Union's (ITU) index. The early 2010s has added new indices to the e-government development research, e.g. Asia Cloud Computing Association's (ACCA) index, Business Software Alliance (BSA) Global Cloud Computing Scorecard or Open Knowledge Foundation's (OKF) index.

The E-government Development Index (EGDI) by the UN is broader than the EU's one by adding a social component as a human capacity measurement together with the provision of online services and the telecommunication connectivity. The UN's E-participation index (EPI) is focused on the use of online services to facilitate provision of information by governments to citizens, interaction with stakeholders and engagement in decision-making processes. The Economist Intelligence Unit's (EIU) ranking measures especially connectivity and technology infrastructure, business environment, social and cultural environment, legal environment, government policy and vision, and consumer and business adoption. The Brown ranking (TBR) was more limited focusing on features of web systems, such as the existence of a privacy policy,

security policy, advertisements, the opportunity to comment, etc. The Waseda E-Government ranking contains comprehensive benchmarking indicators in order to obtain an accurate and precise assessment of the latest development of e-government in the major countries in ICT section. The WEF's Networked Readiness Index (NRI) measures the propensity for countries to exploit the opportunities offered by ICT and has three components: environment, readiness and usage, each is for three actors: individual, business and government. The ITU's ICT Development Index (IDI) is based on eleven ICT indicators, grouped in three clusters: access, use and skills. Another index, which is focused only on the cloud computing state of art, is Cloud Readiness Index (CRI). However, this index is designed to look at the state of readiness for cloud computing only in markets across the Asia Pacific region. The other one is the BSA index examines major laws and regulations relevant to cloud computing in seven policy categories as well as each country's ICT related infrastructure and broadband deployment. The Open Data Index by OKF assesses the state of open government data around the world and has been developed to help answer such questions by collecting and presenting information on the state of open data around the world. A summary of the indices mentioned above is shown in the Table 1.

**Table 1. Comparison of the selected indices**

Index's name	Organization's name	First report from	Last report from	Number of reports	Number of countries covered	
					By the first report	By the last report
BSA index	BSA	2012	2013	2	24	24
CRI	ACCA	2011	2014	3	14	14
EGDI	UN	2003	2014	7	191	193
EIU	The Economist	2000	2010	11	60	70
EPI	UN	2003	2014	7	191	192
EUBR	EU	2001	2014	11	17	33
IDI	ITU	2009	2013	5	154	157
NRI	WEF	2002	2014	13	75	148
TBR	Brown University	2000	2007	7	N/A	198
Waseda index	Waseda University	2005	2014	10	23	61

Source: Authors

Rorissa et al. [11] assessed the strengths and limitations of six selected frameworks for computing e-government indices and concluded that benchmarking evaluations should be extended to include other means of access and delivery of e-government services, such as digital television or mobile technologies. Mohammed and Ibrahim [10] then revisited the existing e-government readiness indices to show the main common indicators and proposed a preliminary framework to refine indices' indicators according to the characteristics of the cloud computing. This framework is based on the claim that the benefits of cloud computing for e-government will reduce the need for some requirements, while the challenges impose more attention to others. Thus, some indicators will get low weight and others will get high weight or even new indicators or variables can be introduced. Špaček [12] concluded that supply-oriented point of view was still more preferred although including demand-oriented approach should ensure more systematic approach.

### 1.2 E-government and Cloud Computing

Cloud computing's aim is to provide computing, communication and storage resources based on a new service consumption and delivery model of computing infrastructure, storage capacity and applications as a service that are remotely provided via Internet platform. It not only brings cost effectiveness but, more importantly, high levels of flexibility and scalability of services solutions offered. The UN's E-government Survey 2014 [14] claims that the on-going financial crisis, low growth, unemployment and aging population has led Europe to actively seek innovative solutions in order to remain competitive, restore growth and to be able to continue to

offer a wide-range of public services to citizens. Thus, the opportunities offered by the digital development of recent years, whether through online services, open big data, social media, mobile apps or cloud computing, are expanding the way for e-government. Also the EU [4] introduced exploiting a recommendation in responding to the need for innovation. It is called "SMAC it up! Combine disruptive technologies" and combines social media platforms, mobile computing, analysis of big data and cloud computing. As cloud services have grown, issues such as reliability of access, security, government access, privacy and intellectual property protection, portability, vendor lock-in and interoperability have emerged as challenges to adoption [3].

Kooshesh et al. [7] proposed the integration of cloud computing in e-government systems to use e-services and the potential benefits and challenges of cloud computing for the users of these services. They highlighted the rapid and reliable scalability, increased flexibility, service compatibility and security, reduced costs and better management. Also Alshomrani and Qamar [2] analyzed cloud computing and its applications in the context of e-government and claimed that the use of cloud based e-government can help in providing best possible services to the citizens and businesses, and to reduce the costs as in cloud based e-government they will not require to purchase and install the ICT equipments on their own premises. Cloud computing technology has brought a great help to improve e-government performance evaluation system. The new e-government performance evaluation system needs cloud computing technology as an effective support to achieve the e-government management, which deals particularly with the processing of big data [15]. All these results are in good agreement with other studies which have shown that there is a need for the use of cloud computing in the public sector.

### *1.3 E-government and Open Big Data*

In recent years, diversity of tools and data formats between public sector institutions and business partners led to the degeneration of data quality and accuracy used in transactions with e-government. Because of large amounts of data produced by the public sector, the open data model has evolved into the open big data model. The emergence of open big data is driven largely by dramatic reductions in the cost of computing power and storage, which have made it possible for institutions to produce data characterized by all key values in data administration: velocity, volume, and variance of data [16]. Therefore, many governments have started creating interoperability and open data frameworks and initiatives spanning boundaries between public sector institutions, citizens and businesses. In all countries, governments should focus more on starting, growing and sustaining open big data initiatives through updating their policy, legal and institutional frameworks as well as improving leadership and raising awareness at higher decision making levels [14].

Marton et al. [9] stated that the fundamental concepts of open big data are technical in nature as they were developed in the fields of computer science and engineering. While big data is about distributed computation and infrastructures, open data is about standards on how to make data machine-readable and linkable. Tsiavos et al. [13] noted that the implementation of open big data policies finds substantial barriers that may be attributed to different factors ranging from organizational and structural inefficiencies, monopolistic tendencies, complacency, conflicting or legacy legislation, lack of instruments of implementation and technical expertise or sheer lack of understanding of the utility of open big data by the decision makers. They also emphasized the use of open source software and open architecture, which is a key ingredient for lowering the costs and ensuring that any investments in the development of open data portals.

## **2 Materials and Methods**

Many indices have been introduced to measure e-government development and readiness of the countries. Nowadays, with the new trends such as cloud computing, open big data or social networks, there is a need to reframe and upgrade these indices. Following the previous part on the theoretical conceptualization of internationally used e-government indices, cloud computing, open big data and looking at the related initiatives, reports and policy development

frameworks, it is possible to assume that their influence is growing. The main aim of this paper is to integrate these trends into the e-government benchmarking framework and propose a new cloud e-government index. This newly proposed index is based on the existing indices and also related international reports such as [3], [4] and [14], which identify ICT trends on the regional and national level. Therefore, the understanding of policy trade-offs in this area is sufficient. Methods of decomposition, aggregation and criteria comparison are used.

The attention of authors was concentrated not only on the new cloud e-government index, but also the description and comparison of the basic background on the e-government indices, benefits and risks of cloud computing and open big data in the public sector. To achieve the aim, the following tasks are defined: to analyze e-government development indices in past and present, to examine the changes and trends of these indices, to identify new trends including cloud computing and open big data, to develop a framework for the e-government development, to identify, develop and propose relevant attributes, to weight selected attributes and groups of attributes and focus on the EU Member States. This is important especially in the case of the EU law, such as regulations and directives, which have direct effect or indirect effect on the laws of the EU Member States, i.e. that they can be omitted in the proposed benchmarking framework.

The first part of this paper explores existing literature on the e-government indices and highlights assumptions and assertions around the development of e-government using cloud computing and open big data. It also identifies and compares the main benefits, challenges and trends. It is followed by the research methodology and description of the new index's framework and weights of the proposed attributes.

## 2.1 Framework Description

Based on the comparison of the indices described above, which aim to identify potential bottlenecks that could slow the e-government development and also serves to help identify challenges to be addressed in the form of the cloud computing and open big data policy, the new benchmarking framework fulfils these requirement was proposed. This framework is then represented by the cloud e-government index. This index is a composite measure of eight sub-indices, which also consist of several attributes, including eleven own attributes suggested by authors, as it can be seen from the Table 2. Each one of these sets of sub-indices itself is also a composite measure that can be extracted and analyzed independently. It is weighted, as well as all the attributes, to reflect its importance to cloud computing and open big data approaches for the public sector. Each individual attribute is also weighted to reflect its importance within each sub-index. Benchmarking result for all the attributes is maximization.

Compared to the e-government indices, which were described above, the new proposed cloud e-government index differs in challenges to cloud e-government such as connectivity, policy and security, which will have high weight in the proposed framework, and attributes such as fixed telephone lines or fixed (wired) broadband subscriptions, which will have low weight.

**Table 2. A proposed framework of the cloud e-government index and its attributes**

Sub-index name	Attributes	Data source	Weight [%]
1. political environment and usage strategy index			10
	1.1 Effectiveness of law-making bodies	WEF	15
	1.2 Laws relating to the ICT	WEF	20
	1.3 ICT use and government efficiency	WEF	20
	1.4 Government success in ICT promotion	WEF	20
	1.5 Cloud computing national framework or strategy	authors	25
2. privacy, freedom and intellectual property index			15
	<i>Privacy environment</i>		35
	2.1 Member of Global Privacy Enforcement Network (GPEN)	GPEN	50
	2.2 Privacy laws or regulations for cloud computing	authors	50
	<i>Freedom of information</i>		35
	2.3 Accessibility of digital content	WEF	40
	2.4 Democracy index	EIU	30
	2.5 Freedom of the press score	Freedom	30

		House	30
	<i>Intellectual property</i>		
	2.6 Intellectual property protection	WEF	55
	2.7 International property rights index	Property Rights Alliance	45
3. ICT readiness, businesses and citizens environment index			15
	<i>Citizens</i>		55
	3.1 Adult literacy rate	UNESCO	15
	3.2 Tertiary education gross enrolment rate	UNESCO	15
	3.3 Mean years of schooling	UNESCO	15
	3.4 Quality of educational system	WEF	25
	3.5 EPI	UN	30
	<i>Businesses</i>		45
	3.6 IT industry competitiveness index	BSA	25
	3.7 Global competitiveness index	WEF	25
	3.8 Availability of latest technologies	WEF	25
	3.9 Government procurement of advanced technology products	WEF	25
4. infrastructure and broadband quality index			15
	4.1 National broadband plan	authors	15
	4.2 Fixed (wired) broadband subscriptions per 100 inhabitants	ITU	10
	4.3 Wireless broadband subscriptions per 100 inhabitants	ITU	15
	4.4 Mobile cellular telephone subscriptions per 100 inhabitants	ITU	15
	4.5 Percentage of households with Internet access	ITU	15
	4.6 Percentage of individuals using the Internet	ITU	15
	4.7 International Internet bandwidth (bit/s) per Internet user	ITU	15
5. government online service index			15
	5.1 Impact of the ICT on new services and products	WEF	20
	5.2 E-service delivery stage 3 – transactional presence	UN	20
	5.3 E-service delivery stage 4 – networked (connected) presence	UN	25
	5.4 Use of virtual social networks	WEF	20
	5.5 Unlicensed software installation rate	BSA	15
6. data security index			15
	6.1 Global risks index	Maplecroft	25
	6.2 Secure Internet servers per one million people	World Bank	25
	6.3 Electronic signature laws or regulations	authors	20
	6.4 Laws or regulations containing general security requirements for digital data hosting	authors	15
	6.5 Laws or regulations that establish a framework for interoperability and portability of data	authors	15
7. open big data availability index			10
	7.1 Open data index	OKF	25
	7.2 National open data portal	authors	20
	7.3 Dataset categories existence	authors	15
	7.4 Various data type format	authors	15
	7.5 Data request form	authors	15
	7.6 Application development with API	authors	10
8. power grid and green policy index			5
	8.1 Energy architecture performance index	WEF	45
	8.2 Environmental performance index	Columbia University	55

Source: Authors

Mathematically, this new index is a weighted average of eight normalized sub-indices on eight most important dimensions of cloud computing and open big data, which were identified in the e-government development. The data for the evaluation and comparison were gathered from publicly available data sources and international reports. To calculate this index, the data have to be standardized to remove their scale, then will be calculated the weighted average and finally will be normalized to fit the data within unity (1), so all data values will take on a value of 0 to 1.

### 3 Results and Discussion

As it was mentioned at the beginning of this paper, this new index is focusing on the EU level. Therefore, the concrete values were calculated for all the 28 EU Member States. Data used were from 2014. Table 3 then shows the results for the top 10 EU Member States and for the comparison also the values for the selected indices, which were described above. The rankings of the EGDI and the NRI are ranked only among the EU Member States. The results show that the Netherlands, United Kingdom, Sweden and Finland are the top Member States according to the compared indices and their values. Estonia is missing in the top 10 of the cloud e-government index because it has quite low values for sub-indices 4, 7 and 8. At the bottom of the cloud e-government index are: Croatia (0.118), Bulgaria (0.137) and Romania (0.161). Compared to the existing indices and methodologies, the available results seem to suggest that the importance of cloud computing and open big data is increasing and it is needed to take into consideration.

**Table 3. An example of the calculated values against the existing indices**

Rank	Cloud e-government index		EGDI		NRI	
	Member State	Index's value	Member State	Index's value	Member State	Index's value
1	Netherlands	0.900	France	0.894	Finland	6.0
2	United Kingdom	0.837	Netherlands	0.890	Sweden	5.9
3	Sweden	0.819	United Kingdom	0.870	Netherlands	5.8
4	Finland	0.792	Finland	0.845	United Kingdom	5.5
5	Luxembourg	0.738	Spain	0.841	Luxembourg	5.5
6	France	0.711	Sweden	0.823	Germany	5.5
7	Denmark	0.703	Estonia	0.818	Denmark	5.5
8	Germany	0.698	Denmark	0.816	Estonia	5.3
9	Ireland	0.659	Austria	0.791	Austria	5.3
10	Austria	0.656	Germany	0.786	France	5.1

Source: Authors

More detailed information, comparison and analysis about the calculated values will be then presented in the future papers. The proposed index could be also expanded using another ICT trends such as m-learning and smartphone technologies, social networks in the context of the public sector institutions or the index could be focused on the regional level (cities and municipalities). Nowadays, there are more open data portals on the city / municipality level than on the national level. Also the weights of the selected sub-indices or attributes could be changed.

### 4 Conclusion

The most important results presented through the proposed benchmarking framework were discussed in this paper to show, how a cloud computing solution and open big data could be utilized to provide reliable, effective and transparent e-government. Compared to the existing methodologies related to the measurement of the e-government development, the framework takes into consideration new ICT trends such as cloud computing, open big data portals, legal framework, infrastructure and security. These are the key issues. Mainly because governments have the full responsibility for protecting citizen's data as well as ensure high availability of the national ICT infrastructure. The issue of opening up data has increasingly to mature and be framed as a broader information society services observing at the whole of the data life-cycle from the public administration to the end user and back. The new proposed benchmarking framework may be also expanded to cover all European countries.

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# Use of the Quality of Life Concept for Decision-making Processes in Public Administration

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## Abstract

The paper relies on experience with researching the quality of life in Pardubice area. It analyzes subjective perception of quality of life in selected target groups based on two researches. These researches were conducted in 2012 and 2014. Subjective perception of quality of life depends not only on cognitive evaluations of individuals life, positive and negative emotions, but also heavily on material conditions, economical activity and education of an individual. These facts were confirmed by researches presented in this paper (both between different target groups and in comparison of the established data in time). Modeling instruments were used to identify those factors that quality of life perception relies upon the most. These principles can help the regional management, if interested, to optimize decision-making processes on both strategical or operative level.

*Keywords:* index of quality and sustainability of life; well-being; decision-making models; public administration; City Pardubice.

JEL Classification: H75, C44, C63

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## 1 Introduction

In the beginning, we want to state that this text will not discuss suitability of definitions of the Quality of Life concept for its use in public administration. The core of our considerations is based on fundamental and established definitions of quality of life, and we try to find a connection between this term and well-being. Well-being is a strictly subjective quantity. Compared to that, we can find some objective indicators in the concept of quality of life. The essential parallel in these terms is found in the fact that both these terms provide some space for individual interpretation. The variability of definitions in tandem with creative freedom carries the danger of misinterpretation, and it is possible, that in the conditions of applicability to public administration, the results of working with the Quality of Life concept will be misunderstood by regional management, and thus won't provide the expected results. If the public administration is about to include the concept of Quality of Life into its decision-making processes, it is essential for them to have a clear understanding of the meaning of this term.

Quality of life depends on people's objective conditions and capabilities. The choice of relevant functioning and capabilities for any quality of life measure is a value judgement, rather than a technical exercise. But while the precise list of the features affecting quality of life inevitably rests on value judgments, there is a consensus that quality of life depends on people's health and education, their everyday activities (which include the right to a decent job and housing), their participation in the political process, the social and natural environment in which they live, and the factors shaping their personal and economic security'. Measuring all these features requires both objective and subjective data.

The objective features of Quality of life are represented by GDP, standard of living of both individuals and households [2, 12, 19].

The primary concept in designing the model is the subjective evaluation of quality of life. The understanding of the term is made clearer by definitions [17, 22], which describe the quality of life from the point of an individual being – how it sees itself in life (its place in life) and how it subjectively considers its current life situation. Phillips [17] determines quality of life as an availability of options an individual has to choose from to fulfill his life, and considers it necessary to view it as a subjective assessment of its own life situation. The subjective side of

quality of life is determined by i.e. life satisfaction (a person's overall judgment about their life at a particular point in time); i.e. the presence of positive feelings or affect, the flow of positive emotions (such as feeling happiness and joy, or a sense of vitality and energy) from moment to moment; i.e. the absence of negative feelings or affect, the flow of negative emotions (such as feeling angry, sad or depressed) from moment to moment [3], more in [5].

Even though the main focus of public administration is individual well-being of Citizen, other determinants have an impact on inhabitants perception of quality of life (i.e. environmental condition, social relationships, respecting dignity of life, quality of government etc.) [4, 19]. Tools for the measurement of subjective quality of life are given e.g. in [10] and [22], pp. 56-63.

The paper's objective is:

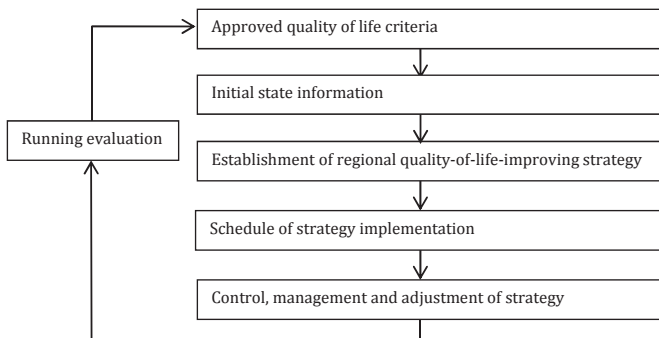
- Analyze the subjective perception of quality of life based on selected attributes of survey
- Compare the results of two researches on subjective perception of quality of life conducted in city Pardubice
- Discuss the models used to support the decision-making of local/regional management, either on strategic or operative level

The paper uses these methods: survey, synthesis, analysis and comparative method. The method of decision trees and neuron networks was used for the analysis of dependence of quality of life on selected attributes.

## 2 Material and Methods

While designing the „reality“ model, it's possible to use various techniques, approaches and methodology. It's possible to utilize the C2 model (Command and Control) [10, 23], Soft Systems Methodology [6, 7, 24], The Decision-Making Modeling Process [20], the CRISP-DM method (Cross Industry Standard Process for Data Mining) [18] or the Analytical model [8]. To determine quality of life on regional level, is possible to use an adjusted system of quality and sustainability of life at municipal level [1] in the Fig. 1.

**Figure 1. Quality of life system on municipal level**



Source: Authors based on [1]

Even though there are studies about classic and modern approach to public administration [9], public administration is still by its nature suited to using objectively measurable indexes. We can therefore use synthesis of various indexes of quality of life together with individual subjective inhabitant's testimonies to plan the use of the concept of quality of life in a municipality [13]. In other words, so called composite indexes are preferred to subjective inhabitant's evaluations when making decisions in public administration, as is shown in [15, 19]. Their approach synthesis includes both soft (statistical censuses), and hard data (public opinion

surveys). It is an index of Quality and Sustainability of Life, where quality of life is characterized in four areas by respective indexes, as is shown in Table 1. Some other composite indices are (UNPD's Human Development index, OECD's Better Life Index, Economic Intelligence Unit's Quality of life index).

**Table 1. Four areas of quality of life for the Quality and Sustainability of Life Index**

Area	Index
Socio-political area	International standing of the Czech Republic
	Internal security and socio-political situation
Social area	Demographic scale
	Standard of living
	Health and healthcare
	Education, science and research
Economical area	Access to information
	Economical effectivity and development
	Indebtedness and balance
Environmental area	Selected economical indicators
	Consumption of natural resources, eco-efficiency
	Quality of environment

Source: Authors based on [15]

Most of the indicators for Quality and Sustainability of Life index can be found in public databases, i.e. Czech Statistical Office, Institute of Health Information and Statistics of the Czech Republic, school statistics of Ministry of Education of the Czech Republic etc.

In the paper, we focus on the option of using the soft data from surveys to support decision-making in the social area. We rely on our experience with evaluating the quality of life in Pardubice. Data from two surveys (years 2012 and 2014) are represented on concrete data files. These surveys contained questions on respondent's subjective perception of quality of life. Beside the results, the paper discusses the models that can be helpful to regional management in decision-making processes (strategic and operative). It has to be said that all analysis of any kind don't have to be respected without question. Analysis need to be viewed as a document used to enhance efficiency of decision-making proceses. Political responsibility for satisfaction with life in a municipality is carried by elected representatives with city council in it's head.

If the submitter (public administration in this case) needs good-quality data, they needs to be correctly defined. This means that the submitter knows what to expect from the results, correctly names the data, defines the categories clearly, and respects that the data are part of a complex system, not the only argument. The direction of local politics needs to be governed from above, with taking into consideration personal needs and wishes of groups targeted by given policy.

The paper uses two analyzed researches that asked the respondents, amongst other, about subjective evaluation of quality of life in the city of Pardubice. Aim of the first research [14] was to provide a basic view of the situation where social services in the city are used as a basis for decision-making proceses in social politics. The research was defined for four target groups: public, social services users, local representatives and social services providers. Used methods were enquiries among city representatives and questionnaire surveys among the public and social services providers and users. Bearing in mind the characteristics of target groups, combined methods of data gathering were used. Data were partly gathered by trained questioners, partly given by social services providers from their own surveys and partly gathered directly from respondents who answered themselves without any help. Aim of the second research was to find opinions of specific target groups on both subjective and objective factors of satisfaction with life with considering safety and social services. A survey method amongst public was used.

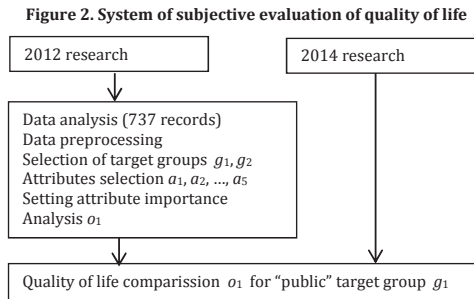
Analyses were created on the same methodical principles, using the same demographic questions about respondents. The first analysis ran its course in 2012, the second in 2014. The main difference is in the depth of researched problem and the extent of research sample.

Data from the 2012 and 2014 researches were used in designing the model. The whole set of data from the first research conducted in 2012 (defined for four groups) was reduced in order to analyze the quality of life attribute at “public” and “social services user” target groups. Data from both 2012 and 2014 researches were used for comparison of the researches’ results, but only for the “public” target group. The system model is on Fig. 2.

The system of subjective evaluation of quality of life  $S$  can be defined as a four by the following way:

$$S = \{R, G, A, O\} \quad (1)$$

where  $R$  is research,  $R = \{r_1, r_2\}$  that  $r_1$  is the research in 2012 and  $r_2$  is the research in 2014;  $G$  is the target group,  $G = \{g_1, g_2\}$  that  $g_1$  is the “public” target group (it contains 384 respondents' answers) and  $g_2$  is “social services users” target group (it contains 353 respondents' answers);  $A$  is set of attributes,  $A = \{a_1, a_2, a_3, a_4, a_5\}$  that  $a_1$  is education,  $a_2$  is marital status,  $a_3$  is economic activity,  $a_4$  is age,  $a_5$  is gender;  $O$  is output attribute,  $O = \{o_1\}$  represents subjective evaluation of quality of life.



Source: Authors

As far as quality of life is concerned, we can evaluate its subjective part by surveys. That's because the first question asked was: “how would you rate quality of your life (satisfaction with your own life)?” Respondents could answer on a scale of 1 to 6, where 1 stands for “Very good”, 2 for “Good”, 3 for “Average” 4 for “Bad”, 5 for “Very bad” and 6 for “I can't evaluate quality of my life”. Surveys from public and social services users (737 records) were used for the following modeling and calculations.

The analysis of quality of life describes the relationship between selected characteristics (attributes) of each respondent and his evaluation of quality of his life. The goal was to find the attributes important for evaluating the quality of life. We use these methods to identify them: decision tree methods (CRT algorithms, Quest and CHAID), Bayes classifier (Bayes net) and seed forward neural net (Neural net) methods. Education, marital status, economical activity, age and gender were the attributes used for the analysis. Model was created with using Clementine software (ver. 10).

### 3 Results and Discussion

The significance of each attribute for every given method is shown in Table 2. Attributes  $\{a_1, \dots, a_5\}$  were used, where  $a_1$  stands for “Education”,  $a_2$  for “Marital status”,  $a_3$  for “Economical activity”,  $a_4$  is “Age” and  $a_5$  is “Gender”. Value 1 means highest significance while 5 means lowest significance.

The attribute found to have the highest significance in all methods was  $a_3$  – economical activity of respondent. We'll therefore focus on this attribute and analyze the answers to this question in context with their subjective quality of life. This question had values 1 to 6, where 1 stands for "Student", 2 for "Employed", 3 for "Self-employed", 4 for "Unemployed", 5 for "Old-age pension recipient" and 6 for "Disability pension recipient".

**Table 2. Significance of attributes**

Method	Attribute significance				
	1	2	3	4	5
CRT	$a_3$	$a_1$	$a_2$	$a_4$	-
Quest	$a_3$	$a_1$	$a_4$	$a_2$	$a_5$
CHAID	$a_3$	$a_4$	$a_2$	$a_1$	$a_5$
Bayes net	$a_3$	$a_4$	$a_2$	$a_1$	$a_5$
Neural net	$a_3$	$a_1$	$a_4$	$a_2$	$a_5$

Source: Authors

Self-employed people and students rate their quality of life the highest, folowed by employed respondents. On the other end of the scale, unemployed people and disability pension recipients rate quality of their life the worst. They are a very critical group from the point of subjective perception of quality of life. Arithmetical averages and medians for each answer are calculated and shown in Table 3.

**Table 3. Average values and medians of Quality of life output attribute  $o_1$  for Econmical activity output attribute  $a_3$**

Attribute value $a_3$	Average attribute value $o_1$	Attribute median $o_1$
1	2.08	2
2	2.24	2
3	2.02	2
4	3.21	3
5	2.69	3
6	2.87	3

Source: Authors

Second attribute of high importance is education of the respondent  $a_1$ . It had values 1 to 5, where 1 stands for "Basic", 2 for "Secondary, without school-leaving exam", 3 for "Secondary", 4 for "Postsecondary", 5 for "Higher". Here we can see increased satisfaction with quality of life with higher education. People with higher and postsecondary education rate their quality of life the highest, while people with basic education rate it the lowest. Table 4 shows calculated arithmetical averages and medians for each answer.

**Table 4. Average values and medians of Quality of life output attribute  $o_1$  for Education output attribute  $a_1$**

Attribute value $a_1$	Attribute average value $o_1$	Attribute median $o_1$
1	2.79	3
2	2.70	3
3	2.47	2
4	2.14	2
5	2.18	2

Source: Authors

The following Table 5 shows average attribute values and medians of the output variable quality of life  $o_1$  for two target groups  $q_1$  (384 answers) and  $q_2$  (353 answers) from set of data  $r_1$  (737 answers). We can see a small increase in favor of the public ( $q_1$ ), which rates their quality of life more positively. This might be because social services user are mostly people with handicaps or in some form of distress. The goal should naturally be as low as possible difference in quality of life between both groups.

**Table 5. Average values and medians of Quality of life output attribute  $\sigma_1$  for target group  $q_1$  of researches  $r_1$  and  $r_2$**

Average attribute value $\sigma_1$		Attribute median $\sigma_1$	
$r_1$	$r_2$	$r_1$	$r_2$
2.39	2.77	2	3

Source: Authors

Table 6 describes comparison of values of quality of life attribute  $\sigma_1$  for target group “public”  $q_1$ . We used data matrix from researches  $r_1$  (384 answers) and  $r_2$  (435 answers).

**Table 6. Subjective evaluation of Quality of life  $\sigma_1$**

Research	Quality of life evaluation scale					
	1	2	3	4	5	6
Relative frequency of subjective quality of life evaluation answers [in %]						
Year 2012 $r_1$	14.06	47.92	27.34	7.03	2.34	1.30
Year 2014 $r_2$	14.57	56.73	23.40	2.87	1.32	1.10

Source: Authors

Table 6 shows a small overall increase in public’s satisfaction with quality of life in 2014. There was roughly the same frequency of respondents, who rated their status as very good (1) and who couldn’t evaluate quality of their life (6), in both researches. In 2014, there was an increased number of respondents who rated quality of their life as good (2), but a considerable decrease of those who rated it as bad (4), or very bad (5). The results reflect the end of economic crisis in 2014, increase in material conditions of the population and therefore higher rating of quality of life compared to 2012.

## 4 Conclusion

While different aspects of subjective well-being (cognitive evaluations of one’s life, positive emotions and negative ones) have different determinants, in all cases these determinants go well beyond people’s income and material conditions. Our researches show that economical activity is a notable factor in subjective evaluation of citizens’ quality of life. The importance of respondents’ economical activity is apparent in all modeling methods. This confirms results of researches conducted as part of other studies on the quality of life issue. For example Stiglitz study [19] states that unemployment considerably worsens perception of quality of life by citizens and nations. Similar to this is the Tickamyer and Duncan [20] research, conducted in one particular region (Eastern Kentucky), shows the prosperity of local manufacturing industry – employment or unemployment – to be a considerable factor that influences quality of life. Another factor is the respondents’ education, that highlights the facts stated above. Material conditions, standard of living and economical activity had an impact in our researches also in time comparison. Higher values of standard of living, evaluated by the “public” target group, were reached in 2014 than in 2012. It can be thought, that with the end of economic crisis the subjective perception of quality of life is getting better.

Even though it is hard to gather data on citizens’ satisfaction on regional and municipal level, recent research [13, 19] has shown that it is possible to collect meaningful and reliable data on subjective well-being. All aspects of subjective well-being should be measured separately, to derive a more comprehensive measure of people’s quality of life and to allow a better understanding of its determinants (including people’s objective conditions). National statistical agencies should incorporate questions on subjective well-being in their standard surveys to capture people’s life evaluations, hedonic experiences and life priorities.

Based on the experience with monitoring quality of life in Pardubice, we consider it is necessary for the needs of decision-making to test the interest of public to influence public policy. Any survey is time consuming and expensive activity. It is therefore important to utilize the most versatile sources of information. In our case this is Pardubice City hall Newsletter. Through this, and subsequently through electronic means (cit web pages), the public can be



addressed by a widespread poll or survey. It is also imperative to set the frequency of these surveys. General practice shows that the best frequency is once, in the beginning twice a year. Any other means of survey publication don't appear to be effective. This model doesn't require too high financial input from public administration. It is important to set a regular mechanism in the surveys, that would enable to evaluate public opinion in more long-term context, with different demographical indexes.

Concept of quality of life evaluation and its possible application in decision-making proceses (on municipal and regional level) is suitable for utilization in each area of services provided by public administration. The basis of input analyses of this type is finding concrete citizens' needs, evaluating current services, identificating their pros and cons and opportunities for improvement. Public administration representatives are then able to set the priorities for providing and financing the services based on the established data. Various models and simulations can be used for this purpose. Our experience show that social politics is a particularly good area. It is a sort of politics oriented on saturation of human society's needs, has a supporting character, concerns itself with individual failure on both individual and society-wide level (bearing in mind the risks of negative effects for society). The quality of life concept helps to best define society's needs towards social system on municipal and regional level.

Recent researches show that quality of life monitoring on national and regional level is getting more attention abroad. It would be interesting to focus on construction of composite index of quality of life on regional level (i.e. municipalities with extended power) in subsequent researches, and by using correct models evaluate its differences amongst regions in the Czech Republic.

In the future it is possible to use the results of models in decision-making in public administration at regional level. Data and results will be used in an implementation of Soft Systems Methodology. Furthermore, it is necessary to systematically collect and store data. Creation of an open database in the observed area, with necessary relevant timelines is also a necessity.

## Acknowledgements

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# The Effect of Transparency in Public Procurement in Terms of Traceability of the Beneficial Owner

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## Abstract

The presented study focuses on analysis of a sample of public contracts for construction works, performed on data from the Information System of Public Procurement (ISVZ). The initial idea is a so-called effect of non-transparency. We assume that with a diminishing transparency of public procurement, there increases the likelihood that public contracts will be overpriced. One of the attributes of transparency is the ability to trace the ultimate owner of the company (Beneficial Owner) carrying out the given public contract. We start from a rational assumption that if it is possible to trace the ultimate owner, such implementer of a public procurement is then relatively easily checked by the public in that it is known its ownership structure. Research results indicate that if it was possible to trace the ultimate owner of the company carrying out implementation of the public contract, these contracts have in turn the lowest degree of overpricing. Contrariwise, the highest degree of overpricing (the difference between the final and initial prices at almost 100%) represented contracts implemented by subjects that cannot be traced from public information sources. Companies owned by foreign subjects (mainly large international concerns) are doing slightly worse than implementing subjects with good traceability (natural persons) and much better than non-transparent subjects for which it is not possible to trace the ultimate owner.

*Keywords:* public procurement; transparency; beneficial owner

JEL Classification: H44, H57

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## 1 Introduction

In provisioning of goods and services for the public, the public sector is put before an institutional dilemma of how the required goods and services should be provided. The question arises whether the requested goods or services are to be provided using own capacities or whether they should be rather purchased [19]. Addressing this issue, either at the central government level or local levels of government, falls into the sphere of political decision-making where one of the starting key assumption is the fact that public institutions are legally responsible for the provision of given goods or services [7,12]. In addressing the institutional dilemma, the relevant public authority should take into account assessment of the quality of provided public services [9], efficiency [10] and other relevant factors, as pointed out in studies by [3,8,22,11,13]. Based on the results of research studies such as [10,14,18,21] and interviews carried out with public procuring bodies it may be concluded that the choice of outsourcing may be preferred, provided the following rational conditions are met: a) use of public procurement achieves higher economic efficiency compared to own production; b) objectively attained is a higher quality of the outsourced product that is at this high level needed, while the public authority objectively does not have its own adequate capacity to produce such goods or services; c) required is a service that is, with regard to its specifics, within internal activities (*ceteris paribus*) as part of own activities objectively impossible to produce using the public authority's own organic unit; d) for other objective reasons worthy consideration, the existing standard of the needed product cannot be reached.

Public procurement is an option when the required goods and services are provided by the public sector externally (outsourced) based on the result of a public tender [5]. In examining external forms of securing the provision of goods and services, the economic theory focuses on the issue of a contract [2], production and transaction costs [1]. Into this discourse falls also the question of a price of public contracts. Are public procurements overpriced? How do they affect

the cost of public procurement (competitive environment) and transparency of public procurement?

In this study we examine transparency of the procurement process and its impact on the final price of the public tender. We start from the assumption [16,18] that the more open is the public tender, the more transparent and similar to an open market it becomes. An indicator of openness of public procurement is the type (class) of procurement procedure. Open procedures may be considered as the most transparent (and also most competitive) procurement procedures since they can include an unlimited number of candidates/bidding subjects. One can also assume that these candidates cannot form bid-rigging (collusive tendering). On the other hand, restricted types of procurement procedures are potentially less transparent (and also less competitive). All this may have an adverse impact on the final and initial price. One of the ways of how to at least partially eliminate non-transparency with potentially linked “unclean practices” in public procurement is a public control of public procurement. To do this, we propose to adopt the concept (procedure) of traceability of the ultimate owner (Beneficial Owner). This problem has been carried out on public construction work contracts for those, specifically, are homogeneous and have enabled us to formulate solid conclusions.

## 2 Material and Methods

The presented study focuses on analysis of a sample of public contracts for construction works, performed on data from the Information System of Public Procurement (ISVZ). The initial idea is a so-called effect of non-transparency. We assume that with a diminishing transparency of public procurement, there increases the likelihood that public contracts will be overpriced. One of the attributes of transparency is the ability to trace the ultimate owner of the company (Beneficial Owner) carrying out the given public contract. We start from a rational assumption that if it is possible to trace the ultimate owner, such implementer of a public procurement is then relatively easily checked by the public in that it is known its ownership structure, linkages to politicians as well as civil servants who decided about the given public contract. If the ultimate owner is not traceable, the tender process becomes non-transparent. There may, for example, emerge speculations on “disguised” money flows, on the “purity” of public procurement, etc. It can be assumed that a public contract with a non-traceable ultimate owner may be more prone to overpricing. The analysis aims to examine a sample of public contracts for construction works, identify ultimate owners of individual companies that won the public tender and to apply these findings to the openness of the procurement procedure, the type of public contract or to the difference between the initial and final price of the contract. Fundamental research questions are as follows:

1. Does the final price of public procurement differ for open procurement procedures and for restricted types of public procurement?
2. Does the possibility to trace the ultimate owner (*Beneficial Owner*) have an impact on the final price of the public tender, respectively, its susceptibility to an overcharge?
3. How is the final price of a public tender affected by suppliers owned by foreign entities?

To investigate the effect of non-transparency of public procurement, we will make use of a randomly selected sample of publicly procured construction works from the Information System of Public Procurement, delimited by the chosen examination period (December–February 2013). Over the monitored period, in the Information System of Public Procurement were in total entered 326 procurements. Followed characteristics included data on: contracting (awarding) authority, type of procurement procedure, number of tender bids submitted, initially estimated value of the public contract, total final price of the public contract, and winner of the contract. During the collection of data from the Information System of Public Procurement, there surfaced a 28.5% error rate in the database with missing data mainly on the estimated value of public contracts. To investigate the effect of non-transparency, we make use of two indicators. First an average difference between the final and tendered price with respect to the type (class) of the awarding procedure while the second indicator is traceability of the ultimate owner.

### 3 Results and Discussion

#### 3.1 Openness of the Procurement Procedure and its Impact on the Final Price of Public Procurement

The problem of the competitive environment is associated with a so-called competition hypothesis which states that the higher the number of candidates competing for the given contract, the higher the probability that the final price will be lower. For instance, similar case has been discussed in a study conducted by the European Commission [21]; or by other non-European authors like [4]. The openness of public procurement procedures in Czech Republic has been empirically investigated by [15, 6, 17, 14].

An indicator of openness of public procurement is the type (class) of procurement procedure. Open procedures may be considered as the most transparent (and also most competitive) procurement procedures since they can include an unlimited number of candidates/bidding subjects. One can also assume that these candidates cannot form bid-rigging (collusive tendering). On the other hand, restricted types of procurement procedures are potentially less transparent (and also less competitive). All this may have an adverse impact on the final and initial price.

Let us ask whether, based on the data on the initially estimated cost of a public procurement (PC) and the final price of the tender (FP) obtained from the Information System of Public Procurement, it is possible to prove a price differential (DiffC) for an open procurement procedure and restricted types of procurement procedures? The price differential (DiffC) can be defined as:

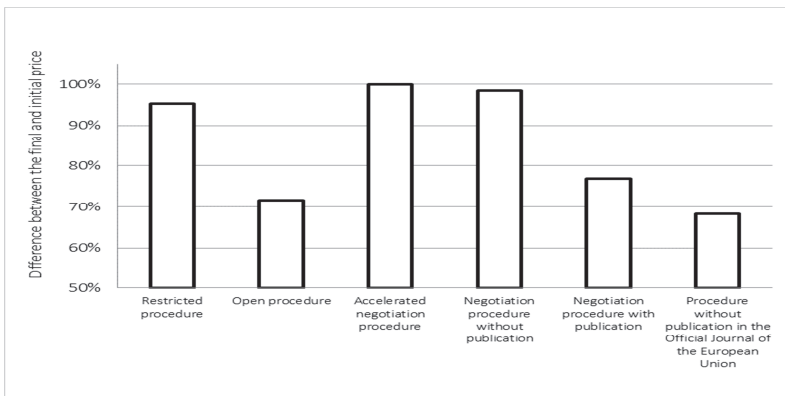
$$\text{DiffC} = FP/PC \quad (1)$$

where:

*DiffC* - the price difference between the final and initial price (in percentage points),  
*FP* - final price of procurement,  
*PC* - initial price of procurement.

Results of empirical research from the perspective of the indicator of an average difference between the final and initial price depending on the type (class) of the procurement procedure are shown in Figure 1.

**Figure 1. Average difference between the final and initial price depending on the type (class) of the procurement procedure**



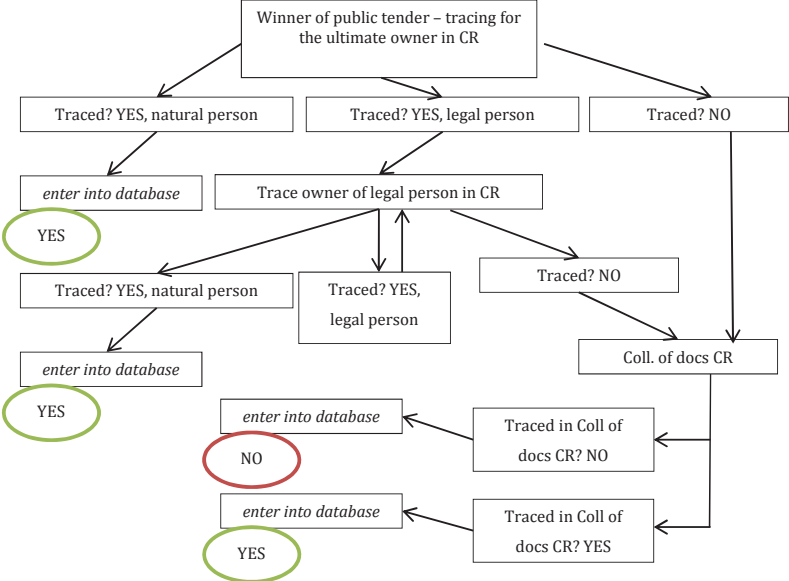
Source: Authors based on ISVZ data

As evident from the chart, the highest savings in the cost of public procurement are on average achieved when contracting authorities choose an open type of procurement procedure. Within the open type, the final price is on average 72% of the initially estimated figure. It is obvious that savings are made. On the contrary, restricted types of procurement do not show any significant differences between the final and initial price and savings occur in a clearly lesser extent. In terms of overcharge prevention, preferable are thus open types of proceedings. As the results of correlation and regression analyses show, there can be established a link between overpricing and the number of submitted bids. Linear representation of the given relationship has the form  $Y=0,978-0,0219X$ , which can be interpreted in a way that with each bid additionally submitted bid into the procurement procedure the final price (i.e. the difference between the final and estimated price) decreases by 2.19%. Open tender process thus may become one of the tools of achieving savings and eliminating waste in the public sector [20].

3.2 Transparency of Public Procurement in Terms of Traceability of the Ultimate Owner

In this part of the study we will, in order to explore transparency of public procurement, adopt an “indicator” of traceability of the ultimate owner (Beneficial Owner). We assume that if the ultimate owner (Beneficial Owner) is traceable, such owner may be subjected to public scrutiny. For example, it may be determined whether the owner does not have ties to officials responsible for the procurement documentation or whether there is a link to politicians who for the part of the contracting authority decide on an award of the public contract. The necessary information needed to detect possible links come through public scrutiny of the beneficial owner in terms of his traceability from public information sources. As public information sources we have used the Commercial Register (CR) of the Czech Republic, administered by the Ministers of Justice and the Administrative Register of Economic Subjects (ARES), operated by the Ministry of Finance. Winners of all public procurements were traced in terms of their ultimate owner based on the steps shown in Figure 2.

Figure 2. Sequence diagram - traceability of the ultimate owner



Source: Authors

In case the winner of public procurement was a consortium of companies, as an ultimate owner was labelled the lead member of the consortium. In the event that the winner of the contract could not be traced in the Commercial Register, the Administrative Register of Economic Subjects (ARES) was used. This was mostly related to cases when the winner of public procurement was an entrepreneur – natural person, not listed in the Commercial Register. These entities, however, are still listed in the ARES database.

Now let us pose a question of how the difference between the initially estimated contract price and the final contract price relates to the fact whether the ultimate owner of the subject that implements public procurement is traceable? We will once again make use of the average of price differences and relate it to the possibility of tracing the ultimate owner. Results are illustrated in Figure 3.

**Figure 3. Average difference between prices due to the possibility of tracing the ultimate owner**



Source: Authors based on ISVZ data

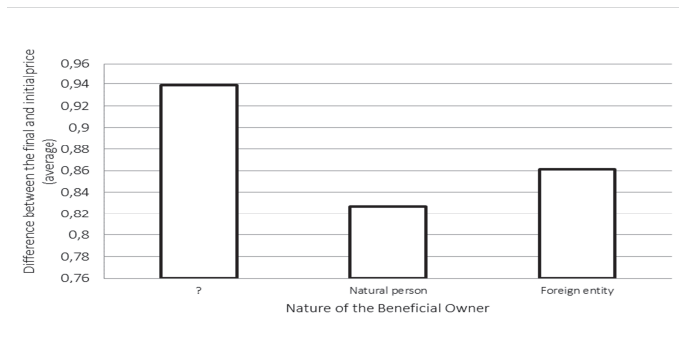
The public procurement transparency analysis of ultimate owner traceability provides us with the following generalizations: The figure reveals that in cases where information on the ultimate owner of the company that implements the public order was not possible to trace from public information sources, the difference between the final and initial cost of public procurement was lower. Research results indicate that if we can trace ultimate owners of companies, these owners may be subjected to public scrutiny. On the other hand it becomes clear that if there is no possibility to trace the ultimate owners, the likelihood of overpriced contracts increases. According to the above evidence we may conclude that for non-traceable final owners there exists an effect of non-transparency which with regard to the final price manifests itself in a fact that these companies carry out public procurement more expensively than their more transparent competitors. That virtually means that companies which don't have a traceable beneficial owner demand higher prices for public contracts. Disconcertingly, the higher profits are gained by the untraceable beneficial owners. Moreover, the public procurement process may be influenced by corruption if the beneficial owner has close ties to the decision-making authorities.

### 3.3 Foreign Companies and the Traceability of Beneficial Owner

It can be argued, however, that some businesses may be transparent, but the ultimate owner may not be traceable. Construction work contracts (especially voluminous construction work contracts) are often implemented by foreign-owned companies. Examples from the examined sample include STRABAG a.s., BÖGL a KRÝSL, k.s., EUROVIA CS, a.s., GEOSAN GROUP a.s., CGM Czech a.s., COLAS CZ a.s., EUROMONT GROUP a.s., HABAU CZ s.r.o., HOCHTIEF CZ a.s., Skanska a.s. and more. The company Skanska, Inc. is owned by a parent company from Sweden (Skanska Kraft AB) and the whole group has got 85,979 shareholders (see Skanska AB, Annual Report 2012, 2013) who are not traceable from Czech public information sources. However, it is not possible to a priori allege that because of this, Skanska, Inc. is non-transparent company.

In the diagram of traceability of the ultimate owner (see Figure 2) we did not assume the possibility that the owner of the implementing subject could be a foreign entity. Undertaken research, however, recorded this possibility for every foreign owner. Results of the comparison are summarised in Figure 4.

**Figure 4. Average difference between prices due to the nature of the Beneficial Owner**



Source: Authors based on ISVZ data

Research results indicate that if it was possible to trace the ultimate owner of the company carrying out implementation of the public contract, these contracts have in turn the lowest degree of overpricing. Contrariwise, the highest degree of overpricing (the difference between the final and initial prices at almost 100%) represented contracts implemented by subjects that cannot be traced from public information sources. Companies owned by foreign subjects (mainly large international concerns) are doing slightly worse than implementing subjects with good traceability (natural persons) and much better than non-transparent subjects for which it is not possible to trace the ultimate owner.

Our findings about companies owned by foreign subjects are in agreement with our concept of transparency in public procurement in terms of traceability of beneficial owners. The differences in prices found between untraceable Czech and foreign companies do account for company's culture, and influences of national and political environment. Scientific investigation of those national and political assumptions on the final prices should be carried out.

#### 4 Conclusion

The sample analysis shows both the effect of competition and that of non-transparency in public procurement. One of the typical non-transparency indicators of public procurement is the traceability of the beneficial owner. Our study has shown that traceable beneficial owners offer lower prices. It also indicates how the traceable owner may underlie public scrutiny. Finally, this can lead to substantial cost savings and establishing of an open, transparent and non-corrupt environment.

#### Acknowledgements

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# Civil Service Education: Basic Concepts, Typology and the Example of the Slovak Practice

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## Abstract

The article is devoted to the general conceptualization of the civil service education and its typology. Typology of the civil service education is based on several criteria, such as the target group, organization of the education and career cycle. Than the article provides examples related to education policies applied in the EU countries and presents preliminary findings related to the system applied in the given area in Slovakia. The final part is devoted to formulating further research focus in civil service education research in Slovakia.

*Keywords:* civil service; education; typology; EU; Slovakia

JEL Classification: H83, I21, I28

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## 1 Introduction

Although the topic of civil service education is widely discussed, it is less conceptualized and scholarly researched. That is the case also for Slovakia and therefore the aim of this paper is to provide the theoretical conceptualization of the objectives of the civil service education and the typology of civil service education. That could serve as a departure for research to be conducted in this field in Slovakia.

The article consists of introduction, methodology, than two parts devoted to theoretical concepts related to civil service education and one part focuses on the approaches to civil service education applied in Slovakia. The final part, conclusion, provides research questions for further research.

## 2 Material and Methods

This article is therefore more theoretical and less oriented on the empirical research. That is reflected also in the methodological approach as the methodology for the following three parts is the secondary literature review with the combination of the inductive analyses of the secondary literature on civil service education in Slovakia.

## 3 Results and Discussion

### 3.1 Conceptualization of the Civil Service Education

This part provides the basic concepts related to understanding the objectives of the civil service education. Education is the subject of various scientific disciplines; the present article will touch upon economics, sociology and political science. Economics takes education to be an immaterial activity, i.e. a service. From the viewpoint of the theory of public goods, education can be categorized as one of the mixed public goods, or possibly, under the particular circumstances education belongs to strictly private goods. This is because the potential consumer can be excluded from the consumption of education, for example physically, and if there is a capacity limit present, then the consumption of this kind of goods is competitive. The characteristics of education listed above allow for it to be a paid service offered by the market

(which does not necessarily mean that there always exists a market covering these sorts of services).

Another economic concept of education is offered by Gary Becker, who claims that *„...expenditures on the education, trainings, health care etc., are investments in capital. These expenditures, however, produce human capital, not the physical or the financial one, for there is no way we can separate a person from his knowledge, skills, health or values, in a way that it is possible to separate an owner from the physical or the financial capital“* [3]. For these reasons Becker comes up with a new concept of *human capital*, which is simply different than the financial and the physical one. Education and training are, according to Becker, the most important investments in the human capital, and the higher education tends to increase the income of the graduates. Becker hints that besides the formal higher education, trainings, i.e. on-the-job education, also bear significant financial impact on the ones who participate in them. He then points at the nonmonetary positive impact of the education on those who partake in it. Becker also notes that after people change their job couple of times, they usually settle into one position for a longer time period, and one of the factors contributing towards the creation of bond between the employer and the employee is precisely the education and trainings [3]. When we put this concept of education into the context of civil service, behind the aim of education and supplementary education we can see the growth of the human capital of the consumers of a particular service (for instance office workers), for example with the goal to increase their income. The part of the concept of strengthening the human capital in the civil service through education, i.e. through the specific capacity, is the improvement of cognitive as well as non-cognitive skills, of the ability to deal with the work tasks successfully, etc.

From the viewpoint of sociology, the main goal of the education is *socialization*. Under the term “socialization,” we imagine the process through which man becomes a social creature, and the impact of the socio-cultural conditions on such a process [6]. Thus, it is an internal process through which man becomes social. Personality development is a relatively complex process affected by many kinds of factors. Education is considered to be one of the external agents of socialization [6]. In relation to the education in the civil service, we can claim that the civil service education should help employees to fit into their work environment and to adopt its culture, customs, and rules.

Education as a means of nation-building represents a broader sociologically-political view on the meaning of education. In comparison with the previous sociological approach, this concept emphasizes not only socialization of the individual within the society or some particular institution, but it also focuses on the nation or the state-building aspect, etc. As noted by [5], this aspect of the higher education is crucial especially in the post-conflict countries, as well as in the countries that are currently in / recently experienced transition. Under the particular circumstances, education can even be perceived as a means of preservation of the state, country or a nation [10]. When we return to the education in the civil service, it is possible to perceive it, under the particular circumstances, as a means of establishing the civil service – for example its indoctrination, network, worldviews etc.; thus creating a class of professionals, who share certain values, skills or ideas.

As was suggested above, the investment in the human capital is also needed in the countries that undertook / are currently in the process of post-socialist transformation. During the communist era, the prevailing model of the civil service was that in which the state bureaucracy was subjected to the communist party. The primary organizational goal was the political control (and not the organizational effectiveness) [13], and the personnel policy served as the main means of subordinating every institution to the control of the communist party. The civil service concentrated mainly on the decision execution [15] and civil servants were not involved in the public policy-making. The policy-making capacity of the civil service was therefore relatively low [9].

Thus, it is possible to conceptualize and to perceive the meaning of the education in the civil service in two different ways: as *an investment* and *consumption*. The civil servant or the public administration invests into the education with the expectation of future benefits. The expected return lies, for example, in the improvement of the way the office functions or handles

its agenda. On the level of an individual, it lies in the investment in a better position on the labor market or in the possibility to improve one's income. When it comes to the civil service education and its consumption, we can state that the very participation of the employee in the education process is beneficial to him, as it tends to inspire positive social interactions, guarantees a certain social status, affects one's views, etc.

OECD takes a similar stand [12] when it summarizes the goals of the civil service education from perspective of the state administration in the following way:

- to secure the capacity to govern.
- to ensure the success of the political reforms.
- to secure stability, predictability and adaptability.
- to ensure the continuity of the administration, taking into account the level of personnel fluctuation.

### 3.2 Typology of the Civil Service Education

The education in the civil service sector is a part of the education market; it is provided by the state administration and it represents a segmented service. This means that the education in the civil service has multiple forms, and the form of the specific educational program should depend on the skills that the employer expects at the particular position, and on the goals that were set in this area by the particular institution. There are several approaches that could be applied when providing typology of the civil service education and within this paper following criteria are used to provide the typology of the civil service education: the target group and the subject/content of the education, career cycle of the civil servants and the organization of the education. Civil service education can be classified according to the two following criteria: the first, what is *the target group* of the particular education, and the second, what is *the subject of the particular education*, as is outlined by the following table.

**Table 1. Typology of the education in the civil service**

Target group Practical focus	All employees	Desk officers in the civil service	Senior staff in the civil service
General / Broad focus	Example: IT skills for all employees		Example: general management skills
Narrow / Specific focus		Example: advanced skills in Excel	

Source: Author

Other type of classification of civil service education is defined by Bossaert et al., who **in terms of the career cycle** in the public administration distinguish between the following types of education [4]: (a) education before the admission into the civil service, (b) introductory general education, (c) education specific to one's newly held position in the civil service and (d) supplementary education that continues throughout the career of a particular civil servant.

In the same regard, OECD distinguishes between the second- and the third-level higher education, then the education before the admission into the civil service and the education after the admission into the civil service [12]. OECD applied this typology to define models of civil service education in EU countries and distinguishes between the following models [12]:

- *Elite approach*: works for instance in France; this system is typical for its state-centered unitary approach represented by École Nationale d'Administration (ENA). It focuses on building of the skills in the administrative leadership with the aim of securing a high inter-administrative mobility. France serves as an example of the country where the education is *practiced before the admission into the civil service*, as there exist universities focused on the education of those who are potentially interested to work as civil servants. Such an education includes knowledge and skills that will help them to succeed in their first job, and the students are gaining the necessary foundation to which they can

return throughout their entire career. The problem of this model is, according to OECD, the fact that it produces „too many chiefs, not enough Indians” [12].

- *Anglo-Saxon approach*: typical for this approach is to include aspects from the new public management also into the education. Skills that are necessary for the work in the civil service allow for the synergy between the state-run and the private educational activities.
- *German approach*: known also as legalistic approach, relies mostly on the elite with legal education, while the lower ranks of civil service take part in a complex educational process before and after entering the civil service. This form of education system is relatively expensive.

That shows that from this perspective there is not one common education model applied by all EU countries, and as is stated by [4] the system of education in a particular country is to some extent determined by its system of civil service. In the career civil service system, where the admission into the civil service is conditioned by an exam and a certain level of expertise in the particular field, the prospective civil servant prepares for a specific position. If the prevailing system in a country is the position system, where the employee is chosen for a specific position and a specific education and skillset are explicitly required, there is no need for the state to provide any supplementary education.

The last approach to civil service education typology that is discussed in this part is from the *perspective of its organization*. The civil service education can be organized as:

- decentralized – meaning that every organization in the civil service sector is preparing and implementing its own educational program
- centralized – meaning that the educational program and its implementation is organized by one common coordinating organ
- a combination of the above mentioned approaches

When it comes to the potential suppliers, in context of education we can think about both public and private suppliers. This means that the service in form of education can be supplied by the state-owned and -run institutions, as well as the private organizations, both for-profit and nonprofit ones [2]. The private institutions might join the education market, given they offer the expected quality at a reasonable price. If there is an existing education market offering services at an appropriate level, it does not necessarily mean that contracting is the right choice for a public institution. The theory of transaction costs developed by [7] can serve as a key in assessing who ought to be the supplier of a particular type of education. The present theory claims that upon making a decision between the internal and the external way of supplying some particular service, we need to consider the so called transaction costs. Coase defines them as the costs of using the price mechanism: "...it is necessary to monitor the prices, to bargain, to freeze the contracts, to oversee their fulfillment, to create a conflict resolution mechanism, etc." [8]. The higher the transaction costs are, the less suitable it is to use the external capacities to provide the particular service. [7] consider various factors that help us to determine the level of the transaction costs. The examples are the measurability of the service (i.e., whether we can measure the quality of the provided service) and the specificity of the assets. In case of the education market, the transaction costs are increased by a relatively difficult measurability of the desired service, which can be partly balanced out through the regulations listed in the order, i.e. through a clear demand from the side of the service seeker and presenting the educators with the specific requests. Clear description of the content of the education and detailed expectations of the quality of educators are needed at both the internal and the external provision of the educational service. In case of a weak specification of the demanded service and contract management, it is necessary to start building these capacities. Another guideline in our consideration of the possible ways of providing educational services for the public administration is the required level of innovations and updates of the content of educational activities.

In relation to the internal capacities for the civil service education and the outsourcing of the selected service, various approaches are applied in the EU countries. The example is Ireland

and its Civil Service Training Centre for the middle and the senior management in the civil service, then also Institute of Public Administration and other external institutions [4]. Sweden, on the other hand, does not have its own educational institution, but Swedish Agency for Administrative Development prepares the education strategy and offers educational programs for the individual positions in the civil service.

### 3.3 *The Approach to Civil Service Education in Slovakia*

In this part we look at Slovak civil service and try to provide a partial answer to the following question: - has Slovakia adopted elite approach, Anglo-Saxon or German approach as defined by [12] or in the words of. [4] - is the Slovak civil service:

- Educated before the admission into the civil service (elite approach) or
- Education is organized specifically to one's newly held position in the civil service (Anglo-Saxon approach) or
- Education in the form of an introductory general education and continues throughout the career of a particular civil servant (approx. German approach)?

A partial answer to this question means that the answer is not provided by analyzing the education background of the selected sample of the civil service officials (that is a intention for further research) but by looking at the supply side of civil service education – what institutions provide this kind of education. We start with providing a few remarks on the history of civil servants, then we touch upon the education before the admission into the civil service, as well as the education after the admission into the civil service in Slovakia.

When it comes to formalized education before entering the civil service, we can rely on the findings of the study performed by Juraj Nemec. Author pointed at the fact that until the year 1968, public sector could not be studied as a separate academic discipline in our country, due to the fact that the senior civil officers were educated outside Slovakia, mostly in Moscow or at the specialized „political“ universities in Prague or Bratislava. The middle and the lower management in the civil service had no specialized education in this particular area [11]. Nemec further notes that in 1997, a branch of the Economic University was open in Banská Bystrica whose aim was to educate civil servants. After the year 1989, quantitative changes appeared in this area, thanks to the fact that programs concentrating on the education in the spheres of civil service and public policy were established at various universities. One of such programs is the Master's program at the Comenius University's Institute of Public Policy dedicated to public policy. In general, it can be concluded that the present educational programs in Slovakia have a variety of primary orientations – from focus on the public administration and law, through public policy and political science, to more economically oriented programs.

The education of the civil service is provided also by *The Institute for the Public Administration* that is a contributory organization of the Slovak Ministry of Interior. It provides several types of civil service education. Furthermore, every branch of government has its own budget from which it finances the selected educational activities. Aside from the previously mentioned approaches, we also meet with the specialized civil service education in Slovakia, represented by the program *Building of the analytical capacities in the public administration*, which offers a high quality public policy education abroad and is for all branches of government administered by the Slovak Ministry of Finance, or *ECDL program* focused on the computer skills.

A specific issue is the role of education in civil service reform in the post-communist environment, which was analyzed by [1]. He saw training measures as one of the possible options, which while not necessarily effective, is politically most acceptable (compared to dismissals) [1].

The following table provides the summary of the findings. The data indicate that when it comes to the education in the civil service, Slovakia seem to combine several approaches and tends to provide German approach when the civil service education in available throughout the carrier, although there is a possibility to receive education before admission to the civil service

as well. Combined approaches to civil service seem also to reflect hybrid position and career system of civil service [4]. The data indicate that Slovakia has not developed a coherent strategy in this area yet [12], [4]. The further research on the given topic is needed that is more discussed in the final part of the paper.

**Table 2. Examples of civil service education in Slovakia**

Type of education [4]	Slovak examples	Approach
Before the admission into the civil service	Comenius university Economic University in Banska Bystrica Other universities in Slovakia	Indicator of the elite approach
Introductory general education		
Supplementary and continues throughout the career	Programs of The Institute for the Public Administration ECDL program Programs of the ministries	Indicator of the German approach
Specifically to one's newly held position		

Source: Author

## 4 Conclusion

The theoretical concepts related to the objectives of the civil service education as well as typology of the possible approaches when organizing civil service education are departures for the empirical research on this topic in Slovakia as well as in other countries. The research related to the supply side of the civil service education provided a partial answer on this area, however more research is needed. The possible research questions can be as follows:

- What is the dominant educational profile of the particular level of the civil service (general directors, desk officers etc.)? Are there differences between the particular ministries? What explains those differences?
- Structures, orientations and decision-making behind educational scheme at the particular ministries and what explains the differences.
- Organizational structures in providing civil service education and quality of education.
- Objectives of the civil service education in the Slovak civil service – formal vs perceived.

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# All Roads Lead to Rome: How Informal Staffing Can Find its Way through Formal Institutions

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## Abstract

This paper attempts to contribute to research on the interactions of formal and informal institutions. We focus on the civil service institution and in particular the area of staffing. Civil service staffing makes a good area to study the interactions of informal and formal institutions as rules are often being avoided for the sake of patronage and nepotism, both of which can be classified as expressions of informal behaviour. We chose to approach the study of informal institutions by focusing on the behaviour that formal institutions allow. This means identifying loopholes that provide *possible* scenarios of informal staffing. As research on patronage and nepotism often found its focus in post-communist countries, we chose Slovakia and its civil service staffing as our case study and focus on the loopholes between temporary and permanent civil service. These two distinct types of service are separate in terms of recruitment and career growth and blurring their boundaries can stimulate informal staffing, patronage and nepotism. We find that the way formal rules are set, they do indeed allow for such behaviour to escape formally sanctioned channels. Our research hence presents a starting point for further research on the *actual* informal staffing.

*Keywords:* civil service; formal institutions; informal institutions; temporary civil service; informal staffing; institutional variation; post-communist democracies

JEL Classification: Z18

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## 1 Introduction

This paper looks at how some formally defined institutions can be misused to serve the purpose of informal staffing. Informal staffing allows for politicization and nepotism to take place and is therefore one of the “danger zones of corruption” [9]. [5] positively correlate the presence of merit recruitment system, a counterpart of informal staffing, with lower levels of corruption.

Central and Eastern European (CEE) countries have had a long tradition of informal staffing dating back to the communist era, when such recruitment practices were normal. After the fall of communism, not least because of the EU conditionality, these countries attempted to introduce merit recruitment systems. However, politicization levels in CEE countries remain high suggesting that informal staffing remains to be a frequent practice in CEE. This is in a way puzzling, since all of these countries have adopted civil service laws that aimed to establish a non-political civil service via a merit recruitment system.

One of the explanations can be the mismatch between formal institutions, represented by the formal merit recruitment system, and the actual practice of informal staffing. One way to approach the study of informal institutions is according to [8] to focus on the behaviour that formal institutions allow. [10] calls this the concept of formal political discretion, which refers to the degree of political interference into civil service nominations that the law actually allows. We inspired ourselves with this concept and decided to focus on the formal “loopholes” in the current civil service legislation. By formal loopholes we mean all the provisions that do not explicitly constrain a particular behaviour and leave discretion to act, whilst still being in line with the rules. By identifying formal loopholes we provide *possible* scenarios of informal staffing, which can present a starting point for further research on the *actual* informal staffing.

Most CEE countries have formal examination systems as a condition to enter the civil service [11]. Therefore we expect formal loopholes to be more likely in instances of mobility of

different types of civil service – for example from the temporary to permanent civil service. The temporary civil service serves in most countries to hire political staff and hence provide responsiveness [6]. Responsive bureaucrats are important for change and reform enforcement, to serve as close collaborators and advisors to the politician, who is politically accountable to the public to achieve his programs [12]. However, it is important to keep this distinction between political staff and permanent staff, who are usually hired under different conditions which is also reflected in their career path. Temporary staff is hired by the government which considers also political or personal criteria, while permanent staff gains its position by recruitment solely upon merit. “Temporaries” usually serve in the civil service during the election period of the politician that hired them, while permanent civil servants are recruited for an indefinite period. Given the different circumstances of recruitment and condition of employment, there should be a formal distinction between the two types of civil service. A lack of distinction can enable political nominations into the permanent civil service, creates loopholes in civil service staffing. According to the logic we presented above, “loopholes” between temporary and permanent civil service can stimulate informal staffing, patronage and nepotism.

We hence question if the institution of the temporary civil service formally preserves the distinction political employees from permanent. If the formal distinction exists, there should be less loopholes for informal staffing through the institution of the temporary civil service. If loopholes to exist, however, the institution of temporary civil service provides the possibility of abused to serve purposes of informal staffing.

## 2 Material and Methods

Our research questions are the following:

- What purpose does the institution of temporary civil service serve? What is the mission of temporary civil servants?
- Are temporary civil servants these easily identifiable in the organization? Do they carry out particular job tasks or occupy particular job positions?
- Are temporary civil servants subject to distinct rules of recruitment and selection?
- Under what conditions can a temporary civil servant become a permanent civil servant?

If the institution of temporary civil service presents a gateway to politicisation and nepotism in the permanent civil service, we should expect to see the following indicators in the civil service act: unclear purpose and mission of the temporary civil service, difficult visibility of temporary employees based on their work tasks, loose rules for recruitment and selection of temporary employees, loose conditions for entering the permanent civil service. These indicators are what we call the “loopholes” of the civil service law, which enable to blur the distinction between temporary and permanent civil service.

Our research strategy is a case study of Slovakia. We chose a country that has adopted a civil service law and, according to some studies, along with Poland has the highest score in politicization of the senior civil service. This is a relevant indicator, because politicization tends to “cascade downwards” to lower tiers and hence loopholes would have a purpose for “stabilizing” temporary civil servants on all levels. Finally, the reason for our selection of Slovakia over Poland is pragmatic – access to data.

The method we used to collect and analyse data was content analysis. To understand the purpose of the temporary civil service, we also looked into the previous versions of the act that have introduced the temporary civil servants or made changes to the institution. More specifically, we looked into the first Act on Civil Service No. 312/2001, Amendment No. 411/2002 and the new Act on Civil Service No. 400/2009. We also searched through parliamentary debates and common reports of committees to reveal the discussion on the purpose of introducing the institution of the temporary civil service. The remaining questions on the legal specifications of job tasks of temporary civil servants or their recruitment process were answered by analysing the content of the current Act on Civil Service No. 400/2009.

### 3 Results and Discussion

The term “*temporary civil service*” was introduced by the Act No. 312/2001 on Civil Service, which came into effect on April 1<sup>st</sup> 2002. It was the very first regulation of the civil service passed by the parliament since the fall of the communist regime since 1989, although there have been attempts to pass a civil service law since early 90’s [14]. The definition of the temporary civil service was rather narrow referring simply to employees that have been recruited for a temporary period. Originally, only experts, political representatives such as ministers and state secretaries as well as ambassadors were covered by this term. Experts had to undergo a selection procedure, whilst political representatives and ambassadors were free of such conditions. The selection procedures were to be carried out by the Civil Service Office. The head of office, appointed by the Chairman of the CSO, would appoint the temporary civil servant. For the experts, the maximum duration of the temporary civil service was five years.

The original act on civil service from 2001 did not provide room for advisors, who were usually political nominees [15]. The law restricted the possibility for the ministers to surround themselves with his their own people in the attempt to strictly depoliticize the civil service. It was common practice, not just in the EU, but also in other state institutions, such as the parliament or the municipalities, that there were advisory positions filled by the politicians closest collaborators, who came into office with him and would leave the office with him too [3].

Not much later after coming into effect, the act was amended by Act No. 411/2002 which came into effect in August 2002. The amendment broadened the temporary civil service, as besides experts, political representatives and ambassadors, it also included “experts in the service of the member of government, president, chairman of the parliament or his deputy” and another group of employees, who were temporarily filling in for cases such as employees being on sick leave, maternal leave, parental leave, unpaid leave, military service or “*cases, where the candidate is occupying a civil service position, for which a selection procedure has been announced, until the time of its execution*”[1]. Neither experts in the service of the government, etc. or substituting temps had to undergo selection procedures in order to be appointed. The experts in the service of the government were appointed by those they served and the substituting temporaries by the head of office. The only category which underwent selection procedures were the “neutral” experts, appointed by the head of office.

The institution of temporary civil service hence covered two types of employees – those who were temporary because of the political character of their service and those, who were temporary because of the temporal duration of their tasks. The first group is clearly political, as it includes political representatives, ambassadors and experts in the service of the member of government, exempt from selection procedures and nominated by the ministers. The other group, included temporary experts and “substituting employees” hence giving no sign of the political character of their service. Nevertheless, the recruitment technique of the substituting employees closely resembles the one of political employees as it is exempt from a selection procedure. This simply means that informally it could provide a channel for political nominations, which were formally not presented as political.

We found it interesting to trace the legitimization of both types of temporary civil service – political and the substituting temp. We were surprised to find that the 411/2002 amendment was originally proposed by a group of MPs from the opposition party HZDS. The amendment was initially aimed at making exceptions from the law for the office of the ombudsman – i.e. had nothing to do with the temporary civil service. It was only in the parliamentary committees headed by the government coalition party SDK that the provision on the temporary civil service got into the amendment. However, it only spoke of the “political temp” and legitimized it as follows: “According to the contemporary legal status, the member of the government has no influence over any civil service position. Practice of developed countries as well as up-to-date practice in Slovakia is, however, that the member of the government brings along a limited number of collaborators who leave with him, when he leaves office. Therefore it is proposed that the member of government has the possibility to fill a certain number of vacancies with his

closest collaborators. These will be political advisors, potentially the spokesperson and the director of the office.” [4]

The question that still remains to be answered is where the substituting temp came from. In the parliamentary discussion of this amendment we found that it was actually an amendment that came from two MPs for coalition parties: František Halměš (SDK) and Anna Záborská (KDH). Both of the MPs gave the same argument: “*the amendment is a reaction to situations, which often occurs in practice, when it is necessary to provide a substitute for a long term sick or absent employee... the process of recruiting a civil servant through a selection procedure is, however, very long and sometimes does not enable to react promptly. It can be said that sometimes it could last even longer than the period required for substitution of an employee*” [7]. [16] used almost exactly the same words in her argumentation; therefore we do not feel the need to transcribe them here.

The proposal was voted off in the parliament. Besides substituting for absent employees it, however, also included the provision to “fill in a not yet filled vacancy” mentioned above. This provision differs from mere substitution in that it gives the temp the opportunity to participate in the selection procedure for the permanent position he has been temporarily filling in. This makes him an uneven candidate to all external candidates for the position. We can assume that he would have more knowledge on the job than his other competitors. Also he would have created informal relations with the staff who may be more prone to hire him for the permanent position than other external candidates. Conversely, the institution can be abused by securing a permanent position for people chosen through informal channels. First they would become temps, gain necessary knowledge and contacts and then swiftly jump over to the permanent civil service.

The initial law also allowed a transfer of the temporary civil servants into permanent civil service after passing qualification exams. This was so until 2006 when the exams were abolished together with the CSO that managed them. The institution of the temporary civil service slightly broadened as the number of situations, where a temporary civil servant would fill in for an absent civil servant broadened (for example, in case he was temporarily transferred to a different position). Until 2009 the law did not specify entry into the permanent civil service for temporary civil servants, while the provisions on temporary civil servants remained the same. Hence we can assume that the conditions were the same as for external candidates – i.e. passing a selection procedure for a permanent position, where the candidate had to come first in order to fill the vacancy.

The new Act on Civil service No. 400/2009 made it even easier for temps to become permanent civil servants. The law defined a new institution of “selection” which posed an alternative to selection procedures. It basically meant that permanent civil service positions could be filled by external as well as internal candidates based on a vague method of selection, which did not require a formal procedure including a committee. It was aimed to test “the abilities, personal qualities and knowledge necessary given the nature of tasks of the given civil service position”[2]. The methods of testing were left to individual service offices, i.e. ministries, to define in their internal regulations [2]. This left a large amount of discretion in the hands on the head of office, who was formally responsible for appointing civil servants.

What increases the risk of abuse is looking at who actually appointed permanent civil servants. That had always been the head of office, what changed overtime, however, was who appointed him. The original Act 312/2001 said he was appointed by the chairman of the Civil Service Office after undergoing a selection procedure. The Civil service office was a central authority aimed to provide coordination, control and centralized management of the civil service. It functioned only for four years, from 2002-2006 and its emergence is often connected to the EU accession. Its abolition is more questionable, but it was a political decision made by the government lead by the same party that had adopted it - SDKÚ. The CSO was chaired by formally an apolitical appointee, who had been a member of SDKÚ in the past. His appointments of heads of offices confirmed the majority of formerly political appointments in their seats [13]. The 2003 reform allowed the minister to nominate the head of office out of those who completed the selection exam and the chairman of the CSO would appoint them only after. The ministers could

also file the dismissal of heads of service offices to the chairman of the CSO, who had formal authority over dismissals. Since 2009, the heads of offices were formally political appointees [15]. The trajectory of heads of office appointments hence moves towards more and more political discretion [14].

The status quo today is of the Act No. 400/2009, i.e. temporary civil servants are of two types. The substituting temps do not undergo selection procedures and can be hired to fill in a temporarily unoccupied permanent vacancy. In such cases, the temp cannot occupy the position for longer than six months. This means that it can actually serve as a probationary period after which a non-performing temp can simply leave, while the performing can undergo the vaguely defined process of “selection” to become a permanent civil servant. Considering the fact that the one who decides, i.e. the head of office, is a political nominee since 2009, this gives a free way to patronage and nepotism.

Patronage can, on one hand, affect external candidates as well as temps. However, there is a higher probability of it affecting temps rather than externals for the reasons already stated above - they have gained knowledge in office as well as contacts established during the time as a temp, which may help them be selected in the “selection” process. Another argument is that once the temporary civil servant filling a vacancy performs well, the office has a motivation to keep him and not want to undergo the lengthy selection procedure including external candidates. This points to higher efficiency of this type of recruitment which, however, violates the principle of equal opportunities. This is because temporary positions do not, by law, have to be openly advertised, i.e. they are filled through professional, personal or political networks. Ordinary citizens may not be included in this network, which excludes them from temporary civil service and, through it, from the permanent civil service, which they would be more likely to get had they been a temp.

#### **4 Conclusion**

In this article we attempted to show how the formal institution of temporary civil service can, hypothetically, serve the purpose of informal staffing. The temporary civil service was initially introduced to serve two purposes: to recruit political employees as well as efficiency reasons in case of substituting temporaries. However, this double purpose means that temporary civil servants can effectively carry out a variety of job tasks, which disables their clear identification in the organization. In other words, any job position can be carried out by a temporary as well as permanent civil servant, which can raise potential problems.

Recruitment into the temporary civil service does not require a selection procedure, unless we are talking about experts for the government members. This is partially understandable for those temporary civil servants, who are political employees. Making them subject to selection procedures would, on the other hand, only raise the legitimacy of their appointment. However, the absence of selection procedures for substituting employees, especially those who are substituting a vacancy “not yet filled by a permanent civil servant” pose a great problem. The substituting employees can attend a selection procedure after having carried out the job for six months. We can expect them to have received the relevant experience and established relevant contacts to have a comparative advantage to other external applicants for the permanent position. This violates the principle of open competition. At the same time, the external applicants do not have an equal access to the temporary civil service, as the temporary vacancies are not required by law to advertise or to conduct selection procedures for them.

It is particularly the channels leading from temporary civil service to the permanent that may be responsible for the high degrees of politicization in CEE. Our case may hence be an example of a formal institution (temporary civil service) serving the purpose of an informal institution (informal staffing). Research on the actual implementation of the law would be necessary to prove this point. However, our research has proved that this risk legitimately exists. To prevent it from taking place, we would recommend policy makers to strictly separate the temporary civil service from permanent. For the Slovak case this means identifying

“political” and “non-political” temporaries, with a distinction in their purpose and mission, as well as in their work tasks (i.e. political consulting vs. expert or administrative tasks). Depending on the type of work tasks, these employees should undergo selection procedures, which ought to be openly advertised. This way, open competition for a temporary position can be ensured.

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# Senior Civil Service in Slovakia

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## Abstract

A growing number of countries are introducing a distinct narrow group of civil service with specific processes for recruitment, management, remuneration and accountability that differ from those applied for general civil service. This core civil service is usually called senior civil service which can be formally recognized by law or not recognized formally but specific processes are being utilized anyway. This paper explores the Senior Civil Service (SCS) in Slovakia after the adoption of the Civil Service Law in 2002. The focus is on the characteristics of the senior civil service institution found in other OECD countries and contrasted with formally recognized type of “nominated civil service” and not formally recognized “posts of superior importance”. The timespan covered is from 2002 to 2014, looking at two important reforms (2003 and 2009).

*Keywords:* senior civil service; Slovakia; Central Europe

*JEL Classification:* J33, N44, Z18

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## 1 Introduction

The structure and staffing of central government differs from country to country. In some countries, all employees of central government are civil servants, in others the administrative and support staffs are public employees and only those tackling the operational tasks are civil servants, yet in other countries the same organization can have civil, public servants but also employees with Labour Law contract. Some government appoint a very small group of civil servants as a senior civil service (SCS). This elite group is considered to be the core of civil service, located very close to the executive and form a layer between the politicians and civil service at large. The SCSs usually include (administrative) heads of ministries, departments, bureaus and agencies within the core civil service and other senior officials as designated within the central government of each country [5]. The SCS correspond to the view of Yehezkel Dror who asks for “delta type” of civil service [4] who would be able to tackle “higher order functions” of the state, such as big infrastructure projects, reforms and radical changes in the state organization, providing security, macro-economic policies or which in his words “will shape the future” [3].

The term of senior civil service differs in individual countries and we can encounter various other terms such as senior executive service (USA), highest civil service (Slovenia), top civil service (Estonia), high-ranking civil servants (France, Romania), nominated civil service (Poland, Slovakia). Kuperus and Rode [7] show how different terms can create confusion of what is meant since “seniority” can mean age, years of service or simply level of experience. Similarly “top” can refer to the highest hierarchical level or to the managerial position. In this paper I will use the term senior civil service (SCS) despite the fact that Slovakia used the term nominated civil service since I argue that there are also other institutions that fulfil the concept of SCS – posts of superior importance.

Figure 1. Introduction of Senior Civil Service



Source: Author based on [8]

In the past 30 years we witness the introduction of senior civil service in many countries of OECD, including Central and Eastern Europe where the SCS seems to be a very attractive concept (scheme 1). The literature recognizes several reasons why SCS is being created and these are linked to two major deficiencies of civil service. First, as an instrument for overall continuity and holistic view on civil service management to overcome the fragmentation of the system. Thus, the system of SCS helps to develop common values, which in combination with personal leadership and example encourage cooperation and horizontal coordination across the central government [1][6]. SCS brings stability and sustainability with horizontal perspective. Second, certain skills and knowledge is a scarce resource in the market and need to be attracted even from the private sector. This is especially true for the Central and Eastern Europe where major reforms are/were conducted for which professionals are/were needed from private sector [15][13]. Mobility between the public and private sector is seen as an extra benefit since it encourages competitiveness, innovativeness and cultural re-identification of the public sector [9].

## 2 Material and Methods

This paper explores the SCS in Slovakia after the adoption of the Civil Service Law in 2002. The focus is on the *characteristics* of the senior civil service institution, looking at both formally recognized by law type of *nominated civil service* as well as on non-formalized type of the posts of *superior importance* which are not recognized as SCS but have specific procedures linked to them. The timespan covered is from 2002 to 2014, looking at two important reforms (2003 and 2009).

Since SCS is expected to provide higher standards of professionalism and performance, decision-making, ethics and accountability, there are certain distinguishing features of this group. The features will form the analytical framework for the discussion to follow (see Table 1). Data are drawn from primary documents (Government resolutions, Law on Civil Service, Civil Service Office reports), and survey conducted under the auspices of the Government Office of Slovakia in 2014.

Table 1. Analytical framework – distinguishing features of senior civil service

Characteristics	OECD countries (30 + 3)*	United Kingdom	USA	France	Poland	Estonia	Slovakia	
							Nominated civil service	Posts of superior importance
<b>Officially recognized system</b>	25 countries yes, 8 no	Yes	Yes	Yes	Yes	Yes, since 2013	Yes	No
<b>Year of recognition (in law)</b>	End of 80s	1996 (reform)	1979	2002 (reform)	1998	2013	2003-2009	2002
<b>Specific procedures</b>	Majority yes	Yes	Yes	Yes	Yes	2008	Yes	Yes
<b>Size % from civil service</b>	0,1 – 3%	3.200 (2,5%)	7.000	5.360	1.500 (0,13%)	96 (0,4%)	Plan appr. 1.000 (2,3%), reality 5	Apr. 300 (0,6%)
<b>Apolitical positions</b>	Yes (small part reserved for political)	Yes	Yes, but 10% are political nominees	Yes, top positions are political	Yes	Yes	Yes	Yes, approved by Cabinet
<b>Career or position system</b>	Various approaches	Career	Position	Career, introducing position	Career	Position	Career	Position
<b>Central structures</b>	Various approaches	Centralized: Cabinet Office	Decentralized (head of agencies), under auspices of Personnel Management	Decentralized: Civil Service Department	Centralized	Top Civil Service Dpt. At Government Office	Centralized: Civil Service Office, later Government Office	Decentralized
<b>Recruitment and selection</b>	Merit	Merit + fast track (generic education)	Merit + specific education	Merit + ENA (early on)	Merit + NSPA	Merit + talent stream	Merit	Merit
<b>Employment contract</b>	Tenure OR contracts		Contracts	„loyalty contract“ for 5 years, introducing contracts	Tenure, „loyalty contract“ for 5 years	5 year contracts	Tenure	Regular civil service employment
<b>Remuneration</b>	Trend: Performance related	Performance related	Performance related	Performance related	Performance related	Performance related	100% of tariff salary	30-100% of tariff salary OR specific salary
<b>Accountability measures</b>	N/a	Yes	Yes	N/a	N/a	N/a	Yes	Yes (until 2009)

Source: Author

Note: \* survey included also Russia, Ukraine and Brazil

### 3 Results and Discussion

#### 3.1 Officially Recognized System

Several governments explicitly recognize a group of SCS by means of a formal definition in the law. According to OECD, 25 countries have formally recognized systems of SCS, such as US, Australia, United Kingdom, Canada, the Netherlands. Yet, there exist countries with SCS not defined by law, though still having special conditions for SCS, such as France, Spain or Sweden.

Estonia, for example, for more than 6 years had a special unit for SCS development at the Government office, providing trainings, and regular meetings and only in 2013 SCS was recognized by law. [7] argue that if one of special conditions for SCS, such as recruitment, specific entry exam or education, employment system, length of contractual basis, support or remuneration is fulfilled, though SCS is not in law, it still qualifies as SCS.

In Slovakia, two institutes qualify as SCS: nominated civil service which was formally introduced by law and posts of superior importance which has special conditions but is not recognized as SCS. Both institutes were introduced as innovative elements in 2003 by reforming Civil Service Law [14], the former one was abolished in 2009 and the latter one still exists. Nominated civil service was created following the Polish (and French) example with special conditions of recruitment, entry, employment, remuneration in order to create a professional core CS that would link horizontally the extreme fragmentation and become the stable feature of the overly politicized system. The posts of superior importance, on the other hand, had a different ambition – to attract professionals from the private sector (particularly for reforms) and/or where good salaries should serve as a prime anti-corruption measure.

### 3.2 Career vs. Position System

SCS is an elite core within civil service which is very small in size: 0,2 – 3% of the overall civil service [5]. There can be both career and position oriented SCS systems. Career system is typical for France, Spain, Italy, Japan where the entry into the elite corps is possible only via career advancement within the civil service and/or on the basis of exams. It can be a closed club like system with stability of employment (even tenure) as in Japan, although the trend is to open up the system. Recent reform in France provided more position-based openings with less stability of position (only twice 3 years in the same position). In some countries (United Kingdom, Japan) talented personnel with good academic records are identified at the beginning of the career and through fast-track system progressed faster. The advantage of the career system is the nourishment of joint culture, mission and values that enables horizontal communication among the ministries. On the other hand, the career system inhibits competition from outside which brings innovativeness into the system. Position system of SCS, as in USA, Australia, the Netherlands, Belgium or Estonia, identifies concrete posts for SCS for which open competitive selection procedure applies, from both public and private sectors. The external mobility is seen as the main benefit which brings new blood and culture into the SCS. There exist hybrid models as well.

In Slovakia, *nominated civil service* was a typical career type of SCS in a position system of civil service. Only a top qualified candidate from within the permanent civil service, fluent in English, French or German and with top personal assessments qualified for specific exams (nominated exams organized by Civil Service Office) into the nominated civil service. It was expected that approximately 1000 civil servants would be part of the ‘nominated service’ with tenure. Only 5 candidates passed the exams (out of 367 applicants) in the first round in 2004 and in 2005 none of the 177 applicants passed [14]. No other exams were organized since the termination of the Civil Service Office in 2006 until the institution was abolished in 2009.

The *posts of superior importance*, on the other hand, were typical position based SCS. There were two types of posts of superior importance approved by the collective body of Government: one with permanent special allowance and one with permanent special salary. Posts with *special allowance* (30-100% allowance to tariff salary) were utilized in big numbers (approximately 300 posts or 0,6% of civil service) around accession period during second Dzurindas government, primarily for a) financial posts – 12% b) strategic decision making posts – 58% and c) EU experts – 30% [12]. The latter one meant that on the basis of recommendation of the Advisory Council of the Government on the EU the budget for salaries has been increased by 10 mil. Skk (apr. 333.000,- EUR) in 2004 which on average increased the basic salary by 7.017,- Skk (by 235 EUR, the average civil service salary in 2004 was approximately 23.000,- Skk = 760 EUR). These posts were identified by individual ministries and approved by the Ministry of Finance and a list was provided to the Government for final approval.

In addition, there were posts of superior significance with *permanent special salary* (market based salary). These posts were designated by ministers and heads of office in appropriate Ministry and approved together with the proposed salary by the government in order to oversee the process. Under Dzurinda's government in 2002-2006 this was used for the following five posts quite successfully: Head of the State Treasury, Head of the Debt Management Agency, Chief Economist at the Ministry of Finance, Head of the Anti-corruption Unit at the Government Office, and Head of Programming of Structural Funds at the Ministry of Construction and Regional Development. Some of these posts were contractual with clear mandate until the task was over.

This, however, was changed with 2009 amendment: the post of superior importance with special bonus was abolished, the post of superior importance with special salary was renamed into post of superior importance with superior salary (approved by the government) and new possibility of remuneration "personal salary" with no link to specific type of position was introduced (approved by line ministries only). Thus, although not anchored in the law, special conditions apply for remuneration and approval of the position.

As of today, there exist simultaneously 2 institutions: posts of superior importance with superior salary and personal salary. Both offer salaries based on market rather than grades for "strategic" positions and tasks of importance to the government. The only difference is that while the former is approved by a collective body (both position and salary); the latter is approved by minister solely. As Table 2 shows this has a profound consequence on the utilization: ministries prefer autonomy in deciding which post and what amount should be offered. Thus, special salary is utilized in 139 cases as opposed of one case of post of superior importance.

**Table 2. Senior civil service in Slovakia**

	Approved by	2002	2003	2004	2005	2006	2014
<b>Nominated civil service (2003 - 2009)</b>	Civil service office	-	-	5	5	5	0
<b>Strategic Posts (2002-2003)</b>	<b>Special allowance</b> Service office of the Ministry (list to be approved by government)	281	-	-	-	-	-
	<b>Special salary</b> Government (if finance covered by ministry then CSO)	1	-	-	-	-	-
<b>Posts of superior importance (2003-2009)</b>	<b>Special allowance</b> Government	-	207	230	342	353	-
	<b>Special salary</b> Government	-	1	2	4	2	-
<b>Posts of superior importance with superior salary (since 2009)</b>	Government	-	-	-	-	-	1
<b>Personal salary (since 2009)</b>	Service offices of the line ministries	-	-	-	-	-	139

Source: Author

Note: Systemization was abolished by 2006 and no data exist between 2007-2014. Data from 2014 are based on questionnaire sent to service offices of line ministries by the Government Office.

### 3.3 Central Management

Within EU only a minimum of countries have created a central management system for SCS: the Netherlands, United Kingdom, and Estonia which are mostly responsible for recruitment, selection and development of SCS. USA and Australia have also central management which regulates but all functional areas are delegated to the agencies.

Nominated civil service was directly linked to the existence of the Civil Service Office who was responsible for recruitment, examination and overall development. Following the abolition of the CSO in 2006 the organization of exams for the nominated civil service was handed over to the Head of the Government Office (a political nominee) who did not organize any exams until

2009 when nominated civil service was abolished. The identification of Posts of superior importance, recruitment, identification of salary/bonus was entirely decentralized and handed over to service offices of line ministries. However a safeguarding mechanism was built in by requiring all posts (and remuneration linked to that) approved by a collective body of the coalition Government. The introduction of personal salary since 2009 does not even have a supervision by the Government (see Table 2).

### *3.4 Apolitical Positions*

The role of SCS is to be a bridge between politicians and civil service. Thus, it needs to balance between political responsiveness and politicization of top civil posts, particularly in Central and Eastern Europe. Some countries (United Kingdom) consider SCS to be a completely apolitical post, while other (USA, France) reserve a certain proportion of SCS for political nominees.

Nominated civil service was foreseen as a completely apolitical cadre, selected by apolitical Civil Service Office. On the other hand, posts of superior importance, were designed by line ministries, and had to be approved by a political body – the Government. Thus, already in the design of this type of SCS a possibility for politicization is in place. A green light to politicization was made by 2009 law on Civil Service where the safeguarding by a collective body, though political, was cut and instead a new institute of „personal salary“ solely overseen by line ministries was introduced in parallel to existing posts of superior importance with superior salary. Thus, the ministries have a choice if they need special conditions (theoretically with not formally recognized SCS): a) collectively approved post and salary or b) post and salary approved by line ministry solely. Naturally, if we look into numbers (Table 2), the line ministries choose almost exclusively the second option which provides the space for politicization. Also, if we look into the type of posts for which special salary is utilized, we can find beside CS also typically political positions: speaker of the minister, head of ministers cabinet, advisor, even secretary of the minister.

### *3.5 Recruitment and Entry into SCS*

Meritocratic recruitment is a precondition for creating the best pool of candidates for SCS. Both academics and practitioners agree that none of the other approaches like seniority or political patronage will choose the best and the most capable. Therefore, the selection systems and entry into to the SCS has to be on competitive basis and be attractive enough for selecting and maintaining the best. There are many questions related to what best practices of selection, what qualifications and what education to ask for. There are several approaches for recruitment applied [11], [10] which can be combined allowing several entry points into SCS (see Table 3). First, an early entry at the beginning of the career for personnel with good academic results through open competitive examination and via fast stream system they are promoted by internal competition (United Kingdom, Estonia). This corresponds to the philosophy of talented amateur [11], advocating for the innovativeness that young people can bring into the top positions [4]. The opponents argue that such a system creates generalists who are not suitable to tackle fiscal and technical questions.

Second possible entry into SCS is only via concrete type of education and examination provided by state institution like Ecole Nationale d'Administration (ENA) in France created in 1945 or National School of Public Administration (NSPA) in Poland created in 1990. In both cases the schools provide generalist education with the possibility of specialization and the graduate is bound with „loyalty contract“ of 5-10 years to serve in civil service. Nevertheless, even France is changing and more and more positions are open also to a third type of entry into SCS which via open competition also for external candidates, including private sector. This is the case of USA, United Kingdom, Australia and more and more OECD countries. This type of entry is mostly position based where recruitment and selection is for a concrete position with concrete requests for qualification, experience and skills prior to the entry into SCS (or civil service).

Thus, SCS is more specialized and often the successful candidates are offered fixed contracts for which they have reapply again. For example, Estonia has 5-year fixed contracts for a position. Finally, the fourth possibility, the closest one, is the entry only via civil service career and hierarchical promotion with no possibility of entry from outside (Japan, Spain, and Turkey).

**Table 3. Recruitment and entry possibilities into SCS**

Recruitment process	Education + required skills and knowledge	Country examples
Open competition at the beginning of the career and developed as a group internally	Generalists	Italy, United Kingdom, Estonia
Entry only after graduating a specific educational institution	Generalists, with possibility of specialization	France, Poland
Most of SCS is open for external competition	Specialized (concrete skills and practice)	Australia, Estonia, Ireland, Italy, Korea, Spain, Sweden, United Kingdom, USA, Slovakia (posts of superior importance)
Closed career system inside of civil service	Generalists	Island, Japan, Spain, Turkey, Slovakia (nominated civil service)

*Source: Author based on [11], [10]*

The entry into the nominated civil service was possible only for those who were in civil service at minimum for 2 years and having superior performance reviews by passing „nominated exam“ administered by Civil Service office. As mentioned before the exams were extremely difficult and in 8 years of existence of the institute, there were only 2 rounds (during the existence of Civil Service Office) with 5 successful candidates. Posts of superior importance, on the other hand, were open for external recruitment with no specific additional examination, but with required specific skills and knowledge. Recruitment was delegated to line ministries with no additional coordination. Both special salary and special allowance linked to the post were negotiated already for the contract during the recruitment process.

### 3.6 Performance Evaluation and Remuneration

Beside recruitment, remuneration and performance evaluation are one of the most typical specific processes linked with SCS. In many countries, performance evaluation and remuneration are entirely different than that of regular civil service. [4] stresses that it is of utmost importance for SCS to filter out those who are mediocre or worse performers and to enable the exit of those who lost their motivation. In his view SCS is not to provide tenure but rather fixed contracts, renewable on the merit basis by independent body. In practice, this is being done by setting performance evaluation linked to concrete objectives which are anchored in individualized fixed contracts reflecting the skills, knowledge and competence and that replaces implicit expectation from SCS anchored in ethical codex or guidelines and which tended to be too general [8], [9]. Performance evaluation is more and more based on competence, as well as achievement of organizational goals. In some countries (USA, France) low performance may lead to the termination of the contract. Performance related pay in some countries is bigger than the fixed basic pay [8]. As the natural tendency in performance related pay is to evaluate civil service the best, in many of the countries the challenge became that results of the performance evaluation showed too many best performers which did not correspond to the natural curve. Therefore, some countries (USA, Canada, UK) set quotas for categories of performers. In United Kingdom, for example, 25% can achieve „top“ grade, 65% „achieving“ grade and „15%“ low grade [2].

**Table 4. Remuneration of SCS in Slovakia**

Type of Civil service	Basic Pay	Allowances		Bonus	Size of recipients
		Personal	Special		
<b>Regular civil service</b> (2004 – now)			-		cca 43.00
<b>Nominated civil service</b> (2004-2009)	<i>Tariff Salary</i>	Up to 100 % of Tariff Salary	50 % of tariff salary	Individually determined based on recommendation of the superior	5
<b>Posts of Superior Importance</b> (2004-2009)			30 – 100 % of tariff salary		353
<b>Posts of Superior Importance</b> (2004-now)	<i>Personal Salary (superior salary since 2009) individual, based on job market</i>	-	-	(no cap until 2009), 20% of functional (basic pay + allowances) salary since 2009	1-5
<b>Regular civil service - Not defined</b> (2009 – now)	<i>Personal Salary (individual, based on job market)</i>	-	-		139

Source: Author

SCS in Slovakia was facing serious problems since wages in civil service were so low compared to private sector, as it is/was everywhere in the Central Eastern European region [15] [14], it was impossible to find enough, if any, qualified candidates for certain civil service positions. Therefore, reform of 2003 brought new ways of remunerating SCS by institutionalizing flexibility in pay systems [10], particularly in the payment of allowances and bonuses (see Table 4). The personal allowance may be as high as 100 % of the basic pay. Special allowance meant automatic 50% pay increase for nominated civil service and negotiable 30-100% pay increase for posts of superior importance with special allowance (reserved for EU staff mostly). The permanent personal and superior salary is calculated on the basis of comparison with private sector.

Each ministry decides internally on the amount and mechanism of the payment of allowances and bonuses for its SCS since the abolition of the Civil Service Office in 2006. Whereas flexible payment of bonuses helps to overcome the problems of the highly formalized and grade based base pay system, the lack of clearly defined criteria for the allocation of allowances and bonuses as well as the ad hoc nature of the system, based as it is on artificially construed wage budgets, make it vulnerable to politicization and risks creating wage budget levels that have little to do with the real needs of the administration. The creation of special salary not linked to SCS and without any collective supervision makes the issue of politicization even more profound.

### 3.7 Accountability

Since SCS take positions with great influence, are close to political executive and are exposed to conflicts of interests, they often have much higher systems of accountability than regular civil service. There are great differences between systems of accountability but mostly they focus on asset declaration (and their family members), restrictions on political involvement, conflicts of interests.

In Slovakia, both formally and not formally recognized SCS had very high and strict accountability requests in the period of 2003-2009, asking for asset declaration of both the SCS as well as the family member, taking list of meetings with people outside of the office, declare to Civil Service Office any income outside civil service, etc. This was all abolished with 2009 Civil Service Law.



## 4 Discussion and Conclusions

The high level of fragmentation and segmentation compounded by poor horizontal coordination practices among the line ministries has a severe consequence on functioning of SCS. The problems of such organisational setup and the related silo effects have caused the formally recognized type of SCS – nominated civil service – not to work from the very beginning. The whole system was simply not suited for the career system of generalists with a central structure above the line ministries as there was no formal career planning in place, but rather a position based approach, where positions were determined by line ministries rather than any central structure. In addition, the rigour of the entry and examination process for formal SCS did not correspond to the real career opportunities of the successful candidate.

The formally not recognized SCS type - posts of superior importance - seems to be more successful in both the numbers and purpose it served. Simply, it was built on the premise of a fragmented civil service with line ministries having the word in suggesting the position as well as the corresponding remuneration. Originally, this proved to be a successful way to go, since there was a collective oversight mechanism (Government) who at least supervised and had a final approval over the line ministries suggestions. Also, accountability mechanisms were in place. All this has changed with 2009 new law on Civil Service, which got rid of the accountability mechanism, collective oversight and non-functioning nominated civil service.

It seems that the system at the time of entering to EU and time of big reforms was eager to get professionals from the private sector as well as remunerate the “leaders” of change appropriately, since the Civil Service Law did not allow that with strict grade system and low decompression which was at the 1:3 level. It was not interested in any type of horizontal coordination foreseen by nominated civil service. Nevertheless, with time, it was the flexibility of remuneration linked with formally not recognized SCS that became the most attractive part of the package and the latest developments show that not SCS but the flexibility of remuneration linked with ministerial autonomy in awarding it sustains the system.

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# What Kind of Control is Delivered by Regional Self-government in Slovakia?

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## Abstract

The study examines capacities and results of control bodies of eight regional self-governments in Slovakia. On the base of reliable data covering the full sample we may argue that our research reveals significant gaps in the regional control system. Control bodies have very different structures, most of them work only in operative manners and the structure and with high probability also quality of their control activities differ. Performance and risk control - audit is not delivered. Such situation is clearly disappointing. Probity control is necessary part of checking the regularity of public spending, but it cannot assess if value for money is achieved. In such situation public resources can be spent correctly, but in non-economic, non-effective and non-efficient way.

*Keywords:* control; audit; internal control; regional self-government; Slovakia

JEL Classification: H83

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## 1 Introduction

Public expenditures in developed countries represent about 30-50 % of GDP. This is billions of EUR in real value and any efficiency improvement can save (reallocate) large sums of resources. The public financial management in our conditions has from this point really difficult role – to provide and manage resources to achieve better administration and better public services delivery, comparable with developed countries, in situation where GDP of most developed CEE countries (per capita) is still significantly below EU average. To be able to cope with this and to obtain maximum from limited amount of resources, being very much one of critical points of reform development (the lack of public resources available to realize effective government policies limits the progress very much – for example in many cases there are no resources to invest to human capital developments, so crucial to achieve competitive level), the public financial management shall guarantee maximum achievable level of allocative and technical efficiency [1, 14] of public expenditures. The amount of resources to cover public expenditures is almost entirely limited by the performance of the economy, some of them might be lost because of ineffective collection methods (we do not focus on this issue in out text), but what is available has to be used really effectively, efficiently and economically. However, this did not happen, yet, and we are able to prove on many examples that available resources are not allocated effectively, to activities where most needed (optimal allocation), and are not used in economic and efficient way (wasting of public money).

The main features of public financial management in our conditions are still similar to the “socialist” time, causing excessive inefficiencies of the public sector (Table 1).

**Table 1. Current dominant public financial management practices in CEE versus modern approaches**

	<b>CEE countries</b>	<b>Modern approaches</b>
<b>Methods of budgeting</b>	Dominant incremental and short-term budgeting	ZBB, programming budgets, medium term-budgeting
<b>Income "freedom"</b>	"Brutto-budgeting" still important	"Netto-budgeting", agencies
<b>Management/execution of budget on organisational level</b>	Centralised, input based	Decentralised, outcomes based
<b>Allocation of resources</b>	Subjective, non-transparent	Transparent, where possible formula-based
<b>Audit/control</b>	Compliance, ex-ante control	Outcomes based, ex-ante and ex-post control
<b>Delivery of public services</b>	The state monopoly is slowly abolished, non-systematic approach	Pluralistic public-private-civic sector mix

Source: [15]

In this paper we focus on audit and control dimension of the public financial management. The formal systems of public sector control and audit in CEE new member states is now formally unified with international standards. National audit offices are established everywhere, responsible for external control in the public sector (and formally claim that they deliver external audits on the base of "Lima Declaration" principles). The system of internal control is based on EU legislation harmonized laws and is really comprehensive – realized by cross-sectorial ministries (especially ministry of finance), sectorial ministries, regional and local state and public administration, internally within public sector organizations, and by bodies specifically designed for respective type of control by specific legislation (office for public procurement for public procurement, etc.). However, we will show in the analytical part that the way how the control is performed does not reach current standards in developed countries.

Control and audit in the public sector is usually connected with three dimensions [5]:

1. Checking and validating the accuracy and integrity of the financial practices, records and reports of an organization.
2. Ensuring that expenditures financed via public funds has been spent on those purposes, and only for those purposes, approved when voting funds.
3. Ensuring that, in addition to the financial probity aspects, organization seeks value for money in the form of economy, efficiency and effectiveness (3E) in pursuing agreed policy objectives.

Taking into the account mentioned dimensions, it is possible to distinguish between probity (compliance) audit and value for money audit [1]. Probity audit concentrates on the conformity of financial transactions to the rules and to the systems. Value for money audit is concerned with 3E aspects of conducting financial affairs of the organization [5]. Value for money (best value, or other names) audit deals with following main concepts and topics [9]:

- Economy, concerned with the conversion of inputs to outputs, trying to assure that minimum inputs will be used to achieve defined outputs.
- Efficiency, analysing the ratio between inputs and outputs.
- Effectiveness, aimed on ensuring that efficiently produced outputs are directed to achieve the desired outcomes.
- Inputs: represents all resources used to produce expected outputs, outcomes and impacts
- Outputs: represents goods and services delivered from inputs. Outputs are usually measured by quantitative non-monetary figures (number of surgical operations)
- Outcomes: represents more difficult concept, and are used to measure of what was really achieved. By this outcomes include both quantitative and qualitative dimension (number of surgical operations and their success). Compared to inputs and outputs, outcomes are very difficult to measure, especially if we want to calculate them in monetary terms (for example to conduct social cost-benefit analysis).

- Impacts: represent the most complex measure to evaluate real achievements in long-term period (decrease of unemployment in respective region as the result of macroeconomic programme).
- Quality indicators.
- Equity.

There is not much international research with focus on the “quality” of control and audit on local or regional level, but some interesting paper exists [2-4, 6, 12]. In our conditions this issue is mainly indirectly discussed by experts close to the authors [7, 8, 10, 13].

### 1.1 Research Goals

To summarize, we may argue that one of main instruments to evaluate and improve economy, efficiency and effectiveness of public expenditures is public sector control and audit. Our paper [11] for this conference few years ago analysed the quality of performance audit in the Czech Republic on the example of the capital city Prague. Results have been really dissatisfactory – the capacity of city auditors to deliver performance audit (see later) was found rather limited. The goal of this paper is delivering comparative study on the same topic from the Slovak conditions: to analyse capacities and results of control bodies of regional self-governments in Slovakia. To achieve this goal we use the method of secondary analysis of existing data and simple quantitative analysis.

## 2 Material and Methods

To check the situation we processed existing information from regional self-government level in Slovakia. The sample is fully representative – we reviewed web pages of all eight self-governing regions in Slovakia (Banska Bystrica, Bratislava, Kosice, Nitra, Presov, Trencin, Trnava and Zilina). We checked and analysed all official documents issued by the regional control unit to obtain information about how the unit is organized, if its activities are based on long or medium term strategic documents and information about quality, quantity and results of controls realized.

In this first stage of our research we used only simple methods to process basic information about the situation obtained via web pages of control units in Slovak regions (structures data for the year 2013, as displayed on line and process data for six years period – all protocols are on line). Concerning the process data (quantity and focus of controls – Tables 3 and 4) the planned volumes are available directly from web pages, the reality was estimated on the base of document analysis method – the title and contents of all reports has been checked.

## 3 Results and Discussion

According to the valid legislation (laws on regional self-government and laws on financial control) regional self-government shall appoint (regional assembly by voting) independent head of the control department and to establish and provide human and financial resources for working of control unit. The Table 2 indicates that the way how regional self-governments established their control units significantly differs. This is not crucial findings, but the situation with large differences may indicate different attitudes and different will to implement real control system for regional activities and resources by the regional self-governments.

**Table 2. The structure of control units at regional self-governments**

Region	Linear structure	Matrix structure	Director of office appointed	Administrative staff available	Assistants to controls available
B. Bystrica	X	X	X	yes	X
Bratislava	Yes	X	Yes	Yes	X
Kosice	X	X	X	X	Yes
Nitra	X	X	X	X	Yes
Presov	Yes	X	X	X	X
Trencin	Yes	X	X	Yes	X
Trnava	Yes	X	Yes	Yes	X
Zilina	X	X	X	X	X

Source: Authors

According to the valid legislation, regional controller is fully independent in deciding about control priorities, number and forms of control activities. One might expect that such concrete decisions are based on existing strategic (or at least medium term) documents. The analysis of information revealed following facts:

- Only Presov region has strategic documents with contents reflecting real situation of the unit. However, this material is not regularly and systematically used for planning of controls.
- Banska Bystrica and Zilina have just formal strategic documents, not connected with reality and practice.
- The rest of regions do not have any framework documents available.

This situation is more alarming and indicates that there is no long term strategy for delivery of control (audit) on regional level in most Slovak self-governing regions.

The Table 3 summarizes the quantity and structure of planned controls for all regions for the period 2008 – 2013 (one control may focus on more issues). Data collected indicate that the approaches how to deliver control on the regional level significantly differ. The most interesting cases are as follows:

- The focus in all regions is on standard/general financial control. In most cases this type of control is combined with specialized focused control.
- Banska Bystrica region control focus is visible exemption – the regional control unit did not plan any targeted control activity towards budgetary operations compliance or property management. In Bratislava and Kosice the situation is just marginally better.
- The differences concerning numbers of repeated controls (controls to check if problems from previous controls are solved) are also rather interesting (especially Kosice case).

**Table 3. The quantity and structure of planned controls for 2008 - 2013**

Region	Total number	Standard general financial control	Repeated control	Budgetary operations	Property	Other
B. Bystrica	494	494	266	X	X	X
Bratislava	225	161	56	36	3	5
Kosice	178	166	4	158	3	3
Nitra	263	263	96	191	149	49
Presov	380	349	151	187	149	67
Trencin	332	160	116	141	140	X
Trnava	377	245	107	96	119	4
Zilina	263	263	68	125	63	X

Source: Authors

The Table 4 represents the core element of our paper. It summarizes the structure and results of really realized controls in all regions. We included into its structure also independent audit, but this is a bit tricky. The valid Slovak legislation is very imperfect and does not clearly define, if regional self-government control units are bodies of external or internal control – audit

[9]. The list of tasks connected with this control body is real complicated mixture of external and internal control – audit (from delivering expert opinion about regional budget proposal to very concrete internal compliance control tasks).

**Table 4. The quantity, structure and results of realized controls 2008 - 2013**

Region	Total number	Compliance control	Performance or risk control	Independent audit	Number of findings	
					General legislation	Internal rules
B. Bystrica	483	483	X	X	5330	1745
Bratislava	260	260	X	X	1065	182
Kosice	187	187	X	X	3194	791
Nitra	295	295	X	X	1327	410
Presov	342	342	X	X	1665	371
Trencin	334	334	X	X	2484	300
Trnava	400	400	X	X	811	170
Zilina	256	256	X	X	618	173

*Source: Authors*

The data collected clearly show that regional self-government control departments deliver relatively large number of controls. However, all controls focus on probity (compliance), performance and risk control/audit is not delivered. Such situation is clearly disappointing. Probity control is necessary part of checking the regularity of public spending, but it cannot assess if value for money is achieved. In such situation public resources can be spent correctly, but in non-economic, non-effective and non-efficient way.

Another interesting finding is the fact that control results differ significantly. Banska Bystrica number of findings is almost ten times higher compared to Zilina. We are not able to believe that controlled bodies in Zilina region perform so significantly better. This should mean that the quality of control and may be control approaches differ significantly between regions.

#### 4 Conclusion

Our intention in this first phase of this kind of research was just to check the situation. To be open, we did not expect so “dramatic” results for all investigated dimensions. On the base of research results we may argue that our research reveals significant gaps in the regional control system and calls for more detailed investigations of findings.

First, regional control bodies have very different structures and the most important - most of them work only in operative manners. Different structures may but must not impact their results – this is one dimension for future research.

Second, the structure of regional control activities (formally planned but also really delivered) significantly differs. Data from Tables 3 and 4 also indicate that this should impact the quality of regional control activities and we also plan to focus on this issue in future.

Third, and probably most important - performance and risk control- audit is not delivered. This issue is fully confirmed by the content analysis of control protocols and the only remaining issue is to establish main purposes/barriers (we need to confirm by academic research that there is no demand for such control and also no human capacity to deliver it).

Concerning the reliability of the data, and the reliability of the research methods, we are not aware about any methodological problems. We used the method of the secondary analysis of official data from regional self-government and processed them by standard methods. Thus, the results are fully reliable and representative.

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# Evaluation of R&D Results in German-speaking Countries

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## Abstract

Evaluation is one of the important strategic instruments for obtaining feedback and testifying on the functionality of the management system of research and development (R&D). Based on evaluation results, top officials usually make decisions and then allocate and redirect funds to support public research. The plans of science policy, research priority direction proposals, R&D system reform, and the reorganization of R&D institutions all proceed from the obtained analytical findings and outcomes under the evaluations. This study evaluates the results of research and development (R&D) in German-speaking European countries, namely the evaluation of universities as public sector bodies. This study includes a review of evaluation schemes, according to which, on the basis of profits originating from sales of R&D, originators are rewarded and other redistributions within those universities occurs. In conclusion these evaluations are then compared and confronted with current evaluations of selected Czech universities.

*Keywords:* competitiveness; patent; rewarding originators; evaluation of R&D; technology; Germany; Austria; Switzerland

JEL Classification: A2, A12

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## 1 Introduction

The importance of evaluation is growing evenly all over the world due to the increasing need for high quality, valuable and unique R&D outputs for society on the one hand and on the other hand, the significantly increasing responsibility for the effective and efficient spending of taxpayers' money. The importance of R&D evaluation is increasing and is also closely related with the increasing pressure from society on the social justification of research, given that it is funded from public sources. A testament to this is also the publication emerging on the given topic. For example, Bloch [1] discusses how public sector innovation can be captured and to what extent measurement can be based on frameworks originally developed in a private sector context. While there are important differences between the public and the private sector that should be reflected in a measurement framework, there is also considerable common ground that can be drawn upon. This paper addresses the need for systematic data, discussing the development of a theoretical framework and indicators for measuring innovation in the public sector. Another study [11] measures and compares the performance of national R&D programs using data envelopment analysis (DEA). Since DEA allows each DMU to choose the optimal weights of inputs and outputs which maximize its efficiency, it can mirror R&D programs' unique characteristics by assigning relatively high weights to the variables in which each program has strength. Every project in every R&D program is evaluated together based on the DEA model for comparison of efficiency among different systems. Bloch et al. [2] in his other paper discusses the development of a mixed methods approach to analyze research funding. We outline and critically assess an approach recently developed for a study of the effects of research grants of the Danish Council for Independent Research over the period 2001–2008. In all, approximately 2600 small to medium sized grants in a total of around \$600 million were awarded to 1600 different principle investigators covering all main fields of science [4].

Lee [11] treats Likert scales as categorical and applies quantification method II to analyze the relationship between short- to mid-term performance factors and the long-term impact factor of R&D projects. We apply the proposed approach to the survey data obtained from the Science and Technology Promotion Fund in Korea.

The aim of this article is to analyze the methods of evaluation of research in German-speaking countries, as well as a comparison of the level or system of remuneration of originators in terms of the division of revenue after the sale of patents and new technologies.

## **2 Material and Methods**

Literary research of scientific literature, and articles on this topic were used during the processing of this issue. A series of documents discussing the evaluation of R&D in the Czech Republic and German-speaking countries were analysed as well as internal documents and measures of the universities in the Czech Republic and German-speaking universities relating to the protection and management of intellectual property. Finally, this issue was consulted with the various representatives of the offices of technology transfer. Qualitative comparative analysis is one of the most remarkable new methods used in many scientific disciplines past two decades. Method that I have used is basic logic and Set-theoretical concepts for analysing complex causal relations. It is particularly suitable for research projects where the number of cases analysed is not sufficient for routine quantitative methods, including in the evaluation of the results of scientific research.

## **3 Results**

### *3.1 Analysis of the Evaluation Methods of R&D Institutions in German-speaking Countries*

Evaluations are usually processed through a critical analysis of the sources, situation analysis, using comparative, logical and historical methods. Data collection is a term used to describe the process of preparation and subsequent retrieval of data. Its purpose is to obtain information when deciding on important issues of the entering and subsequent transmission of information to others. Data collection usually begins with a processed work or project and includes the following activities - preparation, formulation of definitions and methods, structuring questions and verification in practice. Before any data collection, this preparatory activity is one of the most important steps in this process.

According to the form of evaluation, approaches can be distinguished into qualitative and quantitative. Qualitative evaluation uses experts on the given subject matter combined into industry panels, or supplemented with the opinion of managers, industrialists, economists, politicians and users (peer review or expert review). Hendl [9] characterized qualitative research as follows: "It works with a diverse data base and allows the use of a wide range of methods and procedures for its search and processing. However, it is time consuming and the results are difficult to interpret." [9]. In contrast, we can conclude that quantitative evaluation more uses indicators that characterize the individual activities (inputs or outputs) of the given institution in various areas of its activity. The input indicators include the financial volume of grants, external funding, the number of students according to the individual program and the number of employees. The R&D results indicators are primarily the number of publications, number of patents (incl. utility models, industrial designs, and trademarks), other non-published results and the number of graduates in different types of programs. The socio-economic (human) effects are therefore scientific prestige of the award, or recognition, transfer of technology, the number of citations of publications or articles, revenue from licenses and the creation of new start up or spin-off companies. The objectivity of such an interactive assessment assumes that the evaluators are independent, preferably without any relation to the evaluated institution (e.g. in all Scandinavian countries including Finland and Sweden). The disadvantage of this evaluation is the relatively high time intensity and sometimes even higher costs.

"A comprehensive evaluation of R & D institutions should be based on all types of the above mentioned indicators" [17]. It is clear, however, that the weight (importance) of each indicator in the overall evaluation will be different and will vary according to the type of

institutions evaluated. It is interesting that in some countries (Nordic countries) a combination of the above two approaches, the so-called informed peer review is sought after.

However, for each evaluation it is necessary to respect the principle of transparency, the disclosure procedure chosen and the method of evaluation and its use, therefore, the weight of the individual factors. After completion, it is necessary to publish the results, which were reached and the method they occurred and possibly predict what impact they could have on future development.

#### *Evaluation in Germany*

The methodology document for evaluating R&D results, prepared by the Technology Agency of the Czech Republic states: "The system of research and development institutions in Germany is very diverse. Responsibility for that is shared by the relatively low share of federal government spending on university research and development. It is largely funded by the provincial governments. Therefore evaluation activities originated in research institutions themselves rather than from the central authorities, which, however, enables addressing the needs of specific institutions in the evaluations.

The success of individual researchers and research teams is usually evaluated on the basis of peer review, possibly with the use of bibliometric studies as a means of support. Peer review is also often used in the ex-ante evaluation of projects in basic and long-term applied research. The second layer of the evaluation system is the evaluation of research programs and policies. These studies are usually initiated by the administration (government and administrative bodies) in order to verify the achievement of the set goals and may also include evaluation of the effectiveness. The largest sponsor of these studies is the Federal Ministry for Research (BMBF). The studies are usually conducted by independent research institutions using a wide range of evaluation methods. The third level of evaluation is then formed by an evaluation of the entire research institution. For example, the so-called Scientific Council (Wissenschaftsrat, WR) has been conducting the evaluation of individual Leibniz Scientific Community institutions since 1994 with the ability to recommend their closure, restructuring or continued financial support, which is based on the qualitative approach (*peer review*). Further evaluation performed by the WR is presented on the website of the organization. In 1999, a systemic evaluation of Max Planck institutes and DFG was carried out [5].

Germany is second to last in the number of scientific articles published per million inhabitants in the selection of countries listed in the chart below, behind the USA, but nevertheless significantly outstrips the Czech Republic. It is interesting; however, that Germany is in first place, from our selection, in EPO (European patent office) patents and 4th in USPTO (United States patent and trademark office) patents [6].

#### *Evaluation in Austria*

The methodology document for evaluating R&D results, prepared by the Technology Agency of the Czech Republic states: "The new law since 2002 (Bundesgesetz über die Organisation der Universitäten und ihre Studien also called Universitätsgesetz) increased university autonomy, but also introduced a new obligation in the form of two different annual evaluations. Every year they are obliged to report on the achievement of the objectives specified in the performance contract. In addition, the Ministry also provides standardized monitoring data (Wissensbilanz) that contain indicators used in the calculation of institutional support, and quantify the performance contractually agreed in the contracts and the results of research and development achieved. This self-assessment and monitoring data of the universities serves the Ministry for Science and Research (BWF) by providing information and checking the fulfillment of contracts, but has no direct impact on institutional financing [3].

In addition to this annual self-assessment, once every 5 years an evaluation by external experts is also required. The prescribed by law evaluation of universities has been gradually implemented so far and the level of this evaluation varies depending on the institution, because the responsibility for evaluation and its organization are borne by the universities themselves. Some universities have a lower willingness to evaluate, especially concerning their

professionalization, while others have already put in place quite sophisticated and regular evaluations. They assess the performance in teaching and in research and development. The recommended and most commonly used method of evaluation is informed peer review, in which indicators play an auxiliary role [8]. Evaluation is performed by a panel of international experts. Part of the evaluation is auto-evaluation a visit of the committee to the site (site visit) and interviews with the evaluated researchers. The evaluation results are summarized in a written report and in most cases a commentary on the evaluated units is also attached. Some universities, however, consistently publish the results of the evaluations, or at least their summary of 20. The report also contains recommendations which are not however binding for the institutions. However, because mostly the rector or vice-rector of the University is responsible for the evaluation, to which conclusions and recommendations are also presented, there is a loose coupling between the evaluation and future executive decisions.

Austria is slightly above average in the number of scientific articles per million inhabitants, however in the selection of countries made, they ended up in 8th place behind New Zealand. Austria is slightly above the EU average in the number of patent applications at EPO and USPTO converted to one million inhabitants. The conceptual evaluation system of R&D in this country was gradually born from the mid-90s on the basis of a broad consensus of informal research institutions, foundations and managing public authorities. Evaluation and monitoring are one of the strategic directions emphasized by the Council for Research and Technological Development of the National Research and Innovation Plan in 2003, which later established Strategy 2010 - Perspectives of research, technology and innovation in Austria . "

It is apparent that Austria, in the number of surrendered applications and granted patents, is behind Germany and Switzerland, if we compare these German-speaking countries among themselves [7].

#### *Evaluation in Switzerland*

Evaluation in the Swiss Confederation is ensured by the so-called Federal Council ETH. The so-called 'ETH Bereich' is the parent name for technical-scientific universities and research institutes. As an organizational component it is placed under the Ministry of Education, Economy and Development. The primary mission of the Federal Council ETH, which consists of two federal institutes of the University of Zurich (Eidgenössische Technische Hochschule Zürich , ETHZ) and Lausanne (École Polytechnique Fédérale de Lausanne , EPFL) and four research institutes of the Paul Scherrer Institute (PSI), Swiss Federal Institute for Forest, Snow and Landscape Research ( Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft, WSL) Swiss Federal Laboratories for Materials Testing and Research (Eidgenössische Materialprüfungs- und Forschungsanstalt, EMPA) and the Swiss Federal Institute for Water Resources (Swiss institute for water supply, Eidgenössische Anstalt für Wasserversorgung EAWAG), is evaluating the level of science and research. The objectives and sub-tasks of the Federal Council ETH for their region at the time of the exercise of their functions, which is set for the years 2013-2016, is anchored primarily in the following priorities. It includes strategic priorities and financial issues as well as the objectives of the necessary infrastructure and key staff, The Federal Council is actively involved in the design and implementation of the National Innovation Strategy called Park. This Council assesses on the basis of three-part reports [10]:

- Annual financial report - in conjunction with the financial statements
- Usual Information
- Annual report

The ETH Council ensures that the institutions in selected areas and depending on the type of profile, report comparisons, especially with international excellence. The ETH Council in mid-term performance creates a report about of its own evaluation, fulfilling the objectives of the mandate granted by the state or confederation. These reports serve as a basis for external evaluation (peer review). At the end of the period the ETH Council shall submit the final report to the Federal Council, which is finite and provides a comprehensive report on the implementation of the mission of the mandate.

### 3.2 A Comparison of German-speaking Countries with the Czech Republic – Remuneration of Originators and the Division of Revenue Acquired

In general we can say that the legislation in Germany, Austria and Switzerland is a bit similar as is currently in our Czech environment. In no laws of the above mentioned countries as well as in the Czech Law on inventions and improvement proposals is it ever specified exactly how rewards are calculated nor is it exhaustively determined anywhere how and when exactly they are paid. Most approach is proceed the "usual practice in the country". However there are some types of recommendations related to it that are accurate at first glance, but in the final effect bring up a whole range of issues at the same time, such as how to determine the appropriate value of the license, if you do not know it yet? In German-speaking countries, they mostly use the variant (as is the case with us at some universities [13], that first a basic fee is paid, again according to the local customs and financial level and then the real proportion from the license as described below.

#### Germany

*The Max Planck Institute* - In Germany, according to the relevant legal standards, the originator (the discoverer) has the right to remuneration. However, even here it is not anchored in law precisely how it should be carried out or its financial amount. As an example, we chose the Max Planck Institute. Under current rules, at the Max Planck Institute a staff member who has created an invention during their work is to receive a reward, dated March 9, 1967. It is common practice here that inventors receive 30% of the gross income which the Max Planck Institute is to obtain for a license. This financial compensation exceeds the minimum rate of indemnification for inventions that are currently set out guidelines and apply to both the private sector and the public sector. The main aim is to motivate employees / inventors and encourage them to actively participate in the process of commercialization and therefore technology transfer.

*UNI Leipzig* - According to German law, employees have the right to a reward for inventions created by them, which originated in the course of their work and were completed. From a legal perspective, there are no unified EU guidelines on remuneration policies in order that the level of financial compensation, especially depending on the economic utility of the invention, corresponds to the responsibilities and status of employees in the company. For simplification, however, many institutions have internal regulations and one of them is the University of Leipzig. Originators, who create an invention during their working hours are entitled to a reward in the amount of 10-30% of the total income in royalties [16].

#### Austria

It is interesting, however, to take a look back at the dividing of income from licenses. Most universities offer technology to companies through exclusive or non-exclusive license for the intellectual property of their results and / or know-how. The licensee is granted the right to use the technology in exchange for adequate remuneration. The terms of each licensing agreement are negotiated on a case by case basis.

The Department for research, services and professional development (DLE Forschungsservice and Nachwuchsförderung) is responsible for the preparation and negotiation of licensing agreements for the technology of the university.

When the university successfully sells a license or especially a patentable / patented invention it assigns one-third of any income or profit (after deducting expenses), together for those individuals who have significantly contributed to the development of the technology or invention (the "inventor rewards").

Another third of the net income is provided between the respective faculties or institutes to promote research in the same or a related field. The remaining third is left to the University in Vienna for use to support technology transfer activities.

## Switzerland

In Switzerland, the results of R & D must be evaluated in the context of the local Labour Code which in the Czech Republic in this respect would concern the Law on Inventions and Improvement Proposals No. 527/1990 Coll. as indicated [13].

Invention discovered during the course of their work for their employers, known as "Dienstleistung" must be rewarded by employers in Switzerland, if the employee exercises its right to it and if it is utilized [12].

An interesting finding is the fact that the subsequent division of revenue from licenses sold is dealt with more or less compactly in the Swiss Confederation. In Basel, the revenue (read: total income rather than net income) from the licensing of patented inventions is used first to cover expenses incurred during its creation (the cost of patenting, etc.) With regard to possible compensation from third parties, the remaining revenues are distributed as follows, see Table No. 2. In the case of cumulative income in the event of more than 1,000,000 CHF, the University Council may decide a different apportionment for any amount in excess of 1,000,000 CHF [14].

At the University of Bern income (again meaning the total amount not net profit) from the licensing of patented inventions, is primarily used to cover the costs arising from the process of commercialization (patenting costs, etc.), with the exception of any claims of third parties (such as joint invention with another university). It needs to be noted that the first 5,000 CHF in annual net income is stored on a so-called research account under the control of the research group leader, in which the invention was filed. The remaining profit (net income) over 5,000 CHF is shared or divided according to the following Table No. 1.

Revenue of the University of Zürich from licensing of patented inventions is initially also used to cover expenditures arising from use (cost of patenting, etc.). With regard to possible compensation from third parties, the remaining revenues are distributed as follows [15]:

**Table 1. Dividing of the remaining profit (net income) over 5,000 CHF**

	Originator	Head of science team	University
UNI BASEL	40%	30%	30%
UNI BERN	1\3	1\3	1\3
UNI ZÜRICH	1\3	1\3	1\3

Source: [15]

## 4 Discussion

In the example of this case study, it was found that profits from the commercialization of the invention are usually divided between the originator, the research department, where the invention was created and the headquarters of the university. The remuneration of originators is his private income and is not earmarked. Conversely, in parts designated by the Research Department, it is expected that it will be used on other funding of R & D activities. The headquarters of the University provides support services to all departments from its share. The amount of each of the shares is a matter of the internal policy of each school.

It can be seen that in the university environment in German-speaking countries the remuneration of individual originators for their motivation and other R&D activities is implemented. Thereby legislation, which very vaguely establishes an obligation of remuneration, is fulfilled. Perhaps, in these examples, in the framework of the unification of interpretation of the individual universities, it would be worth it for governments of each country to more precisely specify the implementing regulation of this obligation and set the clear intention of this issue. It is clear that the financial amounts of the Universities in German-speaking Countries are determined in much the same way, there is not much variation there, as is the case in the Czech environment [13].

We believe that this approach is more transparent and better for the motivation of researchers. A very significant aspect of this topic is that that in successful commercialization

the good name of the university is spread, thereby increasing the public awareness of the innovators.

It would be worth it to compare the method of remuneration with other universities in Europe, especially in those countries where patent law was developed based on the Anglo-Saxon or Roman system. Both of these systems, unlike the German one, can be very different. We assume that the Anglo-Saxon countries will be closer to the German system, because these areas are very close to each other, with the difference that the Anglo-Saxon system has always been more precise and detailed. Both of these systems stood at the birth of the European patent system.

## 5 Conclusion

The aim of this paper was to study the situation of R&D at universities, as a part of the public sector in German-speaking countries. In a case study, we compared the rewarding of the holders of intellectual property in Germany, Austria and Switzerland, and monitored its increasing and their motivation.

The analysis showed that the studied issue meets the basic prerequisites for increasing competitiveness. On the basis of selected countries and their mutual comparison of the number of surrendered applications and granted PCT patents Austria stands behind Germany and Switzerland, if we compare these German-speaking countries among themselves.

In today's world intellectual property protection and the commercialization and application of these results is becoming more important, in the context of increasing the competitiveness of the individual countries, in the context of the individual facilities of the University environment. It is necessary to prepare the conditions for increasing the motivation of scientific teams. Based on the analysis, it is evident that in the German-speaking countries, this methodology is very compact.

The above comparison shows that German-speaking countries reward their staff or inventors in one form or another, for this activity above the normal wage. From an economic point of view, this remuneration should have a positive impact on the motivation and efforts of employees and generate more patentable inventions. It is confirmed that from the economic perspective of individual states, the reward of employees for inventions in the university environment has undeniable importance and is a powerful motivator. However, the question is whether the proportion allocated to the originator or co-originator should increase or improve, as in some university environments exploitation by employers is spoken about. If you compare it with the Czech environment, the universities were much more generous when setting their internal regulations in what concerns remuneration for originators [13].

Method of remuneration of originators at individual universities would be interesting to compare with other universities in Europe, especially in the countries of the Roman and Anglo-Saxon system.

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**SESSION II:  
PUBLIC FINANCE**

# Local Government in Czechoslovakia 1918 - 1938 and its Impact on Economy of Municipalities in the Czech and Slovak Republics

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## Abstract

The paper deals with the historical development of municipal government in the context of the development of public administration as a whole during the First Czechoslovak Republic, in which the Czech and Slovak nations functioned as an independent state for the first time in history. It discusses the historical consequences of this situation in relation to current issues and problems affecting local government in the Czech and Slovak Republics. The paper is based on the concept of studying the history of contemporary phenomena in terms of the territorial self-government of the Czech and Slovak Republics with an emphasis on the economic context of this issue. If the past is studied, it can be seen that certain elements (the high fragmentation of municipalities, redistribution of competences, municipal debts, the problem of regulation, etc.) arising during the political and administrative developments of the early 20th century are still in existence at the present time, when the Czech Republic and Slovakia are independent states as a result of the dissolution of Czechoslovakia after the Velvet Revolution.

*Keywords:* municipal government; public administration; economic development; public finance; local budgets

*JEL Classification:* H11, H77, H83

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## 1 Introduction

This paper presents the origins and context of local government in the construction of the independent Czechoslovak Republic and evaluates the genesis of local government in terms of its role in public administration and its economic base and economic sovereignty, which is one of the essential attributes of its existence. Based on this structured vision of historical consequences, the paper will accentuate its principal tendencies and contexts, compare them with current theoretical knowledge relating to the subject, and compare the historical form of local government with its current form in the Czech Republic in the 21<sup>st</sup> century. It will identify historical elements, segments, and processes that can be found in the local government of the Czech and Slovak Republic and point out the beginnings of local self-government in history and its legacy in the present or the future. It is our view that the historical traditions in different countries affect the status, organization, competence and financing of local government. This concept, the effects of both informal constraints (traditions, customs etc.), and formal rules (constitutions, laws etc.) in the economy and society is dedicated to the now classic approach (e.g. North [13]) of institutional economics.

In terms of the current research in this area and the research of Czech authors, the approach of Vencovský [17,18], who focused primarily on the issues of national economy (the budget and tax reform), is notable, especially in terms of the historical connotations of the creation of the 1918-1947 state budget with regard to theoretical approaches and economic interpretations of the public finance categories made by the historically significant Czech economists, Alois Rašín and Karel Engliš, who had a considerable influence on the development and implementation of both fiscal and monetary policy in the period of the First (Czechoslovak) Republic.

Among foreign authors, the work of Bryson and Cornia [3,4], who dealt with the issues of fiscal federalism and the relationship between the central and local government in the Czech and Slovak Republics after the revolution of 1989, is important. In their studies, they take into account the historical roots of public administration development in both republics (in terms of

their development under communism) and point out the lack of (mainly tax) autonomy of local governments in terms of influencing the amount of redistributed taxes. Bryson [4] also deals with a high number of local self-government units, which significantly limits decision making at the local level. Again, these authors refer to the historical development of the centralized model under communism in the two post-communist republics. In the paper we assume the hypothesis that the current development of local government and their financing in the Czech Republic and Slovakia with regard to institutional and fiscal decentralization is conditioned by tradition, culture heritage and "informal relationships" and is not only determined by the period of centrally planned economy, as is often mentioned. We suppose that many problems of local government structures and financing of local activities that persist until now, have their origins in the Imperial Austro-Hungarian Empire and occurred even at state-building during the First Czechoslovak Republic.

Due to the limited extent of the paper, there are presented only selected elements of the economic aspects of local government in previous Czechoslovak Republic in its historical development.

## **2 Material and Methods**

The paper relies on the concept of studying the history of contemporary phenomena in terms of territorial self-government of the Czech and Slovak Republic with an emphasis on the economic context of this issue. We study, based on the past, the present and simultaneously "interpret" the past, use of the concept and a perspective that exist in the present, which is one of the possible approaches historical methods and methods of economic institutionalism (the process of evolution of the institutions). Furthermore, we have used the method of logical induction that allows the formation of conclusions based on logical conclusions from individual cases. Linking the historical method with the method of logical induction allows us to confirm (disconfirm) the hypothesis.

We use historical documents as previous Acts and Government Regulations,

The economic independence of municipalities after the establishment of Czechoslovakia was ensured by the existence of their separate budgets, which were characterized as ordinary and extraordinary. The revenues of the ordinary budget consisted of regular income from municipal assets and municipal funds, the net profit of municipal profit-making enterprises, contributions, fees and charges, state allocations, and other revenues. The revenues of the extraordinary budget consisted of extraordinary revenues from municipal assets, incomes from the sale of municipal property, yields from loans, extraordinary contributions, fees and charges, and incidental incomes (see Act No. 329/1921 Coll., Act No. 125/1927 Coll., Law No. 76/1927 Coll., Act No. 77/1927 Coll., Act No. 169/1930 Coll., Act No. 69/1935 Coll., Government Regulation No. 21/1936 Coll., and Government Regulation No. 381/1938 Coll. [19,24-25,27-31]). While the ordinary budget revenues were used to finance current expenditures, including the financing of public services, the extraordinary budget revenues primarily related to the financing of investments. Budget movements were restricted and extraordinary incomes could not be used to cover non-capital expenditures. Current legislation on the relation between the revenues and expenditures of municipal budgets is more flexible; however, some strict limitations apply, especially to state subsidies.

Asset base of communities formed their own historic property, which of course was not divided evenly. Property differentiation between municipalities inherited from Austria-Hungary was deepened with further development. Many communities had a large property (e.g. related to ownership of forests), which was one of the most important income for the community. In the contrary other municipalities held minimum property. The asset of municipality was divided into the financial asset (the proceeds of which were used to cover the needs), administrative capital (which was used for administrative activities (e.g., office buildings)), and property that securing public services (roads, squares, public spaces, parks, etc.). A separate part of the municipal asset was local business property. Domestic enterprises were divided into gainful and

the others. Profit business like funeral homes, forests, mines, gas works, power plants, slaughterhouses, etc. earned a profit. The activities of nonprofit corporations realized on the principle of public interest and in this sense could be unprofitable. These corporations were financed by other revenues of municipalities which included incomes from sanitation, water supply, waste management, public transport etc.

The financial management of local government in ČSR can be divided into two basic phases. The first phase lasted from the founding of the republic until 1927; the second phase from 1927 to the beginning of World War II.

### 2.1 The First Phase of the Financial Management

The first phase is characterized by the growing fiscal powers of local government. Municipal expenses were increasing concurrently as a result of the accumulating competences and tasks of local government, causing budget deficits in a number of municipalities and their increasing indebtedness.

In terms of legislation, the financial management of municipalities was governed by three to four financial amendments, with only the first financial amendment being related to the first phase of financial management of municipalities.

The first financial amendment is considered to be the enactment of Act No. 329/1921 Coll. [25], which codified the financial management of municipalities. Municipalities were allowed to disinvest upon core property and dispose of real property. They were entitled to one half of the revenues from house taxes, part of the revenues from turnover taxes, and some other incomes from the state budget. The bookkeeping of municipalities and profit-making municipal undertakings and the manner of budget setting and approving were provided for by law. Although this Act was based on legislation dating back to the period of Austria-Hungary, it was intended to provide more operational space for municipalities, for example in the area of assets dispositions and income diversification.

In addition to allocations from the state budget and allocations from the revenues of state taxes, municipalities could introduce surcharges on direct taxes, of which they made abundant use, with most municipalities paying for their goods and supplies from them (see Table 1 below). Surcharges accounted for up to one quarter of the total income of municipalities in their budgets [14]. This was also because the allocations from the state budget decreased from CZK 846.0 million in 1921 to CZK 780.5 million in 1924. This decrease, by more than 7.7%, occurred particularly in Moravian and Silesian municipalities. There was a decrease by more than 16% in Moravia and 14% in Silesia.

**Table 1. The allocations of budgets of local government in Czechoslovakia (in mil. CZK)**

Year	Czech	Moravia	Silesia	In sum
1921	512	260	74.0	846.0
1922	496	259	73.6	828.6
1923	498	243	74.2	815.2
1924	501	216	63.5	780.5

Source: [15]

### 2.2 The Second Phase of the Financial Management

The second phase of the financial management is related to the public administration reform carried out in 1927, which initiated changes to the tax system and modifications in the financial management at individual levels of local government and social security. These changes, introduced by Act No. 77/1927 [28], are known as the second financial amendment.

In the municipal area, the reform was intended to decrease the deficit and indebtedness of municipalities, taking advantage of other benefits and fees while adjusting the maximum level of surcharges on taxes [3,4]. The Ministry of Finance itself realized that the limitations of surcharges on taxes can be negatively reflected in the budgets of local governments [11].

Therefore, the state took over the funding of a number of local government responsibilities. Due to the ever-increasing indebtedness of municipalities, the supervision by superior authorities over the budgeting process carried out by the lower levels of local government intensified after 1927. The supervisory authority had the power to intervene in the structure of municipal budgets, to introduce new levies and fees, and to influence the management of municipal property. Special provincial compensatory funds were established at the country level to help indebted municipalities. Incomes of the compensatory funds consisted of the house tax in the municipalities that were not entitled to its allocation, a contribution in the amount of 1.5% which was collected along with the land tax and the amount of CZK 60 million from the revenues of the turnover tax and the luxury tax. Subsidies were provided to municipalities from the provincial funds according to the respective rules of the subsidies granted to municipalities to cover their budget deficit. After the abolition of the provincial compensatory funds in 1930, the obligation to help municipalities was delegated to the budgets of autonomous countries. The allocations that went into the provincial funds became an income of the countries' budgets.

The municipal debt grew despite the increased surveillance and control of local government debts. Due to the insufficient effectiveness of the reform, another, third financial amendment [30] was adopted in 1930, which provided that revenues from municipal property would be the decisive source of the funding of municipal expenditures. Such state interference in municipal budgets is not possible today; however, various regulatory instruments are being considered because of the increasing debt of municipalities.

At the same time, the supervising state authority could impose new fees and levies on municipalities and make changes in the budget, including reductions on the expenditure side, even against the will of the municipal board. The lands were informed that provincial councils would develop and issue financial regulations for municipalities, codifying the entire municipal budgetary process, including its individual phases. However, municipalities continued getting into debt, including due to the impact of the Great Depression. Arrears of tax revenues and arrears of the surtaxes levied by local governments continuously increased until the beginning of World War II.

This made the economic situation of municipalities most tense during the Great Depression when the tax base for surcharges decreased considerably. In 1933, the debts of local governments in Czechoslovakia amounted to CZK 12 billion, and amortization of the debt required one billion crowns a year. The incapacity of local governments to repay the debt had reached such a degree that it threatened the stability of the banking system in ČSR. A group of big banks drew up a memorandum addressing the Czechoslovak government with a proposal on how to relieve local governments from debt [16].

The reaction of the government to the increasing indebtedness of local governments was the adoption of Act No. 69/1935 Coll. [31], on financial arrangements in the field of local government, which modified the previous laws in the sense of limiting new loans. At the same time, the existing agreements concluded with respect to debts began to be regulated. Budget receipts of local governments were also adjusted, including the possibility to increase surtaxes. As a result, the maximum permissible rate for municipalities could increase up to 350% from 1936. The Act is therefore sometimes considered the fourth financial amendment. The problems of the financial system of local governments were not solved by the following legal provisions contained in government regulations (No. 69/1936, No. 202/1936, No. 19/1937 and No. 371/1938 [20-23]) either.

Abundant amendments to the financial management of local governments in the period of the First Republic (1918-1939) usually had a temporary character, were a reflection of efforts to redistribute competences and tasks within the vertical structure of the public administration, and were accompanied by corresponding financial decentralization. The purpose of the reforms was also to cut the costs of public administration; however, this objective was not achieved. Despite the efforts of the state authorities to resolve the debt burden on municipalities, this problem was not solved until the dissolution of ČSR. Objective factors (the Great Depression, the beginning of World War II), which weakened the economic and financial resources of the state,

also played roles here. Concurrently, the phenomena led to the increasing dependence of local government on the state administration.

After the end of World War II, the Czechoslovak Republic was restored on the territory of Bohemia, Moravia, and Slovakia (the Carpathian Ukraine joined the former Soviet Union on the basis of international developments). After the war, a three-tiered system of national committees, specifically local (municipal), district, and regional committees, was created and the principle of vertical subordination was introduced. National committees became decentralized bodies of the state administration and power. Municipalities gradually lost the local government functions and their budgets were more closely linked to the state budget. In 1949, the state nationalized the assets of the national committees. This deprived local governments of essential attributes of their existence and functioning. Despite some developments and efforts to accentuate the self-governing aspects of national committees after 1960, the full-fledged local government system was not restored in Czechoslovakia until the Velvet Revolution in 1989.

As part of building a democratic society and transforming the economy, the municipal order was restored in 1990, based on the historical integrated model combining independent and delegated powers of municipalities. A similar approach was adopted for the competences of municipal bodies, i.e. an assembly, a council, and a mayor. Municipal assembly elections were held at the end of 1990. The status and functions of local governments were gradually approaching the standards of developed European countries. After the division of Czechoslovakia (as of 31 December 1992) into two separate states, i.e. the Czech Republic and Slovak Republic, the public administration structure diversified to a certain extent in the course of subsequent developments.

The Czech Republic became a unitary state, with its public administration structure moving along an axis: government or ministries – district authorities – municipalities (cities), where district offices represented only the state line of the public administration. This asymmetry, which had initially been considered to be only temporary, persisted until the beginning of the 21<sup>st</sup> century, when the regional level of public administration or self-government was created. As in the existing municipal order, it represents a combined model of independent and delegated powers. On the other hand, district offices, which were not included in the concept of public administration reform in the Czech Republic as the state line of the public administration between municipalities and regions, were abolished. The current public administration axis was formed: state – regions – municipalities. In this way, the idea of a regional level of self-government, which had been pursued unsuccessfully in Austria after 1848, was somewhat restored on the territory of the Czech Republic (of course, in its contemporary conception).

The number of municipalities increased by one third in the Czech Republic after the Velvet Revolution as a reaction to the previous regime, under which municipalities were merged in a directive manner under some pressure.

This increase was an expression of the societal democratization and free citizen decisions. Municipal management and fiscal sustainability at the local level became somewhat complicated. The newly established smaller municipalities in the Czech Republic have problems securing the defined structure of public goods and public services in terms of their personnel and financial resources. This situation is reminiscent of the development of the Czechoslovak Republic in 1918-1939, when there was ongoing tension between the defined and increasing competencies of local governments and their financial coverage was continuously solved by the financial amendments.

The Slovak Republic thus returned to the historical Austrian double-track public administration system, though, of course, its current system is equivalent to European conditions of the 21<sup>st</sup> century. The development of the municipal government is similar to that in the Czech Republic, i.e. the number of municipalities and the frequency of duties and responsibilities that municipalities have to meet have increased. The category of joint municipal authorities that should secure the original competences and delegate the execution of state administration in a more efficient manner on the basis of an agreement was designed in an effort to find a solution to this problem.

### 3 Results and Discussion

Institutional economics is based on the assumption of evolution formal institutions, which include legislative system and the political, economic and social institutions and categories of informal institutions, which are difficult to define, however, contain standards of conduct established custom, tradition and everything that we call culture of the society. Continuous and discontinuous processes of social development are interlinked and historical merits of modern design and construction unexpectedly manifests itself in new contexts.

The development of self-government in Czechoslovakia in the 1918-1939 period demonstrates that the newly formed Republic essentially took over the complicated and 'unresolved' model from Austria-Hungary, which was also asymmetric (Bohemia, Moravia, Slovakia, Carpathian Rus), The concept (specifically its Austrian part) was further developed in the democratic and national sense. However, the complicated territorial and ethnic divisions of the country (Czechs, Slovaks, Germans, Hungarians, Ruthenians, etc.) constituted a barrier for the unification of public administration in the whole state.

The double-tracking system of public administration adopted during the development of the ČSR was successfully eliminated only after ten years of its development, through certain modifications and possibly through the 'deformation' of autonomous elements.

More continuous development took place at the level of local government in which, however, the number of competencies was growing, both as their delegated and independent powers.

The economic base, especially the defined revenue structure, of local government did not fully correspond to the portfolio of tasks assigned to be ensured by it. A typical problem related to the economic management of the municipal system during the 20-year period of the First Republic was the permanent indebtedness of municipalities. The state tried to address this through several reforms, but had failed to do so by the time of the dissolution of the Czechoslovak Republic and the outbreak of World War II. Another problem was the fragmentation of the municipal system in the form of a large number of municipalities in the Czech lands (see Table 2 below).

**Table 2. Trends in the number of municipalities in the Czech Republic 1921 - 2014**

Year	1921	1930	1947	1961	1970	1989	2014
Number of municipalities	11,417	11,768	11,695	8,726	7,509	4,120	6,252

*Source: Authors based on [14]*

In terms of the above analysis of the historical development of the municipalities on the territory of Czechoslovakia and their financial instruments, and with regard to the current state of the public administration reform and the degree of fiscal decentralization in the conditions of the Czech Republic and Slovakia, it is possible to discuss the basic problems that have influenced the current form and functioning of local self-government. The high fragmentation of territorial self-government, i.e. the high number of small autonomous units (municipalities) in both the Czech Republic and Slovakia, persisting as a historical remnant and significantly affecting the functioning of local government. The possibility of achieving economies of scale by merging municipalities is increasingly discussed for this reason [1, 2, 5, 7- 10]

The limited tax autonomy of local government, which seems to have been higher in the past than it is today (in the form of surcharges to the vested income tax and land tax). This fact has been criticized by some authors dealing with the Czech Republic and Slovakia [3, 4]. Both studies point out that property tax is used insufficiently in the Czech Republic (e.g. according to the prediction of the Czech Ministry of Finance, the tax revenue in the budgets of municipalities should be 68.3% in 2014. Property taxes account for 6% of the total volume of the tax revenue of municipalities, [12]), which leads to the redistribution of taxes in the form of transfers from the central government to the local budgets and the central government takes responsibility for their collection. However, the transfers generate a moral hazard for local politicians.



The question of the indebtedness of municipalities, which has remained open since the emergence of the independent Czech state and has persisted since the time of the Austrian monarchy. Although different ways of solving this problem have been sought (in discussions of experts and politicians e.g.), including with respect to historical experience, e.g. by creating a separate guaranteed fund to which municipalities and the state would both contribute, and which could provide repayable and non-repayable resources to indebted municipalities, this issue remains unresolved. In the EU member states, the desire to solve the fiscal imbalance of municipalities is intensified by the necessity of meeting the Maastricht fiscal criteria and the resulting implementation mechanisms of fiscal discipline that also apply to municipal budgets [6].

The problem of regulation and control from the state, which is also evident from the analysis of historical experience (second and third public finance reform after 1927). In the First Republic appeared obligation to increase fees and taxes on certain debt limit of the municipality. This possibility is now considered too. The state authorities can "command" to the local government gradual reduction of their debt under threat of "decreasing" of tax revenues. In current discussions reflect variant of insolvency proceedings, including the possibility that under certain circumstances municipality may be forced by state authority to integrate with neighboring municipality, i.e. de facto municipalities could be merged.

All above mentioned problems are summarized in followed table 3. As it can be seen, all problems have their origin in the past. From the historic point of view, these problems were discussed and the people have effort to find solutions. Despite particular efforts, some problems remain due to their complexity and comprehensiveness discussed and unresolved until now.

**Table 3. The main problems of local government in the past and present**

<b>Problem</b>	<b>Past</b>	<b>Present</b>
Fragmentation of territorial local government	origin, discussed	discussed, persisting, unresolved
Redistribution of competences (independent and delegated power)	origin, discussed	discussed, persisting, particular solution
Limited tax autonomy	origin, discussed, particular solution	discussed, persisting, particular solution
Indebtedness of municipalities	origin, discussed, particular solution	discussed, persisting, unresolved
Regulation and control of municipalities	origin, discussed, particular solution	discussed, persisting particular solution

*Source: Authors*

## **4 Conclusion**

Studies of historical consequences with a focus on economic aspects have led to interesting conclusions that are very inspirational from the perspective of the theory of public administration and local government. It is obvious that the problems of today's local authorities have a historical basis dating back to the Austro-Hungarian Empire, which persisted even during the construction of the first Czechoslovak Republic. It is possible to discuss the cause of this, whether it is the bad management of a municipality or the bad setting of the financing system when municipalities are unable to cover their expenses with the income they receive in the form of taxes, fees, or revenues from municipal property, or whether the problem lies in the establishment of the powers of municipalities. It is also evident from historical connotations that not even surveillance and control are a solution that is an end in itself if the system is misconfigured.

It is useful to emphasize that the historical experience of the development of public administration provides indispensable and valuable study material which should be revisited and thoroughly analyzed, including the historical context. The historic footprint within the

framework of the present public administration in the Czech Republic and the Slovak Republic has to be adequately respected, even in the context of the current reform steps.

The presented paper is first step of research local government and its financing. As was mentioned in introduction, due to limited extent of paper, it was analyzed only selected aspects of economic development of local government. Next step should be continuous research in other particular areas of local government and its financing (tax sharing, debt, facility management, relation to other municipal organization etc.) and explore these aspect in depth.

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# Factors Influencing Compliance Behavior in a Tax Laboratory Experiment

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## Abstract

This paper presents preliminary results of a laboratory experiment series studying the topic of tax compliance with Czech subjects. The issue of tax compliance is one of the fields where laboratory results may fill the gap in where the theoretical models are not capable to fully explain the individual decision making and real data are not easy to obtain. We link our results to the western experimental evidence to date. In our research, two factors having potential influence on tax compliance are tested: probability of being caught while cheating on taxes and penalty rate implied on subject who evade. We find that overall behavior of the Czech subjects is in accordance with foreign experimental findings. Our results demonstrate stronger effect when probability of being caught increases while the effect of increasing penalty rate is quite moderate.

*Keywords:* laboratory experiment; tax compliance; voluntary contribution mechanism

JEL Classification: C9, H3

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## 1 Introduction

Tax compliance and tax evasion belong to popular and vivid questions of public policy. As taxes represent a basic source of public revenues, finding motives that make people comply with the tax code is of great interest. Although the media show lots of examples of tax evasion, majority of people do pay taxes (i.e., comply). Our analysis is aimed at identification of potential factors (and scope of their influence) which make people comply with tax law.

The possibility of finding factors which affect individual decision on (non)compliance is critically limited by availability of data. Andreoni, Erard, and Feinstein [6] define four possible sources of data on tax compliance: audit data, survey data, tax amnesty data and data generated through laboratory experiments. Another possible source are results of field experiments. Field or natural experiments use controlled environment, but at the same time real tax authorities are involved. This makes it possible to “*evoke real processes in the usual environment outside the laboratory*” [8].

During the last two decades, U.S. have witnessed more frequent attempts to empirically analyze data on tax compliance. The empirical evidence reveals that there exist certain regularities in taxpayers’ behavior in response to changing parameters of the tax systems (for detailed information on empirical evidence in the U.S., see [6]). On the other hand, these results are based mostly on data files featuring several drawbacks (i.e., survey data or tax return data without socioeconomic or demographic characteristics, etc.)

We are not aware of any empirical study being processed in the Czech Republic; there is very little to say about the empirical evidence on Czech taxpayers’ behavior. Moreover, there is only scarce evidence on systematic research on the factors affecting tax compliance decision in the Czech Republic (see [11], [12], or [16]).

Our research uses method of laboratory experiment and aims at opening the debate in the Czech (and Central European) academic community. As pointed out above, the issue of tax compliance represents one of the topics where laboratory experiments may provide important insights into human economic decision making. The theoretical model based on expected utility theory is not able to cover the complexity of individual compliance decision; the same as in the case of (for example) public goods, the homo economicus concept falls short.

This paper is presenting preliminary results of a laboratory experiment series studying the topic of tax compliance with Czech subjects. We link our results to the western experimental evidence to date. In line with foreign experiments, we are analyzing potential influence of two factors – probability of being caught while cheating on taxes and penalty rate imposed on subject who evade. We conclude that behavior of the Czech subjects corresponds to foreign results. At the same time, there is a stronger effect when probability of being caught increases. The effect of increasing penalty rate is moderate.

### 1.1 Tax Compliance: the Model

The model of tax declaration decision was introduced by Allingham and Sandmo [1]. In the (basic) model, an individual is given a  $W$  income. A tax at constant rate  $\theta$  is then levied on declared income  $X$  (being part of  $W$ ). The individual is aware that he/she is going to get audited with a (declared) probability  $p$ . If he or she hasn't declared all his/her income, he/ she will have to pay a penalty on the underreported amount ( $W-X$ ) at a rate  $\pi$ , higher than  $\theta$ . The individual chooses  $X$  so as to maximize his / her expected utility:

$$E[U] = (1 - p)U(W - \theta X) + pU(W - \theta X - \pi(W - X)) \quad (1)$$

The real implications of this theoretical model are limited. As the levels of audit and penalty are set very low by countries, rational individuals would all evade. However, as we may observe, tax compliance is very frequent in reality.

On the other hand, although not all individuals evade in reality (and behave thus in contradiction to the homo economicus axiom), tax evasion poses an important problem in most countries. Even though this phenomenon may be studied in the field, its real observability is limited. Apparently, if an individual decides to evade, he or she will make all efforts to conceal such behavior.

One of the main advantages of studying the topic inside a laboratory is the control over all pertinent variables. Not only it is the experimenter who sets (and may vary) the levels of main fiscal variables (i.e., audit, penalty, and tax rates), but he or she can control over (or eliminate) other circumstances that could affect individuals' compliance behavior.

### 1.2 Key Experimental Findings to Date

Many experimenters have focused on testing the validity of the theoretical model introduced above and the effects of selected fiscal variables. The results of laboratory experiments mostly demonstrate higher level of income reporting than predicted by the (expected utility) model. According to the study of Alm, McClland and Schulze [5], the subjects seem to overrate the probability of an audit, so the compliance is higher than predicted by the theory of expected utility.

The basic (standard) design of tax compliance experiments builds on voluntary reporting of individuals' income: the subjects are given certain disposable income and pay taxes on its reported part. The pioneer experimental study of the topic of tax compliance by Friedland, Maital and Rutenberg [10] focused on testing effects of fines and audits on tax evasion behavior under various tax rates. The authors concluded that large fines were more effective in deterring evasions than frequent audits. The study had several limitations (like e.g., small participant pool), however, it set the grounds for further research.

Numerous works have followed and extended this early study. The results of laboratory experiments on the tax compliance topic diverge; however, we may find several common findings [15]: Higher audit rate usually leads to more compliance; tax compliance increases with increasing income and it decreases with increasing tax rate.

The studies of Alm, Cronshaw and McKee [3] or Alm and McKee [2] focused on testing the endogenous audit selection instead of random audit. The results demonstrated that the rules such as probability of future audits depending on individual's (evasive) behavior in the past

generated significantly higher compliance compared to random audit rules.

Another factor having positive impact on tax compliance is positive incentives. According to Alm, Jackson, McKee [3], individual rewards (e.g., eligibility for a lottery if audit indicates full reporting) result in greater compliance.

Experimental results, on the other hand, demonstrated little effects of socio-demographic variables (gender, age, etc.). Nevertheless, certain regularities can be found. There is evidence that males evade more than females (see [7]) and, in line with empirical results (mostly originating in the U.S.A.), experimental evidence shows as well that “*age is positively associated with compliance*” (see [6]).

## 2 Material and Methods

One possible way of modeling the issues of tax compliance in a lab is via Voluntary Contribution Mechanism (hereafter “VCM”). As one of the main functions of countries’ tax systems is that of financing public goods for citizens, the VCM model represents a good approximation to reality. Within a *classical* VCM experiment, each player decides whether he or she keeps his/her money on a personal account or he/she contributes to a group account (simulating a public good) that provides benefits to all participants. When VCM is used in order to study the tax behavior, there is certain *prescribed* percentage of individual income that each subject is asked to pay to the group account. This payment cannot be enforced unless the subject gets audited. In the case of being audited, he or she has to pay the (unpaid) tax or its missing proportion and as far as he/she hasn’t paid the totality of the prescribed amount, he/she has to be fined to the unpaid proportion. The probability of an audit and the penalty rate are communicated to participants at the beginning of the experiment.

### 2.1 The Design

Our experiment consists of five different treatments, all building on the Voluntary Contribution Mechanism. All experimental sessions are executed on computer terminals using z-Tree program [9].

Each treatment consists of 20 identical rounds (repetitions) within which a stable group of 24 subjects interacts. All decisions and individual actions take place through PC terminals; subjects don’t have any *paper* instructions at their disposal.

The basic treatment called **Baseline** (B) approximates to the classical VCM. Beyond it, there is an obligation to contribute given proportion of individual income to the group account; the probability of control, however, is very low.

In the beginning of a round, each subject is given 200 tokens (that is  $W = 200$ , using notation introduced in [1]). At the same time, he/she is asked to contribute 30 tokens to the group account ( $W * \theta = 30$ ). The subjects are informed that there is a 0.33 % probability of being controlled ( $p = 0.0033$ ). When the control reveals that the subject contributed less than the prescribed 30 tokens, the missing amount is deducted from his/her private account, as well as a penalty of 20 % of this non-contributed amount ( $\pi = 0.2$ ).

The payoff of an individual  $i$  before the control is given by equation 2.

$$Payoff_i^{bc} = 100 \times (200 - x_i) + 15 \times \sum_{j=1}^{24} x_j \quad (2)$$

where  $x_i$  is  $i$ ’s contribution to the group account, being an integer from [0,30]. (When a subject contributes more than 30 tokens to the group account, the excess amount is transferred back on his/her private account.) The equation 2 indicates that while a token kept on the private account multiplies its value by 100 for the account’s owner, a token contributed to the group account brought its multiple by 15 to each subject (i.e., the Marginal Per Capita Return – MPCR – is equal to 0.15). If an individual  $i$  got controlled, his/her final payoff at the end of a round is given by equation 3.

$$Payoff_i^{wc} = 100 \times 170 + 15 \times \sum_{j=1}^{24} x_j - (30 - x_i) \times 20 \quad (3)$$

The probability of control of 0.33 % and the 20 % penalty rate in the Baseline treatment were chosen according to the *tax reality* in the Czech Republic.

In other four treatments we used different rates of audit and penalty. Two treatments focused mainly on testing the effectiveness of High Penalty (HP) rates (treatments HP1 and HP2) and the other two were designed to test impacts of variable High Audit (HA) probability rates (treatments HA1 and HA2).

The treatment **HP1** uses a (individual) probability of control of 1/24 and the 20 % penalty rate (that is,  $p = 1/24$  and  $\pi = 0.2$ ). The **HP2** uses the same probability of control but in the case where a controlled subject didn't contribute the prescribed amount, the penalty on the non-contributed amount reaches 100 % ( $p = 1/24$  and  $\pi = 1$ ). This modifies the payoff formula to equation 4.

$$Payoff_i^{wc} = 100 \times 170 + 15 \times \sum_{j=1}^{24} x_j - (30 - x_i) \times 100 \quad (4)$$

The treatment **HA1** uses higher level of probability of being controlled while penalty rate remains on its basic level of 20 % ( $p = 1/12$  and  $\pi = 0.2$ ). The **HA2** increases the probability of control to even 1/6 ( $p = 1/6$  and  $\pi = 0.2$ ). Table 1 summarizes variables used in our five treatments.

**Table 1. Treatment Variables Overview**

Treatment	Variable				
	Disposable Income (W)	Prescribed Contribution (W*θ)	Marginal per Capita Return (MPCR)	Probability of Audit (p)	Penalty Rate (π)
B	200	30	0.15	0.0033	0.2
HP1	200	30	0.15	1/24	0.2
HP2	200	30	0.15	1/24	1
HA1	200	30	0.15	1/12	0.2
HA2	200	30	0.15	1/6	0.2

Source: Authors

## 2.2 Hypotheses

Basing on the theoretical model, we hypothesize that:

- i. *Subjects do evade no matter the treatment.*

According to the theory, if it holds that  $p \cdot \pi + MPCR < 1$  the dominant strategy of each individual is to free ride (see [5]). This condition holds in all our five settings.

Further, basing on previous evidence, we hypothesize that:

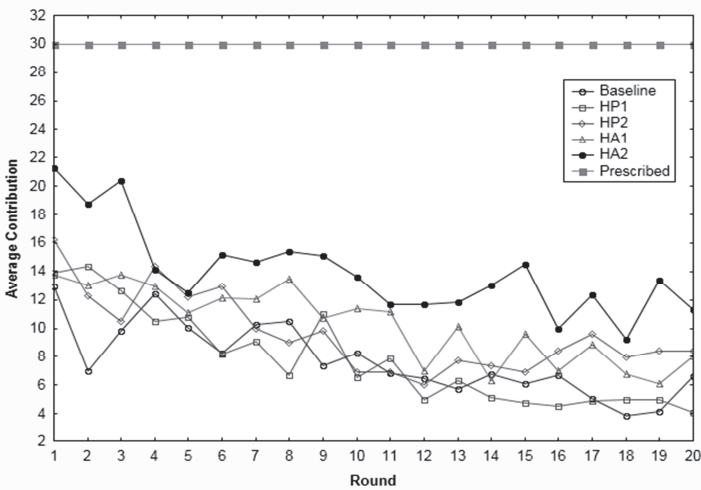
- ii. *The effect of increasing penalty rate (π) is weak, that is, we would observe no substantial change in average contribution ( $\bar{X}$ ). (i.e., it doesn't hold that  $\bar{X}(HP2) \gg \bar{X}(HP1)$ ).*
- iii. *With increasing audit rate (p), subjects would raise significantly their contributions, i.e., it holds that  $\bar{X}(HA2) \gg \bar{X}(HA1)$  (and  $\bar{X}(HA1) \gg \bar{X}(HP1) \gg \bar{X}(B)$ ).*

## 3 Results and Discussion

Our first experimental series covering one session for each treatment (in total 5 experimental sessions) took place in June 2014. In total, 120 subjects, recruited using the ORSEE database among students of Masaryk University, took part in this series. Average earning of a subject was 224 CZK (the exchange rate was 2000 tokens = 1 CZK).

Figure 1 captures average contribution to the group account under different treatments. The horizontal line indicates the prescribed amount of 30 tokens that each individual was asked to contribute to the group account.

Figure 1. Average Contribution to the Group Account by Treatment



Source: Authors

At first glance, we can notice that average contribution was considerably higher in HA2 treatment using the highest audit probability ( $p = 1/6$ ) compared to other treatments. Average contribution under HA1 treatment exceeded other treatments but did so less strongly and average contributions under three other treatments didn't differ significantly.

Our first hypothesis claimed that subjects would evade in all five treatments. When observing the graph of average contributions, we can state that there never was a full compliance (i.e., 30 tokens contribution to the group account) in any round of any treatment (the highest average contributions were noticed under the HA2 treatment, nevertheless, even there they didn't exceed 22 tokens). On the other hand, there never was a complete free riding either.

The second hypothesis was related to the effectiveness of variable penalty rate ( $\pi$ ) as a tool of enhancing tax compliance. According to our hypothesis, this tool would be rather neutral, that is, it wouldn't hold that  $X(HP2) \gg X(HP1)$ . The results endorse this hypothesis; according to the Chi-squared test using all individual contributions, there were no significant differences between both treatments.

In our third hypothesis, we supposed that, contrary to variable  $\pi$ , increasing probability of an audit ( $p$ ) will be of significant impact on tax compliance. That is, it should hold that  $X(HA2) \gg X(HA1)$  (and  $X(HA1) \gg X(HP1) \gg X(B)$ ). The fact that average contributions under HA2 were by far the highest has already been mentioned. This statement endorses our hypothesis and is confirmed by the Chi-squared test, according to which contributions in the HA2 and HA1 treatments differ significantly (the  $\chi^2$  statistic is significant beyond the 0.001 level). Contributions under HP1 are lower than those under HA1, as hypothesized. The difference, however, is only bordering significant (with the  $\chi^2$  statistic significant beyond the 0.1 level). The difference in contributions between the treatments HP1 and B is not significant.



## 4 Conclusion

To sum up, the results of our first experimental series provide us with the following findings. We found out that subjects do evade even if the threat of being controlled (expressed by  $p$ ) is strong and the punishment (expressed by variable  $\pi$ ) is not negligible.

The level of penalty imposed to revealed defaulter (expressed by penalty rate  $\pi$ ) is not of exercising major influence on tax compliance (the probability of an audit remaining relatively low).

Increasing level of probability of an audit, on the other hand, has stronger (positive) impact on tax compliance. However, as significance of the impact increases mainly with high levels of probability, the practical implications of this finding are limited.

Results of our experiments are in line with general knowledge from other countries; we have not identified any country effect. Czech students adopt the same behavioral patterns as their western colleagues. (In this respect, the results are in line with our previous research. We have not found any statistically significant differences in behavior of Czech subjects compared to other studies (see [13] and [14]). On the other hand, the study presented above is part of a larger project which aims at discovering (or ruling out) potential country effects when selected environmental characteristics change. One potentially important factor is the language (neutral or "stronger") used in the experiment. Although no significant differences in subjects' behavior have been found when instruction use the term "tax" instead of "prescribed contribution", we hypothesize that in the Czech environment the situation may be different. Due to experience from the transformation period (with several important cases of extensive tax evasion presented in media), Czech subjects can be more sensitive to the tax language and less willing to comply.

We are aware of limits of our experimental research studying taxpayers' behavior. Firstly, students represent a not particularly appropriate experimental subject pool for the topic in question. They usually do not have experience with paying taxes and in their lives they have not yet been forced to decide whether to comply with tax law or not.

Secondly, the experimental design follows the logic of income tax. However, the decision on tax compliance in the Czech Republic (and similarly in other countries) is valid only for taxpayers who do fill tax returns. Such subjects are usually self-employed people who form minority of subjects paying income tax in the Czech Republic.

Thirdly, laboratory settings have only limited potential to simulate the crucial decision of tax evasion (being a crime according to the Czech law). Even if penalty is high, people inside a laboratory do not risk their reputation as in the real life.

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# Novel Government Debt Indicator: Government Debt to Net Wealth of Households

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## Abstract

Government debt is one of the most important variables monitored in the European economies of 21st century. Due to Euro Convergence Criteria, it is most often calculated as a ratio of government debt-to-Gross Domestic Product (D/GDP). However, this ratio does not have clear economic interpretation and is difficult to understand for the common voter. In this paper, we suggest a new, more appropriate indicator – Government debt-to-Net Wealth of Households (D/NWH), which is inspired by the one-off wealth tax. Using high quality data from the Czech Statistical Office, Eurostat and Wiener Institut für Internationale Wirtschaftsvergleiche the debt burden imposed on the every Czech household was computed. While in 1995 the D/NWH was less than 7%, it has more than tripled by the end of 2012. If the Czech Republic was to repay its government debt immediately, it would have to impose a one-off tax of a quarter of the every household's wealth. While it has been argued that the 60% threshold of D/GDP is an artificial ratio introduced by Maastricht Treaty, D/GDP reaching 182% (which is roughly the recent government debt of Greece) would be the critical insolvency level for the Czech Republic.

*Keywords:* public debt; one-off tax; net wealth of households; gross domestic product; government debt/net wealth of households

JEL Classification: E62, F36

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## 1 Introduction

The predominant part of 20<sup>th</sup> century economic policy was influenced by Keynesian macroeconomic theory. Policy-makers pursued counter-cyclical policies based on smoothing the business cycle. From 1934 when Simon Kuznets first presented the concept of Gross Domestic Product Measuring [10] up to the oil crisis and following stagflation, GDP had played an important role in economic theory. From the 70's to the very end of 20<sup>th</sup> century, Keynesianism was replaced by Monetarism, which focused on monetary aggregates and the Consumer Price Index. The beginning of the new century has brought about with it a new fiscal policy problem: instead of counter-cyclical fiscal policy, policy-makers have been attempting to maintain fiscal stability.

One recent key-indicator of the high importance is the debt-to-GDP ratio. In the European Union the government debt-to-GDP ratio (D/GDP) was introduced by the *Euro convergence criteria* (known as *Maastricht criteria*, as they were originally anchored in the *Maastricht Treaty*). As noticed by Pasinetti, it has never been clear why 3% for deficit/GDP and 60% for the D/GDP were set as threshold [13]. Pasinetti together with Baldwin and Wyplosz [1] suggests, that the 60% ratio was chosen as the roughly average D/GDP ratio observed in Europe when the Maastricht Treaty was discussed and that both leaders of integration, Germany and France, were near this threshold. As the result of the European Sovereign Debt Crisis and the call for an “even deeper integration”, now in the fiscal area, the *Treaty on Stability, Coordination and Governance in the Economic and Monetary Union* (shortly European Fiscal Compact) was signed by 25 EU Members States in 2012 and the new Czech government approved accession in March 2014 [6]. The treaty again stresses the role of a D/GDP indicator. The widely discussed research of Reinhart and Rogoff [14] emphasized the importance of D/GDP ratio in relation to economic growth even in the non-European countries. They suggested that if gross central government debt overcomes 60% of GDP, economic growth decreases by 2% and if the debt-GDP-ratio overcomes 90% of GDP, the economy grows at half the rate.

However, as Shiller noticed, financial markets are overreacting to the D/GDP ratio and demanding fiscal-austerity programs which further weaken the economy [7]. Even if we disregard the 60% threshold, which is not so much the boundary between healthy and unhealthy public finance as rather the boundary between unhealthy and seriously unhealthy public finance, there still remains a key issue: is the D/GDP ratio really the first best or should we develop another and better indicator?

There are several arguments why the D/GDP ratio is an inappropriate indicator:

- GDP is not measured, but only estimated. The International Monetary Fund and Eurostat conclude that GDP is frequently overestimated (this is according the IMF case of the Asian economics, for example Sri Lanka, compare IMF report [8]). If GDP is overestimated, than the denominator of D/GDP ratio is overestimated as well and, as a result, the whole ratio is underestimated
- The increase of a denominator in the D/GDP ratio which consequently leads to the desired decrease of the D/GDP could be also caused by numerous GDP revisions. It is the case of the Greek revision in 2006 when the GDP in the period 2000 – 2006 was increased by roughly 26.6% due to more accurate methodology as well as including the gray economy [7], [10]. In 2014 the new European System of National and Regional Accounts (ESA 2010) triggered the need for an extraordinary national account revision. This revision increased the Czech GDP in common prices by 4.4% and D/GDP ratio decreased roughly from 38.4 % to 38.1% [18].
- The most important argument is that GDP does not represent the source of financing the public debt, therefore the D/GDP ratio does not have clearly interpreted reason. Public debt is cumulated over a period of time (it is the stock variable), GDP on the other hand is the flow variable counted over one year. The thresholds used by the EU (60% of GDP) or psychological threshold of 100% of GDP do not have any economic meaning and they are hardly understandable using the common sense (by a typical voter).

Because of the above weaknesses of D/GDP indicator, alternative indicators of indebtedness are often discussed. According to the Roubini, the most commonly used indicators besides *public debt to GDP* is *public debt to government revenues ratio* and *public debt to exports ratio* [15]. Roubini further remarks that the solvency of countries can change depending on the indicator used. However, both indicators have their weaknesses as well. As for the *public debt to government revenues ratio*, the government revenues are not creating the resources for repaying the debt, as they hardly ever cover government expenditures. Moreover, government revenues are once again the flow variable counted over one year, while government debt is the stock variable. *Public debt to exports ratio* is appropriate only for the countries with high foreign debt and currency with limited convertibility because for those countries the exports are the source of foreign currency in which they can repay the debt. However, this is not the case of the Czech Republic.

For almost 70 years leading mainstream economists often claim that there is no need to repay government debt. This opinion started to be popular in the years of the Great Depression and was even more promoted by followers of John Maynard Keynes. The prominent postkeynesian economist L. R. Wray claims that public finance cannot be viewed on the same line with the private finance because the government does not have limited existence. Wray notices there is “no day of reckoning” for the sovereign government and that no household has the power to levy taxes [20]. It was Schmitdt, in 1943 [16], who challenged the *view that there is no analogy between private and public debt*. The government can afford not to pay off the debt if, and only if, the investors really trust that it is credible (and solvent) enough. Once the government has lost this credibility, financial markets immediately want to get their money back. The bankruptcy of Argentina is textbook example of this.

The aim of this paper is to suggest, in the light of the listed objections against D/GDP, a new, more appropriate indicator of government debt – *government debt/Net Wealth of*

*Households ratio* (D/NWH). This indicator has clear economic interpretation and would be easily understandable by the wider public, who has the power to influence fiscal responsibility in elections. Government debt/Net Wealth of Households is essentially the reverse of the one-off wealth tax concept suggested by Ricardo, Schumpeter, Pigou or, for some time, even Keynes [9]. Unlike them, we use this concept just to highlight the severity of government debt and we are not going to discuss the justification, suitability or even reasonable rate of such a tax.

## 2 Material and Methods

The key question for debt-analysis is which kind of public debt should be used. Because of the predominant role of the *Criteria of Convergence* and *European Fiscal Compact*, we define public debt as so called Maastricht debt [5] in a percentage of Gross Domestic Product. General government sector includes state government, local government and social security funds in the Czech Republic. Maastricht debt is calculated as consolidated general government gross debt of the whole general government sector at nominal value outstanding at the end of the year [5]. The GDP in denominator is calculated in accordance with the ESA95. Gross Government debt consists of a) currency and deposits (does not include currency AF.21 issued by the Czech National Bank [3]), b) securities other than shares, excluding financial derivatives and c) loans [2] according to the Council Regulation (EC) No 479/2009.

Eurostat provides data on Maastricht debt from the year 2000. For the earlier period (1995 – 1999) high quality data from the *wiiw Handbook of Statistics 2010 (WIIW)* are used [19]. This combination of two different data sources can negatively influence our analysis. To check the magnitude of error, we used data for time period 2000 – 2009, for which both WIIW and Eurostat data are available. The WIIW government debt for the Czech Republic is for this whole period overestimated by approximately 1.1 percentage point. When D/GDP as a percentage is rounded to units, the overestimation drops slightly to 0.8 percentage point. Despite this potential error not being too serious, we diminished the WIIW data slightly using the correction  $\eta = -0.8$  for period 1995 – 1999.

Crucial for the design of the new debt indicator is the fact that government debt is a tax imposed on citizens. Every method of paying the government debt off requires future taxation. Baldwin and Wyplosz [1] assume that citizens do not have sufficient creditworthiness and credibility for certain kinds of investments. We can take the new highway between the capital city and the second biggest city in a country as an example: building a highway is an expensive project connected to the high level of risk, the investment will be paid back in the distant future and it would be extremely difficult for a couple of persons (or their companies) to get a bank loan for this project. Contemporary financial markets tend to rate the government as more credible and with higher creditworthiness than private investors. This is even more deepened through the Basel method of assessing credit risk. For this reason, the government acts as a mediator and government debt is being formed and accumulated – certainly under the condition that we leave aside the possibility of fiscally irresponsible government behavior for the purpose of this study. However, if the government is just the mediator between the financial markets and its citizens, it is clear that the final government debt is to be paid by the citizens themselves. In modern society, the only channel of repaying the debt is taxes and the sole source of taxes is the *wealth of citizens*. This simplified example clearly stresses why the wealth of households, as the proxy of the wealth of citizens, is the key variable for our further analysis.

The wealth of households is easily measured by the *net wealth of household's* indicator (NWH) which is published by the Czech Statistical Office. This is mostly based on data from the National Accounts and, to a lesser extent, on additional data sources, such as data from financial sector, Family Accounts and EU Statistics on Income and Living Conditions [4]. The net wealth of households is an indicator of household wealth counted as the difference between the household's assets and household's liabilities [12]. The newly presented indicator *government debt/net wealth of households ratio* (D/NWH) is similar to the *debt to the net asset ratio*, which is a kind of *solvency ratio*, as it evaluates if the unit (company or – in this case – the household) is

able to pay off outstanding debt. Insolvency occurs when assets-to-debt is smaller than one, which means, for our purposes, that  $D/NWH$  is larger than one.

The indicator  $D/NWH$  also has a nice interpretation, which helps to explain the debt burden to the voters. Thus:

$$t = \frac{D}{NWH} \tag{1}$$

where  $t$  is the tax rate of a one-off tax which would have to be imposed on every household (similar to the poll tax) to repay the whole government debt at once.

This household tax  $t$  would have a clear impact on the decline of the household's net wealth. To calculate the year in which the household's net wealth fall we used the relationship:

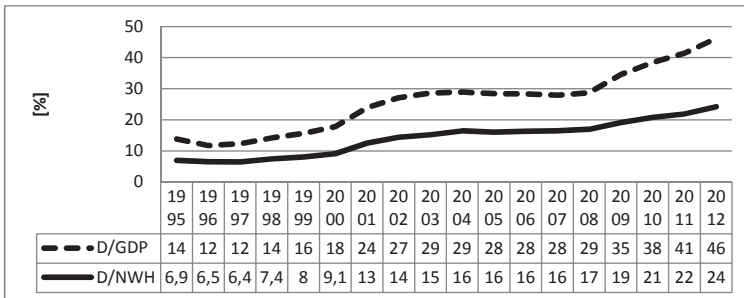
$$lag = year - \min(netNWH_y - NWH_y), y = 1998...year; year \leq 2012 \tag{2}$$

where  $netNWH$  equals the net wealth of households diminished by the government debt,  $year$  is the reference year and  $lag$  equals number of years between the reference year and the year in which the Net Wealth of Households was approximately the same as the Net Wealth of households diminished by the government debt in the reference year.

### 3 Results and Discussion

The  $D/NWH$  ratio in the Czech Republic grew for the period 1995 – 2012 with the exception of the years 1996-1997 and 2005. This corresponds with the drops of indebtedness measured by  $D/GDP$ , though  $D/GDP$  decreased in the period 2005-2007. The year-on-year rate of indebtedness is higher for the standard  $D/GDP$  indicator with the exception of 1996 and the period 2004 – 2007. This is possibly a consequence of the fact that during the boom (2004 – 2008) growth of the household net wealth was slower than growth of the net wealth of other sectors of the economy. This is then connected to the household investments into their own housing [4].

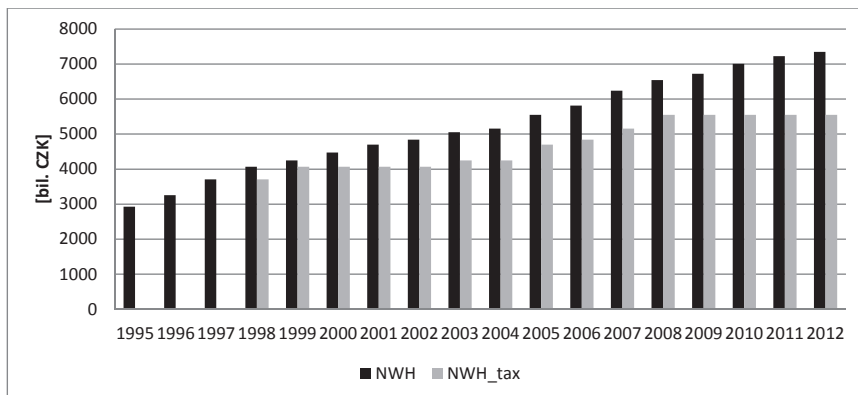
Figure 1. Debt to Net Wealth of Households compared to Debt to the Gross Domestic Product



Source: Authors

If we think about the  $D/NWH$  ratio as an one-off tax rate, then the household tax of 6.9% would be sufficient for repaying government debt in 1995. Households would have to pay a special 24.2% tax for repaying government debt in 2012 (figure 1). If the one-off tax  $t = 24.2\%$  was actually imposed, the decline would mean approximately 4-year loss of household net wealth. As figure 2 clearly depicts,  $NWH$  during the crisis years of 2008 – 2012 would fall to the level of  $NWH$  in 2005 after taxation.

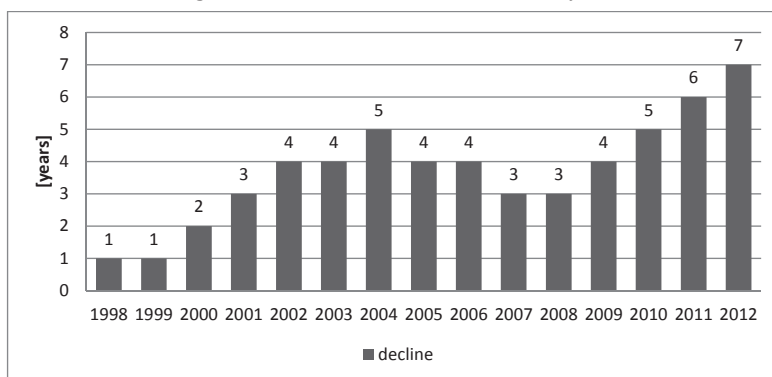
**Figure 2. The consequences of household tax on the Net wealth of households**



Source: Authors

Households would have suffered the largest decline if the one-off tax was imposed in 2012, when the decline would be 7 years, and then in 2011, 2010 and 2004. In theory the least painful taxation would be in 1998 or 1999 (figure 3), when the repayment of public debt would worth the households just one year of their wealth (especially because very low initial level of net wealth of households).

**Figure 3. The Net wealth of household's decline in years**



Source: Authors

When the simple linear regression without the intersection is calculated, then the relationship between the  $D/GDP$  and  $D/NWH$  is

$$\frac{D}{NWH} \approx 0.55 \frac{D}{GDP} \quad (3)$$

which is consistent with the fact that Czech Net Wealth of Households is approximately two times bigger than Czech GDP. This means that if the Maastricht threshold for government debt really was the critical value of the state indebtedness, a one-off household tax should be less than 33%. Insolvency occurs if an economic unit does not have net assets (wealth) that fully cover the debt. The threshold is then

$$\frac{D}{NWH} = 1 = 0.55 \frac{D}{GDP} \quad (4)$$

which means, that the critical government debt-to-GDP is

$$\frac{D}{GDP} = \frac{1}{0.55} = 181.8\% \quad (5)$$

It is clear then, that the Czech government debt to Gross Domestic Product should not outreach 182% GDP, at which level the Czech sector of households would be theoretically insolvent.

#### 4 Conclusion

Government debt is one of the most important economic indicators at the beginning of the 21th century. European countries especially focus their fiscal policy not only on the economic growth, but also on keeping government debt under a certain boundary, which should ensure sustainable public finance. The key indicator of D/GDP is, however, not satisfactory for both economic analysis and communication to the wider public. Therefore we have suggested a new indicator, D/NWH, in this paper. This indicator clearly expresses the real burden which the Czech government debt imposes on the every Czech household.

While at the beginning of the period 1995 – 2012, this burden was endurable (under 7% of net wealth of households), it has more than tripled by the end of this period. In 2012, the debt covered almost one quarter of Czech households' wealth.

We may argue that there is no need for new indicator like D/NWH as popular indicator *government debt per person* is regularly published. However, *government debt per person* has very low explanatory power from the voters' point of view. If the government debt per person is 180 000 CZK, does it mean that every citizen, including infants, could theoretically pay this sum of money? Certainly it does not. Furthermore, this sum could be difficult to imagine for a voter who earns just the minimum wage. On the other hand, it is quite easy for this voter to imagine, what one quarter of his possessions means. Nevertheless, it is clear that concept of a one-off tax is still just a theoretical tool, as debt-to-GDP ratio is.

The aim of this paper is not to propose a one-off wealth tax. However, the concept of a *flat* one-off wealth tax imposed on every household, regardless of its absolute magnitude of wealth, can show the seriousness of government indebtedness better than the hypothetical and artificial, yet still popular, debt-to-GDP ratio. There is no way how the government can get money for debt repayment from the Gross Domestic Product, so there is no reason for voters to keep a close eye on this abstract indicator. Debt-to-Net Wealth of Households on the other hand metaphorically threatens the wealth of every citizen, which may make them more careful about the fiscal policy of their state.

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# Modelling of Municipal Debt in the Pardubice Region

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## Abstract

Analysis of the indebtedness is an important tool for the finance analysis of the state, region, district or municipality. Currently, the indebtedness is monitored by the Ministry of Finance of the Czech Republic (MFCR) at the municipality level. It is realized by the Presentation system of financial and accounting information of state (UFIS). This system contains data for all municipalities of the Czech Republic (CR). It also issues annual information on the evolution of total debt of local budgets. In this paper two approaches of abnormality detection were compared that the abnormality represents the municipality indebtedness. Firstly, the approach of the UFIS on the basis of two monitoring financial indicators was used. Secondly, the data mining algorithms for identifying anomalous values were applied. The suggestion model works with real UFIS data set in the year 2011. The model outputs present sets of municipality indebtedness and the sets elements are compared on the basis of presented approaches.

*Keywords:* anomaly detection; data mining; debt; municipality; Pardubice Region

JEL Classification: H72

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## 1 Introduction

### 1.1 The Municipality and Its Definition

Local government is spatially defined functional unit, which alone has the right to decide their own affairs. A municipality as the basic territorial authorities and regions as higher territorial self-governing units are examples of local governments in the CR. According to the Act No. 128/2000 Sb., As amended, the municipality is defined as follows [4]:

- A municipality is a basic territorial self-governing community of citizens; it forms a territorial unit which is defined by the borders of the territory of the municipality.
- It is a public council which has its own property. The municipality acts in legislative relations in its own name and bears responsibility arising from these relations.
- It attends to the general development of its territory and to the needs of its citizens; in the fulfilment of its tasks it also protects the public interest.

The Act [4] also sets out how the municipality should manage the property entrusted to it. The property of a municipality must be used purposefully and economically in accordance with the municipality's interests and tasks ensuing from its competence as laid down by law. A municipality is obligated to attend to the maintenance and development of its property. The management of the municipality should work responsibly and ethically [26]. The municipality keeps accounting under the Accounting Act [3].

Role and functions of municipalities, their legally guaranteed independence and sovereignty, the opportunity to independently dispose of the financial and real property encouraged municipalities to the development of entrepreneurship. Needs of development of municipalities and efforts to remedy the neglected infrastructure were so demanding that their regular incomes [1, 16, 21] were not enough on their solutions. Therefore, in 1993 the municipalities began to refer to the capital market in a large extent [21]. High demands for capital expenditures of municipalities in the 90s led to high growth rates of municipal debt. Most of the capital expenditures of municipalities is directed to projects whose implementation will not bring any cash generation to pay off the debt [21].

For comparison of municipalities and analysis of various aspects of their functioning it is necessary to divide the municipalities into size categories according to the number of

population. There are several approaches to definition of the size categories [22]. However, the size categories by the Czech Statistical Office (CSO) are in Table 1. This categorization has also its importance for the division the rural and urban areas (however, this division is indeterminate largely). If it is necessary, the CSO uses the two thousand people as the limit to the definition of the size categories of municipalities [10].

**Table 1. Size categories of municipalities table**

to 1999 of inhabitants	2 000-4 999 of inhabitants	5 000-9 999 of inhabitants	10 000-19 999 of inhabitants	20 000-49 999 of inhabitants	50 000- 99 999 of inhabitants	100 000 and more of inhabitants
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Source: [10]

### 1.2 Indebtedness of Municipalities

The indebtedness of the public sector is often discussed issue at national, regional and municipal level [5-8, 12, 15, 19, 24]. Higher indebtedness of entity is usually perceived negatively, because debt has a cost in the form of repayment. For a correct evaluation of management it is necessary to consider other data on the financing of the municipality such as total assets, state on the bank accounts, share or total liquidity of foreign sources. The municipality may have high debt, but also large balances on current account and high liquidity, and this situation is different from the situation of the municipality with less debt but without finance on the current account and with the liquidity smaller than the one.

Bank loans from financial institutions, revenue of municipal bonds issued and repayable financial assistance, loans from the state budget and state funds rank among the resources that the municipality uses to financing of [21]. Banking institutions are the most common providers of loans to municipalities. Česká spořitelna, a. s., Komerční banka, a.s. and Československá obchodní banka, a.s. are a leaders in the provision of loans in the CR [20]. Municipalities can open a current account with selected banks. Under the Act [2], municipalities have obligation to open an account with the Czech National Bank (CNB). The Table 2 shows the indebtedness of cities and municipalities in the years 2001-2013.

**Table 2. The indebtedness of cities and municipalities in the years 2001 - 2013**

Year	Loans	Municipal bonds	Received repayable financial assistance and other debts	Total	Total real debt
2001	22.6	13.3	12.4	48.3	63.2
2002	27.3	15.9	12.6	55.8	71.7
2003	35.2	21.7	13.5	70.4	90.4
2004	38.5	23.9	12.4	74.8	93.4
2005	43.7	23.5	11.8	79.0	96.8
2006	47.1	22.9	10.9	80.9	96.7
2007	46.7	22.6	9.9	79.2	92.1
2008	47.4	22.7	10.0	80.1	87.6
2009	55.8	14.7	10.1	80.6	87.3
2010	59.9	15.8	7.6	83.3	88.9
2011	60.9	14.0	7.5	82.4	86.3
2012	68.3	13.8	7.9	90.0	91.3
2013	68.8	15	8.4	92.2	-

Source: [20]

Note: The indebtedness is in the bn. CZK, real debt is listed in the bn. CZK worth in 2013

The indebtedness or indicators of indebtedness indicate how the municipalities (and others) use debt to the financing of their activities. The analysis is the default step for its rating. It determines if the use of foreign sources has significance for the entity [23].

The Pardubice region lies in the east part of Bohemia. The neighbouring regions are – Central Bohemian region, Hradec Králové region, Olomouc region, South Moravian region and Vysočina region. The Pardubice region forms together with Hradec Králové region and Liberec region cohesiveness of the North-east (so called NUTS 2). It is on the fifth smallest region in the CR with its area of 4.519 km<sup>2</sup> (5.7% of the overall area of the CR). 64% of the region's area covers farmland where 44.2% belongs to an arable land. Forests cover 29.5% of the region's area [9]. Pardubice region consists of 4 districts – Chrudim, Pardubice, Svitavy and Ústí nad Orlicí. It had 451 municipalities in Dec. 31, 2013.

The objective of this paper is comparison of sets of municipality indebtedness in the Pardubice region. The sets were determined on the basis of two approaches. The first is UFIS approach which uses two monitoring financial indicators. The second applies data mining algorithms for identifying anomalies.

## 2 Material and Methods

### 2.1 Indicators

The indebtedness of municipalities is monitored and guided by the Czech Government Resolution of 12th November 2008, No. 1395, the monitoring of municipal finances. This monitoring methodology of the indebtedness has replaced the previous monitoring using indicators of debt service (by this indicator the indebtedness was monitored in years from 2004 to 2008) [27]. Informative and monitoring indicators for municipalities are monitored and calculated in the framework of monitoring, inter alia. The data to 31st December of the given year is important to the calculation and evaluation of results. The set of indicators  $U = \{u_{mn}\}$  where  $m$  is informative  $I$  or monitoring  $M$  indicator and  $n$  is number of indicator that  $n = 1, 2, \dots, 18$  and  $U$  is defined by the following way:

$$U = \{u_{11}, u_{12}, u_{13}, \dots, u_{112}, u_{M13}, u_{114}, \dots, u_{117}, u_{M18}\} \quad (1)$$

There are informative indicators  $I = \{u_{11}, \dots, u_{112}, u_{114}, \dots, u_{117}\}$  [28]: number of inhabitants of municipality ( $u_{11}$ ); total revenue (after consolidation) ( $u_{12}$ ); interest ( $u_{13}$ ), paid instalments of loans and bonds ( $u_{14}$ ); total debt service ( $u_{15}$ ), debt service (in %) ( $u_{16}$ ); total assets ( $u_{17}$ ); foreign sources ( $u_{18}$ ); state on bank accounts (total) ( $u_{19}$ ); loans and municipal bonds ( $u_{110}$ ); adopted repayable financial assistances and other debts ( $u_{111}$ ); indebtedness (total) ( $u_{112}$ ); proportion of indebtedness to foreign sources (in %) ( $u_{114}$ ); foreign sources per one inhabitant ( $u_{115}$ ); current assets ( $u_{116}$ ); and short-term liabilities ( $u_{117}$ ). Proportion of foreign sources to total assets (in %) ( $u_{M13}$ ) and current liquidity (or current ratio) ( $u_{M18}$ ) are monitoring indicators  $M = \{u_{M13}, u_{M18}\}$ . Calculations of these indicators: total debt service ( $u_{15}$ ), the debt service (in %) ( $u_{16}$ ); indebtedness (total) ( $u_{112}$ ); Proportion of foreign sources to total assets (in %) ( $u_{M13}$ ); proportion of the indebtedness to foreign sources (in %) ( $u_{114}$ ); foreign sources per one inhabitant ( $u_{115}$ ); and current ratio ( $u_{M18}$ ) are the following [28]:

$$u_{15} = u_{13} + u_{14} \quad (2)$$

$$u_{16} = u_{15}/u_{12} \quad (3)$$

$$u_{112} = u_{110} + u_{111} \quad (4)$$

$$u_{M13} = u_{18}/u_{17} \quad (5)$$

$$u_{114} = u_{112}/u_{18} \quad (6)$$

$$u_{115} = u_{18}/u_{11} \quad (7)$$

$$u_{M18} = u_{116}/u_{117} \quad (8)$$

The indicator  $u_{M13}$  shows the ratio of the indebtedness to total assets of the municipality (is computed as proportion of foreign sources to total assets). The value of this indicator should not be higher than 25 (in %). Municipalities are addressed by the MFCR and are asked to justify the unsatisfactory condition and the opinion of the regional office, if the value of indicator  $u_{M18}$  is in the range  $[0, 1]$ ; it means  $0 < u_{M18} < 1$  and value of indicator  $u_{M13}$  is greater or equal than 25% ( $u_{M13} \geq 25\%$ ).

The liquidity is next very important indicator. We understand it here as a measure of the extent to which organization has cash to meet immediate and short-term obligations, or assets that can be quickly converted to do this. In the process of determining the liquidity is necessary to cleanse the value of individual items. First of all it is necessary to adjust the value of the receivables, from which must be deducted overdue receivables and bad debts from current assets those that are not for sale [11, 18, 23].

Liquidity Ratios is the related term for the liquidity which indicates the company's (institution's) ability to turn short-term assets into cash to cover debts. Testing a company's (institution's) liquidity is a necessary step in analysing a company. Higher liquidity reduces the insolvency of the entity, which is important information for investors [23].

Common liquidity ratios include the current ratio, the quick ratio and the operating cash flow ratio. Different analysts consider different assets to be relevant in calculating liquidity. We are primarily interested in the current ratio, which is above mentioned indicator  $u_{M18}$ . The recommended value of current ratio for municipalities should be in the range (1.5, 2.5), should not fall under value 1 [17].

## 2.2 Modelling Methods

To create the model, we used cluster analysis and anomaly detection. Generally a data file can contain values that can be considered as extreme. These values are far from the mean, or very high or very low, or anomalous. Anomaly detection [13, 14, 25] identifies outliers by using cluster analysis. This model firstly identifies 'normal cases'. Similar cases fall into this group. Each case can be than compared to others cases in its peer group to identify anomaly. To each case is also assigned anomaly index  $A_i$ . The  $A_i$  is the ratio of group deviation index to its average over the appropriate cluster. Cases with the  $A_i$  greater than 2 are candidates to be detected as anomalous [25].

The specification of the method used to determine the cutoff value for flagging anomalies was very important step. Three following options were used [25]:

- 1st: minimum anomaly index level  $A_i^{min}$ . The  $A_i^{min}$  specifies the minimum cutoff value for flagging anomalies. Cases that meet or exceed this threshold are flagged
- 2nd: percentage of most anomalous records in the training data  $A_i^p$ . Automatically sets the threshold at a level that flags the specified percentage of cases in the training data
- 3th: number of most anomalous cases in the training data  $A_i^n$ . This option automatically sets the threshold at a level that flags the specified number of cases in the training data. The resulting threshold is included as a parameter in the model

## 3 Results and Discussion

### 3.1 Analysis of Selected Indicators

First, descriptive statistics were used for the input data analysis. Outputs are summarized in Tables 3, 4 and 5. The Table 3 shows the number of municipalities in each category, the consolidated revenue for the year 2011 for the categories and the total number of inhabitants in these categories.

Table 4 tracks the total municipal debt in 2011 by the size category. Municipalities are further divided into columns according to the districts where they belong. The total municipal debt is therefore the 2.375 billion CZK in the Pardubice region. The municipalities in the district Ústí nad Orlicí have the largest debt, a total of over 726 mil. CZK. The municipalities in the first

size category have the highest proportion of the debt, a total of 830 mil. CZK. If we compare these outputs regarding to population or number of municipalities, the results would have been different. The difference of revenue budgets in 2011 and 2010 is in the last column of the Table 4 - there was decrease in budgets revenue in all categories.

**Table 3. Number of municipalities in size categories**

Municipality category	Number of municipalities	Consolidated budget revenues	Number of inhabitants
1	417	3 205 736 670	197 340
2	17	1 106 752 600	53 937
3	7	1 197 224 140	50 826
4	8	2 420 994 680	101 420
5	1	630 143 740	23 240
6	1	1 873 004 520	90 401
<b>Sum</b>	<b>451</b>	<b>10 433 856 350</b>	<b>517 164</b>

Source: Authors based on [10]

The following Table 5 summarizes the indicators used by the MFCR to monitor municipal finances. As in the Table 4, values of indicators are related to the size categories of municipalities and their various districts. Municipalities in district Ústí nad Orlicí and municipalities belonging to category 2 have the worst average values of the  $u_{M13}$  indicator. Again, municipalities in district Ústí nad Orlicí and municipalities belonging to category 3 and 5 have the worst average values of the  $u_{M18}$  indicator.

**Table 4. The total municipal debt in 2011 by size categories and districts (in CZK)**

Category	District Chrudim	District Pardubice	District Svitavy	District Ústí nad Orlicí	Sum	Difference 2011-2010
1	137 567 800	167 971 180	341 294 510	183 910 710	830 744 200	-149 521 980
2	99 033 230	58 727 280	19 425 660	120 515 150	297 701 320	-33 781 130
3	71 701 530	7 649 690	22 340 820	122 646 540	224 338 580	-102 618 030
4	114 356 110	-	290 108 670	299 232 840	703 697 620	-323 704 340
5	112 805 060	-	-	-	112 805 060	-13 797 620
6	-	206 545 630	-	-	206 545 630	-448 464 800
<b>Sum</b>	<b>535 463 730</b>	<b>440 893 780</b>	<b>673 169 660</b>	<b>726 305 240</b>	<b>2 375 832 410</b>	<b>-1 071 887 900</b>

Source: Authors based on [10]

**Table 5. Monitoring indicators**

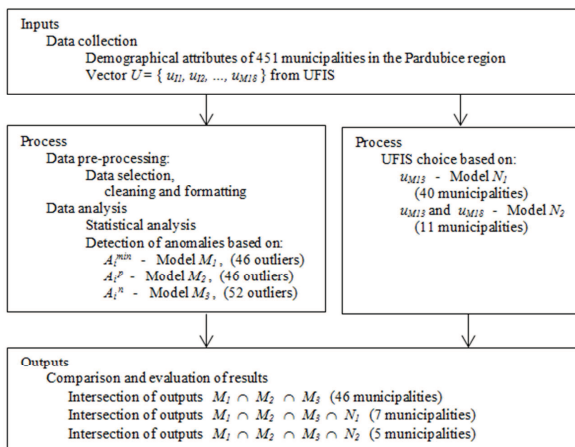
Category of municipality	District Chrudim		District Pardubice		District Svitavy		District Ústí nad Orlicí		Mean from	
	$u_{M13}$	$u_{M18}$	$u_{M13}$	$u_{M18}$	$u_{M13}$	$u_{M18}$	$u_{M13}$	$u_{M18}$	$u_{M13}$	$u_{M18}$
1	4.93	10.05	5.96	14.55	7.53	8.75	7.15	9.15	6.43	10.59
2	12.2	1.86	15.48	1.89	8.51	1.05	15.24	1.12	13.85	1.65
3	16.4	1.15	4.93	1.86	3.54	1.86	12.95	1.48	9.81	1.60
4	15.8	1.49	-	-	11.43	1.84	9.58	1.61	11.05	1.68
5	9.87	1.48	-	-	-	-	-	-	9.87	1.48
6	-	-	5.95	2.03	-	-	-	-	5.95	2.03
<b>Mean</b>	<b>5.59</b>	<b>9.36</b>	<b>6.45</b>	<b>13.54</b>	<b>7.61</b>	<b>8.44</b>	<b>7.67</b>	<b>8.41</b>	<b>6.85</b>	<b>9.92</b>

Source: Authors based on [10, 20]

### 3.2 Modelling of Municipal Debt

Pre-processed input data contained a total of 22 attributes and 451 objects (municipalities). Models for the detection of anomalies have been constructed according to the following Fig. 1. In modelling, we changed the settings in the node Anomaly Detection to determine the cutoff value for flagging anomalies. The minimum anomaly index level  $A_i^{min} = 2$  was set for the first model  $M_1$ . In this case 46 outliers were detected. Percentage of most anomalous records in the data  $A_i^p = 10$  was set in the second model  $M_2$ . By this model 46 anomalies were detected. The third model  $M_3$  used to determine the cutoff value for flagging anomalies number of most anomalous records  $A_i^n = 25$ . This model detected 52 anomalies.

Figure 1. Model of Municipal Debt



Source: Authors

If we make the calculation of the intersection of outputs  $M_1 \cap M_2 \cap M_3$  we obtain 46 objects. These are municipalities Barchov, Bystré, České Libchavy, Horky, Horní Čermná, Hroubovice, Choltice, Chornice, Chrudim, Janov, Jarošov, Krouna, Kukle, Labské Chrčice, Lichkov, Linhartice, Lukavice, Oldřiš, Pardubice, Poběžovice u Holic, Podhořany u Ronova, Pomezí, Prachovice, Radiměř, Rohozná, Ronov nad Doubravou, Rosice, Rozhraní, Seč, Selmice, Semánín, Semín, Slatina, Sloupnice, Srch, Stolany, Svitavy, Tisová, Třebařov, Třebosice, Ústí nad Orlicí, Valy, Vendolí, Vlčkov, Vračovice-Orlov, Zámrsk. This output can be further compared for the same year and region with the outputs of UFIS monitoring. For the  $u_{M18}$  indicator we found set of 40 municipalities with  $u_{M18} < 1$  and this set is named  $N_1$ . In the next step we compute  $M_1 \cap M_2 \cap M_3 \cap N_1 = 7$ . Municipalities Třebosice, Valy, Podhořany u Ronova, Vlčkov, Slatina, Semín, Hroubovice are in this set.

For the  $u_{M18}$  and  $u_{M13}$  indicators we found in UFIS set of 11 municipalities with  $u_{M18} < 1$  and concurrently  $u_{M13} > 25$  and this set is named  $N_2$ . In the next step we compute  $M_1 \cap M_2 \cap M_3 \cap N_2 = 5$ . Municipality Třebosice, Podhořany u Ronova, Vlčkov, Semín and Hroubovice are in this set.

A specialized data mining software IBM SPSS Modeler was used for the modelling.

## 4 Conclusion

To deal with the municipalities' finance analysis is highly desirable due to the long-term growth of the public debt of the CR and the growth of municipal debt of the CR. The presented text describes and defines the basic concepts of municipality, its finance and figures on the debt of municipalities in the CR. Subsequently, we focused on the regional level and we got data from

MFCR on the financial status of all municipalities in the region in 2010-2011. By [20] it was nationwide total of 559 municipalities with a pointer  $u_{M18} < 1$ . In addition, 84 municipalities had both two indicators critical, including indicator  $u_{M13}$ . At the level of the Pardubice region 40 municipalities do not meet the indicator  $u_{M18}$  and 25 municipalities do not meet the indicator  $u_{M13}$ . We used a more comprehensive evaluation based on data mining tools. For modelling, we used anomaly detection based on clustering analysis. We got the list of 46 municipalities which our model defined as abnormal on the basis of the data. All input attributes were used for these models and calculations.

Finally, we compared the sets  $N_1$  and  $N_2$  of high-risk municipalities with municipalities in the set which was computed on the basis of the proposed anomaly models  $M_1$ ,  $M_2$  and  $M_3$ . This linguistic term 'high-risk' is defined in [20] and MFCR works with this information. It means that MFCR sends an alert message and organizes a municipality audit etc. The intersections of achievement results ( $M_1 \cap M_2 \cap M_3 \cap N_1$ ) and ( $M_1 \cap M_2 \cap M_3 \cap N_2$ ) can decrease number of municipalities in the high-risk set.

In future work the modelling will be carried out on the basis of various clustering algorithms for finding groups of similar objects (municipalities). It is also possible to deal with the use of Case-based reasoning algorithm or Rough set theory for a decision on the basis of already existing cases and MFCR decision.

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# New Trends in the Evaluation of Public Contracts. The Lowest Tender Price or Economic Advantageousness of the Tender?

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## Abstract

This paper analyzes the application of evaluation criteria. In the discussion on a transparent and non-discriminatory procurement is necessary to examine the most appropriate way of assessing public procurement in the Czech Republic and in the European Union. The problems have been demonstrated on sample of a sample of contracts awarded by public contraction entities in the Czech Republic and other countries, especially European Union Member States and parties to the GPA. The goal is to find the best international practices and the use of appropriate evaluation criteria. Some assumption were confirmed, including in the Czech Republic, the trend assessment by the lowest tender price due to concerns allegations of unfair practices and formal approach to procurement, compared to the trend in the European Union (new procurement directives) and in foreign countries where the predominant evaluation according to value menus. The author gives recommendations to improve the quality evaluation of public procurement.

*Keywords:* public procurement; evaluation; criteria; lowest tender price; economic advantageousness; best evaluation practice

JEL Classification: H83

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## 1 Introduction

Evaluation of public contracts is the key phase of public procurement award procedure. The evaluation of public contracts is such phase of the award procedure where the “complete and suitable” bids of suppliers are compete according to the evaluation criteria known in advance.

### 1.1 Statutory Limits Assessment

According to par. 78 and 79 the Czech Law no. 137/2006 Coll., on Public Contracts, the basic evaluation criterion for the award of a public contract shall be

- economic advantageousness of the tender, or
- the lowest tender price.

The basic evaluation criterion in competitive dialogue shall be the economic advantageousness of the tender only. The contracting entity shall select the basic evaluation criterion according to the type and complexity of the public contract and indicate it in the contract notice or in the call for competition. If the contracting entity decides to award a public contract according to the basic evaluation criterion of the most economically advantageous tender, it shall always establish partial evaluation criteria, so as to express the relationship between the use value and the price. Such partial evaluation criteria shall be linked to the performance of the public contract offered. They may, in particular, involve [8]:

- a tender price
- quality
- technical merit of the performance offered
- aesthetical and functional characteristics
- environmental characteristics
- impact on the employment of people with disabilities

- operational costs
- cost-effectiveness
- sales and after-sales service
- technical assistance
- delivery period or period of completion
- other criteria which express the relationship between the use value and the price

Some criterion shall not be a partial evaluation criterion, such as:

- contractual terms and conditions, the purpose of which is to secure the obligations of the economic operator
- terms of payment
- qualifications prerequisites

If the basic evaluation criterion of the most economically advantageous tender is applied, the contracting entity shall accord relative weightings expressed in percentages to the individual partial evaluation criteria or establish another mathematical interrelationship between partial criteria. The established relative weighting accorded to individual partial evaluation criteria may be identical. The contracting entity shall indicate the partial evaluation criteria and the weightings thereof in the contract notice or in the call for competition or, where appropriate, in the invitation to submit tenders in restricted procedure or in negotiated procedure with publication or in the invitation for negotiations in negotiated procedure without publication or, if appropriate, in the invitation to confirm an interest to participate or in the competitive dialogue documentation. If the contracting entity is not objectively able to establish the relative weightings of partial evaluation criteria, it shall indicate the partial evaluation criteria in the descending order of importance attributed thereto by the contracting entity. The evaluation committee shall carry out the evaluation of tenders according to the evaluation criteria indicated in the documents pursuant. If the basic contract award criterion of the most economically advantageous tender is applied, the evaluation committee shall evaluate the tenders and establish the ranking thereof in accordance with the individual partial evaluation criteria and the relative weightings thereof. If the contracting entity has established partial evaluation criteria pursuant in the descending order of importance, the evaluation committee shall be obligated to evaluate the tenders in accordance with the partial evaluation criteria, and justify the assignment of specific values in respect of every partial evaluation criterion of a particular tender in the report on the assessment and evaluation of tenders for the selection of suppliers of goods, services and works [3], [9]. Selection of partial evaluation criteria should be associated with functional characteristics and subject of the authority should establish assessment method in accordance with the principle of transparency [13]. This legal framework has strong public aspects what is given by fact that there are spending public money (more about public aspects see in [12]).

### *1.2 Possible Practice and Possibilities How to Evaluate*

The above options have been identified contracting authorities to choose the evaluation criteria. The Public Procurement Act allows many variations how to evaluate public contracts and which criterion should be used. The Contracting authority has “right to choice”: lowest tender price or put various criteria of an economic nature [6], [10]. Even the contracting authority is not - if evaluated according to the economic advantage of offers of sub-criteria evaluation - used price. In the following chapters we put emphasis on the analysis of evaluation practice selection criteria.

## **2 Material and Methods**

That is the most complex in terms of the Czech Republic pays particular attention to [1], [15], their research supports the empirical analysis, while pursuing the influence of type of

award procedure on economic, effective and efficient allocation of resources and examines the role that the selection of evaluation criteria for effective allocation of resources. In this part of the analysis of data obtained by evaluation of the Information System on Public Procurement [17], the European Union Tender Electronic daily on Public Procurement [16] and the annual report on the use of electronic marketplaces[10]. In these electronic systems, author obtained information on public procurement, which are further used (see table no 1-3). USA data was obtained from the Government Point of Entry [4]. Always been considered the first above-threshold public contracts awarded in 2014. Eventually, public contracts corresponding above-threshold public contracts under the WTO Agreement on Government Procurement. Based on the analysis of data obtained is carried its evaluation compared with the practice in other countries. Consequently, measures are proposed to improve the practice of evaluation of public procurement. In this direction, this paper builds on the work and in particular [2], [14] who review contracts donated more from the perspective of the individual analysis of evaluation criteria such as not already. We are put more emphasis on international comparison. That is the main contribution of this paper.

### *2.1 The "Evaluation" Practice in the Czech Republic*

According § 6 decree no. 232/2012 Coll., on details of the scope of justification of purposefulness of public contract and statement of reasons for public contract<sup>6</sup> Justification of Delimitation of Basic and Partial Evaluation Criteria and of Manner of Tender Evaluation the contracting authority shall set forth basic and partial evaluation criteria in proportion to its needs. The contracting authority shall justify proportionality of setting forth partial evaluation criteria, where it applies the evaluation criterion of economic advantageousness of the tender and where a partial evaluation criterion of the tender price is subject to a lower weighting than

- 60 % in respect of public service contracts, or
- 80 % in respect of public supply contracts and public works contracts.

From the above, the Government Regulation on the Law on Public Procurement follows preference evaluate the state procurement with emphasis on price, respectively justify the evaluation of bids less than the weightings of the offer price.

### *2.2 Analyses of Evaluation in the Czech Republic*

As mentioned above, in the evaluation of procuring entities are competent to evaluate public contracts according to the lowest bid price or economic advantageous of the tender. Setting criteria should take into account the principle of best value (equivalent proportion between price and quality). Some aspects to the economic aspects of evaluation were already described [11]. Author chose in the framework of examining a sample of 25 the largest contracting authorities (see table 1). Next, author use information obtained from electronic marketplaces in the Czech Republic (see table 2).

**Table 1. Usage of basic Evaluation methods – period 1. 1. 2011 – 30. 9. 2014**

Procurement entity	Number of public contracts	Price of public contracts (thousands CZK)	Economic advantageousness (%)	Lowest price (%)
1. CEPRO, join stock company	146	222 769 686	64	36
2. Czech railway company	90	50 714 691	71	29
3. Railway Infrastructure Administration, state organization	346	46 809 905	76	24
4. NET4GAS, company	45	33 466 455	66	34
5. Road and Motorway Directorate of the Czech Republic	1235	31 171 762	81	19
6. OKD, join stock company	89	22 373 629	71	29
7. Czech Post, state company	206	19 262 784	78	22
8. Forests of the Czech Republic	1194	19 159 381	71	29
9. ČEPS, company	115	18 149 813	66	34
10. Prague Public Transit Company	87	17 512 616	80	20
11. Capital City Prague	399	16 086 728	74	26
12. Pilsner Public Transit Company	19	13 326 295	73	27
13. Ministry of Interior	472	12 602 129	81	19
14. Ministry of Finance	301	11 674 414	82	18
15. Ministry of Defense	489	9 126 047	90	10
16. ČEZ, join stock company	248	8 998 714	61	39
17. Usti Region	225	8 718 085	83	17
18. Brno City Municipality	523	8 412 751	87	13
19. The South Moravian Region	115	7 954 800	90	10
20. Moravian-Silesian Region	280	5 752 100	89	11
21. Ostrava City Municipality	461	5 330 747	82	18
22. Brno University of Technology	453	5 169 959	89	11
23. Vysočina Region	401	4 636 278	84	16
24. Pilsen City Municipality	257	4 572 522	83	17
25. Middle-Bohemia Region	245	4 772 121	81	19

Source: Author based on [17]

**Table 2. Basic Evaluation methods on electronic markets**

Years	Number of public contracts	Price of public contracts (without VAT)	Economic advantageousness (%)	Lowest price (%)
2012	13490	1.176 mld. CZK	89,76	10,24
2013	34816	3.364 mld. CZK	90,02	9,98

Source: Author based on [10]

From Table 1 and 2 is clear that at bellow and above thresholds public procurement also as at small scale public contracts awarded for electronic marketplaces is a basic evaluation criterion of the lowest price, an average of 80 to 90 percent in the Czech Republic. Lower rate of use of this criterion is found in sector contracting authority, but also there is the use of the criteria above average. Putting is probably due to the concerns of officials procuring public contracts at contracting authorities from allegations of lack of transparency. The next aspect leading to this behaviour is that frequent changes of official and the fact that evaluation according to prices is the easiest and don't requires expertise [5].

### 2.3 International Comparison

In the bellow table we are analyze using of basic evaluation criteria in some EU member countries and some countries which have international treaties with the EU (e.g. Norway, the United States of America).

**Table 3. Basic Evaluation methods in selected countries**

Country	Number of analyzed public contracts selected 2014	Publication of criteria in advertisement	Economic advantageousness (%)	Lowest price (%)
Austria	20	No	55	45
Belgium	20	No	51	49
Bulgaria	20	No	34	66
Cyprus	10	No	44	56
Czech Republic	25	Yes	15	85
Germany	20	No	40	60
Denmark	20	No	45	55
Estonia	10	No	25	75
Spain	20	No	30	70
Finland	20	Yes	33	67
France	20	No	45	55
Greece	20	No	32	68
Croatia	20	No	29	71
Hungary	20	Yes	38	62
Ireland	10	No	48	52
Italy	20	No	42	58
Lithuania	20	Yes	29	71
Luxembourg	10	Yes	44	56
Latvia	10	Yes	33	67
Malta	10	No	44	56
Netherlands	20	No	47	53
Poland	20	Yes	36	54
Portugal	20	No	41	49
Romania	20	Yes	31	69
Sweden	20	Yes	41	59
Slovakia	20	Yes	30	70
United Kingdom	20	No	41	59
Norway	20	Yes	43	57
Switzerland	20	No	39	61
Gibraltar	10	No	40	60
Jamaica	10	No	39	61
Republic of Macedonia	10	No	25	75
United States of America	20	No	43	57

Source: Authors based on [12], [2]

From Table 3 it follows that the basic criterion for evaluating the lowest tender price is the predominant criteria in particular in the newer EU members in the older Member States and other countries - MEMBER to the Agreement on Government Procurement - the basic criterion used more economically advantageous tender. That conclusion is supported not too large

number of analyzed public contracts awarded in 2014 by not drawing a distinction for supplies, services and works and particular types of contracts (construction of roads, entering consulting services, cleaning services, the supply of cars, etc. ), which would be beneficial.

#### *2.4 European Procurement Directives and Evaluation Criteria*

Without prejudice to national laws, regulations or administrative provisions concerning the price of certain supplies or the remuneration of certain services, contracting authorities shall base the award of public contracts on the most economically advantageous tender.

The most economically advantageous tender from the point of view of the contracting authority shall be identified on the basis of the price or cost, using a cost-effectiveness approach, such as life-cycle costing in accordance with Article 68 Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC, and may include the best price-quality ratio, which shall be assessed on the basis of criteria, including qualitative, environmental and/or social aspects, linked to the subject-matter of the public contract in question. Such criteria may comprise, for instance [4]:

- quality, including technical merit, aesthetic and functional characteristics, accessibility, design for all users, social, environmental and innovative characteristics and trading and its conditions;
- organisation, qualification and experience of staff assigned to performing the contract, where the quality of the staff assigned can have a significant impact on the level of performance of the contract; or
- after-sales service and technical assistance, delivery conditions such as delivery date, delivery process and delivery period or period of completion.

The cost element may also take the form of a fixed price or cost on the basis of which economic operators will compete on quality criteria only. Member States may provide that contracting authorities may not use price only or cost only as the sole award criterion or restrict their use to certain categories of contracting authorities or certain types of contracts. Award criteria shall be considered to be linked to the subject-matter of the public contract where they relate to the works, supplies or services to be provided under that contract in any respect and at any stage of their life cycle, including factors involved in:

- the specific process of production, provision or trading of those works, supplies or services; or
- a specific process for another stage of their life cycle, even where such factors do not form part of their material substance.

Award criteria shall not have the effect of conferring an unrestricted freedom of choice on the contracting authority. They shall ensure the possibility of effective competition and shall be accompanied by specifications that allow the information provided by the tenderers to be effectively verified in order to assess how well the tenders meet the award criteria. In case of doubt, contracting authorities shall verify effectively the accuracy of the information and proof provided by the tenderers [3].

The contracting authority shall specify, in the procurement documents, the relative weighting which it gives to each of the criteria chosen to determine the most economically advantageous tender, except where this is identified on the basis of price alone. Those weightings may be expressed by providing for a range with an appropriate maximum spread. Where weighting is not possible for objective reasons, the contracting authority shall indicate the criteria in decreasing order of importance.

### **3 Results and Discussion**

As summarized in Tables 1 to 3, Czech Republic used to evaluate public procurement mostly criterion of the lowest price (about 80 percent), and even small-scale contracts on

electronic markets (90 percent). We can state that this method is simpler and more transparent. However, it may lead to reduced quality of implementation of public procurement, which may be one reason for the lower quality built highways, bridges, etc. On the other hand greater emphasis on assessment according to the overall economic benefit we can watch in other countries. In this case, a greater emphasis on professional evaluation of the bids, which in the Czech Republic could ensure good law on the civil service that is not yet effective. Another problem is that if the Czech Republic and the authorities have decided to put more emphasis on evaluation according to economic expediency, lack a pattern of such procedures, for example. Evaluated as the ratio of price and heat saving in public buildings, etc. States of such evaluation methodology has not been able to made by the Czech State which puts more emphasis on formal aspects of public procurement, which is to be changed.

The new directive contain more detailed evaluation of the tenders treatment with an emphasis on the efficiency of the procurement process, especially taking into account the possibility of life-cycle costs, including external costs (e.g. impacts on the environment), while it is accepted into account the expertise of the team that will perform a public contract, in cases where this expertise has a significant impact on the quality of performance. In this article only discusses the guidelines for contracting authorities. According to Article 67 of Directive contracting authorities No. 2014/24/EU economically advantageous tender in terms of the contracting authority shall be determined on the basis of price or cost through cost efficiency, for example by life-cycle costs in accordance with Article 68, and may include the best ratio between price and quality, which is assessed on the basis of criteria that include quality, environmental and social aspects related to the subject of the contract. These criteria may include, for example: quality, including technical merit, aesthetic and functional characteristics, accessibility, design for all users of the social, environmental and innovative features, business, and its terms; organization, qualification and experience of the staff assigned to performing a public contract in the event that the level of public contract may have a significant impact quality of staff involved, or after-sales service and technical assistance, delivery conditions, such as delivery date, delivery method, delivery time or completion . Member States may provide that contracting authorities may use only price or only cost criterion as the sole criterion for the award of the contract or limit their use to certain categories of public authorities or certain types of procurement.

#### **4 Conclusion**

Comparing the choice of evaluation criteria in the Czech Republic and in other countries can be said that the Czech Republic is the vast majority of contracts to the lowest evaluated bid price. Such evaluation is the most transparent, but not always effective. Evaluation by the lowest tender price leads to the risk of low quality in the implementation of the subject of the public contract. When we compare the basic evaluation methods in the different states, we can conclude that in the developed countries is more common basic evaluation method the most economic advantageous of the tender (see table 3, e.g. Germany, United Kingdom), in the post-communist states is more common basic evaluation method according to lowest price (see table 3, e.g. the Czech Republic, Croatia, Estonia). This is given by wider experience and less impact on formal aspect of award procedure in the developed countries. For wider use basic evaluation criterion of the most advantageous of the tender in the Czech Republic absent a proven methodology. We should prepare complex evaluation methodology after implementing of new European Directive in 2016 [7]. This is necessary from the reason that is difficult to define the evaluation criteria and their weights and description and justification evaluation sub-criteria evaluation. Additionally there is a risk of subjectivity in deciding the evaluation committee, which members of the evaluation committee worried. New procurement directive, however, put on this method of evaluation greater emphasis.

In international comparisons, placing more emphasis on the evaluation of the economic benefits of that example Germany and Austria is obligatory membership in business (trade)



chambers, which oversees the activities of its members, which in itself leads to greater quality in public contracts. In this country do not even have the Public Procurement Act, a reference to compliance with procurement directives contained in the Act on Protection of Competition. In France, through general business conditions for construction work (FIDIC) solves complex construction problems (e.g. additional works). It is therefore recommended to learn from the international experience. However, if in the Czech Republic acceded to the evaluation according to the economic benefit, it would be necessary to prepare certified methodology such manner to carry out in relation to individual subjects procurement. Individual contracting authority is not able to effectively choose the partial criterion in the economic advantageousness of the tender.

The next topic for future work would be provide analyze concerning evaluation system, deeply international comparison and open discussion about the evaluation methodology. For example World Bank Consultants' Guidelines describe evaluation at selection of experts these criterion: consultant's specific experience (5 to 10 points), methodology (20 to 50 points), key personnel (30 to 60 points), transfer of knowledge (0 to 10 points), participation by nationals (0 to 10 points) – total 100 points.

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# Are Fiscal Illusions Real or Are They Just an Illusion? A Review of Contemporary State of Art

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## Abstract

This paper addresses some difficulties in designing empirical research aiming to obtain an evidence of a real existence of Fiscal Illusions – the concept well known within a theoretical economic literature for more than a hundred years. There is an extensive literature trying to demonstrate empirically the presence (or absence) of fiscal illusion in the real world. The results are not convicting, according to a classical Oates study (1988) and it seems to be confirmed by our review of current papers dealing with this topic. The contemporary empirical literature includes numerous highly relevant, instructive, and comprehensive papers dealing with many facets of fiscal illusions. One aspect, however, seems to be omitted. Econometric studies comparing within sample of governmental institutions on the same level certain measures as explanatory variables (e.g. complexity of the tax system, the share of subsidies, etc.) with the amount of public budgets, and the dynamics of their growth are mainly used in order to indicate the fiscal illusion. In fact, fiscal illusions may be used/initiated not as an attempt to increase (annual) budget expenditures but rather because of a) avoidance of voters resistance against given taxation volume; b) to govern easier, with lower transaction costs (e.g. with less pressure to demonstrate effective use of public funds...). These measures are inherently difficult to quantify. We discuss possibilities to replace their direct measurement by using some auxiliary indicators, such as number of officials and/or public employees, the relative level of wages in the public sector, the relative proportion of certain types of expenditure, etc.

*Keywords:* fiscal illusion; expenditures; slack theory; bureaucracy

JEL Classification: E62

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## 1 Introduction

In essence, the fiscal illusion hypothesis suggests the benefits and costs of governmental activity may be misconstrued by citizens. As a system error it leads to the fact that voters overestimate or underestimate the costs and benefits of public expenditure programmes. Since in the real world it is more likely to see fiscal illusions leading to underestimation of the amount of taxes, or rather of the amount of the costs of public expenditure programmes, it is suspected that the total amount of public expenditures, for which voters are willing to vote, is higher than it would be if illusions did not occur.

On the other hand, it should be noted that even well-known authors such as [6] or, in the Czech literature, [22] argues that the benefits of public production are not evident or difficult to measure, which leads to their systematic underestimation by the public. Downs says that even indirect taxes are more visible than many benefits resulting from public sector activities, so he is afraid of lower rather than an optimum level of public expenditures [17]. This opinion can be found in a number of academics who deal with the problems of the public sector and public administration in this country. However, this view, more or less intuitive (as far as is known, no empirical study to test this hypothesis has been published either in the Czech Republic or Slovakia), is contradictory to the obvious fact that a considerable part of the Czech public calls for intensive state intervention, either for higher expenditures or more regulation.

Although the intellectual genesis of the fiscal illusion concept goes back to J. S. Mill and J. R. McCulloch, it was Fasiniani, an Italian, who reintroduced the concept of fiscal illusion into the modern economic literature [5]. In his detailed treatise, published in 1941, he “rediscovered” the concept that was originally created by the Italian economist Amilcare Puviani. Puviani published his book *Theory of Fiscal Illusion* (*Teoria della illusione finanziaria*) in 1903.

Puviani himself based his theory on the nature of the state as the monopolist of power. In this sense, the national will is derived from the will of the ruling elite. The elite wants to minimize the resistance of those controlled, especially their resistance to taxation, so taxpayers are told in every possible way that the tax burden is smaller than it really is. In the quoted work, Buchanan points out that even within democratic fiscal systems we can find the same institutions in which Puviani can see fiscal illusions. What they have in common is that they are (or may be) accompanied by systematically incorrect estimations of the effects of taxes and public expenditures. Traditional fiscal illusions include:

1. Financing of public expenditures from the revenues of common property (quite relevant at the local level today, in transition economies with the use of privatization revenues).
2. Financing of expenditures by deficit. Deficit is always evaluated cheaper than increase in taxes.
3. Multi-source and indirect taxation encourages the demand for public goods more than simple direct taxation.
4. End payers are hidden under corporate taxes, social security and health insurance payments and withholding taxes paid by the employer.

Fiscal illusions, if they really exist, can play basically two roles: (1) They either play the role of tools in the hands of politicians and bureaucrats convincing voters to support more and more public expenditures, taxes and regulation on the basis of wrong estimation of expected costs, tax rates or benefit, or (2) they are an unintended (and perhaps compensated by other reasons) source of systematic distortion of the demand for public goods, as well as the willingness to pay for them. Economists would probably agree with the fact that some fiscal institutions may hinder the awareness and rationality of the voting behaviour of individuals in making collective political decision more than others. The question, of course, is how significant the distortion is, or to what extent the rational expectations of voters will be applied (for more about the relation between fiscal illusions and rational expectations see [7]).

Fiscal illusion is, "very tantalizing, but empirically elusive, phenomenon" [17]. There is an extensive literature trying to demonstrate empirically the presence (or absence) of fiscal illusion in the real world. The results are not convincing, according to that classical study.

This paper reviews available papers presenting empirical research aiming to obtain "a proof" of the real fiscal illusions existence. It seeks to explain why the results of such studies differ quite a lot and they can be hardly interpreted as clear evidence.

In order to do that, more than hundred papers were investigated. The first set of papers was found mostly within JSTORE and Google Scholar browsers using simple expression "fiscal illusions". Other resources were tracked from cited literature. The Public Choice journal has been dealing with this subject for a long time and dozens of interesting studies have been published there.

The objectives of this paper are:

1. To present a comprehensive review of current empirical studies published in this field in order to find out the scope of methods and approaches used in order to confirm fiscal illusions' presence.
2. To addresses some difficulties/weaknesses in prevailing empirical research design.
3. To propose and to support an additional method of measurement.

## 2 Results

### 2.1 Fiscal Illusions in Current Economic Literature

Economic literature is full of studies that deal with development and testing of various hypotheses aimed at measuring of the impact of fiscal illusion. At this point, it is necessary to state the frequently cited study [17], the work of [4] and another study of [25]. [25] among other things, extends the concept of fiscal (i.e. relating to public revenues and expenditures) illusions and speaks about (public) *politics* of illusion. In his view, illusions manifest themselves

particularly strongly in the support of high costs (in the form of loss of benefits) arising from the implementation of regulatory functions of government. He says that the Competitive Enterprise Institute ([www.cei.org](http://www.cei.org)) estimates the costs of federal regulatory politics in the USA for about \$ 700 billion per year, which is approximately 2,500 USD for one American. The problem is that there is not only one regulatory action whose consequences could be likened to the tax system in which the taxpayer pays one tax. Regulations are rather similar to the system with a large number of small excise taxes and their burden variously overlaps, comprises and revokes.

Various authors, of course, differ in whether real data can serve as evidence of the existence of different types of fiscal illusions, respectively if they can be used as explanatory variables in monitoring development of public expenditures. For example [21] experimentally tested the Mill hypothesis that the tax burden resulting from indirect taxes is often underestimated, because these taxes are less visible. The results show that this underestimation occurred, as opposed to just as high direct tax. In a referendum on taxation and redistribution of tax yield, the study discovered the effects of fiscal illusion affecting these democratic decisions and leading to excessive redistribution. However, authors suggest that sooner or later voters will learn to overcome fiscal illusions.

The study Fiscal illusion and the demand for government expenditures in the UK [12] offers similar conclusions. The authors completed the model of demand for government expenditures, which uses the data from the period 1955-1994, with variables which show (as estimated by the authors) two main fiscal illusions, tax visibility and the share of deficit financing in expenditures. According to their interpretation of the results, deficit financing can be regarded far less as an "illusory plan to hide expenditure growth from voters" as a short-term necessity resulting from the impact of external shocks on the balance of income and expenditures. With regard to indirect taxes, it has been proved that the government more and more relied on them to sustain higher government expenditures, which is consistent with the hypothesis of the fiscal illusion. However, the authors note that the data confirm the hypothesis that governments use the most profitable taxes at a given tax rates to finance their expenditures (and they simply tend to be less visible). In addition, there is no evidence that fiscal illusions played a role of tools resulting in the increase in future expenditures above the level supported by taxpayers nowadays. At current rates of indirect taxes it is hard to believe that these taxes will remain "less visible". However, if the government tried to replace indirect tax yield with direct tax yield, it would be very difficult to maintain the current level of expenditures.

The same authors reached a bit different conclusions in a later study [13], when they examined errors in the estimates of the tax burden of value added tax (VAT) as the main indirect tax. They showed the evidence of systematic distortion toward the *overestimation* of the tax burden, which is in contrast to the assumptions reported in theoretical literature dealing with fiscal illusions.

[2] suggested the possibility how to reach more unambiguous results when testing the presence and influence of fiscal illusions. The nature of their approach is the distribution of the "size of the public sector" ("*government size*"). In particular, they distinguished the real growth from the expenditure growth; they separately examined the extent of transfers and of government expenditures on goods and services. In the cited article, they say that they managed "quite well" to explain the changes in the size of the public sector in the post-war period, which is in sharp contrast to the weak empirical support of many explanations that attempt to approach the size of the public sector as an aggregate quantity. As regards fiscal illusions, they found that the extent of government purchases (as opposed to transfers) can hardly be explained within the so-called excessive explanation, i.e. the presence and influence of fiscal illusions deliberately used in order to satisfy the interests of politicians or bureaucracy have not been proved in this part of government expenditures. On the contrary, the results suggest that the revenue generated by fiscal illusions were used primarily to support the increase in transfers. The authors however claim that "the evidence suggests that the responsive interpretation serves as a better explanation of the growth of public sector than excessive views do". [2]

The conclusions of the previous research are consistent with Tabellini's idea [24]. According to it, the bigger the size of the public sector is, as measured by the number of employees, the more government motivation we can find to provide benefits to specific groups of recipients and not to provide classic public goods. "In all political systems, governments have a strong motive to provide a less amount of public goods which all benefit from. Instead, they prefer to focus on the satisfaction of influential interest groups or to provide decent rents for themselves. Targeted benefits are far more effective tools for winning elections, compared with general public goods. A politician needs only majority support to stay in power. In fact, it is often only the support of a relatively small core group that is sufficient. It is therefore waste for politicians to provide benefits for all." [24]

In his article, [24] also comes with another interesting idea. On the expenditure side, we can meet a specific fiscal illusion - typically in connection with increasing expenditures on education and healthcare. They may commonly represent only "targeted redistribution", if they are not associated with a real increase in the quality of human capital, the number of students, years of schooling, knowledge, etc. "What is called expenditures on education may in fact be (only) higher wages for public employees with zero impact on quality improving of public services." [24]

While the most traditional fiscal illusion, which is probably the complex and opaque system using indirect and withholding taxes, is not so convincingly empirically demonstrated, the situation is different with some other types of fiscal illusions. A good example is the use of yield from the property of municipalities, respectively an analogous case in which municipalities use the yield from municipal services as a source for their budgets. In his research, DiLorenzo confirmed that cities that use this source have higher expenditures compared to those that do not [9]. The results were similar to [10]. Dowell examined the relationship among the provision of local public services, fiscal illusions and the use of the income from municipal power companies. Dowell examines the link between fiscal illusions and the so-called flypaper effect. This term describes the known phenomenon of the existence of subsidies causing higher expenditure growth than would correspond to the amount of subsidies received - money generates more money. Rich economic literature traditionally deals with this phenomenon too but to follow it would exceed the aim and scope of this paper. We would like to mention at least these three works [17], [11], [23].

The conclusions from [19] can be well used to sum up this part of our paper. The study dealt with the first test of the hypothesis of fiscal illusion based on international comparisons. The authors stated that they had not found any support for the hypothesis in either of the two following options: (a) Countries that rely more on direct taxes do not show lower income growth, which is in contrast to the assumption that increased visibility of direct taxes leads to greater political difficulties in increasing them, (b) Countries with more diversified tax systems do not show higher tax revenues, though the theory would assume a greater ability to "hide" tax increases. Why is it that they did not confirm the "traditional truth"? *The problem may be in the theory itself, methods of its testing, or both.* "We could just be wrong about which taxes are less visible or annoying for voters... We should also note that our results in fact do not exclude the idea that voters realize or that they mind some taxes more than the others. In fact, they simply refute the idea that these differences in voters' reactions are sufficient to affect the government's income policy. Maybe governments have little choice which taxes they can increase, and maybe at the same time they have in mind other context (e.g. consequences for external trade, justice, economic growth, political support from key sectors)..." [19] It is necessary to realize that in the interpretation of Royeda and Borrelli the hypothesis of fiscal illusion is based on the fact that government effort to minimize resistance to taxes is the dominant form of motivation in determining the tax system. It is obvious that this is rather one-sided interpretation. In our view, the hypothesis of fiscal illusion (and rather the above mentioned Wagnerian hypothesis of "politics of illusion") leads more to the extent spending and the frequency and intensity of government interventions, whereas the impact of taxation and revenue is rather significant, but after all mediated.

To assess the real impact of fiscal illusions we consider Kornay's opinion [14] to be more relevant than some other sophisticated empirical studies. He is undoubtedly better acquainted with the realities of transition economies. He explains the results of the researches that point out the persistent tendency of the public (at least two-thirds) in the post-socialist countries to expect paternalistic behaviour from the state partly by fiscal illusions. He states: "In my opinion, the respondents in favour of the paternalism were influenced by the two circumstances. Firstly, it was not clear to them what price, in the form of huge tax, the public must pay for ostentatiously free health care, university education, ... Let's consider, for example, that the wage tax and social and health insurance benefits paid by employees and employers in the Czech Republic, Hungary, Poland and Russia are already about 50 percent of gross wages or more without considering other forms of taxation. ...I think people would respond differently if the question was put in another way, in other words, if respondents were better informed about the tax "price" ... and were given alternatives from which they could choose." [14]

We would perhaps only add that it is not maybe the case of general underestimation of the tax price, it is rather the case of overestimation of impacts of the tax system, especially its progression rate from the side of citizens. They may often feel that they *themselves* are able to avoid the tax price and that somebody else will pay for benefits. In essence, it is a manifestation of a complicated system full of symbioses and parasitisation. We have learned to see the state as a very useful tool for the promotion of group interests, besides there is no other possibility as the ethos of the nation state as a bastion, community spirit, the nation's representative and a successor of a sovereign ruler has fallen. The quote "*Government is the great fiction through which everybody endeavours to live at the expense of everybody else*" by Frédéric Bastiat [1] is topical even more than any time before. The "demand for paternalism", respectively breeding ground for paternalistic efforts of some politicians, bureaucracy and elites originates from this.

There are several scholars convinced deeply that fiscal illusions not only exist but they are measurable. Dell'Anno and Dollery apply really sophisticated research methods in [8] to obtain EU countries' "fiscal illusion indexes". They estimate an index of fiscal illusion for 28 European countries over the period 1995–2008 employing a structural equation approach - based on statistical relationships among latent (i.e. unobservable) and manifest (i.e. observable) variables. The SEM approach is an extension of the general linear model that simultaneously estimates relationships between multiple independent, dependent and latent variables. In this sense, the SEM includes factor analysis and multivariate regression as special cases. It thus integrates two important aspects of economic analysis: (a) variable measurability and observability and (b) the causal relationship between them. The paper concludes that the chief determinants for the deployment of fiscal illusion strategies are the share of self-employment on total employment, the educational level of citizens, and the size of tax burden. At the same time, policy makers attempt to 'conceal' the real tax burden by means of debt illusion, fiscal drag, wage withholding taxes, as well as taxes on labour. According to their ranking, those countries with the highest public indebtedness also have the highest levels of fiscal illusion [8].

### 3 Discussion

The contemporary empirical literature includes numerous highly relevant, instructive, and comprehensive papers dealing with many facets of fiscal illusions. Most of econometric studies compare within a sample of governmental institutions on the same level certain measures as explanatory variables (e.g. complexity of the tax system, the share of subsidies, etc.) with the amount of public budgets, and the dynamics of their growth are mainly used in order to indicate the fiscal illusion. They actually do not suggest any clear evidence in favor of fiscal illusions [17], although they bring numerous proofs of very weak ability to assess tax burden and other fiscal parameters by general public. [20] conducted a nation-wide and representative survey in Sweden. Respondents systematically and significantly underestimate the share of an ordinary worker's income that is transferred to the public sector. The study suggests it happens mainly

because of misperception derived from seemingly deliberate tax design and tax labeling, as appears to be the case with the pay-roll taxes in Sweden.)

One aspect, however, seems to be omitted. We believe, fiscal illusions (*in the way Puviani and Buchanan define them*) may be used/initiated not only as an attempt to increase (annual) budget expenditures but rather because of a) avoidance of voters resistance against given taxation volume; b) *to govern easier, with lower transaction costs (e.g. with less pressure to demonstrate effective use of public funds...)*. Although these measures are inherently difficult to quantify, we believe it is a promising concept to be exploited in order to test fiscal illusions presence.

The latter is directly inspired by the slack-maximizing bureaucrat theory [26]. It has been a reaction on classical Niskanen's model of budget maximizing bureaucrat [16]. To maximize the size of his budget, a bureaucrat would have to reduce the price charged to the sponsor (politicians) to the level of his costs, eliminating productive inefficiency. This means that there would be no discretionary funds available for increased staff, perquisites of office, high salaries etc., over and above what is minimally required to produce the services of the bureaucracy [3] It is obviously not a typical case. "Slack-maximizing" models of bureaucracy [15], [3] seem to be much closer to the reality. In these models, the bureaucrat tries to maximize the difference between his revenue and the minimum cost of production. [18] uses the term "fiscal residuum". This slack can then be used to purchase whatever non-productive expenditures the bureaucrat desires [26]. It seems reasonable to assume, politicians may prefer similar slack - under nontransparent fiscal environment preventing the voters to assess precisely expected costs and benefits - to maximize the difference between revenues and necessary cost of "promised" public goods in order to make their life easier.

Let's suppose this assumption is true. It would give a sense to *replace above mentioned explained variables as total public expenditures, etc. for some auxiliary indicators, such as number of officials and/or public employees, the relative level of wages in the public sector, the relative proportion of administrative expenditure, etc.*

#### 4 Conclusion

The contemporary analysis of the existing empirical literature is instructive, comprehensive and covers quite a lot of facets of the fiscal illusions. One aspect, however, seems to be omitted. Econometric studies comparing within sample of governmental institutions on the same level certain measures as explanatory variables (e.g. complexity of the tax system, the share of subsidies, etc.) with the amount of public budgets, and the dynamics of their growth are mainly used in order to indicate the fiscal illusion. In fact, fiscal illusions may be used/initiated not as an attempt to increase (annual) budget expenditures but rather because of a) avoidance of voters resistance against given taxation volume; b) *to govern easier, with lower transaction costs (e.g. with less pressure to demonstrate effective use of public funds...)*. These measures are inherently difficult to quantify. Inspired by the slack-maximizing bureaucrat theory we propose some alternatives to replace their direct measurement by using some auxiliary indicators, such as number of officials and/or public employees, the relative level of wages in the public sector, and the relative proportion of certain types of expenditure.

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# Political Business Cycle in Local Government. Case Study of Czech Municipalities

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## Abstract

The politicians use some economic instruments in order to influence and get the most potential voters in upcoming elections. Specifically, politicians at local level use mainly public expenditure, especially public investment and expenditure on various projects that are so apparent that they may influence voters in their electoral decision-making. The aim of the paper is to examine whether changes in public expenditure of Czech municipalities, specifically in expenditure on non-investment transfers and on public investments, are affected by electoral cycle. The study analyses expenditure of all Czech municipalities over the period 2003-2013 and uses correlation analysis. Conclusions show that analyzed expenditure is influenced by the political business cycle.

*Keywords:* political business cycle; local government; municipality; Czech Republic

*JEL Classification:* H57, G14

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## 1 Introduction

Behavior and activity of politicians especially gets influenced the rational motive to be re-elected in elections among other factors. For this purpose the politicians use some economic instruments in order to influence and get the most potential voters. Explanation of this issue is provided by theory of political business cycle that conceives politicians as rationally behaving actors acting on the political market [5] with effort to influence decision-making of voters in their favour.

With the idea of political business cycle, [11, 9, 10] came among the first. They assume opportunistic parties and irrational voters. [7] uses different view. Rational voters search political party whose program meets their preferences. Both models found their followers and elaborators. In 1980s there is emerged new approach based on rational expectations of voters [15, 14] and [1, 2] come with rationally ideological model. More recent studies, which confirmed existence of political business cycle, were performed by [6, 13, and 17]. [4] concluded that political business cycle may also be "shrouded" by manipulations of politicians with public expenditure. This means that at first glance manipulation of politicians with the economic instruments may not be apparent. Nevertheless, all of the above studies have an identical conclusion that politicians have sought to influence the outcome of elections through instruments fiscal policy, especially public expenditure.

Also in the Czech Republic there are some studies dealing with political business cycle at local level [20, 18, 8 and 3]. Results of these analysis leads to the conclusions that based on economic impacts of political decisions of central government there can be assumed the existence of political business cycle.

At the level of local governments (municipalities) can be also expected political business cycle because politicians have similar aim as politicians at central level, ie. be re-elected. But political business cycle at local level will probably have their specificities resulting primarily from limited possibilities of local politicians to use economic tools to influence potential voters. The extent of politicians' influence is determined by the type of fiscal federalism in the country.

## 1.1 *Fiscal Federalism in the Czech Municipalities*

In the Czech Republic there is so-called mixed model of fiscal federalism. It means that the revenues of municipality include both municipality's own revenues (tax, non-tax and capital revenues) and subsidies from the state budget and EU funds. The largest part of tax revenues is "shared" taxes that are distributed on the basis of the Act on Budgetary Allocation of Tax Revenues and thus the distribution of tax revenues is strongly influenced by the decision of the central government. Although municipalities may influence the coefficients of property tax (so-called ...) and implement local fees, the laws define the limits and types of local fees and property tax too. It significantly reduces possibility of local politicians to determine amount of revenue in the municipal budget and it also means that local politicians cannot influence potential voters by manipulation of taxes. Also subsidies (from state budget or EU funds), except for contribution to performance of state administration, are discretionary grants. Municipality does not have legal entitlement. The only truly own income of municipality that may be influenced by decisions of local politicians are capital revenues.

In public local expenditure ordinary and capital expenditure are differentiated. Ordinary expenditure includes expenditure on public local services that municipalities have to provide. In this area the political business cycle could be discover how politicians try to influence the decision of voters in election through increasing expenditure on these services.

Furthermore non-investment transfers belong to this expenditure. They are non-equivalent payments to individuals, legal persons or non-profit organizations. Through them, politicians support sport, culture, civil associations or various educational facilities. Capital expenditures (investments) are used for various projects such as building or repair of local roads, reconstruction of the church, school, football field or building of playground. It can be assumed that the distribution of non-investment transfers and using investment represents "only truly visible" activities local politicians in the eyes of inhabitants in municipality. Therefore there can be expected political business cycle.

Investments and relationship between them and political business cycle are explored by one of the few Czech studies on this topic [16]. They tested expenditure of 205 Czech municipalities in 2001 -2007 and the results confirm the existence of political business cycle and opportunistic behavior of politicians.

The aim of the paper is to determine whether changes in public expenditure of Czech municipalities, specifically in expenditure on non-investment transfers and on public investments, are influenced by electoral cycle, ie. whether there can be identify political business cycle at the level of Czech municipalities. Partial goal is to verify the effect of decentralization on existence of political business cycle in the Czech municipalities, ie. impact size of municipality (in terms of population) on public expenditure in pre-election year. Partial goal is based on assumption that, especially in small municipalities, voters decide based on their personal experiences with the candidates or by mutual friendly relations than on the basis of activities politicians during the previous election period. Thus, candidates have very limited opportunities to influence potential voters by economic tools.

## 2 **Material and Methods**

For the analysis the data from system of Ministry of Finance of the Czech Republic were used in 2003-2012. The analyzed period covers two election cycles, municipal elections were held in 2006 and 2010. To the analyse data from 2002 could not be included, although it was also an election year, because there were not available complete data.

According to the budget structure there was selected expenditure of all Czech municipalities identified as §521 - Non-investment transfers to business subjects, §522 - Non-investment transfers to non-profit organizations and similar, §523 - Non-investment and non-subsidy transfers to business subjects, §524 - Non-investment and non-subsidy transfers to non-profit organizations and similar and class 6 - Capital expenditure.

Selected data were adjusted for inflation, recalculated to the base year 2003 and divided into 12 groups according to the size of municipality (Table 1). Distribution of all municipalities into 12 size categories is based on the structure of the originals date which authors had available.

**Table 1. Distribution of Czech municipalities by size category**

Size category	Number of residents
1	0 – 100
2	101 – 200
3	201 – 500
4	501 – 1,000
5	1,001 – 2,000
6	2,001 – 5,000
7	5,001 – 10,000
8	10,001 – 20,000
9	20,001 – 50,000
10	50,001 – 100,000
11	100,001 – 1,000,000
12	Over 1,000,000

Source: Authors

For each group there are 10 annual data on expenditure of non-investment transfers and investments which are therefore labelled  $cost_{ij}$ , where  $i \in \{1, 2, \dots, 12\}$  indicates the group to which the given data belong and the index  $j$  in turn indicates the year while there applies that  $j \in \{1, 2, \dots, 10\}$ . Expenditures in individual municipal size categories were expenditure  $cost_{ij}$  recalculated into expenditure per resident ( $costres_{ij}$ ) and from such adjusted expenditure were determined time moving averages ( $\bar{x}_{ij}$ ) that are always based on three consecutive years. For analysis of the dynamics of expenditures on transfers and public investments we operate with differences in absolute values of expenditures in individual years:  $difcost_{ij} = costres_{ij} - \bar{x}_{ij}$

From the values were determined dependencies of differences in expenditures on non-investment transfers and investments on whether there did or did not take place elections. There was verified a dependency of whether the size of a municipality has within the election period any effect on the change in municipal expenditures (per capita) outlaid on transfers and public investments. There was carried out a correlation analysis of dependencies between differences in expenditure per resident  $difcost_{ij}$ , with the parameter  $elect_j$  (1 = election year, 0 = non-election years) and the size of a municipality  $i$ . The calculation of correlation coefficient was carried out using the formula:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}} \quad (1)$$

where  $x$  and  $y$  are random variables.

It is necessary to take into account that applied methodology has its limits relating primarily to the field of municipalities financing in the Czech Republic. Correlation analysis is not able to capture significant changes in revenues and expenditures of municipalities affected by other factors than political cycle (subsidies from European funds; change of the Act on Budgetary Allocation of Tax Revenues). Due to these limits, the dependent variable is difference between expenditure and moving average in the size category of municipalities for the last three years. At the same time, this approach allows to compare expenditures in election year with moving average of expenditures for last three years preceding election year.

### 3 Results and Discussion

At the beginning there were analysed changes in volume of non-investment transfers and changes in volume of investments according to election and non-election years. These average differences were recalculated to the per capita basis with using moving average. Results are shown in Table 2.

**Table 2. Average difference in non-investment transfers and in investments**

	Non-election years	Election years
Average from the difference in investments	-0.09362	0.371336
Average from the difference in transfers	-0.01373	0.053869

Source: Authors

As from the data evident, for non-investments transfers there are recorded only very small changes in election years. There may therefore observe that municipal politicians do not use transfers as a tool for influencing voters. On the other hand, within analysis of investments we find out that in election years there comes to a significant average difference in expenditures on investments. These conclusions are supported by further analysis presented in Table 3 where percentage of positive differences is calculated. Positive differences indicate what percentage of analysed expenditures' items is higher than the corresponding moving average.

**Table 3. Percentage of positive differences**

	Percentage of positive differences	
	Non-election years	Election years
No-investment transfers	0.458333	0.500000
Investment	0.37500	0.708333

Source: Authors

As Table 3 shows for investments, the difference significant increase between election and non-election years. It can be said assumption that political business cycle is identified in expenditure on investments. On the other hand, there is no significant difference for non-investment transfers.

More precise results are obtained using correlation analysis and linear coefficients. There are monitored values of differences in investment and differences in non-investment transfers depending on election and depending on size of municipality. That is followed by another correlation which examined the impact of size of municipality on non-investment transfers and on investments in electoral and non-electoral years. Results are in Table 4.

**Table 4. Results of correlation analyses, correlation coefficients**

	Elections	Index size of municipality	Index size of municipality	
			Non-election years	Election years
Transfers	0.100916	-0.00101	0.084980	0.367483
Investments	0.317032	-0.00245	0.055874	0.242804

Source: Authors

The results of correlation analyses confirm that there was not established the relationship between election and an increase in expenditure on non-investment transfers. Similar conclusion applies to relationship between size of the municipality and non-investment transfers. However, when the analysis is divided into electoral and non-electoral years, the results are different for non-investment transfers. The data for election years show a moderately strong linear relationship between non-investment transfers and elections. There can therefore be express the conclusion that the size of municipality has an impact on the amount of non-capital transfers in election years.

Already previous tests have shown that political business cycle can be demonstrated for investment. Also the results of correlation analysis have similar conclusions. Regarding relation

of the size of the municipality and increase in expenditure on investment, the results are similar to the non-investment transfer. Then, there can be created conclusion, that the size of municipality has impact on the amount of investment in election years. There was not confirmed assumption that voters make decision in elections on the basis of familiarity with political representatives in the council, particularly in small municipalities. Limiting factor in these findings is the small number of data analysed for the election years.

Thus, the analyses confirm the existence of political business cycle in local public expenditure, as [16]. Unlike [16], this study explores data for all municipalities in the Czech Republic.

Finding also builds on research conducted by Portuguese authors [19]. They examined investment of municipality as expenditure which inhabitants can directly see in the form of various building projects in the municipality. According to their results, in election year there is increase capital expenditure aimed to “visible” investment projects.

This study did very similar conclusions. Politicians try to influence voters’ decisions by increasing expenditure on investment, especially in election year, and thus increase their chances of re-election. Therefore, there are completed, respectively approved, many projects in the time immediately before the municipal elections, which are held at the beginning of autumn in the Czech Republic. It means that municipal politicians behave rationally and pragmatically. They also assume that their potential voters are informed very well and pragmatic those observe politicians’ care about their inhabitants. However, how [16] point, in the Czech Republic conditions public investment to various projects may be at the same time the cause of none-election of politicians. That is, where a politician is seen as on part of the corruption environment in the municipality relating to the construction of public projects.

As it was shown, expenditure on transfers is not significantly changed, some change occurs only in an election year. It can be so again lean towards [19] – politicians prefer the “visible” expenditure on public projects. Nevertheless, non-investment transfers have some potential to influence of potential voters in municipality. Their distribution is on-going without clear and objective rules in most municipalities in the Czech Republic. [12] Politicians can expect to increase their electoral votes from among those who non-investment transfer was allocated in election year.

When interpreting results of analysis, the limits of methodology must be taken into account as mentioned above. They are connected with financial management of municipalities. These changes in monitored period (2003-2008) were caused by e.g. projection of finances from European funds to budgets of Czech municipalities. It has led to demonstrable growth public spending on investment. Other factors include e.g. significant changes in budgetary allocation of taxes. Such change has occurred in the reporting period in 2008. In practice, this change meant an increase in tax income only for the smallest municipalities and municipalities around 5,000 inhabitants.

#### **4 Conclusion**

Correlation analysis of expenditure on non-investment transfers and investment at level of municipalities in the Czech Republic for the period 2003–2012 leads to the conclusion that also there is present the political business cycle. However, this political business cycle has its peculiarities compared to the macroeconomic level. These mainly arise due to the limited options of municipal politicians to use economic instruments to increase electoral votes in municipal elections.

Municipal politicians use public investments and projects to win electoral votes. This is confirmed by the rising expenditure on investments prior to elections. Expenditures on transfers do not prior to elections significantly change. This finding may be interpreted in a way that politicians prefer investment projects that the potential electoral constituency so-called clearly “see” while transfers are mostly used to cover current operating expenses of associations,

athletes and other groups. Limiting factor in these findings is the small number of data especially analysed for the election years.

Performed analysis can be considered as a further step in exploring the political cycle at the level of Czech municipalities. This research includes all size categories of municipalities unlike the previous ones. The following research should focus both on the differences between the municipalities and at the same time on the issue of factual limits of the analysis.

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# Aging, Public Pensions and Productivity of Labour: A Simulation of What the Czech Republic Afford

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## Abstract

Presented simulation uses the population projection for years 2013-2100 and average government's revenues and expenditures related to citizen of every year of age. Its goal is to find out how public pensions can grow in relation to the growth of labour productivity without threatening the sustainability of public finances. Simulation is simple and transparent. It concludes that increase in pensions of the same magnitude is much easier when pensions increase much more slowly relative to productivity than when they increase on a similar pace. This nonlinearity can be explained by the demographic structure of the Czech Republic.

*Keywords:* aging; pension system; fiscal policy; labour productivity; simulation; indexation

JEL Classification: C63, H55, H68

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## 1 Introduction

This paper uses author's own approach to calculating future expenditures and revenues first introduced in the paper focused on the role of productivity in different population projections with no indexation of pensions [11].

In the paper presented here only one population projection is used, the most likely scenario for years 2013-2100 published by Czech Statistical Office (CZSO) in 2013 [3], but this time it is not just the productivity of labour that increases but the pensions are allowed to increase as well. The level of pension indexation to the increase in productivity and wages is in the center of the simulation. Using the population projection data, e.g. the number of people of every sex and age for every year of the simulation, it is possible to calculate total expenditure and revenue of every year of the simulation as well as its budget surplus or deficit. To do so, average government's expenditures and revenues for person of every year of age from current years are used. This average revenues and expenditure are then multiplied by the number of agents of given age in every year of the simulation which gives total revenues and expenditures of given year.

Costs of education, healthcare and others are all related to the age of agent and do not change in the simulation. The only changes are demographic changes, different levels of productivity of labour growth and different levels of indexation of pensions.

The simulation serves to answer the question what would happen to public finances under the described circumstances on behalf of population aging. What would be the deficits? In which year will the situation be worse? How high the cumulated deficit will go and most importantly what level of productivity of labour growth is needed for different levels of indexation of pensions to be fiscally bearable.

## 2 Material and Methods

The simulation presented here is very simplistic as its transparency was considered a main priority. This simulation does not use any traditional method mostly used in pension policy research such as overlapping generations (OLG) or generational accounting (GA). Rather it is author's own approach and serves only to answer the question what would happen if the only

changes in years to come would be the demographic changes under the different levels of labour productivity growth and different levels of indexation of pensions. In the simulation there is no inflation and there are no firms, only agents representing citizens. Agents work and their labour is taxed, they use public healthcare, go to schools, they age, can be unemployed, they receive benefits and public pensions.

In the simulation there is no reform or any detail of pension system. The current PAYG is basically just projected onwards. This is partly supported by findings in [7] where authors claim that PAYG system appears to be the only viable system to perform well in terms of risk and volatility of returns. Some arguments against the viability of now failed introduction of the second pillar in 2013 and supporting PAYG were presented as early as in 2009 in [8].

In Table 1 the basic parameters of CZSO population projections are shown. The middle projection is the only one used in this paper as it is described as the most likely scenario by CZSO. In this projection the population is expected to be reduced to the 7.687 mil. by the end of the period. The exact origin of fertility rates, life expectancies and migration numbers was not provided by CZSO. Traditionally the fertility is the most problematic for long term projections as is explained in [6].

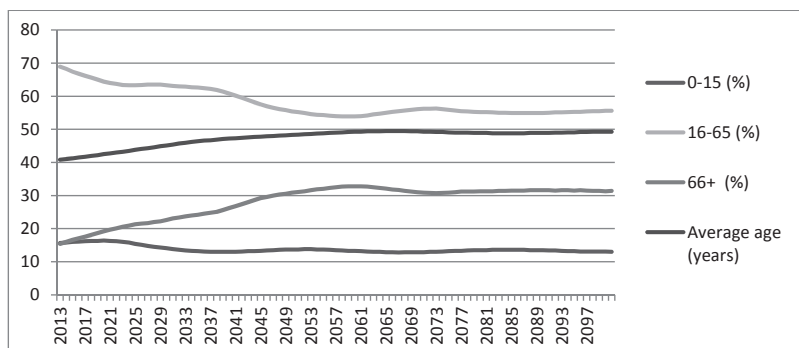
**Table 1. Basic parameters of projections**

Year	Total fertility			Life expectancy (men / women)			Net migration		
	Low	middle	high	low	middle	high	Low	middle	High
2012	1.45	1.45	1.45	75.0 / 80.9	75.0 / 80.9	75.0 / 80.9	10293	10 293	10293
2015	1.45	1.45	1.45	75.6 / 81.4	75.8 / 81.6	75.9 / 81.8	-996	8 934	18864
2030	1.45	1.50	1.52	78.2 / 83.8	79.5 / 85.1	80.6 / 86.1	2 226	11 659	21110
2050	1.45	1.56	1.61	81.1 / 86.2	83.0 / 88.0	84.6 / 89.3	5 571	14 384	23291
2100	1.45	1.56	1.61	84.2 / 88.8	86.6 / 91.1	88.4 / 92.9	10 350	17 671	25400

Source: [4]

The aging of Czech population is apparent from the Figure 1, where rising average age and rapid growth of those over 65 years of age is shown. It is clear that from the perspective of public finances the situation will most likely only be getting worse from now till approximately 2060, since when it should remain relatively stable.

**Figure 1. Share of main age groups and average age**



Source: [4]

## 2.1 Revenues and Expenditures

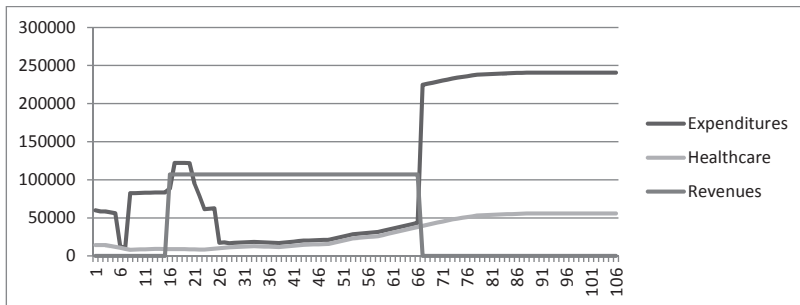
The government's expenditures and revenues related to the average citizen of every year of age used at the beginning of the simulation are shown in Figure 2. All prices are in 2010 Czech crowns (CZK). There is no inflation in the simulation so pensions actually are inflation adjusted. The revenues rise as the wages rise with the productivity of labour increases and the expenditure rise as the pensions are indexed to the rise of wages. Total revenues and expenditures used in this simulation are calculated using the number of agents of every year of age for each year of the simulation.

On the revenue side the simulation uses complete revenues from taxation of labour which consist of tax on personal income and both the employee's and employer's health and social security insurance. From the average gross wage of 23951 CZK, which is equivalent to net wage 18471 CZK and super-gross wage of 32095, this tax is 13624 CZK. In the simulation, 163488 CZK ( $12 \times 13624$ ) is used for all agents at the beginning of the simulation and without labor productivity increase it would stay unchanged.

Expenditures consist of social benefits related to every year of age, costs of every level of education as provided by OECD in [10], unemployment, healthcare costs and pensions. The secondary education is currently completed by 84 % of the population and tertiary is started by 50% and finished by 29%, which is likely to increase in the future but kept stable in the simulation. Healthcare costs are a linear interpolation of data provided for cohorts of five years by the CZSO in [5]. This data was provided separately for both sexes, so the average has been used here for the purpose of the simulation. The Czech Republic's aggregate replacements ratio (pension to the earning before retirement) is around 53% and is above the OECD average [9]. Although average monthly pensions were 11240 CZK for man and 9189 CZK for a woman [4], giving an annual average of 122574 CZK, a much higher number was used. In the simulation the average annual pension is 184957 CZK which is the result of 299 076 mil. CZK, which is the whole pension budget of 2012 spent on pensions of 1617 thousand recipients. This was done deliberately, the cost of the system are not likely to go down in the future.

On the simple example of a ten year old child some mechanics of the simulation can be shown. The cost of primary school child of that age are 72584 Czech crowns (CZK), other social benefits are 1521 CZK and average healthcare cost of a girl that age is 8679 CZK a year. This gives the expenditure on a ten year old child for the whole simulation.

**Figure 2. Selected government's expenditures and revenues from the average citizen in the Czech Republic (CZK)**



Source: [4]

In simulation calculated using NetLogo there is 1 agent for every 1000 living Czechs so the simulation starts with 10514 agents. The CZSO population projection says that there will be for example 38862 ten year old girls in 2040 (it was 45444 in 2013) so in simulation there will be 39 female 10 year old agents in 2040.

### *Growth of Productivity and Indexation of Pensions*

Rise in the productivity without any increase on expenditure side has many shortcomings from economic point of view. Higher productivity means higher wages which means equally higher revenues in the simulation, but higher prices are a likely result in reality. The capturing of the whole productivity increase by taxes is not likely or desirable option. Also keeping the pensions at their current level would mean a dramatic drop in a replacement ratio.

To provide a more realistic insight into future development this simulation uses different levels of indexation of pensions. This indexation is called real indexation as there is no inflation in the model and the indexation is related to the growth of productivity of labour. This means that when productivity growth is 1 % and real indexation is 0.5 than the average pension of 184957 CZK will grow by 0.5 % every year. When productivity growth is 3 % and real indexation is 0.66 than the pension will grow by 2 % every year. Real indexation of 1 then means that pensions are increasing at the exact same pace as productivity of labour.

### *Previous Results*

Author's previous work in [11] has two main conclusions. First one is that the current level of pensions is not sustainable without growth of labour productivity which makes economic growth top priority in dealing with an aging population.

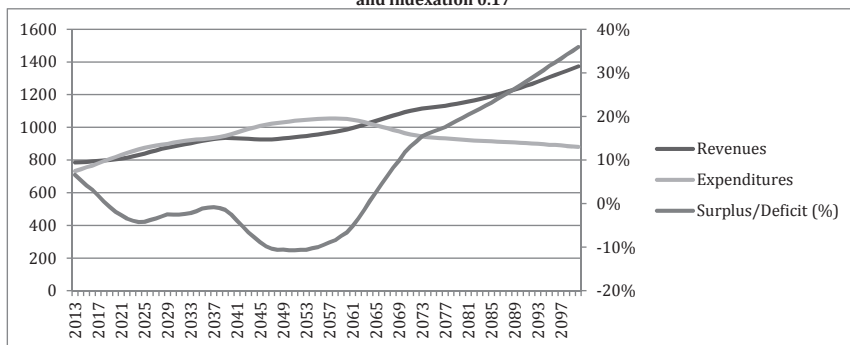
Second one is that even very modest growth of less than 1% a year can make the current system sustainable. However even though the absolute income of the seniors would be sustained, the relative would drop dramatically. This goes well along with results in [1] where authors show that existing private pension plans will not be able to fill the gap to the desirable replacement rate and without implementation of additional pension saving plans during the active period, there is a threat that many individuals will fall below the poverty line after retirement.

## **3 Results and Discussion**

As there is no interest rate in the simulation and no firms it is not quite suitable to speak about GDP or total debt. Instead of these a cumulated deficit is used which is a sum of all deficits/surpluses in the simulation which takes only a part of the economy in account. The deficit in this paper is expressed as the percentage of government revenues from the taxation of labor, not as the percentage of GDP. It is important to keep this in mind when comparing to the results to other studies on the topic such as [2]. One sixth was chosen as an increment for pension indexation so the indexation levels that come into consideration are 0, 0.17, 0.33, 0.5, 0.67, 0.83 and 1. Indexation of 1 is the only that keeps replacement ratio from falling. Results are presented in three tables by the indexation of pensions from low to high.

The Figure 3 shows the simulation results for productivity growth 1.25 % and indexation 0.17. The public finance balance starts at surplus 6.61 % which is true for every setting of this simulation and is consistent with generation accounting point of view on current generation. The deficits are significant and before they turn into surpluses in 2064 they cumulatively reach 218.22 % of government's revenues in the simulation as is shown in the fourth column of Table 2.

**Figure 3. Expenditures and revenues (billions of 2010 CZK) and deficits for labour productivity growth 1.25 % and indexation 0.17**



Source: Author

In the low indexation pensions shown in Table 2 we observe that maximal surplus is reached at the end of the simulation. The low productivity growth considered here as it is sufficient to reach acceptable levels of both maximal deficit and cumulated deficit is enough to do that when the worst years around 2050 or 2060 are overcome. The big role of the productivity of labour is clear from the dismal results of lowest considered growth of 1 % and their improvement when productivity rises by 1.5 % a year. From the rest of the table it is clear that for low levels of indexation a modest change in productivity growth changes a lot.

**Table 2. Low indexation of pensions to productivity**

<b>Real indexation</b>	0,00	0,00	0,00	0,17	0,17	0,33	0,33	0,50	0,50	0,50	
<b>Productivity growth (%)</b>	1,00	1,25	1,50	1,25	1,50	1,50	1,75	1,50	1,75	2,00	
<b>Max surplus year</b>	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	
<b>Max surplus (%)</b>	28,56	42,39	53,51	35,93	47,14	39,24	48,50	29,46	38,42	46,10	
<b>Max deficit year</b>		2053	2048	2023	2050	2048	2048	2024	2053	2050	2048
<b>Max deficit (%)</b>		-16,33	-6,09	-0,41	-10,69	-2,31	-7,74	-0,75	-14,40	-7,23	-1,12
<b>Max cumulated deficit year</b>		2067	2060	2013	2063	2013	2062	2013	2066	2061	2013
<b>Max cumulated deficit</b>		-413,26	-73,27	6,61	-218,22	6,61	-113,57	6,61	-319,03	-84,51	6,61
<b>End of period cumulated def.</b>		104,82	933,10	1655,31	548,78	1248,09	781,89	1375,14	247,21	799,95	1299,65

Source: Author

The worst year varies around 2050 and the maximal accumulated deficit is in the year when the economy reaches surplus for the first time after that in most years. In some years the maximal cumulated deficit is at the beginning of the simulation as the situation gets so much better from the financial point of view in the first decades of the simulation that the bad years in the middle do not lower the cumulated deficit below its starting value. This is caused mainly by the low increase in individual pensions.

The result in Table 3 show that if the public pensions are to grow at any level near the productivity, the productivity itself must on average rise around at least 2 % a year.

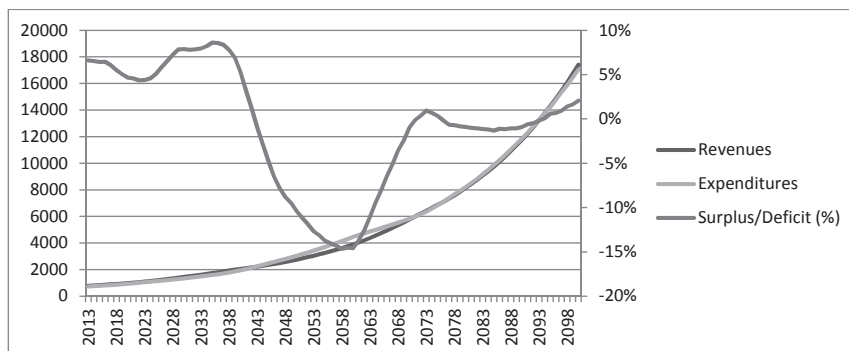
**Table 3. Middle indexation of pensions to productivity**

<b>Real indexation</b>	0,66	0,66	0,66	0,83	0,83	0,83	0,83	0,83
<b>Productivity growth (%)</b>	1,75	2,00	2,25	2,00	2,25	2,50	2,63	2,75
<b>Max surplus year</b>	2100	2100	2100	2100	2100	2100	2100	2100
<b>Max surplus (%)</b>	41,78	32,59	38,78	14,65	19,65	41,84	41,91	28,00
<b>Max deficit year</b>	2053	2053	2050	2055	2055	2055	2053	2053
<b>Max deficit (%)</b>	-15,59	-9,62	-4,18	-20,55	-15,87	-11,54	-9,54	-7,63
<b>Max cumulated deficit year</b>	2067	2063	2013	2071	2068	2065	2064	2063
<b>Max cumulated deficit</b>	-340,87	-137,44	6,61	-490,29	-310,73	-155,76	-85,66	-20,02
<b>End of period cumulated def.</b>	124,25	571,48	979,68	-305,41	28,50	334,02	477,35	614,82

Source: Author

The main thing to notice on Figure 4 is the depth of decline in the worst years and also the fact, that despite quite high labour productivity growth the deficits did not become surpluses till 2093. Also the fully indexed pensions do not allow revenues to significantly overgrow the expenditures as it happens with lower indexation levels.

**Figure 4. Expenditures and revenues (billions of 2010 CZK) and deficits for labour productivity growth 4.25% and indexation 1.00**



Source: Author

The last presented Table 4 shows how bad the fiscal impact of aging can actually be. The results presented as percentage are percentage of total government's revenues from the taxation of labour for reasons explained earlier. Cumulated deficit is a simple sum of these. Even though the health expenditure, education costs and other social benefits do not rise in the simulation, the pensions by themselves, if they are not to lose their role significantly, drive the need of productivity rise to levels that are not likely to be reached in long term. For comparison the actual level of labour productivity average annual growth was 4.3% in the exceptionally good pre-crisis years 2004-2007.

**Table 4. High indexation of pensions to productivity**

<b>Real indexation</b>	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
<b>Productivity growth (%)</b>	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75
<b>Max surplus year</b>	2013	2013	2013	2013	2013	2035	2035	2035	2035
<b>Max surplus (%)</b>	22,43	22	22,43	22,43	22,43	44,74	22,49	34,21	43,04
<b>Max deficit year</b>	2058	2058	2058	2058	2058	2058	2058	2058	2058
<b>Max deficit (%)</b>	-25,47	-23	-21,04	-19,17	-17,49	-15,99	-14,65	-13,45	-12,38
<b>Max cumulated deficit year</b>	2100	2100	2100	2099	2097	2094	2093	2070	2013
<b>Max cumulated deficit</b>	-784,09	-632	-496,31	-375,03	-267,32	-171,27	-85,36	-9,12	6,61
<b>End of period cumulated def.</b>	-784,09	-632,02	-496,31	-374,67	-265,36	-166,91	-77,97	2,67	75,91

Source: Author

It is worth noting that even though productivity rise of 2.75 % is enough to allow a indexation of 0.83 (the last column in the middle table) for the pensions to be fully indexed to productivity the needed level of productivity growth is at least 4.25 %. The results of this combination mean maximum deficit of 14.65 % in year 2058 and also cumulated deficit of 85.36 % and the first year in which economy will reach a surplus is 2093. This is a dim perspective indeed.

#### 4 Conclusion

The mechanic of computing the revenues and expenditures in the simulation have been explained and the role and meaning of both increasing productivity of labour and rising pensions have been emphasized.

The main conclusion from this simulation is that growth itself will hardly be enough to keep the present replacement ratio of pensions and public finances sustainable. The productivity growth needed to allow the full indexation of pensions reaches to approximately 4.5 % which is more than the Czech Republic had even in the best times and can hardly be expected in the future. In scenarios with lower than full indexation the simulation offers a slightly more optimistic results. If the pensions would increase for example at only half the pace of wages and thus lowering the replacement ratio the productivity growth needed would be only 2 %.

#### Acknowledgments

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# Evaluation of Draft Budgets: A View of Local Politicians

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## Abstract

Published draft budget is the basis for debate and decision and therefore its content and convenient format matters. Politicians are the key drivers of its changes or improvements in case of any deficiencies. A survey of 51 Prague district council members revealed high level of satisfaction with the current praxis despite the impression that no significant changes took place during their term in office. Significantly less satisfied are opposition council members in districts which committed themselves to transparency. Establishment of a transparency committee led to some changes in the draft budget but did not increase satisfaction with it. These findings are extremely discouraging: The commitment to or promise of greater transparency four years ago did not mean, from the point of view of the council members, any significant changes in the draft budget documents. At the same time the coalition council members, thus those who could (were in power) and should (made the promise/commitment) have initiated these changes are satisfied with the current (not really changed) state.

*Keywords:* council members; local government budget; transparency

JEL Classification: H72

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## 1 Introduction

Politicians constantly promise higher budget transparency. It should bring more votes before election and more trust in them and their policy after election. Budget transparency is perceived as a tool for effectiveness improvement, accountability enhancement [9] and increase of the probability that corrupt or wrong decision is detected [1]. However, budget transparency is very difficult to grasp [9]. Evaluating transparency usually means comparing the current state to an established standard such as the IMF Code of Good Practices on Fiscal Transparency [10] or the OECD Best Practices for Budget Transparency [12].

Unfortunately, this evaluation ignores two aspects. First, if the disclosed information really allows citizens to assess if they are getting a good deal for their money [14]. And second, if citizens can hold public officials accountable. Public accountability helps citizens to control those holding public office for their acts, decisions or expenditures and is thus extremely important from a democratic perspective [3] and transparency is only a necessary but not sufficient condition for ensuring greater public accountability [8]. Crucial element of accountability is the possibility of sanctions as it makes the difference between non-committal provision of information and being held to account [3].

In this paper we deal with the first issue, i.e. meaningful budget information disclosure, which promotes the understanding of both the decision-makers (i.e., elected officials which needn't to be financial or accounting experts) and general public. The purpose of this paper is to evaluate opinions of council members on the published 2014 draft budget and to discuss their impact on future improvements or innovations.

The paper is based, first, on the review of literature dealing with budget transparency and public accountability in local government and, second, on a survey e-mailed to council members of the Prague districts before the approval of the 2014 budget.

## 2 Material and Methods

### 2.1 *Draft Budget as One Part of the Budgetary Process*

Public or government budget is a term with numerous meanings which depend on time, situation and users. It can be a process, a document, an accounting statement, a plan or a system [17]. In this paper we narrow the issue in two ways. We focus on a single moment and a single document: draft budget published on the public notice before its approval. We look at the document, which is completed for the moment, need not to comply with strict requirements for accounting statements and is accessible for everyone in the same format.

Published draft budget comes into sight during the debate phase, before the approval in the legislation body (i.e., local government council). Until then the budgetary process takes place (solely) inside the government. From outside it is a black box. The published draft budget is the outcome of the early stages of the budget process and it enters the public part of the budget debate in the local government council. In this debate both the council members and citizens can take part. Thus the published draft budget has several roles or functions: It is the basis for the debate and the decision (i.e., council approval). It provides information of local government activities, plans and priorities. It is an important tool of public accountability as voters can hold the officials accountable for their fiscal action in the elections [13].

While the draft budget is prepared by experts (this is true as long as the local government employs adequate professional staff; it may be questionable in very small local governments), majority of its users are non-experts, including the council members who ultimately make the decision. So the experts decide what and how (!) include in the draft budget [2], with very limited input from the users [11] shows that popular reports are generated from within the government without any consultation with either council members or citizens).

Czech legal regulation gives only minimal requirements and leaves significant space for local governments regarding the individual steps of the budgetary process and the content of individual budget documents. The law on budgetary rules for local governments (250/2000 Coll., §11-3) requires that the full (unabridged) version of the draft budget is published on the web page or the electronic public notice of the local government at least 15 days before the budget debate in the council. While the mandatory content of an abridged version is specified (revenues and expenditures classified according to individual classes of the budget classification, i.e., tax revenues, non-tax revenues, capital revenues, grants, current expenditures and capital expenditures), the unabridged version is not. The level of detail of the budget classification used is not specified with the exception that binding indicators have to be indicated, but the structure of binding indicators is not specified by the law. Thus the regulation generally leaves on the local government decision, how detailed the draft budget is and how is its content or format.

### 2.2 *Research Strategy*

Our research focused on the opinion of the council members of the 2014 draft budget. The council members evaluated the draft budget they have received before the council meeting. This document may but needn't be exactly the same as the document published on the public notice. We are aware of two cases when the documentation provided to the council members differed from that provided to general public: one council member admitted that she received a table in the .xls format while there was published only a scanned version (hard to read due to very small font and impossible to elaborate) and in the district Praha 20 the council members received the text commentary while the public did not (it was made available only after approval of the budget).

We have designed a simple questionnaire with 10 questions: Four questions identified the district, political party and membership in financial and control committee. Three questions were 10 points Likert scale questions. The respondents evaluated how much they agree or disagree (0= totally disagree, 10=fully agree) with the following statements:

- The draft budget includes a summary of major issues and gives me a good overview of the proposed budget.
- The draft budget contains very detail information about individual revenues and expenditures.
- The display of the information is clear, i.e., I can find easily what interests me, and easy to understand, i.e., everything is explained well.

These statements represent the key dependent variables SUMMARY, DETAIL and CLARITY. These questions are of course able to capture only the difference in the perception of the current state and personal or individual optimal state. However the personal or individual optimal state may be very different in case of different respondents.

The next question dealt with the magnitude of changes in the document during the term in office (it was the last year before election). Possible answers were: did not change, small changes without impact, minor changes, significant positive changes and negative changes. The resulting variable is CHANGE. The final two questions were open questions asking about major past changes and suggestions for further improvement.

During the preparation the questionnaire was discussed with a council member and some of the formulations were adjusted based on this discussion.

The questionnaire was e-mailed between December 2013 and February 2014 to the council members of the districts Praha 1-22 if their e-mail address was available. In case of 5 districts all the council members were approached, in case of 2 districts none. Out of the 688 council members 593 were reached (86.2%) and 51 replied (8.6%). The response rate in the individual districts varied between 0% (2 districts) to 17.8%.

There were used five types of control variables: membership in financial and control committee, membership in the ruling coalition (i.e., if the council member belongs to the party which forms the district commission; COALITION=1), commitment to transparency (i.e., the policy statement prepared after the 2010 election contains open or transparent government, administration or management; TRANSPARENCY=1) and existence of a special transparency, openness or anticorruption committee (COMMITTEE=1).

Collected data were analyzed using the contingency tables, difference of means test and correlation analysis.

### 3 Results and Discussion

The overall satisfaction with the draft budget was quite high, the average evaluation reached from 6,3 to 7,1 (see Table 1) in case of the three evaluated parameters. The highest score reached SUMMARY followed by CLARITY and DETAIL. There was a strong and significant correlation among the answers, the correlation coefficient being between 0,792 and 0,815 in the individual cases.

Table 1. Evaluation results, grouping variable COALITION and TRANSPARENCY

COALITION	Mean-total	Mean 1	Mean 0	t-value		Valid N 1	Valid N 0	Std.Dev. 1	Std.Dev. 0
SUMMARY	7,078	8,607	5,217	-4,769	***	28	23	2,362	2,713
DETAIL	6,333	7,929	4,391	-4,542	***	28	23	2,734	2,808
CLARITY	6,440	8,037	4,565	-4,278	***	27	23	2,594	3,145
TRANSPARENCY		Mean 1	Mean 0	t-value		Valid N 1	Valid N 0	Std.Dev. 1	Std.Dev. 0
SUMMARY	7,078	6,821	7,917	-1,100		39	12	3,042	2,937
DETAIL	6,333	5,897	7,750	-1,754	*	39	12	3,283	2,896
CLARITY	6,440	6,053	7,667	-1,483		38	12	3,345	3,085

Source: Author

Note: Note: \* denotes 90 % and \*\*\* 99% of statistical significance respectively

Evaluation of the draft budget differed significantly between coalition and opposition council members. The average score of the coalition council members was about 1,5 points higher in case of all three variables (see Table 1), i.e., opposition is much less satisfied than coalition. The membership in either the financial or the control committee or the existence of the transparency committee does not have any impact.

With exception of DETAIL there were no significant differences among council members in districts which committed themselves to transparency and which did not. However, those serving in districts which promised transparency are less satisfied than those who did not.

A further disintegration (Table 2) shows that that this is caused by extremely unsatisfied opposition council members in districts which committed themselves to transparency. So coalitions which promised transparency are satisfied with their efforts while opposition in the same districts is very critical. On the other hand, in districts where transparency is not „a topic“ the opinion of the council members is very similar regardless the member party. This is an extremely disappointing finding, because those who could drive the change are satisfied with the status quo.

**Table 2. Average satisfaction; disaggregation based on coalition membership and attitude to transparency**

	opposition, non-transparent	opposition, transparent	coalition, non transparent	coalition, transparent
number of council members	3	20	9	19
SUMMARY	7,333	4,900	8,111	8,842
DETAIL	7,333	3,950	7,889	7,947
CLARITY	7,333	4,150	7,778	8,167

Source: Authors

Note: the Least Significant Difference (LSD) test proved at 95 % significance level differences between transparent opposition and any other group with exception of SUMMARY and transparent and non-transparent opposition

Only a minority of respondents (15.9%) did not see any change in the draft budgets during their term. Only one opposition member thinks the changes were negative. Vast majority of the members thinks that the changes were small with no or minor impact (77.3%) and two coalition members believe there happened significant positive changes.

The evaluation of changes is very similar in districts which did or did not commit themselves to transparency. On the other hand the establishment of the COMMITTEE played a role: all members coming from districts with a transparency committee think some changes took place.

The most frequently mentioned past changes were improved clarity or detail of the budget or existence of a narrative accompanying the budget tables. Respondents acknowledge inclusion of multiannual budget outlook or total instead of annual expenditures related to major investments.

The satisfaction of the draft budget is pretty high. Council members in districts which did not commit themselves to transparency are equally satisfied regardless they belong to coalition or opposition and they perceive the magnitude of the past changes in a similar way as well. In districts which committed themselves to transparency the situation differs significantly: coalition members are much more satisfied and to a greater extent think that positive changes took place during their term in office. In contrary the opposition members are not satisfied and more often believe no or even negative changes took place. Establishment of transparency committees led to some changes which the council members acknowledge regardless their party membership but has no effect on the general satisfaction with the draft budget.

These findings are extremely discouraging because of several aspects: The commitment to or promise of greater transparency four years ago did not mean, from the point of view of the council members, any significant changes in the draft budget documents. And the coalition council members, thus those who could (were in power) and should (made the promise/commitment) have initiated these changes are satisfied with the current (not really changed) state. Unfortunately, the ruling politicians are those who could best introduce any

change or innovation [5] proved that politicians are the strongest predictor of innovator status, i.e., if politicians are not interested it is unlikely innovations are realized).

At the same time the stated suggestions for further improvements reflect quite limited range of ideas what could be done: There prevail non-specific requests for more detail, clarity, simplicity or explanations. More specific requirements deal with the non-existing interconnection of the budget, plan of economic activity or strategic plan, graphs or the clicking budget. Our independent evaluation of the 2014 draft budgets in Prague districts [16] which was based on 8 criteria revealed more shortcomings: graphs are only used in two districts, documents are in formats which do not allow further processing or searching within the document, there is no list of abbreviations or a vocabulary of technical terms. In case of five districts the draft budget does not contain any commentary or narrative; however none of the council members coming from these districts expressed such a requirement.

Successful examples of improvements in budget documents abroad are often a result of a nongovernmental initiatives such as a competition or independent ranking. Preparation of popular reports in US cities was driven by finance managers who wanted to succeed in completion sponsored by Government Financial Officers Association and who were able to get political support [11]. The utilization of the Open Budget Index as an advocacy tool is described by [6]. [4] describes other successful budget-related transparency and accountability initiatives. Anecdotal evidence from the Czech Republic shows some positive impact of various nongovernmental initiatives. However all of these initiatives can only encourage politicians to introduce or enforce a change. An observation of [7] clearly expresses the process: council members should drive the strategy forward but often the managers have to propose some options.

#### 4 Conclusion

Claims of very low government transparency are omnipresent; however comparisons of the current state with the legal requirements [15] or with unambiguous evaluation criteria [16] show that the situation is not that hopeless. And the opinion of the council members in Prague districts is even better – satisfaction prevails despite only limited changes took place.

This is, however, the end of good news: The current state is definitely far from perfect and those who were elected because of their promises to improve transparency and who are in position to enforce these improvements (members of ruling coalition) are satisfied with the current state which is very closed to the state before the election three years ago. At the same time the unsatisfied opposition has little means to enforce any changes.

In any case putting the transparency issue on agenda either in the policy statement or by establishment of a special transparency committee caused that at least someone criticizes the current praxes in the former case or that some, not always meaningful changes, took place.

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# Fraud Risks in Indirect Taxes on Mineral Oils

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## Abstract

The paper deals with the tax evasions in the case of the indirect taxes. Mineral oils are the selected commodity burdened with indirect taxes. The research was carried out in the Czech Republic. There were studied two significant issues - the carousel fraud and the illegal mixing. The aim of this study was to evaluate the susceptibility of the value added tax (VAT) and excise duty imposed on the mineral oils to tax evasions and to deduce appropriate recommendations in terms of necessity of the focus of interest of inspecting authorities to the identified the risk field of the indirect taxes. When processing there were identified determinants of tendency for execution of the tax evasion and evaluated the possibilities of a real execution. Furthermore, there were also created links between the identified factors and the time factor which is essential from the perspective of a potential fraudster. There were selected 11 evaluated parameters, which are compared with respect to the VAT and excise duty. The results show that it is easier to commit fraud in case of the VAT, even though the profit from the fraud in case of the excise duty on mineral oils may be higher.

*Keywords:* excise duty; fuels; tax evasion; value added tax

JEL Classification: H20, H26

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## 1 Introduction

Tax evasions are issues which significantly determine the formation of tax policy and the state of public budgets. It is possible to meet them in case of all taxes regardless the subject of tax, object of tax, tax rate, rate of progression, method of payment or the field of applicability. The only difference will be in the rate of realized tax evasions depending on defined parameters of the imposed tax and other related factors, which will be discussed below with the support of already conducted research in this field.

It is not possible to address and resolve the issue of tax evasions in a completely global level. Any difference in the parameter of tax brings with it the specific need for solution in the case of the tendency to tax evasion. The more specific is the focus of studying, the more specific may be the result. This paper will be focused on tax evasion from the indirect taxes in the territory of the Czech Republic, although the results can be territorially generalized. Specifically, these are indirect taxes imposed on mineral oils, i.e. the value added tax and excise duty.

Indirect taxes within the European Union are in a very advanced stage of the harmonization process, which brings in addition to the indisputable advantages also the significant risks. If the system of the indirect taxes provides space for the realization of tax evasion, then this problem is global in the Community and not just local. This means that tax evasion will be generally significantly higher, and also due to the form of the approval process within the Community, that it will be significantly more difficult to enforce and implement the necessary changes to the legal framework. The tax frauds are truly the global problem, as evidenced by the work of [13] which is focused on the problems in China or the work of overseas authors [15]. [19] also discussed it as long-term problems. Both authors have focused on non-traditional approach to crime, especially for business people and citizens from upper class.

In the European Union countries the value added tax is imposed, with few exceptions, to all goods and services. Excise duty is then imposed only to the selected types of goods. Goods that are homogeneous, interchangeable and burdened with the high levels of taxation will be the most susceptible for the tax evasion in terms of the tax object, for what the tax is imposed. Organized groups usually chose such commodities that can be easily and quickly sell and move,



but at the same time they are difficult to identify and easily interchangeable [22]. Even the chosen mineral oils satisfy these parameters. The basic characteristics of the mineral oils are clearly defined by the legislation. Their utility value is resulting from them. There are some efforts in the market for the differentiation of the products of some manufacturers of the fuels, but these are only the various additives added in the fuels, which does not fundamentally change their characteristics. The mineral oils are very easily interchangeable. Layman and often even an expert cannot, without measuring instruments and laboratory equipment, distinguish the different types of oils attributable to the various nomenclature codes. Finally, it is clear that mineral oils are liable to high levels of taxation and they are burdened with relatively high specific rate of excise duty and also ad valorem tax base rate of value added tax, which is even calculated from the amount including excise duty. The actual tax burden is for certain subjects very attractive potential profit from crime activity. It can be assumed that with increasing tax rate considering *ceteris paribus* there will be an increase in the volume of the machinations with the tax base. Tax frauds are matter of choice between the amount of profit from the fraud, the maximum penalty level and the risk of disclosure. [4] introduces, in the process of making decisions about evasion, an interesting fact that the punishment for the evasion in case of his disclosure comes later than the tax savings when performing the tax evasion. In the short term perspective the entities can accept carrying out the fraud. Also when evaluating the effectiveness of anti-fraud measures it is necessary to calculate with delay between the implementation and efficiency of the measures [2].

According to [1] it is not even possible to ignore the state of the economy and standard of living of the population. The rising standard of living may be one of the tools to reduce the tax frauds. To the above mentioned it is also appropriate to add other factors, which overlap to some extent with some already mentioned. These are especially the stability of the legal environment, the quality of legislative and the will of the public administration for the solving of the selected problem.

Traditional instruments for reducing the tax evasions are very expensive and time consuming. In order to indicate tax as reasonably effective, so it must not be excessively administratively burdensome, this includes, among other things, the administrative demands of control of the taxpayers. Also the burden which is imposed on taxpayers should not be excessive and burdensome. Search for the risk characteristics of taxes in terms of susceptibility to tax evasion is the subject of the research not only for the tax administrations but also for researchers. [17], for example, deals with the tools of appropriate detection of tax fraud and errors. [3] create static and then also a dynamic model of the behavior of the taxpayer, where the tax rates, penalties and probability of control which determines the probability of disclosure are the variables of tendency to tax evasion. However the empirical examination is recommended for the verification. The introduced model is based on the theory of optimal portfolio and economic uncertainty. The problematic field of the most models is the difficulty when obtaining the necessary data and so they are therefore applicable only on a theoretical level. The results on the probabilistic basis must also be supplemented by control, which is the only tool for detection of the real fraud [7]. Also [20] admits that the tools in the form of parameters of controls and penalties are more important in the reduction of the tax evasions than the setting of the tax rate.

From the above mentioned facts it is clear that the aim is to evaluate the susceptibility of the value added tax and excise duty levied on mineral oils in the Czech Republic and to draw appropriate recommendations in terms of the focus of interest of inspecting authorities to the identified risk field of the indirect taxes applied in the Czech Republic.

## **2 Material and Methods**

First of all the authors identify the problematic type of taxes in terms of the tax evasion, problematic tax object and the location of the examination of the issue. Afterwards they define the real possibility of the committing the tax evasion in the selected risk field. In order to achieve the defined aim, it is crucial to identify the variables which determine the tendency for the

execution of tax evasion used in the previous examinations and their supplementing with other determinants specific for the execution of the tax evasion in the identified critical forms of frauds. Furthermore, there will be created link between the identified factors determining the tendency for realization of tax evasion and the time factor, which is demonstrably important in process of decision-making of entities about the execution of the evasion. Research comes to the confrontation of the selected taxes in terms of susceptibility to tax evasion with respect to the all selected parameters of the susceptibility to tax evasion. Evaluation of the individual factors is divided by logical and systematic evaluation by the authors according to simplicity of the execution of tax evasion, while using the following characteristics of parameters:

- 0 does not create a barrier or this barrier is inconsiderable for the execution of the tax evasion,
- 1 forms a barrier against the execution of the tax evasion,
- CP critical condition, without which it is not possible even to commit fraud or with undue effort.

The results from the research will enable the evaluation of the susceptibility of the selected taxes imposed on specific product to tax evasion with regard to the defined critical conditions and taking into account the determinants of time and also to draw appropriate recommendations in terms of the focus of interest of inspecting authorities to the identified risk field in order to reduce the tax evasions and to achieve the rational rate of efficiency of tax administration.

The authors are working with the previous works carried out in this field, particularly with regard to the identification and interpretation of the determinants of tax evasions. Specific data identifying the values confirming the existence of the problem, in the selection of the given taxes and relevant commodity, may be obtained from the entities with the significant market power in the given field, policy-making organizations, and also from the present results from the research of the authors.

### 3 Results

In tax practice there are many alternatives of the realization of the tax evasion in the field of indirect taxes levied on the fuels. We will focus on two substantive fields of concern, one includes the value added tax and the other excise duties on the mineral oils.

[10] dealt with the evasions on the value added tax and they accentuate the problem with carousel frauds. These at the first sight ordinary transactions are actually well prepared and organized frauds. Their only aim is not to fulfill the tax liability for the missing trader. In the last few years, this type of frauds has expanded so much that even some authors characterize it as a systematic attack on this indirect tax [9]. It is estimated that all Member States of the European Union suffer a loss of approximately 100 bln. EUR per year [17] in the tax frauds. The European Commission [8] is even more pessimistic and it estimated a loss of \$ 193 bln. EUR for 2011.

Excise duty frauds carried out through illegal mixing are the second problematic field. Illegal mixing was defined [22] as a process in which there is an intentional modification of the chemical composition and physical-technical characteristics of the fuels, which is not in accordance with the legal or technical standards. This takes place without the knowledge and consent of the state institutions, especially of the tax and customs administration, for the purpose of trade and final sale with the aim to collect the tax from the consumer and not to declare and pay it properly. They are usually mixed with chemical substances, compounds and mixtures with similar technical characteristics, but with a lower rate of excise duty or they are totally exempt from taxation or under certain conditions, i.e., they are used for other method of use or for disposal. Specifically, the Customs Administration reported imports of untaxed mineral oils misusing the lower rates because of the different way of using or complete exemption in the country of origin [15; 20]. For these specific oils, which are not subject to excise duty, there is no mechanism for monitoring the move and place of the origin.

In order to create the excise duty fraud, beyond the simple failure to pay taxes, the fraudster must have the sufficient resources of the mineral oils, whose rate is lower than for the fuels that are sold. The report of the customs administration shows the fact that the fraudster may have such sources. During July and August 2011, Poland exported 32 million liters of oils exempt from excise duty. These oils were imported into the Czech Republic, the Slovak Republic and Hungary [6]. Information on fraud with fuels can also be found in other Member States. For example, in the United Kingdom of Great Britain and Northern Ireland, the estimated annual loss on excise duty was about 850 million pounds [13].

Table 1 shows that the tax burden on two major types of the fuels reaches about one-half of the sales price. Taking into account that the fuels are transported in tanks with volumes exceeding even 30,000 liters, the tax burden of the entire volume of the tank is 596,100 CZK in the case of petrol and 507,600 CZK in the case of diesel.

**Table 1. Composition of fuel prices**

Item	Diesel [CZK/L]	Diesel [%]	Petrol [CZK/L]	Petrol [%]
Purchase price at refinery	16.96	49.34	15.85	44.88
Excise duty on mineral oil	10.95	31.85	12.84	36.35
Margin of sellers	0.50	1.45	0.50	1.41
Value added tax	5.97	17.36	6.13	17.36
Total price	34.38	100.00	35.32	100.00

*Source: Authors based on [22]*

Basic weekly prices of ČEPRO, a.s. for the week 23th – 29th September 2014, 27.91 CZK/litre for diesel and 28.69 CZK/litre for petrol, were used in the Table 1.

Now there will be identified the risks during the tax administration, specific needs for committing a fraud and factors of frauds on both of indirect taxes, which will be subsequently used in the Table 2. There have been previously identified the fundamental general factors determining the tendency for tax evasions. These are mainly the tax burden rate, the risk of disclosure and the penalties [3]. Furthermore, there will be used in the research the factor of time in connection with the works of [4] or [2]. Finally, in the research there will be included also the factor of interchangeability defined by [21]. Other general factors are the state of the economy, standard of living, legislative quality, stability of the regulatory environment or the will of the public administration to solve the given problem.

The introduced list of the factors appears to be insufficient for the purposes of the specific field of indirect taxes imposed on fuels. Therefore it is supplemented with other determinants specific for the execution of tax evasions in the form of carousel frauds on the value added tax and illegal mixing on the excise duty so that the evaluation of the tendency of the taxes to evasion was perhaps the most meaningful.

The variable in form of input costs and formal requirements imposed on individual businesses should be also certainly supplemented. Fulfillment of these criteria is necessary to enable the entities to become the fuel distributors. From the theoretical knowledge of the functioning of carousel frauds it must not be forgotten the weakest point of intra-community fulfillment. The risk subject is then the first subject, which becomes liable to declare and pay VAT (reverse charge mechanism). No other entity in the chain in the same state, cannot even theoretically achieve a comparable level of tax fraud.

It is necessary to manipulate with the fuels in the effort to execute excise duty fraud and so it is also necessary to have the appropriate equipment (in our case we refer as factor of background and equipment). In connection with the frauds it can also be compared their extent, when there can and cannot be fraud on both taxes simultaneously.

For the actual trading with the fuels it is necessary to have a distribution network, so customers and suppliers, in order to distributor have to whom and also what to sell. Of course, for the tax fraud there can be expected sales for the lower traded prices, so it is usually not too difficult to get customers. Suppliers naturally incline to realize the greatest volume of the sales. In the most cases it is also necessary to have an appropriate number of personnel because some

types of frauds would not be possible to realize in sufficient quantities without adequately informed and well organized staff.

Given that the time factor appears to be important not only as itself, but also in relation to other factors during the decision of carrying out the evasion, there are modeled three time zones - the preparatory stage, the time during the fraud and phase after the fraud. On this basis there is created evaluation, which corresponds on the one hand to the theoretical foundations but on the other hand also to realistic scenarios of the execution of the frauds on the value added tax and excise duty on mineral oils.

**Table 2. Evaluation of determinants to tendency to tax evasion on indirect taxes**

Stage of fraud	Preparatory stage		During fraud		After fraud		
	Tax	VAT	Excise duty	VAT	Excise duty	VAT	Excise duty
Input costs		Lower	Higher	x	x	x	x
Formal requirements		Yes	Yes	x	x	x	x
Interchangeability		No	Yes	No	Yes	x	x
Personnel requirements		Lower	higher	Lower	Higher	Lower	Higher
Intracommunity transaction		Yes	No	Yes	No	x	x
Time factor		x	x	Shorter	Longer	x	x
Manipulation with fuels		x	x	No	Yes	x	x
Distribution network		x	x	Yes	Yes	x	x
Background and equipment		x	x	No	Yes	x	x
Tax burden - profit		x	x	Lower	Higher	x	x
Extent of activity		x	x	Limited	Wider	x	x
Penalty		x	x	Lower	Higher	Lower	Higher
Risk of disclosure		x	x	Higher	Lower	Higher	Lower

Source: Authors

Input costs and formal requirements are conditions that the taxpayer must fulfill in order to trade with the fuels. Since 2013 it is valid that every trader with the fuels out of the filling stations must be registered with the customs administration as a distributor. In terms of the value added tax, the potential fraudster must provide a refundable deposit or obtain a bank guarantee. If the distributor has the right to operate a tax warehouse so he must ensure the tax by providing the deposit in the corresponding amount. However, if the fraud takes place outside the territory in which is the tax warehouse, it is not necessary to deposit resources. Therefore, it is possible to evaluate the input costs for both taxes as comparable.

Distributor must also fulfill (factor of formal requirements) condition of impunity and indebtedness and these conditions must be fulfilled in the course of its all operations. These conditions must be fulfilled in order to allow the potential fraudster even to run business activities. As different people can be used for the fraud, their fulfillment is negligible barrier in relation to the fraud on both investigated taxes.

It is necessary that the fraudster would have a sufficient quantity of interchangeable products with fuels in order to ensure committing excise duty fraud. These oils, as already mentioned in the introduction, have a lower tax rate than the declared fuels. The second necessity is the sufficient equipment for illegal mixing. These critical conditions (critical points - CP) must be strictly fulfilled in case of the excise duty, which consider them as the important barriers unfavorable to the machinations with the excise duty.

These machinations furthermore require a real manipulation with the fuels, which also requires trained personnel, who knows in what proportion should be mixed the fuels. Both factors therefore again see easier committing the fraud in case of the value added tax.

Contrary the critical condition in case of the value added tax is that the fuels must be imported from another country, i.e. not from the home country. The missing trader, who is the most important part in relation to fraud, must appear in the chain during the carousel fraud. His only job is to figure in the state as the first entity in the chain of the retailers in the home country.

Item in form of the personnel requirements results from the above mentioned text. In the case of the value added tax fraud it is sufficient only one person who manages a system of orders and invoicing. In contrast in case of the illegal mixing it is necessary to have both sufficient facilities and equipment (min. tanker or space for pouring and mixing these products), so it will also need more people for the whole period of the activity. This suggests that easier is to commit the value added tax fraud.

The tax administration can disclose the VAT fraud after the end of the reporting period, after the filing the tax returns. The fraud can occur even several years without noticing in case of excise duty. Like in case of other scandals, however, it is sufficient for the disclosure to make a mistake in the proportions of mixed substances and harm the final consumer. From the perspective of the long-term it is therefore more sustainable the fraud on excise duty.

Without customers it is not possible to do a business and therefore neither to commit fraud with indirect taxes. The distribution network is therefore necessary in order to sell as soon as possible and receive the payment for the fuels affected by the fraud. This factor is identical in terms of determination of tendency to tax evasion in both variants (the value added tax and excise duty).

The tax burden is the main motive why the fraudsters are trying to commit a fraud. The value added tax burden is absolutely lower than excise duty burden, as results from Table 1. Moreover, if there is a fraud on the black market, so both excise duty and also the value added tax are cut. The factors of the tax burden and the extent of the fraud, which can be achieved, sounds in favor of a tendency to committing the fraud in case of excise duty.

The risk of disclosure when following and maintaining the technical standards (quality) is higher in case of the value added tax which creates the risk of disclosure in the actual fraud (unusual price) as well as after the filing the tax return. There should logically follow the punishment at the statutory rate after the disclosure. The disclosure of the fraud with the value added tax is mainly more probable in terms of time. In the case of excise duty there may occur greater damage when attempting to tax evasion. Apart from cutting the tax liability it may result in damage of property of the final consumers.

#### **4 Discussion and Conclusion**

Based on the analysis performed in Table 2 it can be assigned to the individual factors the comparing values with use of evaluating characters of the parameters specified in the methodological section of the text, which allows the better evaluation of both the taxes at each stage. The achieved results from the individual factors and barriers are summarized in Table 3. This table comprehensively evaluates each factor, especially in terms of its relevance for committing the tax evasion.

From the Table 3 it is evident that some of the factors cannot be considered significant ("0"). The more significant factors are evaluated as "1". If any factor has approximately the same burden or the importance so the evaluation is the same for both taxes. This evaluation helps to the differentiation of the difficulty of executing the evasion on the selected taxes. Some of the selected factors are so significant that it was necessary to implement CP evaluation - critical point. Without fulfilling this factor it is de facto not possible to commit the tax evasion on the selected tax.

**Table 3. Factors that creates barrier against the committing tax fraud**

Tax	VAT	Excise duty
Input costs	1	1
Formal requirements	0	0
Interchangeability	0	CP
Manipulation with fuels	0	1
Personnel requirements	0	1
Necessary cross boarder transaction	CP	0
Time factor	1	0
Distribution network	1	1
Background and equipment	0	CP
Tax burden - profit	0	1
Extent of activity	0	1
Penalty	1	0
Risk of disclosure	1	0
Total	6 (incl. 1CP)	8 (incl. 2CP)

Source: Authors

Following evaluation is obtained when summarizing. It is easier to commit fraud on the value added tax, although it is subject to cross-border transaction throughout the distribution chain. Excise duty fraud can achieve higher amounts, however it includes two critical conditions. In particular, there must be ensured the adequate amounts of oils that approximately meet the requirements according to the standards for the fuels. Therefore it is also necessary to ensure the possibility of mixing (parameter "equipment and background"). However higher requirements on staff are linked to this. There is also increased risk of disclosure as the fraud must engage more people. The authorities' active in the criminal proceedings may therefore have plenty of witnesses. It can be assumed that the sophistication of the organized criminal groups committing the criminal activities is at high level. They are able to hide their illegal activity for a longer period. Evasion on the value added tax can be disclosed much earlier, practically after the deadline for the filing the tax returns.

We made assessment of indirect taxes in terms of susceptibility to tax evasion after the previous adding of specific aspects of the selected commodity and respective taxes to the hitherto known determinants of tax evasion. This research, unlike previously identified factors [2, 3, 4, 21], summarily shows that when comparing susceptibility to tax evasion the VAT shows worse results compared to excise duty. However, this should not be a reason to contemplate reducing the significance of this tax or even abolishing it. In general, VAT is assessed as a good tax [11, 14]. It is therefore necessary to focus the interest of the inspecting authorities and the legislative process especially to the identified risk field of the indirect taxes, namely to the value added tax.

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# Potential Revenues from Inclusion of Migrants from the Third Countries into Czech Public Health Insurance System

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## Abstract

Self-employed migrants and their dependent relatives, as well as dependent relatives of foreign employees legally staying in the Czech Republic, without permanent residence, cannot participate in the public health insurance system. As they need to be insured, they are forced to conclude commercial health insurance which is disadvantageous compared to the public health insurance system. We estimate contributions on public health insurance that would be paid by self-employed migrants and by dependent relatives, if they were insured. To calculate the contributions for self-employed migrants, we use data on income distribution of self-employed persons from the personal income tax returns. According to our estimates, almost 32,000 of self-employed migrants would contribute to the system by more than CZK 723 mill, based on the income distribution data from 2011. For full impact of the inclusion of the migrants from the third countries also other aspects must be taken into consideration, mainly relevant expense on the health care.

*Keywords:* migration; public health insurance; self-employment; third countries; dependent relatives

*JEL Classification:* F22, J15, J61

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## 1 Introduction

International migration is highly topical as it is common political issue in many countries. Lately, numerous empirical studies have analyzed the impact of international migration from many points of view (impact on the economy of the host or home country, impact on the labor markets, type of immigrants etc., see for example [1, 2, 11]).

For the EU countries, it is very important to distinguish between intra-EU migration and migration from the third countries, since there is different legal background (immigration rules, employment rules, social security rights etc.) for both groups.

Discrimination (direct or indirect) within the EU (intra-EU migration) is prohibited [12, 13]. When it comes to third countries' nationals legally residing within the EU, special anti-discrimination rules also apply. However, this rule does not apply to self-employed workers. [14]

One of the most important issues for migrants is to keep their social security rights and health care coverage when migrating. For this purpose, international coordination of social security (including health insurance) takes place. For the EU countries (plus Norway, Liechtenstein and Iceland) the Regulation 883/2004 about coordination of social security applies [15]. This Regulation under certain conditions covers also third countries nationals as stated in 1231/2010 [16].

Besides the regulation 883/2004, some countries conclude so called bilateral agreements on social security. [8] These bilateral agreements differ according to their scope and therefore some include health insurance as others do not. The Czech Republic has bilateral agreements on social security with the coverage of health insurance with Turkey, Israel and countries of former Yugoslavia. The Czech Republic has also concluded agreements exclusively for health care purposes of migrants with temporary stay with Yemen and Cuba. [10]

Legal approach to the Czech public health insurance of migrants from the third countries (meaning countries with which the Czech Republic has no coordination of health insurance through EU coordination of social security or bilateral agreements) without permanent

residence is criticized by some as discriminatory for self-employed, employees and dependent migrants without income; even though the situation for these groups differs. [6]

Self-employed migrants from the third countries without permanent residence are not within the scope of public health insurance; therefore they are not contributing to the health care system through the obligatory contributions. However, they must be insured by commercial health insurance.

Employed migrants from the third countries, even without permanent residence, are within the scope of public health insurance during their employment. When they lose their job they are not covered by public health insurance anymore and must be insured by commercial health insurance.

Dependent relatives of migrants from the third countries without permanent residence (e.g. children born to legally residing migrants in the Czech Republic without permanent residence) are not within the scope of public health insurance system, if they do not possess the permanent residence them self. This can cause existential problems for the whole residing family as often new-borne need special highly expensive health care, which also does not have to be part of the commercial health insurance. [6]

The commercial health insurance is disadvantageous compared to the public health insurance. [6, 7]

Within the Czech Republic, most self-employed migrants come from Vietnam, Ukraine, Russia and USA. Even though there are bilateral agreements with Ukraine, USA and effective from November 1th, 2014 new agreement with Russia, none of these agreements covers health insurance. (Assumed expansion of the material scope on health insurance with the USA does not cover self-employed migrants.)

The Czech public administration has considered the question of including the self-employed migrants from the third countries without permanent residence to the public health insurance system several times. There are arguments both for and against their inclusion. Advocates for the inclusion believe that the rise from the contribution paid by self-employed migrants would exceed the expenses on their health care [6]. Opponents of such inclusion argue that expenses on their health care would be much higher than the contribution, pointing out the potential problems with collection of contributions and possible so called health care tourism.

However, proper calculation predicting the impact on the finances of the public health insurance system to support the arguments of either side is rare. [7]

The aim of this paper is to provide a partial analysis of the impact of including migrants from the third countries to the public health insurance system. We calculate the theoretical contributions of self-employed migrants from the third countries, the state insured dependent family members, as well as persons without taxable income for the year 2011 (as all needed databases are available to us for this year) to get the preliminary estimate of potential income to be realized by the inclusion of these groups of migrants into the public health insurance system. This figure could be further specified based on more precise (up to date) data if available and used for the very important discussion of this topic.

## **2 Material and Methods**

To calculate the resulting impact of the inclusion of certain groups of migrants from the third countries in the public health insurance system, we must 1) identify the relevant group of migrants to be included in the system. 2) The next step would be the assessment of the potential income generated from their subsumption to the system. 3) Finally also the costs incurred by the system relating to those newly included foreigners should be evaluated.

In our discussion paper, we do not attempt to calculate the expenses spent on the newly insured persons of the public health insurance system. We concentrate only on the first and second step to identify the size of relevant group and estimate the revenues (contributions on health insurance) of such change.

## *2.1 Specification of the Group of Migrants to be Included*

Prior to the calculation of the total assessment base of the migrants from the third countries, we must specify the relevant group of migrants to be included into the Czech public health insurance system. We consider both self-employed migrants and their dependent relatives, especially children and spouses. We also include dependent relatives of migrants from the third countries who are employed in the Czech Republic. The employees from the third countries themselves are insured in the public health insurance system, whereas their dependent family members are not.

The group of self-employed migrants is significantly different from their dependent family members and from the dependent family members of employees without permanent stay. The point is that the self-employed migrants would contribute to the system based on their earnings, whereas the contribution for the dependent (non-working) persons would often have to be covered by the state. [4] It should be born in mind that the revenue (contributions) associated with the state insured individuals create cost of the state budget at the same time. That means, the potential contributions of self-employed migrants from the third countries would be the only real and relevant income realized by the public budget as a whole by the subsumption of these foreigners.

Therefore we consider both groups - self-employed migrants and dependent family members (of both self-employed and employed migrants) - separately.

We include all self-employed migrants from the third countries, staying on long-term visa in the Czech Republic (further only "the CR") as available from the Ministry of the Interior "The report on Migration" [8]. That means that we exclude those migrants falling under regulation 883/2004 [15] or bilateral agreements between countries (with the exemption of migrants covered by regulation 1231/2010 [16], as no relevant data are available). We also excluded the migrants from Croatia (even though Croatia had no bilateral agreement on social security with the Czech Republic in 2011) as it became the member of the EU in 2013 and since then migrants from Croatia are covered by regulation 883/2004. Thus, the number of migrants from Croatia is not relevant for our calculation that should be used for the discussion of potential revenues of the public health insurance system in future years.

Unfortunately, the numbers of migrants, according to their economic activity reported in the migration report by the Ministry of Interior are not divided into the category of long-term and permanent stay of the migrants. [9] For the employed migrants, the migrants with the permanent stay can be distinguished as they do not need the employment permit. Also the totals on foreign employees from the third countries applying for the employment permit are available.

That is why, for the self-employed, we had to make an assumption that the proportion of self-employed migrants from the third countries, staying on the long-term visa is the same as this proportion of all migrants from the third countries. The latter ratio is available from the migration report [9] as it contains the data on total numbers of migrants from the EU and third countries split to long-term and permanent stay.

The migration report [9] provides total number of visas issued for the long-term stay to migrants from individual countries. The totals as of 31 December 2011 are further divided according to the status of migrants to the employed and self-employed ones. Therefore, it is possible to withdraw the number of non-working migrants (children of self-employed and employed migrants, non-working spouses, retired persons, students, etc.) as a residual category of these data.

Table 1 contains necessary figures for the calculation of the self-employed migrants from the third countries and non-working foreigners from these countries staying in the CR based on a long-term visa.

**Table 1. Migrants from the third countries with long term visa according to their economic activity**

<b>Economic status and type of visa of migrants</b>	<b>Number of migrants / ratio</b>
Migrants from the third countries with the long term visa	112,989
Migrants from the third countries - total (long term and permanent stay)	251,670
Proportion of migrants from the third countries with the long-term visa	0.45
Self-employed from the third (non-contractual) countries	71,140
Self-employed from the third (non-contractual) countries with the long-term visa (estimated)	31,939
<i>Non-working migrants</i>	
Non-working migrants from the non-contractual third countries with the long-term visa	42,382

Source: [9]

For further calculation of potential revenues into the public health insurance system, it is necessary to distinguish non-working migrants from the third countries on those whose insurance is paid by state and those who pay their minimum insurance by themselves (in the relevant legislation so called “persons without taxable income”).

At first, we estimated the number of state-insured persons (children and students under 24 years and persons older than 65 years) based on the data from the Czech Statistical office (further just the “CSO”) contained in [5]. Then the difference between state-insured and all non-working migrants represents the so called persons without the taxable income. Results are presented in Table 2 together with the estimated contributions of all those groups of migrants.

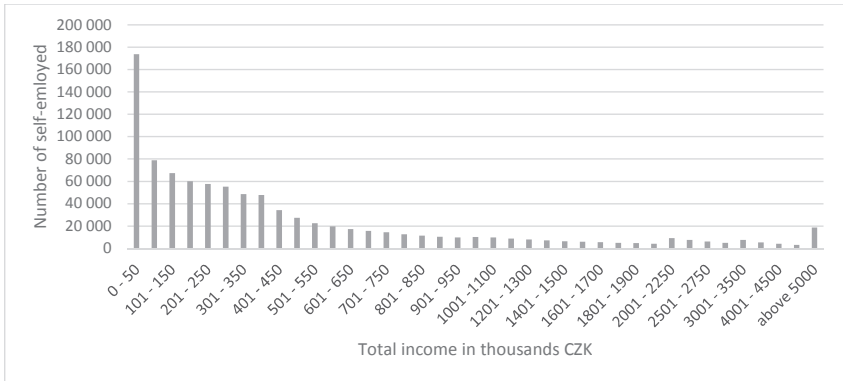
### 3 Results and Discussion

For the calculation of assumed contributions we use information on the income from the business activity (as to section 7 of the Income Taxes Act, further “the ITA”, [3]) declared by the self-employed in personal income tax returns to the tax authorities, obtained on request from the system ADIS kept by the Ministry of Finance (further only “MF”). So far, we could not retrieve these primary data, sorted by the nationality of the tax payers. Therefore, for the purposes of our discussion paper, we assume that the distribution of income is the same in the whole population of self-employed persons in the CR as in the group of self-employed migrants researched. Based on such preliminary premise, we would estimate the income of the relevant group of self-employed migrants by using the number of these migrants and the distribution of income found out from the summarized data available from the MF.

The assessment base for the calculation of the health insurance contributions of self-employed persons is based on the unadjusted tax base (total income less expenses incurred) of taxpayers declared according to section 7 of the ITA. The information on the unadjusted tax base for relevant level of the income can be also obtained from ADIS. According to the data there was 929,219 self-employed persons in total (local and migrants) declaring in the personal income tax return their income from business activity under section 7 of the ITA in 2011; and their total unadjusted tax base in thousands of CZK was 144,397,730.

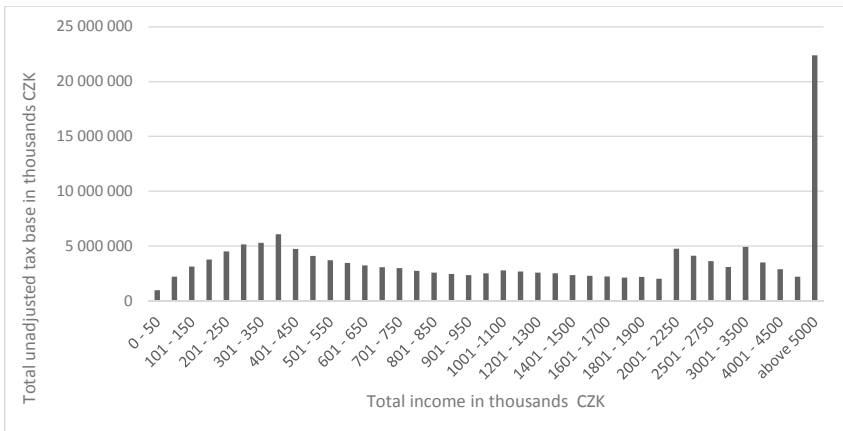
For illustration, we include below two figures. Figure 1 represents the number of self-employed persons in each income range in the year 2011. Figure 2 shows the total unadjusted tax base attributable to each income range in the population. As we assume a similar distribution of taxpayers and their total tax bases for the migrants from the third countries, we use it in the estimation of the assessment base of self-employed migrants for the health insurance contributions.

**Figure 1. Number of self-employed persons according to income ranges in the year 2011**



Source: ADIS, Ministry of Finance

**Figure 2. Tax base distribution in the year 2011 for self-employed persons in total**



Source: ADIS, Ministry of Finance

Further, we use the estimated numbers from Table 1 for the calculation of potential revenues of the public health insurance system as follows. Firstly, we apportion the number of self-employed migrants from the third countries to individual income ranges. Then we estimate the total unadjusted tax base for each income range by multiplying the number of migrants by average unadjusted tax base in this range calculated from the MF data.

The assessment base for the health insurance contributions of self-employed persons is stipulated as 50% of the difference between their income and expenses declared income tax purposes. Thus, we can get the assessment base for our calculation by counting 50% of the computed unadjusted tax base. We also take into account the minimum assessment base valid in the year 2011. We use the figure valid in 2011 so that it corresponds with the data on the income distribution. However, the minimum assessment base is slightly higher in subsequent years. The minimum assessment base was used in those income range groups where the average monthly health insurance contribution per migrant computed from the total assessment base was less

than the minimal monthly contribution of 1,670 CZK. We do not use the maximum assessment base in our calculation as it has been currently abolished.

The potential contributions of the self-employed migrants are then computed as the product of the calculated assessment base and the rate of 13.5%.

For non-working persons whose number is estimated as the difference between the residual from the total migrants and economically active migrants from the third countries, staying on long-term visa, we calculated the contributions as follows.

The persons without the taxable income would contribute the amount of 1,080 CZK per month in the year 2011. The contributions for the state-insured migrants (payable by state) equaled to 723 CZK in the year 2011.

Table 2 summarizes our estimation of the contributions to be paid by self-employed migrants, by the persons without taxable income (e.g. spouses of self-employed or employed migrants) and on behalf of state-insured migrants from the third countries if they were included in the public health insurance system based on 2011 data.

**Table 2. Estimate of total contributions generated by the inclusion of migrants from the third countries (Self-employed and non-working migrants) into the public health insurance system in CZK**

	<b>Number of migrants</b>	<b>Total contributions</b>
Self-employed	31,939	723,134,370
State-insured	12,291	106,635,825
Persons without taxable income	30,092	389,985,935
Total revenues		829,770,196

*Source: Authors based on [3, 5, 9]*

#### **4 Conclusion**

The inclusion of migrants from the third countries into the public health insurance system is very important social question with potential significant impacts on the finances of whole health insurance system.

Based on 2011 data from the personal income tax returns, we have calculated estimated contributions into the public health insurance system. We had to make several assumptions in our calculation due to the limits of the data; some of the assumptions can be overcome when more specific data from the Ministry of Finance is available. However, we emphasize the importance of assumed income of self-employed migrants for the calculation of estimated contributions as this has not been taken into consideration in the discussions so far.

According to our results, the self-employed would contribute to the system by more than CZK 723 mil., insurance for state insured would be more than CZK 106 mil. and so called “persons without taxable income” would contribute by almost CZK 390 mill. It should be pointed out, that we work with the data for 2011 with corresponding minimal bases and payments for state insured persons (with the exception of maximum assessment base). Therefore, final contribution can be higher, if current higher minimal bases and state payments are used.

Data about the distribution of income from self-employment also shows that up to CZK 1,100 thousands of revenues the contribution is paid on average from the minimum assessment base. This applies to 87% of all self-employed in the CR, which corresponds to 27,692 of foreigners in question (with the assumptions described in the methodology).

[7] provides in his analysis the calculation of potential revenue of the inclusion of foreigners into the public health insurance system with significantly higher contribution; he assumes revenue from approx. CZK 1.7 bill. to CZK 3.1 bill., depending on how many foreigners would join the system. First, he works with higher number of foreigners due to different methodology. Second, according to our opinion he overestimates the assessment base for the calculation of the contribution, as he calculates with average monthly income of self-employed in

the amount of CZK 53,602. This is not in line with our data we use about the income distribution of self-employed.

As further step, relevant data and methodology for the calculation of the estimated expense on the health care should take place. Also further adjustments of the methodology might be needed, as it can be argued that there will be for example lower compliance rate for the migrants from the third countries than for other persons insured. On the other side, wide discussion can follow on the setting of the whole system, such as higher minimum contribution, limited stay in the country (probably in months) before inclusion of the migrants into the system or limited insurance of dependent family members.

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# Czech Pension System and Ways of its Rationalization

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## Abstract

In 2010, the Constitutional Court of the Czech Republic stated that the complex construction of the pension system is nontransparent to a degree that it is de facto absolutely incomprehensible for its addressees. The so-called small and great pension reforms, which followed, contributed to the system transparency only very little. By contrast, the implementation of the so-called 2<sup>nd</sup> pillar in the form of an opt-out with high government subsidies complicated the entire system – if nothing else, then due to the fact that we have a hypertrophied and heterogeneous third pillar (with 2-3 tiers) that relies on the utilization of extreme fiscal support. The basic (public) pension pillar consists of two, fully or substantially solidary tiers, which is not comprehensible. In the present situation, the 2<sup>nd</sup> pillar is absolutely redundant. The objective of the paper is to confront the basic components of the Czech pension system with the findings of pension theory and policy as well as the analysis of possible rationalization of the system as well as of its individual pillars and tiers. The rationalization of pension pillars is also reflected in the rationalization of income taxation.

*Keywords:* old-age pensions; pension reform; NDC; flat-rate pension; soft compulsion

JEL Classification: H55, J26, H24

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## 1 Introduction

The great pension reform (as of 2013) consisted in the formation of the second pension pillar within the meaning of the World Bank classification [4] and in the reform of a significant part of the third pillar, referred to as the supplementary pension insurance till then; this group of products had been provided by joint stock companies called pension funds. A “mutual funds model”, provided by “pension companies”, was introduced within this segment as part of the great pension reform. A significant part of the reform also consisted in the introduction of the state regulation of fees, collected by pension companies for individual funds of the 3<sup>rd</sup> and 2<sup>nd</sup> pillars. The second tier of the government-supported 3<sup>rd</sup> pillar – i.e. the so-called private life insurance, provided by private insurance companies, was virtually unaffected by the reform. There was a partial reform of state contributions to the participants’ contributions under the supplementary pension insurance or the new supplementary pension savings (as appropriate), aiming at higher contributions of participants. The reform has not taken account of the growing international evidence that fiscal incentives are often costly and ineffective in inducing more saving. The system has remained quite complex (a combination of matching state contributions and tax relief on employee and employer contributions). At the same time, the net tax cost was the highest in the OECD and about twice the average [3]. On the contrary, additional second pillar, with even higher fiscal support, was added to the strong and heterogeneous 3<sup>rd</sup> pillar.

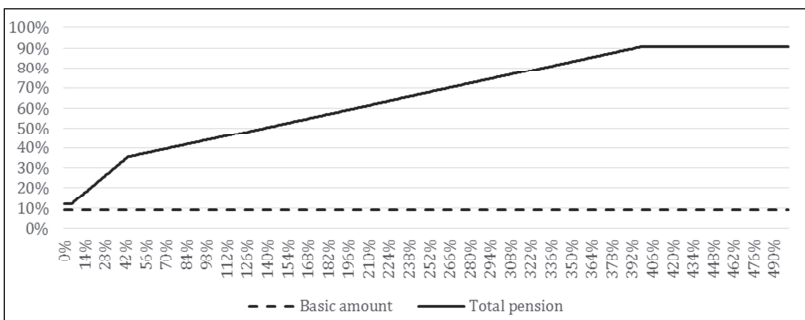
Above all, the small pension reform was a necessary prompt reaction of the Government to the Decision of the Constitutional Court of the Czech Republic of 2010. Ideologically, the Constitutional Court apparently relied on the opinion that the Czech “pension insurance” (1<sup>st</sup> pillar) should be a social insurance scheme, which currently mainly relies (particularly in Germany) on the principle of (insurance) equivalency between pensions and insurance premiums. The applicable bend points, included in Section 15 of the Pension Insurance Act, were declared unconstitutional, “as they – consequently and in combination with other parameters and existing design of the pension system – do not sufficiently guarantee the constitutionally guaranteed right to adequate material security pursuant to Article 30(1) of the Charter of Fundamental Rights and Basic Freedoms, leading to unacceptable inequality between various groups of people insured under the pension insurance scheme” [2].

The primary objective of the paper is to analyze the existing pension system as a whole, including the concepts of individual pillars and tiers, within the historic context of their formation, and from the perspective of the modern international pension theory and policy, using the secondary analysis of sources. We will subsequently derive the basic rationalization possibilities of the system, using our own graphical and computational analysis.

## 2 Material and Methods

The universal “basic amount” of pensions has existed in the Czech Republic since 1996; it is presently set at 9% of average national wage (AW), amounting to CZK 2,400 per month in 2015. The second component of all Czech pensions is the “percentage amount” of pensions; it is calculated from valorized average wages and then reduced by reduction coefficients. The combination of low solidary “basic amount” with “percentage amount” that is significantly solidary from a rather randomly selected point (44% of AW), lacks any basic conceptual/system logic. This is further pronounced by the fact that the precondition to claiming pensions is a long period of insurance (vesting period). This is also apparent in Figure 1. The basic amount should either be considerably higher with the percentage amount non-solidary (i.e. earnings-related), or the basic amount should be abolished and the percentage amount should be even more solidary. Both approaches are used throughout the world; the first alternative is used in several countries, whereas the second alternative is used in the United States.

**Figure 1. Relation of net pension to average wage 2015 (insurance period of 40 years), both in % of AW**



Source: Author

The “supplementary pension insurance” was formed in 1994, as a government-supported system of private pension insurance. The Government declared the application of the “civil” principle, consisting in the fact that solely individuals could enter into “supplementary insurance” contracts with various pension funds. However, it also made it possible for employers to pay contributions to their employees’ personal accounts.

The original supplementary pension insurance product gave the impression of pension insurance with relatively large variability; however, it basically was a mere multipurpose savings scheme with a state contribution of up to 50%. The 1999 amendment of the Act introduced an income tax base deduction for participant’s contributions over CZK 500 (up to CZK 1,500) per month. One year after the supplementary pension insurance, insurance companies were able to push through government support in the form of the tax base deduction for the so-called private life insurance, a legislative abbreviation for endowment insurance, survival insurance, and pension insurance. The amendments resulted in four concurrently existing subsidy systems with different level of subsidies, depending on the product type (supplementary pension insurance or private life insurance) and the contribution payer (participant or employer). Such differences cannot be explained based on facts. The conditions

for employers' contributions under the supplementary pension insurance scheme and the private life insurance scheme were unified in 2008.

One significant difference between the products of the Czech supplementary pension insurance and the private life insurance consists in the fact that the supplementary pension insurance products are basically easily comparable (with appreciation being compared in practice), while the private life insurance products cannot virtually be compared by laics and are also usually less beneficial than the supplementary pension insurance, e.g. due to higher commissions included in the price thereof.

The OECD [11] has repeatedly published comparisons based on data from 10 years ago; according to the comparison, the Czech supplementary pension insurance received the highest government support for any product of this type in the OECD. (This concerns a comparison of total fiscal costs under occupational pension schemes that consist of three components: lost taxation on contributions, lost taxation on investment returns, and taxation of benefits.) For the sake of completeness, we must add that New Zealand has claimed the top spot in terms of fiscal incentives – by introducing the KiwiSaver product in between.

High government support of the supplementary pension insurance had translated into a significant increase in the number of supplementary pension insurance policies. Nearly 2.5 million people took part in the system by the end of 2001. Substantial year-to-year increase – by more than 500,000 people – occurred in 2012, to more than 5.1 million participants. The “placement” of supplementary pension insurance within “transformed funds” of pension companies represented an impulse to extensive sales campaign prior to 30 November 2012 – as such funds were closed for new clients as of that date. Insurance brokers mainly emphasized the benefits in the form of a guarantee of invested funds and possibility to withdraw fifty percent of savings after 15 years (for young people), which is not possible for new products.

As part of the great pension reform, a “mutual funds model” was been introduced as of 2013; new clients may only enter one of the “participating funds” of pension companies. Participants of the original supplementary pension insurance are eligible for this conversion. The transformed funds represent a hybrid of the old and new systems: the law specifies the maximum remuneration for their management at 0.6% of assets per year plus 15% of profits of a transformed fund (of which at least 5% of profits being allocated to a special reserve fund). At the same time, the new fees are much smaller than the previously reported operating costs of pension funds (i.e. 1.4 to 1.5% of assets per year); in terms of an international comparison, the OECD rated the Czech Republic as a country with the highest operating costs in 2010.

The key weakness of the supplementary pension insurance consists in its low real returns for clients; the average returns in the period of 2002 to 2012 amounted to less than 0.7% per year [11]. There are two reasons for this: the product design (guarantee of non-negative nominal returns in each year) and high overhead of pension funds. The World Bank assessment of 2011 is thus materializing – the Czech supplementary pension insurance scheme shares weaknesses of both Latin American open-end pension funds (high marketing and other costs) and of occupational pension schemes of OECD countries (insufficient transparency), without sharing any of their benefits: higher transparency of open-end funds and lower costs of occupational funds [13].

The great pension reform failed to establish uniform conditions for the contributions of participants and employers, further favoring supplementary pension insurance and supplementary pension savings compared to private life insurance when it comes to contributions made by clients. Although the relative state contribution amount decreased, the government motivates participants to increase their contributions.

The largest age group in terms of the supplementary pension insurance scheme includes clients over 60 – 26% of all participants at the end of 2011, with additional 21% being in the age group of 50 to 59 years. The share of clients over 60 has been increasing in the past six years, with declining share of participants within the group of 50 to 59 years [8]. The provision of the state contribution to pensioners may be viewed as a sign of equal approach to government subsidies; however, it also makes the entire supplementary pension insurance concept more

questionable [12]. The age structure would be absolutely different, if the state contribution would be replaced by a tax deduction.

As expected, the changes in the pension savings parameters introduced as of 2013 have resulted in a significant year-to-year increase in the average monthly contribution of the supplementary pension insurance participants by 22%, to CZK 568 per month. The average monthly contribution of participants in new participating funds even amounted to CZK 749 in 2013. However, there are not very many of these participants for the time being – 77 thousand at the end of 2013. The prognosis of, for example, the Scientific Council of the Czech Banking Association about the conservation of existing funds for participants has proven true; they will tend to remain in these funds [10]. The total amount of state contributions to supplementary pension insurance and supplementary pension savings has increased by 16% year-to-year to CZK 6.9 billion.

As part of the great pension reform, the Government (or the Ministry of Finance, as appropriate) did not consider the area of private life insurance at all, in spite of long-term impairment of clients in the form of high commissions and by “resigning” policies, as many intermediaries openly impair clients by cancelling long-term life insurance policies and arranging new policies – with clients being charged high cancellation fees and sellers receiving commissions for new policies. As part of a major Income Tax Act amendment in 2014, the Government approved an exclusion of the unit-linked insurance from the category of private life insurance, substantiating this measure by alleged misuse of this insurance scheme by the provision of employer’s contributions to private life insurance, where employers provide these contributions to partially set off wages. However, the core of the problem consisted in an extremely high government support, particularly in the form of exemption from social security / health insurance premiums and abuse of a loophole in the Income Tax Act, where the so-called extraordinary benefits (withdrawals from personal accounts under the unit-linked insurance scheme) were not interpreted as insurance indemnification. The situation was “rescued” by an amendment of a Chamber of Deputies Member, which annuls the proposed exclusion of the unit-linked insurance and bans extraordinary benefits under the private life insurance. However, this does not affect the exemption from social security / health insurance premiums.

There were 3.5 million private life insurance policies in 2013; the number of policies with employer contributions amounted to 374 thousand. The premiums written under private life insurance amounted to CZK 40.5 billion, with CZK 3.7 billion (9%) coming from employers [1]. The total public expenditure on fiscal support of the private life insurance amounted to CZK 3.5 billion in 2013. Together with supplementary pension insurance and supplementary pension savings, the fiscal support amounted to CZK 16.4 billion – i.e. 0.4% of GDP.

The second pension pillar, introduced by the Pension Savings Act, was formed without proper analyses of the Czech conditions; it was “discovered” just before its launch that the opt-out is detrimental for more than half of all potential participants. The pension reform manual states the following in respect of the aforementioned: “Generally speaking, the 2<sup>nd</sup> pillar is more beneficial for younger people, who may save for a longer period of time, as well as for people with above-average income” [9]. Furthermore, the given pillar was introduced under adverse economic conditions and without consensus with the opposition and the President. Only a few pension companies entered the market, with only 83 thousand people enrolling under the pillar.

The Government of Nečas presented very general arguments in introducing the 2<sup>nd</sup> pillar – aging population, increasing deficit of the so-called pension account (1<sup>st</sup> pillar), and strong dependence of today’s pensioners on the 1<sup>st</sup> pillar. With regard to the 3<sup>rd</sup> pillar, the Government claimed that, in spite of extensive fiscal support, average savings are very low, thereby not guaranteeing sufficient income in old age. Moreover, the Government stated that the appreciation under the 3<sup>rd</sup> pillar often does not even cover inflation, that there is no regulation of costs of clients’ asset management, and that the savings may be withdrawn all at once (lump sum benefit) [9].

The opt-out method was applied in respect of the 2<sup>nd</sup> pillar; in case participants decide to (partially) leave the public pillar, they cannot return (with some, basically temporary exceptions in the Czech Republic). The opt-out is associated with lower insurance premium payments to

public pension insurance of 3% of wage, whereas participants must pay additional 2% of wages (after taxes). The 2% add-on obligation was not substantiated by anyone. And, in a way, it was the other way around: the Government explained that the 2<sup>nd</sup> pillar is the savings product with the highest subsidies on the Czech market, because participants receive 3% to their 2% contributions – i.e. subsidies of 150% of the participants' contributions. The dedicated advertising campaign only later acknowledged that future pensions would be reduced – by reducing the coefficient of 1.5% for each year of insurance (from reduced earnings) to 1.2%. This is an equivalent reduction of the coefficient – for average-income employees; at the same time, it disregards the fact that entire decades usually pass between the 3% opt-out from the government budget and the awarding and payment of pensions. Even the Czech version of the opt-out represents an enormous advantage for the opt-out participants. The fiscal costs of the 2<sup>nd</sup> pillar, calculated as 3% of average wage per year, amount to about CZK 750 million (transition costs) for 83 thousand participants. This amount should pay off in decades – provided we ignore the value of money (and of wages) today and in the distant future.

In November 2014, the new coalition Government passed a resolution relating to the termination of the 2<sup>nd</sup> pillar; the transfer of 3% of income is to be suspended as of 1 January 2016. Participants are to have the opportunity to either withdraw all their funds in cash or to transfer them to a contract under the 3<sup>rd</sup> pillar.

### 3 Results and Discussion

The modern pension theory requires strict detachment of the solidary pension pillar. The two basic versions thereof are universal pensions (demogrant) and means-tested pensions for all residents. This is a crucial piece of information that earlier pension committees kept secret from governments. The first Pension Committee of Bezděk had “another assignment”; the focus of the second Committee of Bezděk consisted in the implementation of the 2<sup>nd</sup> pillar – as also documented by the Committee members.

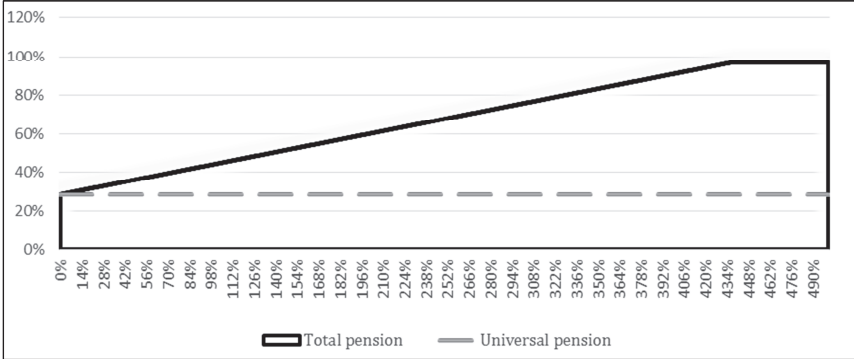
The decisive political powers in the Czech Republic may not oppose a major reform of the existing 1<sup>st</sup> pillar, consisting in its partition into 2 transparent pillars – a solidary pillar and a public insurance pillar. World Bank experts have been recommending since 2003 to use NDC (notional, later nonfinancial defined contribution) scheme as the first pension pillar, which largely copies modern private pension FDC (funded, later financial DC) products. However, the key difference between an NDC and a private FDC is the fact that an NDC is a (modern) universal social insurance (i.e. one product for all wage earners), whereas the investment risk relating to private FDC products is borne by clients – each of them individually. Insurance premium under an NDC scheme is attributed to clients' accounts; balances of such accounts increase in value each year, depending on the development of average nationwide wages (with potential correction); old-age pensions are calculated based on the final balance of personal accounts, using a conversion rate determined on the basis of actuarial principles.

The combination of an NDC scheme with a solidary pillar (minimum or universal pension) has been proposed by a World Bank advisor for the Czech Ministry of Labor and Social Affairs [7]. The proposed universal (flat-rate) pension amounted to 25% of the average nationwide wage, with the insurance premium rate for the NDC pillar at 12%. The Committees of Bezděk did not even consider the proposal – the World Bank recommendations were not taken into account. Various experiences with NDC schemes were summed up in a two-part book of the World Bank published in 2012 [6].

The easiest (yet crucial) pension reform in the Czech Republic would be a transition to the combination of an NDC scheme with a universal (flat-rate) pension amounting to about 28 to 29% of AW. The reason for this is as follows: in case we “straighten” (raise) the curve of pension to wage dependence in the Czech Republic, as shown in Figure 1, in the section of up to 44% of AW, we get a line that intersects the y axis at 28.54% of AW – with 40 years of insurance. Consequently, if we increase today's lowest old-age pensions – as calculated from income of up to 44% of AW – in this manner, we would arrive at the basic old-age pension amount at 28 to

29% of AW (approximately CZK 7,600 per month) and low percentage amount with coefficient of  $1.5\% * 0.26 = 0.39\%$ . Less than 14% of pensioners currently receive old-age pensions of up to CZK 7,600. In terms of a model, it is also possible to move away from the basic pension amount to a universal (flat-rate) pension for all residents, whereas the percentage amount of pensions can be easily replaced by an NDC scheme with an insurance premium rate of about 9% of wage. This will result in a system with two public pension pillars, which is compatible with the Pan-European pension scheme of the World Bank – see Figure 2. Since the solidary pillar is tax-financed by default, it is possible and rational to reduce the pension insurance premium rate by about 11 percentage points, with simultaneous equivalent increase of an income tax rate, for example.

**Figure 2. Dependence of net pensions to gross wage in 2015 (insurance period of 40 years), both in % of AW: transition to flat-rate pension + NDC**



Source: Author

Robust fiscal incentives of private pension savings represent one of four forms of soft compulsion as a method of implementation of the mandatory pension savings – in addition to an opt-out, auto-enrollment, and matching contributions on the part of employers. Soft compulsion is an alternative to hard compulsion; soft compulsion allows nonparticipation within the system not only for obstinate opponents of mandatory savings or insurance, but also for socially weaker groups – which tend to be secured otherwise in old age in developed countries, e.g. through relatively high flat-rate pensions.

No foreign country combines two pension pillars that utilize soft compulsion; the Czech Republic is an exception. A pillar that relies on soft compulsion must take into account higher overhead compared to the same pillar with hard compulsion. However, the overhead of a private pillar is significantly affected (also) by other construction elements of the system, including government regulation. All other factors remaining constant, we deduce that the present existence of the 3<sup>rd</sup> and the 2<sup>nd</sup> pension pillars in the Czech Republic is absolutely irrational. The entire 3<sup>rd</sup> pillar ought to be thoroughly reformed / rationalized prior to potential implementation of the 2<sup>nd</sup> pillar.

The possible ways of rationalizing the 3<sup>rd</sup> pillar are as follows: unification of terms and conditions in both currently existing parts of the 3<sup>rd</sup> pillar, particularly products, forms and amounts of government support, including the elimination of preferential treatment to employer's contributions. The government support cannot include the exemption from social security / health insurance premiums. The simplest solution for today's providers would be to abolish the state contribution to supplementary pension savings and to transit to exclusive application of tax deductions and full taxation of all benefits. Alternatively to tax deductions, it is possible to have a state contribution, whereas any benefits should be fully taxed in this system as well. In the light of the inherent hypertrophy of the third pillar (nearly 5 million clients of

pension companies and 3.5 million private life insurance policies), it would also be possible to discontinue the government support of such saving schemes, leading to a reduction in the number of contracts to the internationally usual coverage level (2 to 3 million participants under the Czech conditions) within the horizon of 5 to 10 years.

The key problem of a mandatory or quasi-mandatory private pension saving scheme is the high overhead of the private sector. Such overhead may be reduced in many ways:

- Annul lifelong old-age pensions (annuities) as part of the product/scheme; such pensions may be paid out by a national pension company (Sweden, Poland).
- Form a national pension company for the savings phase, to compete with the private sector (Sweden and currently also Chile).
- Form a default fund within the national pension company, with new clients automatically enrolled therein, with the possibility to transfer to a private pension company (in Sweden, more than 90% of people remain in the national company).
- Allow anonymous investments (“blind accounts”) in private pension funds only (Sweden).
- Transition to hard compulsion (Sweden).

However, by applying all of these recommendations of international pension theory, we will basically end up outside of the “second” pension pillar, which is also the case of the Swedish Premium Pension often referred to in the Czech Republic; it is considered one of three national pensions in Sweden, not a private pension pillar.

#### 4 Conclusion

The Czech public pension pillar is a conglomerate of the solidary “basic amount” (9% of AW) and strongly solidary “percentage amount” of pensions. Public old-age pensions can be, relatively very easily, rationalized by transforming them into a fully solidary pillar – i.e. universal pension for all residents at about 28 to 29% of AW – and to a fully earnings-related insurance pillar (e.g. NDC) with pension at  $1.5\% * 26\% = 0.39\%$  of prior income for each year of insurance. Simultaneously, it is also possible to rationalize the insurance premium rate for old-age pension insurance by reducing it by about 11 percentage points to roughly 9% of wage. Universal pensions in a rational pension scheme are financed in the same manner as any other public expenditure program. The deficit of fiscal revenue as a result of lower insurance premium may most conveniently be compensated by increasing an income tax rate. Following a reform of old-age pensions, it is also necessary to reform disability and survivor pensions. Sufficient international experiences exist in this regard as well; however, it is also a challenge for further university research. The same is true for introduction of full taxation of any earnings-related social benefits as well as universal pensions.

The Czech private pension pillar, the so-called 3<sup>rd</sup> pillar, is also an unsystematic conglomerate of the so-called supplementary pension savings and the so-called private life insurance. These heterogeneous subsystems are “interconnected” when it comes to extremely high tax benefits for employers’ contributions ranking the Czech Republic first or second in this regard globally – all this in a situation, where the number of participants of the said subsystems exceeds a reasonable coverage several times. A standard international finding is the fact that fiscal support of pension savings does not, in principle, lead to higher savings of the population, but only to the transfer of such savings into government-supported products. The costs of this fiscal illusion amount to CZK 16.4 billion per year; however, it is politically difficult to eliminate it. In any case, we should fully consolidate the government support systems as well as the unification of products and other terms and conditions for all providers; these products may newly be offered by banks as well. Possible full elimination of government support in the third pillar with subsequent reduction of the income tax rate is a challenge, even in terms of research.

The concept of the newly introduced Czech second pension pillar is largely outdated and disregards the trends in international pension theory. Moreover, it represents competition to the hypertrophied third pillar in the Czech Republic. Both pillars are two alternatives of a soft



compulsion system. The second pillar was set up not only with the opt-out and add-on combination, but also extreme government support, declared at 150% of participants' contributions. The very complicated construction of the pension savings within the second pillar has contributed to the fiasco of the 2<sup>nd</sup> pillar, with only 83 thousand participants enrolling. The abolishment of this pillar is thus relatively simple.

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# The Comparison of Particular Characteristics of the Environmental Taxation and the Emission Tradable Allowances in the Czech Republic

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## Abstract

This paper is focused on comparison of CO<sub>2</sub> emission tradable allowance and environmental taxation in the Czech Republic in 2013. Firstly, both the general overview of the EU ETS and environmental taxation is presented, including the overview of important scientific studies in this area. The second chapter, methodology and data, shortly describes the method, as a one part the questionnaire, as a second part the Mamdani methodology is presented, including official sources of data. The key chapter, results and discussion, focuses on the comparison of particular characteristics of emission tradable allowances and environmental taxes, based on the behaviour of particular stakeholders of the EU ETS in the Czech Republic, the most interesting findings of the questionnaire and public budgets revenues from particular "pollution prices" in the Czech Republic. The discussion is focused on the general public finance consequences. Observing the characteristics of an auctioned emission allowance in the Czech Republic in Y2013, we can say, that it behaves almost entirely as an environmental tax or fee. The most significant difference can be visible in the floating "tax rate".

*Keywords:* environmental taxation; emission tradable allowance; comparison; ex-post analysis; Czech Republic

JEL Classification: H23, H3, Q48, Q58

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## 1 Introduction

Regarding particular analyses and scientific studies dealing with environmental taxation and tradable emission allowances systems, there are many interesting papers. Focusing on environmental taxes, we can find various analyses focusing on general environmental taxation impacts [2, 3, 31], distributional impacts [5, 30], competitiveness impacts [10] or the administrative burden of environmental taxes [24]. Stranlund and Chávez [29] focus on the optimal distribution of administrative costs between polluters and the government and the optimal level of the emissions tax in relation to marginal pollution damage.

Since emission allowance trading has primarily started in the US, the majority of publications dealing with tradable emission allowances assess the market for SO<sub>2</sub> emissions under the Acid Rain Program [4]. Regarding the EU ETS, scientists have focused mostly on modeling and forecasting the prices of CO<sub>2</sub> emission allowances [4, 8, 12, 15, 16], the incidence of the carbon price [14], the EUA price drivers [1, 18, 32], the marginal cost of both energy intensive companies and power sector [7, 17], the influence of emission allowance trading on electricity producers [7, 17, 11] or its innovation impact [26, 27].

Considering the characteristics of particular instruments of CO<sub>2</sub> pricing, their impacts, efficiency and optimization, the particular economists have different opinions. The comparison and assessment of these economic instruments is not trivial, since it can be important additional source of information for policy makers in particular countries.

Dealing with the most interesting studies in this area, for example Nordhaus [21, 22] focused his research mainly on carbon taxation and emission allowances efficiency comparison, advantages and disadvantages of both economic instruments, and he strongly prefers taxation before emissions trading. Regarding his opinion, the fluctuations of the EUA price and its volatility within the EU ETS in one trading period is not good for investments planning. As a recommendation for the policy makers, he has proposed pure carbon taxation in the context of

current fiscal policy as the most suitable instrument for greenhouse gas emissions cutting. He also suggests the consequent international harmonization of carbon taxes throughout the world as one of the policy instruments of international climate policy.

Speck [28] also recommends carbon taxation, since there are many sources of emissions, which cannot be involved in emission allowances trading system and moreover which are considerably heterogeneous. He also emphasizes potential benefits of carbon taxes in the field of so called „double dividend“, which can be considered as a typical argument of environmental taxation supporters [5, 10].

On the other hand, there are economists, which support emission allowances trading. For example Mansur [19] indicates that relative to a tax, tradable permits may improve welfare in a market with imperfect competition. Moreover, based on his model of strategic and competitive behavior of wholesalers in a Mid-Atlantic electricity market, in case of regulators are opted to use a tax instead of permits, the deadweight loss from imperfect competition is greater.

However, Goulder [13] for the purposes of research of climate change policy's interactions with the tax system included both a carbon tax and cap-and-trade system under the general label of “green tax”, since the two environmental policies have the same features. Regarding the efficiency of “green taxes” and marginal costs of pollution abatement, we can have two different groups of “green taxes” - 1) carbon tax (revenues recycled lump-sum) and cap-and-trade, freely allocated allowances; 2) carbon tax (revenues recycled via marginal rate cuts) and cap-and-trade, auctioned allowances (revenues recycled via marginal rate cuts).

Based on Goulder's idea [13], this paper will focus on the features of particular economic instruments within the climate change policy and the comparison of characteristics of the emission tradable allowance with the characteristics of current environmental taxation in the Czech Republic and its possible consequences for the public economics.

The main target of this paper is an ex post analysis of the EU ETS in the Czech Republic in 2013 from the companies' view and the comparison of particular characteristics of emission tradable allowances and environmental taxes, mainly from the companies' behaviour view.

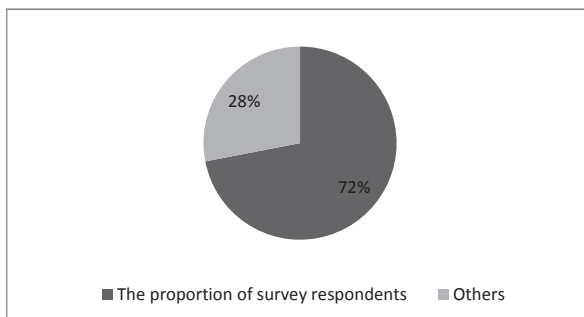
## **2 Material and Methods**

For the purposes of this paper, the different sources of data and information have been used. At first, focusing on CO<sub>2</sub> emission allowances price and its development, data from EEX exchange [9], the leading energy exchange in Europe, has been used. Regarding environmental taxes and fees in the Czech Republic, the data from current legislation has been used, including particular rates of taxes and fees.

Dealing with the behavior of the companies in the Czech Republic and their decision-making [25], 2 sources of data and information have been used. The first data set and consequent results were based on the consultations with the expert from Association for the District Heating of the Czech Republic - Association of Entrepreneurs in the Field of Heat Supply, who is responsible for the emission allowances trading. The second step of data mining and obtaining more precise information was based on the questionnaire, which was sent to the key heat and electricity producers, members of working group on the EU ETS and environmental taxation.

The following Figure 1 shows the proportion of CO<sub>2</sub> emissions of survey respondents on total verified CO<sub>2</sub> emissions in the Czech Republic in the second trading period 2008 – 2012. We can see that the credibility and information content of the survey is sufficient.

**Figure 1. The proportion of CO<sub>2</sub> emissions of survey respondents on total verified CO<sub>2</sub> emissions in the 2<sup>nd</sup> trading period in CR**



Source: Authors

In general, for the purposes of our research, the respondents of the questionnaire were divided to the group of owners of combustion processes within the big sources (6 owners) and to the group of owners of combustion processes within the small and medium sources (3 owners). In total, all owners of combustion processes manage 27 big sources, 6 medium sources and 9 small sources.

For the purposes of this paper and consequently for the purposes of the companies behavior analysis, the fuzzy rule-based system has been used, precisely Mamdani type of rules [6].

The Mamdani fuzzy rule-based system is defined as

$$\text{IF } (x_1 \text{ is } A_{1,1}) \text{ AND } \dots (x \text{ is } A_{n,1}) \text{ THEN } (y_1 \text{ is } C_1) \quad (1)$$

$$\text{IF } (x_1 \text{ is } A_{1,1}) \text{ AND } \dots (x \text{ is } A_{n,1}) \text{ THEN } (y_2 \text{ is } C_2)$$

.....

$$\text{IF } (x_1 \text{ is } A_{1,r}) \text{ AND } \dots (x \text{ is } A_{n,r}) \text{ THEN } (y_r \text{ is } C_r)$$

We created set of Mamdani rules for the producers within the sector of combustion processes. General rules are based on purchases or sales of the EUAs on the market. Based on Mamdani rules, we have created 162 rules for the electricity and heat producer in the Czech Republic. We have used the economic indicators, which can influence the behavior of the typical producers. The following economic indicators were selected on the basis of the results of the questionnaire survey - respondents indicated that these indicators influence their decision-making:

- The EUA price trend development;
- The producer situation – the current amount of available EUAs and the current CO<sub>2</sub> emissions;
- The environmental policy development in the CR and the EU;
- GDP development.

There can be 3 results of behavior of the producer, precisely the following:

- no action – the producer has no requirements on the market;
- standard sale or standard purchase – the producer will calculate his own profit, he can trade on the market;
- big sale or big purchase – the situation is really outstanding for the trading on the market – the producer will surely buy or sell the EUAs on the market.

The example of one Mamdani rule is the following: “IF the EUA price trend development is decrease AND the producer has EUAs for all of his CO<sub>2</sub> emissions AND environmental policy has

been tightened AND GDP development is increase THEN behavior on the market is standard purchase.”

Based on defined 162 rules, the behavior of companies in the Czech Republic has been generalized and helps to specify the characteristics of particular economic instruments for CO<sub>2</sub> emissions cutting, implemented in the Czech Republic. We also identified and specified the “price” rules for the electricity and heat producers in the Czech Republic, based on results of the questionnaire. The general “price” rules can be defined as the following Mamdani rules:

IF the EUA price is SMALL AND environmental taxes are almost constant THEN the producer buys the EUAs only to cover his CO<sub>2</sub> emissions;

IF the EUA price is MIDDLE AND environmental taxes are almost constant THEN the producer buys the EUAs to cover his CO<sub>2</sub> emissions, but starts to think about trading with the EUAs on the exchange;

IF the EUA price is HIGH AND environmental taxes are almost constant THEN the producer buys the EUAs to cover his CO<sub>2</sub> emissions, but starts to make his own predictions and calculations of the EUAs;

IF the EUA price is HIGHER AND environmental taxes are almost constant THEN the producer buys the EUAs to cover his CO<sub>2</sub> emissions, but starts to trade with the EUAs on the exchange;

IF the EUA price is THE HIGHEST AND environmental taxes are almost constant THEN the producer buys the EUAs to cover his CO<sub>2</sub> emissions and trades with the EUAs on the exchange.

The results of the questionnaire showed us the precise values of SMALL, MIDDLE, HIGH, HIGHER and THE HIGHEST and it served as an input to the Table 2 in chapter Results and Discussion.

### 3 Results and Discussion

For the purposes of the comparison of particular characteristics of the EU ETS and environmental taxation in year 2013 in the Czech Republic, we selected the following characteristics: pollution price in case of the EU ETS, tax rate in case of taxation, trading on the market, the major role of companies, budgetary determination of revenues, regulated emissions, who is the payer and primary price impact.

Focusing on budgetary determination of revenues obtained from the EUA auctions, the following Table 1 shows us the distribution of 50 % of total auctions revenues. The rest of the auction revenues come to the general state budget.

**Table 1. Distribution of 50 % of Total Auctions Revenues**

Period	State Environmental Fund	Ministry of Industry and Trade
2013	100 %	0 %
2014 - 2015	65 %	35 %
2016 - 2020	60 %	40 %

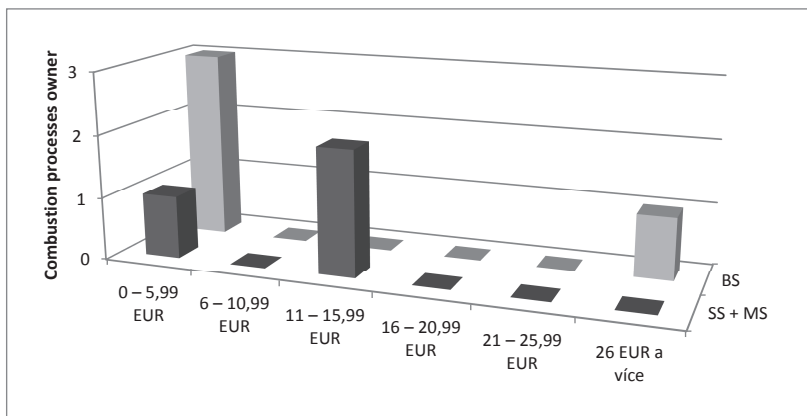
*Source: Authors based on current legislation*

You can see that in year 2013, all additional revenues obtained from the auctions (the EUA auctions on behalf of the Czech Republic) were the income partially of the State Environmental Fund and partially of the general state budget. It is same as in case of environmental taxes and fees in the Czech Republic.

We also identified the “price” rules for the combustion processes in the Czech Republic, based on Mamdani fuzzy rule-based system. Regarding results of the questionnaire, the producers consider the price of emission allowances 0-5,99 EUR per EUA most suitable for their purchases. On the other hand, they would sale the EUAs when the market price will be almost 11 EUR and more per EUA. The following Figure 2 shows the results of one question within our questionnaire, focused on ideal purchase and sale price of the EUAs. “BS” means big sources (more than 100 MW of rated power consumption), “MS” means medium sources (50 – 100 MW

of rated power consumption) and “SS” means small sources (up to 50 MW of rated power consumption).

**Figure 2. Purchase and sale motivation price of the EUAs in Y2013**



Source: Authors

You can see that the answers on this particular question were obtained only from 3 owners of combustion processes within the big sources group and 2 owners within the small and medium sources group, since the others (3 owners of big sources and 1 owner of small sources) were not allowed to answer to these kinds of questions by their top management.

The following Table 2 summarizes particular characteristics of the EUAs, environmental taxes and emission fees in year 2013 in the Czech Republic and focuses on their comparison.

**Table 2. The characteristics of economic instruments in CR in Y2013**

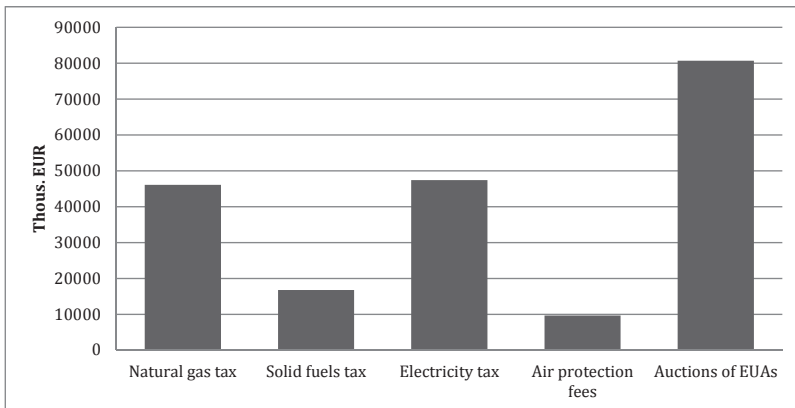
	<b>EUA - auctions</b>	<b>Environmental taxes</b>	<b>Emission fees</b>
<b>Pollution Price, “Tax” Rate</b>	Floating – based on auction price development	Fix - based on 2003/96/EC	Fix - based on national legislation
<b>Trading on exchange Secondary market</b>	Market price < 6 EUR/EUA – almost only purchase Market price > 11 EUR/EUA – possibility of sale	No	No
<b>The major role of companies</b>	In Y2013 – almost only the EUA market price payer	Tax payer	Fee payer
<b>Budgetary determination of revenues</b>	General state budget, State Environmental Fund	General state budget	State Environmental Fund
<b>Emissions</b>	CO <sub>2</sub> and ekv.	Indirect relationship - Mix of emissions	SO <sub>2</sub> , NO <sub>x</sub> , VOC, PM
<b>Payer</b>	Companies	Companies, households	Companies
<b>Primary price impact</b>	Energy product’s prices	Energy product’s prices	Energy product’s prices

Source: Authors based on current legislation

Since the EU ETS system has changed in the third trading period 2013 – 2020 and the total amount of the EUAs for companies is no more entirely for free, the companies are more interested in the EU ETS rules and possibilities and pay attention on their own predictions and calculations of the EUAs prices. Besides trading on the secondary market, the companies can buy the EUAs in the auctions.

Focusing on total revenues obtained from EUA auctions, air protection fees and general environmental taxation, based on current 2003/96/EC directive, in year 2013, we obtained the interesting results. The following Figure 3 shows us the comparison of all revenues from environmental taxes and charges in the air and climate protection area and the EUA auction's revenues in the Czech Republic in year 2013.

**Figure 3. Environmental taxes and EUA auction's revenues in CR in Y2013**



Source: Authors based on [20]

It is obvious, that the revenues obtained from the EUA auctions in year 2013 were higher than revenues obtained from all air protection fees and revenues obtained from general environmental taxes – natural gas tax, solid fuel tax and electricity tax. We can say that the auctioned EUAs are currently important source of public budgets revenues. Moreover, it is evident, that this kind of revenues will be more important in the future depending on increasing share of total EUAs determined for the auctions.

#### 4 Conclusion

To provide the first basic ex post analysis of the EU ETS in the Czech Republic in 2013, we focused on the behaviour of particular stakeholders of the EU ETS in the Czech Republic, precisely companies within the group of combustion processes, since this group emitted the most significant yield of total CO<sub>2</sub> emissions in year 2013.

We can say that the characteristics of CO<sub>2</sub> emission allowances in year 2013 were more similar to environmental taxes and fees, since the general rules changed and the companies were buying the EUAs partially in the auctions, so they paid for each ton of emissions over the limit. However, based on the questionnaire survey, they were not sellers of the EUAs on the market, excluding the only one company. Generally, the companies understood the EUA much more as an additional tax or fee than the commodity which can be traded on the exchange. Moreover, the additional revenues from the EUAs' auctions came partially to the State Budget of the Czech Republic and partially were dedicated to the State Environmental Fund of the Czech Republic.

Focusing on the particular characteristics of an auctioned emission allowance, we can say, that it behaved almost entirely as an environmental tax or fee in the Czech Republic in year 2013. The most significant difference can be visible in the floating "tax rate".

## Acknowledgements

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**SESSION III:  
PUBLIC SERVICES**

# Empirical Evidence on the Unequal Chances to Education in the Czech Republic

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## Abstract

The present paper focuses on one of the key-questions in education - equal chances. As in other European countries, the right to equal chances is also formally settled in the Czech Republic. The *Charter of Rights and Freedom* gives every person the right to free of charge primary and secondary education and also the right to study university based on personal abilities and possibilities. The aim of the paper is to compare this normative right given by the *Charter of Rights and Freedom* to the empirical evidence, given the main dimensions of the Czech educational system. To what extent is the access to secondary education with GCSE conditioned by the social background in the Czech Republic? Are there any changes in time in the social chances to access upper secondary education by the social background? Although, it seems at first glance, that there are no barriers in the access to Czech educational system, the results based on the PISA data gathered in 2000 and 2009 confirm that the Czech educational system reproduces socially conditioned inequalities from one generation to another.

*Keywords:* education; inequality; unequal chances; Czech secondary school system

JEL Classification: I24

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## 1 Introduction

Currently, the equal access to education belongs to the key-challenges of the educational policy both in the Czech and larger international context. This is confirmed by the fact that the Czech Republic in 2001, through the government document "National Education Development Program" - so called the "*White Paper*" [11], undertook the responsibility to ensure greater equality in the educational system.

Pupils enter the educational system both with intellectual predispositions and with social differences arising from their family background. When we talk about equal opportunities in education, it is not meant in the sense of complete equality (i.e. everyone should have the same level of skills and knowledge), but it represents a requirement of equitable distribution of education among population. The concept of equal opportunity in education is related to the issue of educational inequalities, which we consider to be unfair because they have not their roots only in the efforts and abilities of the individual.

Generally speaking, inequalities can be considered either as a consequence of the fact that people receive something (it differences then by income, wealth, standard of living, educational aspirations, occupational ambitions or way of life), or as a consequence of the fact that they occupy different positions, which limit their livelihood, and therefore have different chances [9] [10].

The first approach is called "attributional" and it is widespread especially among economically oriented scholars. From an empirical point of view, it is related to the mapping of the incomes distributions - inequality is understood as the result of economic disparities (e.g. [3]; [12], in the Czech Republic, [19], [20]). The second approach is called "relational" and is especially widespread among sociologists who consider this concept of social inequalities as a source, and in many cases, also an explanation of the attribution of inequalities (see [5], [6]). The relational concept maps the uneven benefits associated with the position of a person in the labour market. These are not random, but systematically maintained advantages that are an

inherent part of the positions in the labour market. They define social barriers and create different chances for people.

### *1.1 Educational System and Unequal Chances*

The equality of opportunities is often referred to the access to various levels of education (e.g. [13]; [14]; [18]). The educational system, in which the descendants, ranked by class, had the same opportunities, was not yet established anywhere. In some countries, these opportunities are more equal (such as in the Netherlands and Sweden) than in others (in Europe we can enumerate Bulgaria, Ukraine and Greece among the countries with the highest inequality of opportunity by socioeconomic origins). However, unequal educational chances still exist [17].

Unequal chances in education are empirically measured as the difference between the educational attainment of people belonging to a certain social class and educational attainment of people belonging to another social class. In the event that the university education is graduated in a given year proportionally by such a share of young people growing up in a lower social class, which corresponds to the representation of their families in society, and similarly, by a share of people who grew up in upper middle class, on the other hand, we can say that the chances of both categories of young people in tertiary education are identical. If, however, this ratio does not correspond to the ratios of these status groups in the population, it means that the chances of offspring growing up in a lower status environment to higher education are considerably lower.

There are social and economic characteristics of the family environment, in which children grow up, that limit or favour them in the educational system. These advantages and disadvantages characterize descendants as members of social classes – they are related to the means of livelihood and labour market status of their parents. We cannot talk about an accidental character of these advantages and disadvantages, but the specific characteristics arise from the work position of the parents. These characteristics are of a structural nature. When parent changes the job position, the nature of these characteristics also changes. They are not the characteristics of parents and their children, but they are defined by the market relationships, such as the existing positions in the labour market, which vary in the size of income level, its limitations, the number of hours devoted to paid work, employee benefits, job security and career prospects [4]; [9].

One of the key research questions in studying the unequal opportunities in education is the question of to what extent the educational system reproduces class inequalities from one generation to another, and on the other hand, to what extent the reproduction of class inequalities actually weakens. According to some authors, the educational system is part of the intergenerational reproduction of class position (e.g. [2]). Educational inequalities that are created by school correspond in a very large extent to the class background of the pupils, so we cannot exclude them as part of the reproduction of the class status. According to other authors and contrary to previous findings, the western educational system operates on the principles of merit and the relationship between the class background of the pupils and their parents rather weakens over time (e.g. [1]). Whether a child is successful in school depends less on the actual social status of his parents and rely more on the broader social environment that shape his educational aspirations and on his efforts, pursuit and talents.

If we accept the first explanation, we should understand the variation in educational aspirations as a consequence of different class positions, in which the children grow up. Small chances to succeed in the educational system lead to low educational aspirations, and high chances to achieve high education lead to high aspirations. According to Bourdieu and Passeron [2], it is the structure of chances that determines the disposition of descendants in the educational system for social advancement through it.

On the contrary, if we accept the second explanation, we should understand the disparities in educational aspirations as a result of different conduct of students and their parents towards school. Parental support lays behind high educational aspirations - temporal, cultural, social and economic investments of parents in their children, their common interest in school and

education. According to some authors (e.g. [7], [15], [16], [8]), the educational aspirations are one of the several variables, such as motivation, value orientation, parental support and expectations, support from teachers, close friends etc., that together influence the level of education, regardless of the social class in which the child grows up.

The aim of this paper is to identify in the Czech context the following:

- To what extent is the access to secondary education with GCSE conditioned by the social background of the family?
- Are there any changes in time in the social chances to access upper secondary education by social background?

## 2 Material and Methods

Data that can be used to empirically prove unequal educational opportunities come from PISA survey (*Programme for International Student Assessment*) conducted in the Czech Republic in 2000 and 2009. PISA is an international quantitative survey of reading, math and scientific literacy of students in selected countries. These studies are carried out under the auspices of the OECD. Information is obtained both by use of written tests on students and questionnaire survey among students and school principals. So far, five waves of data collection (three-year return period) were held: in 2000 (32 countries participating in the survey), 2003 (41 countries), 2006 (57 countries), 2009 and 2012 (in both years 65 countries).

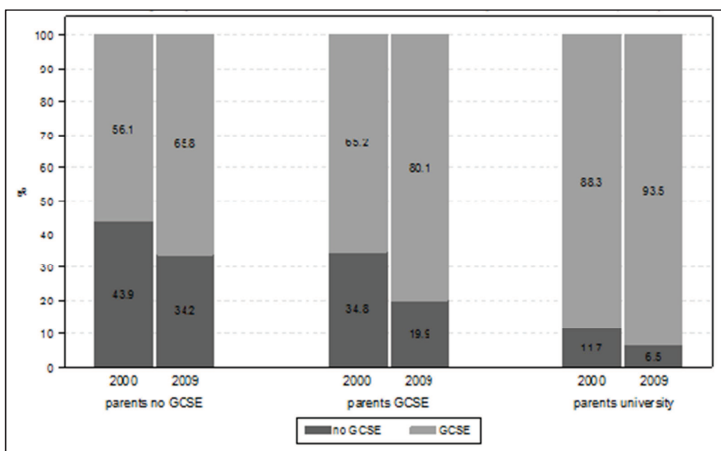
Data is collected from students aged 15 (this age represents the age of completion of compulsory schooling in most OECD countries), either attending the ninth grade of elementary school or the first year of secondary education or corresponding grade in grammar schools/gymnasium (3rd year of six or 5th year of eight-year grammar school/gymnasium). 5365 students from 229 schools (born in 1984) took part in the Czech survey in 2000; in 2009, 6064 students (born in 1993) from 261 schools were interviewed. Selection of pupils and schools in both years of study was implemented so as to be representative of the regions of the Czech Republic and the different types of schools included in the educational system (elementary school, vocational school without GCSE, special schools, vocational schools and secondary schools with GCSE, grammar schools/gymnasiums). In our sample, 3101 interviewed students in 2000 were enrolled in secondary education; while in 2009 there were only 2,702 students (total size of our sample is therefore 5803 pupils).

The presented results arise from the descriptive analysis of our data. The main variable we analyse is admission to secondary education. This variable has four variants: 1) vocational schools without GCSE; 2) secondary technical schools with GCSE (vocational schools, secondary technical schools and lycées with GCSE); 3) four-year grammar schools with GCSE; and 4) 6/8-year grammar schools with GCSE.

Figure 1 shows the proportion admitted to the GCSE (college, high school and grammar school) and non GCSE education between 2000 and 2009 in the Czech Republic according to the educational level of their parents. Figure 2 shows the same proportion but by socio-economic status of their parents indicated by ISEI (ISEI is an English acronym of the International Socioeconomic Index of Occupation). Original ISEI is a continuous variable (range from 16 to 90 points), where the higher the value, the higher economically and socially better-rated work position. For presentational reasons, we divided ISEI quintiles into five equal categories (20% of the first value ISEI continuum corresponds to the first category, 20% of the final value ISEI continuum corresponds to the last fifth category).

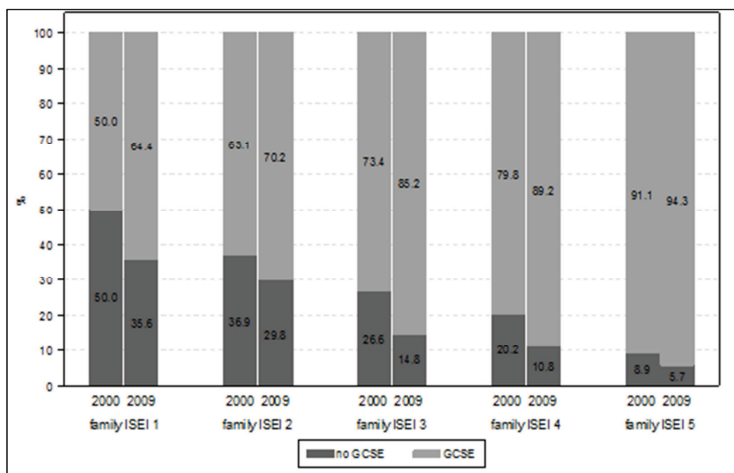
For each bivariate analysis presented below by graphs, we tested the value of chi-square. In all bivariate relations the chi-square test was statistically significant at the level 0.05.

**Figure 1. The proportion of admitted students in secondary education with and without GCSE by the parental level of education in 2000 and 2009**



Source: Pisa 2000, 2009

**Figure 2. The proportion of admitted students in secondary education with and without GCSE by the family of origin quintile ISEI in 2000 and 2009**



Source: Pisa 2000, 2009

Trends in both graphs are obvious: the higher educational and socio-economic status of parents, the higher proportion of offspring enrolled in secondary education with GCSE. The proportions in all categories of parents, no matter the educational level or socio-economic status, increased in the analysed period of time (between 2000 and 2009).

### 3 Results and Discussion

In terms of unequal opportunities in education, we are mainly interested in the ratio of the proportion of offspring coming from different social backgrounds and who are enrolled in the same type of education. Particularly we are interested in how the ratio has changed between 2000 and 2009.

The chances of students with parents having university education to gain upper secondary education (with GCSE) was 1.57 times higher in the Czech Republic in 2000 in comparison with students having parents with secondary vocational education (calculated from Figure 1 as 88.3/56.1). In 2009, these chances were 1.42 higher (again calculated from Figure 1 as 93.5/65.8). The ratio of these two chances shows that the chances of students with parents having university education to graduate upper secondary education between 2000 and 2009 decreased by 0.91 time, i.e. about 9%. Chances of students having parents with vocational education to graduate secondary school with GCSE have increased by 1.10 times, i.e. about 10%.

When we compare the chances for graduating secondary education with GCSE at the highest quintile of parental ISEI with the chances for graduating it in the lowest quintile of parental ISEI between 2000 and 2009, we find that these chances dropped by 20% (calculated from Figure 2 as 94.3/64.4 and 91.1/50.0). The chances for graduating secondary education with GCSE for students having parents in the lowest quintile ISEI increased by 24% in the same period.

If we are to summarize, we can conclude that the results taken together from both graphs show that the unequal chances for gaining secondary education with GCSE between 2000 and 2009 weakened by social background. Chances to enrol (and study) secondary schools with GCSE grow mainly for students having parents from socio-economically unprivileged environments. This means that the educational expansion – the increase in the number of places within the secondary educational system with GCSE observed in our country between 2000 and 2010 - has also led to a slight reduction of unequal opportunities in this educational level by the social background.

Figure 3 shows how the share of people with higher education (upper secondary and university education together) and lower education (primary and lower secondary education together) depending on the father's educational level (again "with GCSE" and "without GCSE") evolved between 1990 and 2009 in the Czech Republic.

**Figure 3. Proportion of people with upper secondary and university education and with primary and lower secondary education by father's educational level (age group 25-40).**



Source: VŠPS

The vertical distance (in years) between the curve “*father upper secondary and more*” and “*descendant upper secondary and more*” and the curve “*father lower secondary and less*” and “*descendant higher secondary and more*” indicates more unequal opportunities by the educational origins. In the event that these curves approach one another in time (measured in years), unequal opportunities in education would decrease. Thus, the proportion of offspring growing up in families, where the father does not have upper secondary education, but who himself graduate upper secondary or even university education will increase, while the proportion of offspring whose father has upper secondary and university education, but who himself would graduate from lower secondary education will decrease. In the period under review, however, this is not the case. The chances to education by educational origins do not change. Places in the Czech educational system are primarily occupied by educational origins. Offspring of parents with higher education also gain higher education and offspring of parents with lower education then ends at lower educational levels too. The effect of class position to attained education increases, and the social homogeneity of educational groups reinforces.

#### 4 Conclusion

Unequal educational opportunities are related to social groups. It is a macro-sociological concept that characterizes social units, not individuals. The sociological question is how people as members of certain social groups are favoured or discriminated against compared to the members of other social groups. To what extent the fact that a person is part of a larger social entity affects its educational opportunities in the Czech Republic and impacts his/her life outcomes? Our findings show that between 2000 and 2009 there was a slight increase in the chances of offspring from families with lower socioeconomic status to gain upper secondary education. As a consequence, the differentiation according to social origins weakens. On the other hand, the answer to our first question is that the access to upper secondary education is still largely conditioned by social origins, respectively, the chances to gain this level of education does not change much by the educational origins.

Sociological knowledge referring to inequalities in social opportunities highlights the importance of the social environment a person belongs to, and knowledge of the social opportunities that are associated with this environment and which are not influence by people, not only allow us to get to know the fate of people as members of various social classes, but also help these barriers to be crossed and ensure equitable access to education for all individuals.

EU member states still put greater emphasis on the concept of inclusive education, as a tool for reducing inequalities by removing selective mechanisms. The question is whether there is a political will or general consensus in the Czech society, both within the professional and the general public, whether it has to be one of the main tasks of educational policy - especially at the level of primary education- reducing socially conditioned educational inequalities or not, whether the public interest is to exclude the elite or unprivileged pupils in a special educational stream or on the contrary their collective education.

Fairly widespread practice of the Czech educational system to group elite pupils on one hand and weaker pupils on the other hand, in a relatively early stage of their life - at the level of primary education - even more enhanced the effect of social environment they belong to and are raised in.

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# Quality and Availability Assessment of Public Services Using the Example of Social and Health Services

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## Abstract

Public services and approaches to their assessment are a current issue in a number of countries. This article deals with quality and availability assessment of two significant branches of public services in the Czech Republic, namely health and social services. The empirical part provides an assessment and a comparison of availability of social and related health services for senior and disabled citizens in regions of the Czech Republic in the years 2007 and 2012 in accordance with recommended quantitative standards. To compare availability of services in the regions, the method of multidimensional scaling was used, and research confirmed the suitability of this method. The results have proved marked differences among regions in the selected social-health services. The most notable differences in the structure of availability were observed in the region of Ústí nad Labem and of South Moravia, with dominant services of social care and lesser availability of health services; further also in the capital city of Prague with lower availability of social services associated with accommodation but higher availability of health services.

*Keywords:* assessment; quality; availability; social services; health services

JEL Classification: H00, H41, I19

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## 1 Introduction

Problems of quality and quantity assessment occur in provision of public services. A number of authors deal with the definition of public services [3, 20, 18, 1, 13, 8]. One approach of public-service level assessment is the standard and quality to be supplied to citizens. The criterion of the level, extent and quality of provided public services is their standardisation, i.e. the definition of single conditions and recommended procedure in accordance with quantifiable criteria.

In connection with standardisation, public services are explained by [19, 2, 4]. [19] defines public services as a provision in a form of a specific standard that grants (qualitative, quantitative, or rather qualitative-quantitative) sameness of the provided type of public service in terms of a given territory. [18, 19] distinguish physical, expense and programme standards, while these can be regarded as aims also. Standards are divided by [4] into *private standards*, based mainly on market conditions and followed on a voluntary basis, and *public standards*, promoted by governments and meant to serve the public interest. Standards can also be specified as *process standards*, i.e. they directly impact on the quality of either a product or a service (ISO certification).

This article aims to provide assessment of two significant branches of public services, namely health and social services, from a qualitative and quantitative viewpoint, and to supply a theoretical-empirical view on an assessment of selected public services of the Czech Republic, using the standards of availability, while making use of social care and related health services for senior and disabled citizens in regions of the Czech Republic, comparing the years 2007 and 2012.

In the Czech Republic, the assessment of *health care and health services* is currently based on accreditation standards defined by the International Society for Quality in Healthcare (ISQua) in collaboration with the WHO, where, as [11], a comparison of health facilities with standards defining a specific level of performance, leading to provision of safer health services of better quality is implemented. It is derived from “evidence based” and “consensus based” standards,

which represent recommendations to diagnostic and treatment procedures. “Evidence based” means that the standards reflect the expert opinion substantiated by convincing studies, and “consensus based” means that the standard is approved of by recognised authorities in a given field, excluding significant professional disagreements [16]. Accepting of standards relates to a nation, at least, and the extent of agreement is not precisely defined. The possibility of undergoing an assessment of accreditation standards is voluntary for a health facility, and in case all requirements are being fulfilled, they will be awarded an accreditation certificate.

Health care assessment from the quality viewpoint is explained by [10, 2, 9]. Quality assessment of health services and health care stems from the principle of the so-called Donabedian model (Figure 1), where quality of care is assessed from three angles: the structure, the process, and the outcome of care [17].

**Figure 1. Health care quality assessment according to Donabedian model**



Source: Authors based on [11]

Attention is paid to *assessment of social services* in the Czech Republic from both qualitative and quantitative point of view. *Social service quality* relates to satisfying of needs and demands of not only the users, but also the ordering parties, i.e. those subjects that order the services and pay them from public resources. Social service quality standards (Figure 2), according to the law 108/2006 Sb. on social services, represent a set of criteria used for the definition of social service provision quality from the perspective of personnel and organisation (personal standards), the perspective of operation (operational standards) and the perspective of relations between the provider and users of the service (procedural standards)[7].

**Figure 2. Social service quality assessment**



Source: Authors

Social service assessment is also approached from the *quantitative viewpoint*, i.e. standards of availability of social services in territorial units. According to [23], assessment of availability within a territory is based on an option to define a standard. What is used are quantitative standards, which so far have had an indicative nature.

## 2 Material and Methods

Scientific research carried out by authors and used in the article is based on the classification analysis method, comparison and abstraction in creation of theoretical-methodological framework. In the application part, the method of secondary data analysis and multidimensional analysis and comparison are used, which are based on available statistical

data of the Ministry of labour and social matters of the Czech Republic and Institute of medical information and statistics of the Czech Republic.

The availability of services in regions of the Czech Republic, using the examples of residential *social care services* (homes for seniors, homes with a special regimen, weekly-care centres) and *health services for senior and disabled citizens* (institutes for long-term patients, hospices and other special therapeutic institutes) from years 2007 and 2012 is compared to recommended standards. It uses the method of multidimensional analysis – multidimensional scaling. Multidimensional scaling provides a wealth of information in one image. It captures objects characterised by multidimensional profiles in an area (or to a multidimensional space) and enables their comparison. Multidimensional scaling also visualises the relations between and variables [12]. The method is often used to compare objects (in this case administrative regions of the Czech Republic), when the basis for comparison is not known. The aim of multidimensional scaling is determination of dimensions and location of objects (their coordinates). That means, the more alike the two objects (administrative regions of the Czech Republic) are, the closer the points that represent them should get in the graph. The output of multidimensional scaling takes form of a scatter plot (*perception map*), where the axes represent basic dimensions, and the points represent products, respondents, opinions, or other objects (e.g. organisations, territorial units, regions, countries) of comparison [6]. Methods with a numerical output are used as the basis of the construction of an image, but they have their own specificity of interpretation. They are used not only to define specific conclusions, but also to reduce information, to provide quantification and scoring [12]. This method was used, for instance, in papers [5];[6].

There are two indicators that are decisive for the validity of result of multidimensional scaling):

- a degree of good fit (S-stress), i.e. the difference in the distance of objects calculated in multidimensional scaling and the real distance between objects determined prior to its conduct. The smaller the value is (in the interval between 0 and 1), the better the good fit. Kruskal stress formula is considered to be an appropriate index:

$$s - stress = \sqrt{\frac{\sum_{k=1}^m (d_{ij} - \hat{d}_{ij})^2}{\sum_{k=1}^m d_{ij}^2}} \quad (1)$$

$d_{ij}$  - the real distance between two objects

$\hat{d}_{ij}$  - the distance of two objects, predicted by the model

$m$  - the number of variables

Each step is repeated, until the stress reaches a low level (the interval of 0.05 - 0.1).

- Square of the correlation coefficient (RSQ) of input distance and distances calculated from and determined by coordinate values of individual objects of perceptual map. RSQ can take values from within the interval <0,1>; where values  $\geq 0.60$  are considered acceptable for the validity of the result [12].

### 3 Results and Discussion

#### 3.1 Assessment of Social-health Services Availability in the Regions of the Czech Republic according to Recommended Standards

The current assessment of availability of social and health services in regions is based on recommended quantitative standards, i.e. given number of places or people for a particular

service [23];[7]. The assessment of availability of selected services related to social care in Czech regions in years 2007 and 2012 is carried out in accordance with “recommended standards” from the year 2010 (Table 1).

**Table 1. Recommended standards of service availability for the aged and the disable from the year 2010**

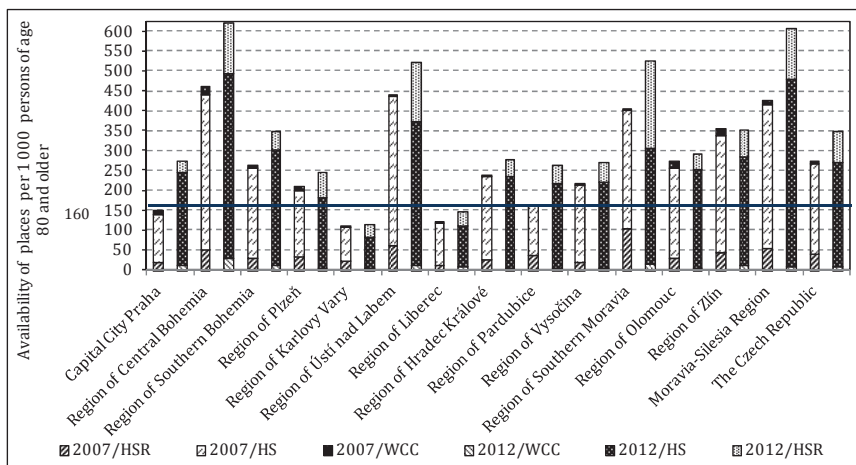
Recommended availability standards in selected social care services	Availability of places
Availability of places in homes for seniors per 1 000 people 80+	160 places
Availability of places in homes for seniors per 1 000 people 65+	26 places

Source: [23]

Selected residential social care services (homes for seniors, homes with special regimen, weekly-care centres) are compared with the recommended availability standard of homes for seniors in the ratio 1000 people aged 80+ years (i.e. 160 places).

Due to the absence of specific quantitative standards for health services, the selected health services (institutes for long-term patients, hospices, other special therapeutic institutes) were assessed in accordance with the recommended standards of social care services for senior and disabled citizens, with a focus on the target group of users. In this paper, we concentrate on availability of places in homes for seniors in the ratio 1000 people aged 65+ years (i.e. 26 places).

**Figure 3. Availability of places in homes for seniors, homes with a special regimen and weekly-care centres in regions (per 1000 people aged 80+) in years 2007 and 2012**



Source: Authors based on [6, 14, 15]

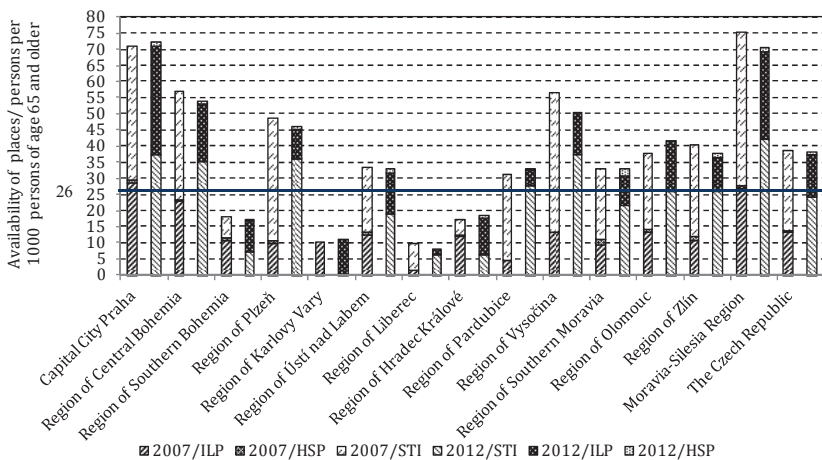
Legend: HS – homes for seniors, HSR – homes with special regimen, WCC – weekly-care centres

In the observed years of 2007 and 2012 (Figure 3), availability of places in homes for seniors, homes with a special regimen and in weekly-care centres rose most markedly in Central Bohemian and Moravian-Silesian region, also in the Capital city of Prague, in South Moravian region, the region of Pardubice, South Bohemian region and the region of Ústí nad Labem. Based on the results of service availability, it can be said that common availability of places in homes for seniors, homes with a special regimen and weekly-care centres in most regions (with the exception of the regions of Karlovy Vary and Liberec) the recommended standard of 160 places per 1000 people aged 80+ was exceeded.

In connection to availability of selected social care services in regions in the years 2007 and 2012, also availability of places in related health services for senior and disabled citizens in

regions (Figure 4). In the years 2007 and 2012 the highest availability of places was in institutes for long-term patients, hospices and other special therapeutic institutes in Moravian-Silesian region, Central Bohemian region and the capital city of Prague. Unlike availability of selected social care services (Figure 3), availability of selected health services showed a stable level in all single regions. A slight increase was, however, observed in the capital city of Prague and the regions of Pardubice and Olomouc.

**Figure 4. Availability of places in institutes for long-term patients, hospices and other special therapeutic institutes per 1000 people aged 65+ in years 2007 and 2012**



Source: Authors based on [21, 22]

Legend: ILP – institutes for long-term patients, HSP – hospices, STI – other special therapeutic institutes

### 3.2 Using Multidimensional Scaling for Comparing Availability of Social-Health Services among Regions of the Czech Republic

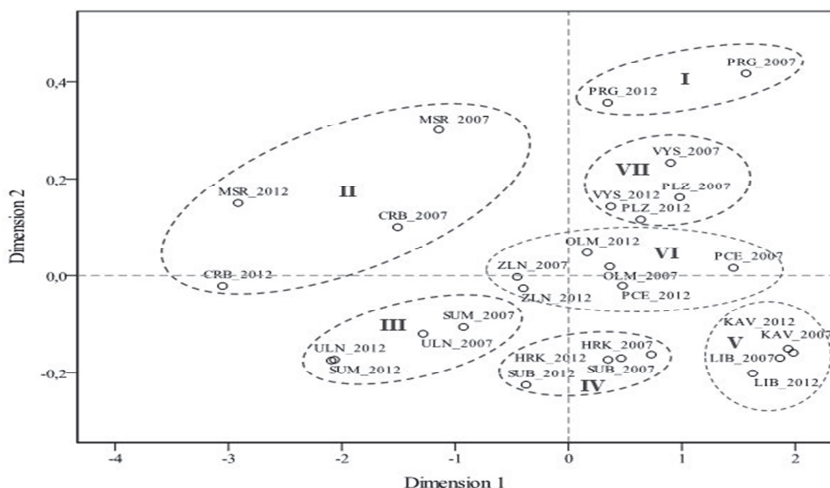
Comparison of availability of selected social-health services in regions of the Czech Republic in the years 2007 and 2012 is carried out using multidimensional scaling. The decisive factor for assessing the validity of the results is the S-stress = 0.0, i.e. the extent of positive agreement of the difference between the object distances (regions) and  $RSQ = 1.0$ , i.e. the correlation coefficient square of input distances between the objects and distances arrived at through multidimensional scaling. The RSQ indicator reaches the value 1.0, thus proving the quality of the multidimensional scaling model for two dimensions. A potential third dimension would bring no relevant information.

The structure of similarities among regions of the Czech Republic in availability of social and health services for senior and disabled citizens in the years 2007 and 2012 captured in two dimensions is presented in Figure 5. More marked differences among regions exist in availability of social care services of an accommodative nature, which is confirmed by the distances in dimension 1, whose values range from -4 to 2. In dimension 2 (availability of health services), the values show a narrower distribution, ranging from -0.2 to 0.4.

Figure 5 indicates the following relations: Dimension 1 shows that the more to the left are regions to be found, the higher the availability of places of residential social care services (homes for seniors, homes with a special regimen, weekly-care centres). By contrast, if they move towards the right, availability of accommodative social care services reduces. Values around 0 represent medium values. In dimension 2, the higher position the regions are to be found, the higher the values of availability of health services (institutes for long-term patients,

hospices, other special therapeutic institutes). By contrast, the lower the position, the lower the availability of these services.

**Figure 5. Availability of selected social-health services for senior and disabled citizens in regions of the Czech Republic in the years 2007 and 2012**



Source: Authors

Regions of the Czech Republic divided into clusters according to availability of selected social-health services for senior and disabled citizens, and according to the structure of availability of social-health services in the years 2007 and 2012 (Figure 5) can be characterised as follows:

*Cluster I* – The capital city of Prague (PRG) had a relatively low availability of residential social care services and also the highest availability of health services for senior and disabled citizens in the years 2007 and 2012.

*Cluster II* – Central Bohemian (CRB) and Moravian-Silesian (MSR) region showed the highest availability of selected social care services and also belonged to regions with the highest availability (in case of the latter one, the highest) of selected health services for senior and disabled citizens in 2007 and 2012, compared to the other regions.

*Cluster III* – The region of Ústí nad Labem (ULN) and South Moravian region (SUM) had a higher availability of selected social care services, but a slightly below-average availability of health services for senior and disabled citizens, compared to the other regions.

*Cluster IV* – South Bohemian region (SUB) and the region of Hradec Králové (HRK) represented regions with average availability of the selected social care services and low availability of health services for senior and disabled citizens, compared to the other regions.

*Cluster V* – The regions of Liberec (LIB) and Karlovy Vary (KAV) showed the lowest availability of both the selected social care services and health services for senior and disabled citizens, compared to the other regions.

*Cluster VI* – The regions of Pardubice (PCE), Olomouc (OLM) and Zlín (ZLN) showed average availability of selected social care services for senior and disabled citizens, and average to slightly above-average availability of selected health services, compared to the other regions.

*Cluster VII* – The region of Plzeň (PLZ) and the Vysočina region (VYS) represented regions with average availability of selected social care services and also a higher availability of selected health services for senior and disabled citizens in 2007 and 2012.

Based on the comparison of regions according to their availability of selected social-health services for senior and disabled citizens in years 2007 and 2012 (Figure 5), it can be said that the following regions belong to the regions least similar in availability of selected social-health services: the most populated regions (cluster II) Central Bohemian and Moravian-Silesian region, which showed the highest availability of both social and health services, which can be also related to local availability of services in these regions, and the regions of Liberec and Hradec Králové (cluster V), which showed the lowest availability of both social and health services for senior and disabled citizens, which is mainly connected with the lowest number of inhabitants. The comparison of availability structure (Figure 5) also proved that the region of Ústí nad Labem and South Moravian region (cluster III) belong to the least similar, with prevailing availability of residential social care services for senior and disabled citizens, but lower availability of health services, and the capital city of Prague (cluster I) with a relatively low availability of residential social care services, but a higher availability of health services for senior and disabled citizens, compared to other regions. Similar outcomes are provided in [6], in the assessment of selected social services connected with housing, ambulatory or field services. [23] argue that some differences in provided social and associated health services in regions can be influenced mainly by the extent of urbanisation, structure of age, qualification, profession and society, structure of inhabitation of territorial units, size of municipalities and population density.

In connection with the assessment of availability of social-health services in the Czech Republic, some issues remain unsolved. According to [23], mainly in the assessment, the statistics fail to distinguish between target groups in facilities that provide service to both senior citizens and the disabled. The assessment of the scope of provided social and related health services in regions needs to be based on their availability, but different views need to be applied across the Czech Republic. Also, availability of social and health services needs to be understood and developed in a broader context (local and financial availability, informed citizens, service quality, economic efficiency) than just the presence of facilities and activities.

#### 4 Conclusion

For assessing qualitative level of selected public services, it has been proven that it is suitable to use comparative methods, when the comparison can be provided not only at the level of countries and regions, but also mutually among them. Assessment of health care and health services in the Czech Republic is based on accreditation standards defined by the International Society for Quality in Healthcare in collaboration with the WHO. The assessment is realised according to standards of structure, process and outcome. The most elaborate is the assessment of social services. In terms of quality, systematic attention has been paid to social service assessment since 2000. Quality standards of social services have been implemented since the Law 108/2006 Sb. on social services came into effect. The focus is placed on procedural, personal and operational standards. Quantitative standards are in the Czech Republic also used in assessing local availability of social and health services, for instance according to a given number of places or people making use of a given service.

The results of the assessment through the method of multidimensional scaling in years 2007 and 2012 have proved marked differences among regions in the selected social-health services. Between the years 2007 and 2012, the most significant changes in availability of services were demonstrated through an increase in availability of selected services of social care in the region of South Moravia (cluster III) and the region of the capital city Prague (cluster I). The most notable increase in availability of social care services, but a moderate decrease in availability connected with health services, took place in Moravian-Silesian region and the region of Central Bohemia (cluster II). By contrast, the most notable decrease in the availability of selected health services was demonstrated in the region of Vysočina and the region of Plzeň (cluster VII) and the region of Zlín (cluster VI).



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# Gender Wage Differences in Czech Public Healthcare: Results from the Selected Hospital

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## Abstract

The aim of the study is to estimate the unexplained gender pay gap in the individual departments of the selected hospital, to find out whether these vary between the individual departments and if so, to identify the possible causes of these differences. We systematically examined the gender wage differences within one occupation. To estimate the unexplained part of the gender pay gap, we used the average treatment effect on the treated (ATT) and to identify the causes of the possible differences in the unexplained gender pay gap, we used the linear regression model. We found that the ATT varies significantly between the individual departments. To explain these differences, we used the selected characteristics of the departments: department size, proportion of women and gender of the department head. We came to the conclusion that the wages of women increase relatively to the male wage with a growth in the proportion of female orderlies together with a female head of department. Separately, it has not been proven that the unexplained gender wage gap tends to be lower in departments of smaller size.

*Keywords:* gender pay gap; healthcare; average treatment effect on the treated

*JEL Classification:* I14, J16, J24, J71

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## 1 Introduction

The existence of wage differences between men and women is a well-known fact. According to the Czech Statistical Office [7], data from 2012 shows that women in the Czech Republic earn 78 percent of the average male gross monthly earnings, with further variances in the individual sectors of the Czech economy. Using the CZ-NACE classification, the gender wage differences are largest in groups K: Financial and insurance activities, Q: Human health and social care activities and J: Information and communication. Here, women earn less than 70 percent of the male average wage. On the other hand, the lowest gender wage differences are identified in sector H: Transportation and storage, where female earnings amount to more than 95 percent of male earnings.

This data though gives no evidence as to the potential wage discrimination against women. Part of the existing gender wage disparity can be explained by the observed differences in the characteristics of men and women. The part of the gender pay gap (GPG), which remains unexplained, is known as the remuneration effect, effect of discrimination or most frequently as the unexplained part of the gender pay gap. A number of empirical studies are devoted to the estimation of the unexplained part of the gender pay gap in the Czech Republic [13, 14, 8, 10]. The studies show that differences in the average characteristics of men and women only account for a small part of the raw gender pay gap, simultaneously indicating that constant characteristics like occupation and sector act as important factors explaining disparities in male and female wages in comparison to the personal characteristics of employees.

The existing unexplained part of the gender pay gap cannot be attributed to wage discrimination against women, as it only represents the upper limit. A part of the unexplained wage difference may be explained by differences in the unobserved characteristics of individuals (i.e. talent, work effort, loyalty) or by the characteristics unavailable from official data (e.g. actual job content, responsibility). The second issue could be minor and is related to the use of detailed data from just one firm or from the selected firms. There are many studies that use data provided by only one or a few chosen Czech hospitals or deals with a specific issue of a selected

department (for example [2, 3, 17, 10]. [10] used data from a selected hospital and applied the Oaxaca-Blinder decomposition to identify the causes of gender pay differences and to estimate the unexplained gender pay gap. They concluded that the unexplained gender pay gap is negligible as it amounts to only 2.6 percent.

The unexplained part of the gender pay gap also varies according to sector – public and private. [13] and [8] conclude that the unexplained gender pay gap is lower in the public sector compared to the private one, yet it still exists. Wages in the public sector are subject to regulation and this gives less opportunity for discrimination by gender.

Recently, studies focusing on the identification of the causes of the variation in the unexplained gender pay gaps have begun to appear. [1] and [5] analyse the gender wage differences in selected European countries. They use the selected country's specific policies that reconcile work and family life, and wage-setting institutions to explain the differences in the gender pay gaps among EU countries. They identify the relationship between the unexplained gender pay gap and the country's specific policies and institutions. [8] searches for the causes of the differences in the unexplained gender pay gap within the individual sectors of the Czech economy. Using the linear regression model together with the proportion of women, the proportion of female managers, the proportion of small firms and ownership (public or private) as explanatory variables, she indicates that ownership and the proportion of women in management are significant factors contributing to the explanation of the variation in the unexplained gender wage differences. We have taken inspiration from these studies, analysing the issue using data from a selected public sector company and focusing on a specific occupation.

This study is devoted to the wage differences between male and female orderlies working in a selected hospital. The aim is to identify the unexplained gender pay gap in the individual departments and to find out whether it varies and if so, to identify the possible causes of these differences. In order to estimate the unexplained part of gender pay gap, we used the average treatment effect on the treated (ATT) and to identify the causes of the possible differences in the unexplained gender pay gap, we used the linear regression model.

## **2 Material and Methods**

### *2.1 Data*

We used data from a selected Czech hospital, which was willing to provide us with the necessary information. The hospital in question is the large University Hospital, which boasts over 2,000 beds and has more than 5,000 employees.

The character of the provided data is administrative and dates back to 2010. Our dataset enables us to identify 12 groups of employees working in more than 60 departments: worker, orderly, technical and economic worker, lower medical worker, medical laboratory technician, paramedical worker, nurse, midwife, pharmacist, pharmaceutical assistant, other professional, doctor. Female employees dominate in most of the occupations, with the exception of the position of worker. In seven cases women represent more than 90 percent of the employees (lower medical worker, medical laboratory technician, paramedical worker, nurse, midwife, pharmacist, pharmaceutical assistant). To be able to work with a relatively large and the most homogenous sample of men and women in terms of job content, we selected to work only with employees on the position of orderly. Due to the fact that we needed to examine the differences in the unexplained gender pay gap among the individual departments, we excluded departments containing only male or only female orderlies. The final data set covers the data of 399 employees working in 18 departments. The average characteristics of male and female orderlies and selected characteristics of our 18 departments are shown in table 1 and table 2.

When examining the impact of the manager's gender on wage discrimination against women, it is essential to take into consideration the factor of the wage setting-power of managers. Wages in the Czech public health sector are regulated by Government Regulation No. 564/2006 on the salaries of employees in public service and administration. This regulation

defines the wage classes and grades and assigns workers to these, setting the base gross wage for the individual classes and grades. The maximum amount of permitted bonuses is not regulated; this also being the case in our hospital where the amount of assigned bonuses is not even controlled by an internal regulation. This means that the final gross wage of an employee, including bonuses, depends on the decision of the head of department, who is solely limited by the Government Regulation, regulating only the minimum wage, and by the size of the budget assigned to him/her. This implies that the leaders of the individual departments have relative flexibility in wage formation.

**Table 1. Observed characteristics of male and female orderlies**

Characteristic	Mean men	Mean women	Characteristic	Mean men	Mean women
Age (year)	39.74	43.57	- tertiary – bachelor level	0.97	0
Education (in percentage)			- tertiary - master and doctoral level	2.91	0.68
- lower secondary	14.56	26.1	Contract	0.98	0.98
- upper secondary –without certificate	0.00	0.34	Years in the hospital	8.29	8.34
- upper secondary – with certificate	42.72	53.04	Sickness (days)	5.93	10.73
- upper secondary - school diploma	37.86	19.93	Overtime (hours)	54.04	29.21
- tertiary - higher professional	0.97	0	Female manager (in percentage)	41.75	15.20

Source: Author based on data from various hospitals

**Table 2. Characteristics of departments with male and female orderlies**

Department	Number of employees	Number of orderlies	Percent of female orderlies	Head of department	Department	Number of employees	Number of orderlies	Percent of female orderlies	Head of department
1	129	45	17.78	Female	10	100	13	92.31	Male
2	188	22	77.27	Male	11	92	14	78.57	Female
3	237	18	77.78	Male	12	92	9	88.89	Male
4	96	13	84.62	Female	13	111	6	83.33	Male
5	73	16	93.75	Female	14	97	71	77.46	Male
6	100	8	87.50	Male	15	182	45	64.44	Male
7	140	18	94.44	Male	16	74	24	91.67	Male
8	229	15	93.33	Male	17	234	39	76.92	Male
9	139	20	95.00	Male	18	23	3	66.67	Male

Source: Author based on data from various hospitals

## 2.2 Methods

To identify the unexplained part of the gender pay gap among orderlies and to find out whether it varies among the individual departments, we estimated the unexplained part of the gender pay gap on department level using an estimation of the average treatment effect on the treated (ATT).

The ATT is the average benefit resulting from being treated. In our case, the ATT is the mean effect for women in the form of a lower wage resulting from being a woman. We counted the ATT for the individual departments using the following calculation formula for ATT

$$ATT = E(y_i(1) - y_i(0) | T_i = 1). \quad (1)$$

Where T is the binary treatment indicator, T = 1 denotes treatment and T = 0 otherwise, y(1) is the potential outcome with treatment and y(0) is the potential outcome without treatment. In our case, to be treated means being a woman. We can rewrite the ATT as

$$ATT = E(y_i(1)|T_i = 1) - E(y_i(0)|T_i = 1) \quad (2)$$

Where ATT represents the gender pay gap, which cannot be explained by the different characteristics of men and women. The term  $E(y_i(1)|T_i = 1)$  is the sample average of the logarithm of the gross wage of women and the term  $E(y_i(0)|T_i = 1)$  is the sample average of the logarithm of the gross wage of women, if they were men.

From our sample, we know the first term on the right-side of equation 2, the sample average of the logarithm of the hourly gross wage of women. The second term, the average of the logarithm of the hourly gross wage of women if they were men, needs to be somehow estimated. There are more ways to carry out such an estimate -for more details see Wooldridge [18]. We carried out the estimation using the coefficients of male wage function

$$(y_i|T_i = 0) = \beta_0 \cdot X_i + u_i \quad (3)$$

Where  $y_i$  is the logarithm of the male gross hourly wage,  $\beta_0$  is the vector of the coefficients of the wage function,  $X_i$  is the vector of the chosen observed characteristics of men and  $u_i$  is a disturbance term. The number of male orderlies is too small in most departments to be able to estimate the coefficients of the male wage function for the individual departments. Hence, we estimated the male wage function for the whole sample of male orderlies using department as one of the explanatory variables.

Apart from department, also age, education level, years in the firm, squared years in the firm, sickness, overtime hours and contract were used as other explanatory variables. Age is the age of the employee in years. Years in the company is the number of years the employee has been working in the hospital. Education represents the highest level of attained education. Dummy variables are used where seven stages of education are distinguished: lower secondary education, upper secondary vocational education without certificate, upper secondary education with vocational certificate, upper secondary education with school diploma, tertiary higher professional education, bachelor level of tertiary education and master and doctoral level. The other explanatory variable is overtime, which denotes the number of hours the employee works overtime. The explanatory variable sickness represents the number of days which the employee has spent on sick leave. Contract represents the dummy variable for a full time job. Department is the dummy for department where the employee works.

The ATT is then estimated as the difference between the average of the logarithm of the gross hourly wage of women and the average of the predicted values of female wages computed using estimated coefficients of the male wage function.

$$ATT = E(y_i(1)|T_i = 1) - E(\beta_0 \cdot X_i|T_i = 1) \quad (4)$$

Where  $E(\beta_0 \cdot X_i|T_i = 1)$  is the mean of the predicted wages (the logarithm of the gross hourly wage) of every woman in the sample.

A separate estimate of the ATT has been made for the individual departments of the hospital. To identify the possible causes of variation in the estimated ATT, we constructed the linear regression model where we used the calculated ATT for the individual departments as the dependent variable. To explain the variation in the unexplained gender pay gap between departments, we used similar control variables as Hedija [8] but on department level. We used the gender composition of the departments, department size and dummy for the female head of department as explanatory variables.

$$ATT_j = \alpha + \beta_1 \cdot \text{proportionofwomen}_j + \beta_2 \cdot \text{femalemanager}_j + \beta_3 \cdot \text{size}_j + u_j \quad (5)$$

Where  $j$  denotes the department,  $\text{proportion of women}_j$  is the proportion of female orderlies working in the individual departments,  $\text{female manager}_j$  is the dummy variable for the

female head of department, size denotes the size of the department according to the number of employees and  $u_i$  is the disturbance term.

The unexplained gender pay gap may be affected to some extent by the proportion of women in the department. The unexplained pay gap between male and female orderlies could be lower in departments with a very low and a very high proportion of female orderlies. Women may have more male characteristics in the departments with a low proportion of women. They could be perceived as men and this can also be applied to their salary. The same could be valid for men working as orderlies in departments with a dominant share of female orderlies. We used dummy for the proportion of female orderlies, where we distinguished three groups: departments containing 20-40 percent of female orderlies (there is no department that contains less than 20 percent of female orderlies), departments containing 40-80 percent of female orderlies, and departments with more than 80 percent of female orderlies. Not only the proportion of female orderlies but also the proportion of women employees within the department as a whole could play an important role. Women working in departments with a low proportion of women could be perceived as men not only in their occupation and vice versa could be applicable for men. Taking this fact into account, we also used the proportion of female employees as an indicator of the proportion of women.

The unexplained gender pay gap could be lower in the female headed departments. Hedija [9] confirms that the presence of a female manager lead to a decrease in the gender pay gap. These conclusions are in accordance with the social identity theory that states that individuals tend to favour members of their own group to other group members (Tajfel [15], Tajfel and Turner [16]). Applying this theory on remuneration, female head of departments could evaluate female employees better than male employees. Hence, we used dummy for female head of department as another control variable.

The unexplained gender pay differences could be lower in small departments in comparison to the large ones; the reason for this being that the employees of small departments tend to know each other better and may also be inclined to disclose the amount of their wages. To maintain a good working environment and good relationships at work, imposing the wage discrimination against women is more difficult in such cases. (Hedija [8]) We used dummy for the department size according to the number of employees. The ATT though could be affected not only by the number of employees in the department but rather by the number of orderlies in the department, therefore the number of orderlies was also used as an indicator of size.

To estimate the coefficients of the model we used the OLS estimator with robust standard errors.

### **3 Results and Discussion**

Using equation 4 we estimated the ATT for the individual departments of our hospital. This represents the unexplained part of the gender pay gap. The results are shown in table 3 where beside the ATT we can also see the raw gender pay gap. The raw gender pay gap is calculated as the difference between the logarithm of the average hourly wage of female orderlies and the logarithm of the average hourly wage of male orderlies.

**Table 3. Average treatment effect on the treated**

Department	1	2	3	4	5	6
Raw GPG	-0.307	0.136	-0.079	0.092	0.216	-0.071
ATT	-0.233***	0.048	-0.028	0.039	0.182***	-0.154***
	(0.042)	(0.059)	(0.064)	(0.095)	(0.051)	(0.048)
Department	7	8	9	10	11	12
Raw GPG	0.243	0.061	-0.100	0.161	-0.079	0.201
ATT	0.205***	-0.022	0.010	0.194***	-0.072	-0.156***
	(0.044)	(0.036)	(0.035)	(0.04)	(0.066)	(0.042)
Department	13	14	15	16	17	18
Raw GPG	0.156	-0.085	-0.011	0.166	-0.197	0.297
ATT	0.092**	-0.065*	-0.067**	0.138***	-0.179***	0.331***
	(0.046)	(0.035)	(0.027)	(0.053)	(0.036)	(0.078)

Source: Author

Note: \*\*\*significant at the 1 per cent level, \*\*significant at the 5 per cent level, \*significant at the 10 per cent level, robust standard errors in brackets

The unexplained gender pay gaps vary significantly between the individual departments. The estimated ATT is positive for nine of the eighteen departments; the female orderlies working in these departments earn more than their male co-workers with similar observed characteristics. The estimated ATT ranges from -0.233 for department 1 to 0.331 for department 18. This indicates that the male orderlies earn about 23 percent more than female orderlies in department 1 and on the other hand department 18 shows that the female orderlies earn about 33 percent more than their male counterparts, where it is not possible to explain these differences by known observed characteristics of men and women (age, education level, years in the hospital, sickness, overtime hours and contract).

We used the linear regression model (equation 5) to identify the causes of the differences in the unexplained gender pay gaps between the individual departments. Table 4 shows the results. We chose the size of the department, proportion of women and gender characteristics of the department head as possible factors explaining disparities in the ATT among departments.

With regards to the size of the department, we considered this using both the number of orderlies in the department as well as the number of employees. The number of orderlies in contrast to the number of employees has not proven to be a statistically significant factor explaining the differences in the ATT. This indicates the fact that if the department is small taking into account the number of employees, it is then generally more difficult to implement wage discrimination also regardless of the number of people carrying out a particular occupation within the department. Hence, we continued to use the number of employees as an indicator of size. Our results do not confirm the idea that the wage differences between male and female orderlies increase together with a growth in the size of the department.

When considering the effect of the proportion of women on the variation in the ATT between departments, we again used two alternative indicators. These were the proportion of female orderlies and the proportion of female employees in the department. Also in this case only one of the indicators proved to be statistically significant and this was the proportion of female orderlies. We used dummy variables and considered three groups: departments with less than 20 percent orderlies, from 20 to 80 percent and departments containing more than 80 percent orderlies. Model 2 in table 4 shows the results. The ATT is lower in departments with less than 20 percent orderlies, and higher in departments containing more than 80 percent female orderlies. There is no evidence that gender wage differences are lower in departments containing a high or low proportion of female orderlies. It is important to interpret this conclusion carefully, as our sample contains only one department containing less than 20 percent of female orderlies as shown in table 2. In our case, the ATT tends to increase with an increase in the proportion of female orderlies. Hence, we used the proportion of female orderlies as the explanatory variable (model 3 in table 4). Our results show that a growth in the proportion of female orderlies by 10 percentage points decreases the unexplained gender pay



gap (increased ATT) by 4.4 percentage points. These results are different from the study by [8], which analyzes the effect of the proportion of women on the unexplained gender pay gap on the level of individual sectors of the Czech economy. This study shows the effect to be negligible. This could be due to the fact that the proportion of women has not been studied on the level of individual firms or departments but on the level of the industry as a whole.

Finally we included into the model the dummy for the female manager. The results are to be found in model 4 in table 4. Having a female head of department increases the ATT by 8.4 percentage points. Our findings are consistent with [11 and 12], [6], [4] and [9], which concluded that the gender wage gap reduced with a greater representation of women in management. It is important to interpret our results carefully due their low statistical significance.

**Table 4. Linear regression model**

<b>Model</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
<b>Size</b>				
- 50-100 employees	-0.320*** (0.056)	-0.378*** (0.030)	-0.405*** (0.049)	-0.466*** (0.089)
- 100-150 employees	-0.312*** (0.077)	-0.349*** (0.093)	-0.364*** (0.048)	-0.390*** (0.057)
- 150 + employees	-0.381*** (0.038)	-0.398*** (0.046)	-0.431*** (0.042)	-0.442*** (0.047)
<b>Proportion of women</b>				
- 0-20 percent of female orderlies	-	-0.215** (0.093)	-	-
- 80 + percent of female orderlies	-	0.087 (0.058)	-	-
Proportion of women (orderlies)	-	-	0.443*** (0.089)	0.542*** (0.124)
Female manager	-	-	-	0.084 (0.084)
Constant	0.331*** (0.000)	0.331*** (0.000)	0.036 (0.060)	-0.030 (0.083)
R <sup>2</sup>	0.303	0.534	0.556	0.584
N	18	18	18	18

Source: Author

Note: \*\*\*significant at the 1 per cent level, \*\*significant at the 5 per cent level, \*significant at the 10 per cent level, robust standard errors in brackets

We can conclude that our three selected explanatory variables - size of department, proportion of women and gender characteristics of department head, provide an explanation for 58.4 percent of the variability in the unexplained part of the wage differences between male and female orderlies in our hospital.

#### **4 Conclusion**

The aim of this study is to identify the unexplained part of the gender pay gap in the individual departments of the selected public sector company and to find out whether these vary and if so, to identify the possible causes of these differences. Firstly, we estimated the unexplained gender pay gap between the orderlies of the selected Czech hospital using an estimation of the ATT. The estimated ATT varied significantly among the individual departments, ranging from -0.233 to 0.331. The estimated ATT proved to be positive in nine from the eighteen examined departments. This indicates that the female orderlies earn more than their male co-workers with similar observed characteristics in these departments.

We then went on to use the linear regression model to identify the possible causes of the differences in the ATT. We used the size of the department, proportion of female orderlies and gender characteristics of the department head as control variables. Our results showed that the unexplained gender pay gap decreased (the ATT increased) with an increase in the proportion of female orderlies. The growth in the proportion of female orderlies by 10 percentage points decreased the unexplained gender pay gap (increased the ATT) by 4.4 percentage points. The unexplained gender pay gap also showed a decline with a female head of department. A female head of department leads to an increase in the wages of the female orderlies in relation to their male co-workers by 8.4 percent. It is important to interpret this result carefully due its low statistical significance. Finally, the results did not confirm the idea that the wage differences between male and female orderlies increased together with a growth in the size of the department.

Our study demonstrates some strengths together with weaknesses. We used detailed data of one selected hospital on the department level. This enabled us to identify the gender of the head of the individual departments and to minimize the bias from different job contents for a similar occupation. Using data related to only one group of employees, specifically orderlies, enabled us to minimize the part of the unexplained gender pay gap resulting from unobserved characteristics like talent, which could play an important role in the professional position as is doctor. On the other hand using data from only one company reduces the explanatory power of the study and our results may not be valid for the entire Czech healthcare.

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# Student Satisfaction with Higher Education Service Quality: Dimensions and Antecedents

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## Abstract

Higher education (HE) institutions are facing dynamic environment and increased international competition. Their success depends on quantity and quality of students they recruit and retain that is influenced to a great extent by student satisfaction. Therefore, HE institutions should be able to properly measure student satisfaction and find ways to manage it. For effective measurement and managing of student satisfaction, HE institutions should be aware of its dimensions and antecedents. The article aims to examine student satisfaction dimensions and antecedents, proposed by various student satisfaction models. The findings suggest that researchers do agree on a several education service quality dimensions (quality of academic and administrative services, physical environment, interpersonal communication), but have different opinions on their precise definition and relative importance (which may be context-specific). Student expectations, perceived value of education service, image of an institution, students' pre-enrolment opinions and motivation to participate in higher education, as well as learning style are viewed as antecedents of student satisfaction (direct and indirect) in various models.

*Keywords:* student satisfaction; student satisfaction models; student satisfaction antecedents

JEL Classification: I21, L32

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## 1 Introduction

Higher education (HE) institutions are facing dynamic environment and increased international competition. Their success depends on quantity and quality of students they recruit and retain. A number of studies have shown that student satisfaction has a positive impact on student recruitment [17], student performance [14], loyalty [4], [15], retention [2], [17], as well as negative relationship to attrition [30] and dropout [16]. To attract students and establish positive long-term relationship with them, HE institutions should be able properly measure student satisfaction and find ways to manage it. To design a reliable tool for student satisfaction measurement, HE institutions should be aware which education service dimensions are most important for students. In order to successfully manage student satisfaction, its antecedents and their relationship with satisfaction should be known.

### 1.1 Student Satisfaction Models

Student satisfaction measurement research could be divided into two main areas: student satisfaction with teaching quality and courses [2], [19], [20], [21] and overall student satisfaction with their educational experience [4], [18], [23]. This article is focused on overall student satisfaction.

As theoretical background for constructing student satisfaction models, customer behaviour theory often is used. Many customer and student satisfaction models employ disconfirmation paradigm, where satisfaction is measured as a gap between student expectations and perceived actual performance. In this case customer satisfaction can be defined as "*the extent to which a product's perceived performance matches a buyer's expectations*" [26, p. 29].

Despite its popularity, customer satisfaction is not the only concept applied in HE context. Various other concepts from social behaviour theory or psychology are commonly employed in student satisfaction models. Some models use employee satisfaction as a basis [7]. Also

interviews with representatives of HE institution, students and other stakeholders often take place.

The variety of student satisfaction models can be classified depending on their practical implications. Many of them were designed for and/or tested on a specific HE institution in order to develop internal quality assurance tool [1], [14], [22]. Some such models became well-known and utilized beyond the original institution, like College Student Satisfaction Questionnaire (CSSQ) or College Student Experiences Questionnaire (CSEQ). Other authors aimed at finding a satisfaction model for higher education sector of a specific country [3], [4], [33]. There are also works that investigate student satisfaction in specific areas of studies [6], [27].

## 2 Material and Methods

The input data for the research in the form of articles on student satisfaction was gathered from March to June 2014. The data search was performed via online platforms of publishers (e.g. Taylor & Francis Group) and search engines (Google Scholar). Additionally, bibliographic indices from the articles were used for gathering more input data for the research.

Qualitative research procedures were applied in the research. Categorisation process consisted of several stages. Only articles devoted to overall student satisfaction with HE services were selected for the research. From them, articles containing satisfaction models were chosen for in-depth study. These articles constituted the final sample for the research. Last stage of categorisation included qualitative analysis of student satisfaction models and their categorisation based on the nature of satisfaction determinants. Employing such categorisation procedure resulted in defining two main categories of student satisfaction models – those focused on quality dimensions of the HE service and those examining various antecedents of student satisfaction. Finally, models in both groups were analysed using qualitative comparative analysis technique.

## 3 Results and Discussion

### 3.1 Dimensions of Student Satisfaction

It is considered, that in pure services, like education, service quality is a dominant element of customer perceptions of the service [34]. The models, mentioned further, focus on measuring overall student experience with HE service and its aspects. In this case, satisfaction models consist of satisfaction or quality dimensions that comprise more specific attributes or items. The strength of relationship between student satisfaction and its determinants, as well as their relative importance are usually concluded from regression analysis. Though, in some models relative importance of the constructs is evaluated by students themselves (SSI [18], the University of Central England student satisfaction approach [23], [13], and others).

#### *Models based on SERVQUAL Dimensions*

The well-known SERVQUAL framework, developed by Parasuraman, Zeithmal and Berry for quality measurement in service firms, found its application in various other areas, including public services and higher education, in particular. The authors identified five service quality dimensions [34, p. 87]:

- Reliability: ability to perform the promised service dependably and accurately.
- Responsiveness: willingness to help customers and provide prompt service.
- Assurance: employees' knowledge and courtesy and their ability to inspire trust and confidence.
- Empathy: caring, individualized attention given to customers.
- Tangibles: appearance of physical facilities, equipment, personnel, and communication materials.

There is not much research devoted to determining relative importance of the SERVQUAL dimensions. Hasan and Ilias [24] attempted to examine relationship between SERVQUAL service quality dimensions and student satisfaction on example of 200 Bachelor students of two private universities in Malaysia. The results showed that “*empathy has the strongest relationship with satisfaction followed by assurance, tangibility, responsiveness and reliability*” [24].

Douglas, McClelland and Davies [14] designed a conceptual model of student satisfaction and dissatisfaction by combining of original 10 determinants developed by Parasuraman, Zeithmal and Berry in 1985 and Johnston's 18 redefined determinants into 16 determinants: (1) reliability, (2) responsiveness and attentiveness/helpfulness, (3) flexibility, (4) friendliness, (5) competence, (6) access and availability, (7) courtesy, (8) communication, (9) credibility and integrity, (10) security, (11) understanding/knowing the customer and care, (12) tangibles and cleanliness/tidiness, (13) aesthetics, (14) comfort, (15) commitment, (16) functionality. They also identified specific HE service quality dimensions: team work, socialising, usefulness, motivation, management and virtual resources that were also included in the model. The results of the survey of 163 undergraduate students (using Critical Incident Technique) showed that communication and responsiveness are the most crucial determinants of perceived quality, therefore satisfaction. [14]

Applicability of SERVQUAL in higher education is widely discussed. Some researches successfully utilized modified SERVQUAL for student satisfaction analysis [24], [27], but others criticize it for its inappropriateness for educational context [11], [12].

#### *Student Satisfaction Multi-dimensional Models*

A great number of other student satisfaction models focused on students' perception of higher education service quality exist. Several examples such conceptual models are presented in the Table 1.

**Table 1. Student satisfaction multi-dimensional models**

Title of the model (if exists), country and related works	Dimensions
College Student Satisfaction Questionnaire (CSSQ), The USA [7], [31], and others	Policies and procedures, Working conditions, Compensation (amount of input required relative to academic outcomes), Quality of education, Social life, Recognition. [7]
Student Satisfaction Inventory (SSI), the USA [8], [18], and others	Academic Advising and Counselling Effectiveness, Academic Services, Admissions and Financial Aid, Effectiveness Campus Climate, Concern for the Individual, Instructional Effectiveness, Registration Effectiveness, Responsiveness to Diverse Populations, Safety and Security, Service Excellence, Student Centeredness. [8]
Athiyaman [5], Australia	Emphasis on teaching students well, Availability of staff for student consultation, Library services, Computing facilities, Recreational facilities, Class sizes, Level and difficulty of subject content,

	Student workload (Defined in the model as „services and service characteristics“)
Wiers-Jenssen, Stensaker, and Grøgaard [33], Norway	Quality of teaching Quality of support facilities Quality of physical facilities Social climate Leisure activities
Baykal, Sokmen, Korkmaz, and Akgun [6], Turkey	Education contents, Relationship between college, students and other institutions, The way the college is managed, Relationships with the educational staff, Student orientation and supportive services, Socio-cultural services by the college for student, Medical services, Measurement and evaluation, Physical structure of the school, Respect for students from whom? Keeping students informed about school affairs and participation in decision making process.
Clemes, Gan, and Kao [10], New Zealand	Interaction Quality, Physical Environment Quality, Outcome Quality.
Gruber, Fuß, Voss, and Gläser-Zikuda [22], Germany, the UK, Switzerland	Relevance of Teaching to practice, School placements, Lectures, University buildings, Support from lecturers, The presentation of information, Courses, Reputation of the university, Lecture theatres, Number of semesters.
Abbasi, Malik, Chaudhry, and Imdadullah [1], Pakistan	Teaching, Administrative support, Augmented facilities (defined in the model as “constructs”)

Source: Author

Analysis of existing models of student satisfaction has shown that there is no common opinion on what the dimensions of student satisfaction are. Though several dimensions are present in the majority of the models, they commonly have different titles and attributes. *Quality of academic services* is present in all of the models, though it has diverse titles and sometimes is divided into separate dimensions, such as quality of teaching (instruction), communication with academic staff (including advising and counselling), course content, organization and assessment, etc. Another dimension, present in all models, is *physical environment quality*, or quality of infrastructure that includes library, lecture rooms, availability of computer access, and all aspects relating to comfort, cleanliness of these facilities. Another service that is inseparable from students' education experience, provided by a higher education institution is *administrative* (non-academic, support) *service*. As a result, it is represented in most of student satisfaction measurement models. Administrative services usually include student admission, course registration and other administrative support, library services, cafeteria, etc.

Aspects of *interpersonal communication* are also commonly considered as a determinant of student satisfaction. In models they are referred as interaction quality with academic and non-

academic staff, treatment of students by staff, recognition of students as individuals or interest in a student as a person, or, in broader sense, as social climate or social life and environment provided by a university. Several authors also define student centeredness as an important construct.

Little research on relative importance of the dimensions has been carried out. In the majority of the models, teaching quality (and other academic quality constructs) is usually considered as the main or one of the strong predictors of student satisfaction in the models [13], [17], [33]. Besides that, communication aspects of educational experience, like student interaction with staff, social climate, and student centeredness are supposed to have a significant effect on overall satisfaction [10], [17], [33]. Students' perception of infrastructure and facilities is not been proven to be a strong predictor of student satisfaction, but still is considered as rather important dimension [10], [33]. It is highly probable that context of the research (country, area of study) may have impact on the difference among the results.

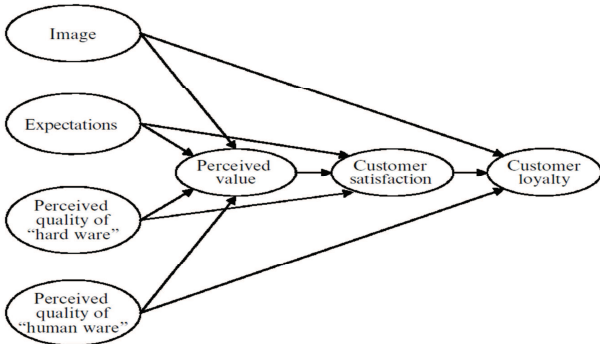
3.2 Antecedents of Student Satisfaction

In order to successfully manage student satisfaction, HE institutions should understand its antecedents and interrelations between them and student satisfaction. Models, discussed further, examine various antecedents of student satisfaction and their casual relationships (direct and indirect) with student satisfaction. Some models also link between student satisfaction to its consequents – students' behaviour intentions (loyalty, retention, etc.)

ECSI Model in Higher Educational Context

A relatively recent trend in student satisfaction model development is employing European Customer Satisfaction Index (ECSI) concept [4], [15], [35]. The ECSI is a model developed by ECSI Technical Committee, a successor of the Swedish Customer Satisfaction Barometer (SCSB) and the American Customer Satisfaction Index (ACSI). The basic ECSI model incorporates four determinants of customer satisfaction – expectations, image, perceived quality and perceived value, as well as its consequent – customer loyalty. [29] The interrelations of the ECSI constructs are presented in Figure 1.

Figure 1. The basic ECSI model



Source: [29]

In order to conform to higher education context, the ECSI constructs are modified to reflect specifics of HE service [15], and sometimes new constructs are added [35]. Some of them will be discussed in more detail further.

*Student expectations* are one of the student satisfaction determinants in ECSI model for higher education. Student expectations are present in the majority of satisfaction models, tough



many models follow disconfirmation paradigm, where satisfaction is measured as a gap between student expectations and perceived actual performance (SSI [18], [5], and others). But there are such studies, like Student Satisfaction Index, where student expectations are considered as a separate antecedent of satisfaction [3].

Besides perceived quality, an important determinant of student satisfaction according to ECSI model is *perceived value*. In ECSI perceived value represents the perceived level of service quality received relative to its price. In higher education the 'price' construct may include not only the tuition fee for the programme and other costs related to studies, but also non-price costs, like time and effort [35]. According to latest results of a survey among 412 Portuguese students, perceived value has the strongest relationship with student satisfaction among all ECSI determinants [15].

*Image* is another determinant of student satisfaction widely discussed in literature [4], [10], [22] and others. Research findings of Alves and Raposo [4] support existence of strong relations between image and formation of students' expectations, satisfaction and loyalty.

**Thomas and Galambos' Model of Student Satisfaction**

Another area of interest among researchers is discovering possible antecedent of student satisfaction in pre-enrolment stage. Thomas and Galambos [32] model includes the following student satisfaction predictors:

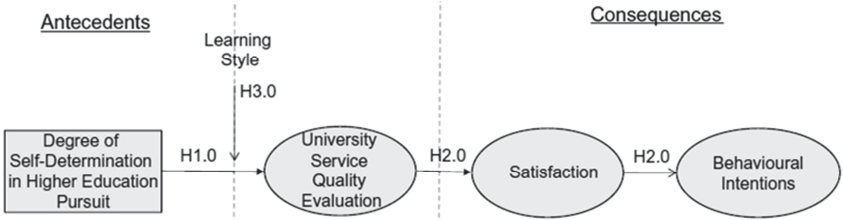
- Academic experience,
- Social integration,
- Campus services and facilities,
- Pre-enrolment opinions.

Student pre-enrolment opinions, in this model, depend on accuracy of pre-enrolment information, and reasons for students' choice of an institution. The survey among 1689 public university students showed that "student satisfaction is influenced significantly by precollege attitudes as well as campus experiences" [32].

**Chong and Ahmed's Model of Student Satisfaction**

Student motivation of higher education participation is considered in another study [9], where authors compute self-determination index (SDI) as student's degree of self-determination in participating in higher education and analyse its influence on student satisfaction. Additionally, a moderating (or indirect) effect of learning style is considered in the model. The Chong and Ahmed's conceptual model is presented in Figure 2.

**Figure 2. Chong and Ahmed's conceptual model of "Antecedents and consequences of university service quality evaluation"**



Source: [29]

Results of the model testing on 1919 business students from public and private local, and foreign universities showed that self-determination in higher education participation positively influences student's perception of university service quality and, consequently, satisfaction. [9]

## 4 Conclusion

Student satisfaction is a widely discussed topic in higher education quality assurance, as well as managing and marketing strategies of HE institutions. A lot of research devoted to search of reliable forms of its measurement and examining its antecedents and consequents has been carried out.

Although, agreeing on a several main student satisfaction dimensions: quality of academic and administrative services, physical environment quality and interpersonal communication quality, researchers still have different opinions on their precise definition and relative importance. Conceptual models for student satisfaction measurement have very different sets of dimensions in the end. As a result, no comprehensive student satisfaction measurement model has been developed yet. A possibility of development of a general model that would enable student satisfaction measurement and comparison among various institutions and countries should not be rejected, but from the analysis of the models it can be concluded that some aspects of student satisfaction may be country-specific and/or may depend on area of studies. It would be beneficial for future research to define which dimensions of student satisfaction don't depend on a context and which are context-specific, as well as how context (country, area of studies) may affect relative importance of dimensions.

Several models, discussed in the article, analyse antecedents of student satisfaction, like student expectations, perceived value of education service, image of an institution, students' pre-enrolment opinions and motivation to participate in higher education, as well as learning style, and examine relationships between them and student satisfaction. This seems to be a high-potential area for further research. Elaboration of various antecedents of student satisfaction into one comprehensive model and examining causal relationships between the constructs would contribute to better understanding of the complexity of student satisfaction concept in the future.

As for the current situation in the student satisfaction research in the Czech Republic, no research on dimensions of student satisfaction has been carried out, and no student satisfaction model has been developed for the Czech higher education context yet. Thus, the main aim of the author's further research is to determine key dimensions of student satisfaction with quality of higher education service in the Czech Republic and, consequently, develop a model of student satisfaction for the Czech higher education context.

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# Public Universities in the Czech Republic: Analysis of Efficiency

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## Abstract

Analyzing and evaluating the status and popularity of universities compared to the others is one of the fundamental tasks of every school management and leadership. It is important to monitor development of indicators which determine decision-making of potential applicants for studies. Analyses of preferences and decision-making across universities can be based on a wide spectrum of mathematical and statistical methods and concepts. Usually, correlation analyses and regression modeling are constructed or multi-criteria decision making models and evaluating of the effectiveness of the analyzed units based on methods such as DEA and SFA models are applied. This paper focuses on the comparison of the set of Czech public universities and colleges (26 cross sectional units) based on DEA (Data Envelopment Analysis) models. The key indicators are employed in the role of inputs and outputs. For the purpose of estimates the real Czech data from 2012 are used. The main aim is to find out the influence of the size (measured by the total number of students) of the university/college and the influence of the research points on the efficiency.

*Keywords:* public universities; Czech Republic; DEA; efficiency; preferences

JEL Classification: C44, C67, I21, I22

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## 1 Introduction

### 1.1 Efficiency of Higher Education Institutions

University education and its comparison are among the frequently discussed questions. The problem of the comparison is influenced by many factors such as different conditions of each university and also complicated definition how to measure the quality of universities. The evaluation is necessary for the academic staff and its reputation, for the Ministry of Education to distribute the finance, for students to make a good choice or for stakeholders that may influence accreditation, grants, sponsorship etc.

The ranking of higher education institutions (HEI) can be created on a national or international base like The Times Higher Education World Reputation Rankings 2014 [11] or Top universities [13]. These rankings use various kinds of information taken from the universities, from the questionnaires, from the Ministries of Education etc. and also various techniques and methods for the comparison. Worthington [14] provided a survey of the empirical analyses in education via frontier efficiency measurement techniques.

The measurement of “efficient” and “inefficient” HEI’s can be made through Data envelopment analysis (DEA) developed by Charnes, Cooper and Rhodes [2]. The main idea of DEA models is the projection of each decision-making unit (DMU) on the so-called efficient frontier dependent of the selected inputs and outputs of DMUs. This frontier is created on the basis of available DMUs. The efficient DMUs lie on the frontier. For others DEA calculates the possibility for improvement (inputs or outputs) to move onto the frontier. DEA models have been used for the comparison of Canadian universities by [9] and Australian universities by [1], or they have been applied toward the comparison of faculties [6], [5] or departments [7]. The same methodology is also used in this article.

The different points of view onto the higher education efficiency can cause the problem of the definition of the models. Some of the students prefer quality of the HEI given by its reputation and well-known academicians that have written a lot of books and articles. The

others try to find the HEI where it is easy to pass the entrance examinations or the HEI with interesting study programmes, with no mathematics, with a lot of students (that can give them higher chance to study and pass) etc.

The opinion of the employees or Ministry is probably different – maybe less quantity of students but higher quality, but we have arrived at the question if it is possible to measure the quality of the teaching process. In this article we try to take into account the students point of view only. Before the data definition we first describe the situation in the Czech Republic considering the university network and higher education itself. Afterwards we create different models to find the impact of selected data on the results. One of the aims is to find out if the efficiency can be connected with the size of the HEI described by the total number of students.

### *1.2 Development and Trends of selected Indicators in Higher Education*

Demand for higher education is strongly influenced by the demographic situation and evolution in the country. Relatively strong wave of number of students, and university graduates later, came in the mid-90s, particularly as a response to baby boomers of 70s that was determined by policy of natality of the government. Then there was a reduction in the size of the corresponding demographic cohorts (the late 90s and the first half of the previous decade). Since approximately 2004 the size of university age cohorts started to stagnate or decline. Between 2012 and 2014 comes a slight decrease repeatedly as a result of decline in the birth rate in the first half of the 90s – the trend of live births shows right graph in Figure no. 1. According to estimates there is no considerable variation in the development in the coming decade – an increase in the college age cohort is expected around the year 2025, as mentioned in [8]. The projections of the number of university students and graduates are based on the projection of high school graduates as it is essential population for the higher education.

On the other hand, interest in tertiary education grew after 1989. This is evident particularly in recent years – number of college students doubled between 2000 and 2010, as Czech Statistical Office states [12]. Along with the relaxation of structures (e.g. law no. 111 from 1998) and growing interest in higher level of education this sector became to be interesting also for private investors - the number of private colleges increased more than 5 times in the last 10 years (from 8 in 2000 to the current 44), while the number of public colleges increased only slightly (from 23 to the current 26).

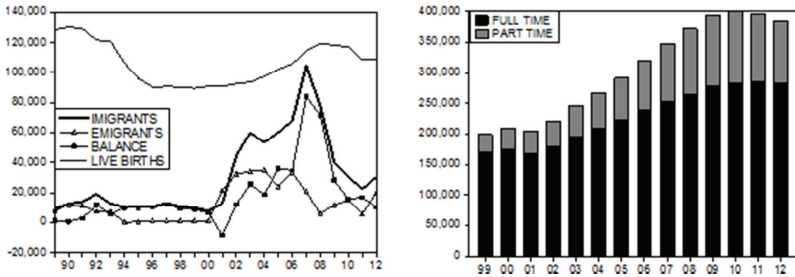
The demographic development is significantly influenced by migration – nearly half of incoming immigrants are 19-32 years old. The highest positive balance consists of age categories from 20 to 21 years of age – many of them enter the population of university students. According to OECD information, the immigration declined in 2009 in response to the economic crisis – in EU by 22 % and to the level of about 40 thousand in the Czech Republic (that is about two thirds less than in 2007). The decrease was even deteriorated to 30 thousand immigrants in 2010 and an increase comes in 2012. Time series plots of the numbers of immigrants, emigrants and the balance is shown in Figure no. 1, graph on the left. The number of foreign students is increasing during the whole sample period 1989/90-2012/13, while the number of Czech students has been slightly decreasing in recent years.

The right graph in Figure 1. illustrates trends in composition of number of students by study form, divided into full-time and part-time mode, between 1999/00 – 2012/13. Both, numbers of full-time and part-time students are increasing during the whole sample period with slight decline in the last 1-2 years, while a decrease of number of part-time students is more significant - of about 14 000 students between 2010/11-2012/13 (2 300 for the full-time mode in the year 2012/13).

The distributions of students between private and public universities in each year of the sample period 1999/00 – 2012/13 are shown in Figure 2. (the left graph). The graph on the right side implies number of applications (lot of applicants submit more applications simultaneously), number of applicants, number of accepted applicants and number of enrolled students - all the data are given for academic years 1999/00 – 2013/14. The graph shows a decline of all variables in the last years that indicates continuing downward trend in number of

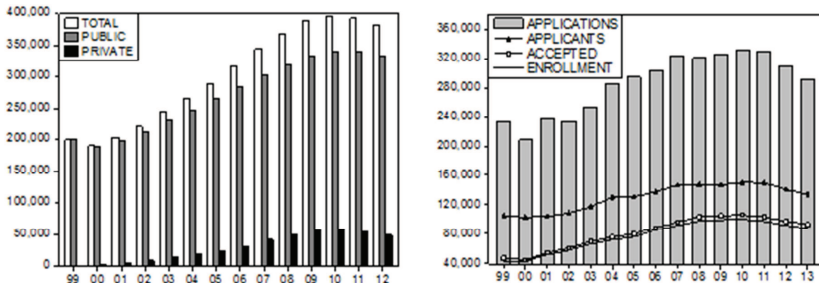
applicants and new students. In each graph the bottom axis labels are truncated, for example label 99 means academic year 1999.

**Figure 1.** Development of migration (left graph) between 1989/90 and 2012/13 and composition of college students by type of study (right graph) between 1999/00 and 2012/13



Source: [10, 12]

**Figure 2.** Development of composition of students by type of university (left graph) and trends in number of applications, applicants, accepted and enrolled students



Source: [10, 12]

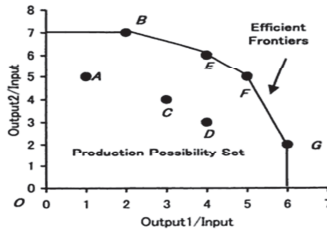
## 2 Material and Methods

Data envelopment analysis (DEA) is one of the tools that are widely used for the comparison of alternatives according to different criteria separated to inputs and outputs. The basic idea of DEA models consists in estimation of an efficient frontier that defines production possibility set of the problem. Based on the set of available decision making units (DMUs) DEA estimates so-called efficient frontier, and projects all DMUs onto this frontier. For the model with two outputs and one input the graphical representation can be used (Figure 3.) to know the shape of the efficient frontier.

DMU that lies on the frontier can be marked as efficient. Input oriented DEA model assumes fixed level of outputs (CCR-I), the output oriented model assumes fixed level of inputs and maximize level of outputs with respect to given inputs (CCR-O) [2]. These models are used if we assume constant return to scale.

In the case of variable return to scale we work with BCC (Banker, Charnes, Cooper) models. The review and detailed information about DEA models can be found in [3] and [4]. The basic idea for the efficiency calculation is to maximize the rate of weighted sum of outputs divided by weighted sum of inputs.

Figure 3. Efficient frontier for 2 outputs and 1 input



Source: [4]

As for our analysis the BCC input oriented model is used it can be defined as following linear programming problem:

$$\begin{aligned}
 &\text{To maximize} && z = \sum_{i=1}^r u_i y_{iq} + \mu \\
 &\text{Subject to:} && \sum_{i=1}^r u_i y_{iq} + \mu \leq \sum_{j=1}^m v_j x_{jq}, \quad k=1,2,\dots,n \\
 &&& \sum_{j=1}^m v_j x_{jq} = 1 \\
 &&& u_i \geq 0, \quad i=1,2,\dots,m, \\
 &&& v_j \geq 0, \quad j=1,2,\dots,r, \\
 &&& \mu \text{ is free in sign,}
 \end{aligned}
 \tag{1}$$

where  $q$  represents the evaluated DMU,  $y_{iq}$  are known outputs of the unit  $q$ ,  $x_{jq}$  are known inputs of the  $q^{\text{th}}$  DMU,  $u_i$  and  $v_j$  are the variable weights to be determined by the solution of this problem and  $\mu$  is the dual variable assign to the convexity condition in the primary model. In BCC model  $\mu$  is free in sign, in CCR is equal to zero. The efficient unit  $U_i$  lies on the efficient frontier in case that the optimal efficiency (calculated by the model)  $z = 1$ . The inefficient units have  $z$  lower than 1 [3].

First part of the DEA analysis consists of definition of DMUs and its inputs and outputs. In our comparison we take into account 24 public universities and colleges from the Czech Republic (Table 1.). All data relate to the year 2012 [10]. To measure their efficiency we have to define inputs and outputs. Inspired by McMilan and Datta [9], Abbott and Doucouliagos [1] and Jablonsky [6] we use (all or some of these) 3-4 inputs and 4-6 outputs.

The inputs describe a number of full-time equivalent academicians and the institutional budget (the methodology for the budget concept can be found on the web pages [www.msmt.cz](http://www.msmt.cz)). The outputs cover number of students (admitted, total, graduated – covering full-time and combined form and all levels such as bachelor, master, PhD), number of study programmes (it represents the fact that it needs more effort and money to have more study programmes), employment rate of the students of each HEI and so-called “RIV” points that are assigned to each HEI according to its research and development in 5 previous years (2007-2011). The methodology of the calculation of these points is not so easy, for better understanding see [www.msmt.cz](http://www.msmt.cz). The main idea of the comparison is to find out which HEIs are efficient in the transfer of the inputs (workload and money) into outputs (serving the students and study programmes, preparation of students to appropriate jobs, research and writing articles). As we know some of the HEIs have different specialization (technical, arts) and it is evident that there are different conditions for tuition and research (and also for budgeting) than in other universities and colleges, it should be reflected in the final results. It might seem as a limitation



of performed comparison, but on the other hand the complex approach should clearly illustrate factors of diversity in HEI sector and it can therefore be the basis for effective segmentation for subsequent more analytical research in this field.

**Table 1. Data set of information about Czech HEI in 2012**

HEI	I1	I2	I3	I4	O1	O2	O3	O4	O5	O6
AMU	56,78	56,15	137,01	225378,5	449	1525	611	17	99,095	4 217
AVU	11,25	7,68	25,85	58507,42	62	339	85	15	76	253
CVUT	186,36	305,26	929,6	1257351	11439	22146	5514	176	93,813	203 284
CZU	76,54	121,9	378,05	873319,5	15431	23359	5888	106	90,564	28 676
JAMU	10,28	12,72	37,23	123446,3	111	360	101	2	93,75	1 297
JCU	32,18	105,25	409,93	532828,8	8390	13458	3170	164	85,62	54 652
MUNI	214,55	332,8	606,83	1744521	24739	43253	8619	229	90,637	181 027
MZLU	56,5	112,41	223,77	512769	7350	10680	3244	73	80,828	28 457
OSU	34,38	91,5	299,11	407494,3	4933	10637	2558	120	89,221	16 598
SLU	18,92	44,55	121	270754,4	4299	7952	2087	63	90,176	10 078
TUL	49,22	88,37	373,92	363355,6	5398	8417	2085	112	90,183	22 279
UHK	30,85	70,6	205,35	290217,6	5146	9373	2123	49	91,503	6 473
UJEP	35,3	86,4	269,4	415904,4	5305	11362	2168	106	88,245	9 966
UK	457,17	814,28	1727,61	2482309	21337	52131	9093	427	96,898	481 005
UPCE	57,9	107,5	221,3	461977,4	7133	10618	2263	67	84,559	46 803
UPOL	137,66	227,25	645,33	963053,6	9178	22316	5346	244	90,695	99 207
UTB	40,67	93,64	199,57	556756,5	6554	12009	3782	100	85,253	16 256
VFB	30,3	42,3	127,8	244069	1244	3149	634	6	80,702	16 819
VSB-TU	92,39	173,28	583,61	869564	10946	20850	5506	124	83,246	34 916
VSE	69,68	125,02	327,15	570489	8132	19928	4866	88	96,261	20 241
VSCHT	66,18	102,05	234,75	298330,3	3172	4300	863	62	92,701	65 034
VSPJ	5,5	12,68	37,69	93734,78	1393	2798	740	5	72,727	0
VSTE	4,3	7,9	23,4	86978,77	1521	3492	572	8	72,549	64
VSUP	8,21	10,75	37,3	76818,94	175	522	187	7	95,522	996
VUT	137,54	261,43	528,17	1063022	15976	23996	5390	74	84,883	124 761
ZCU	61,69	140,33	451,62	635278,1	9663	15084	3727	131	91,126	50 855

Source: the Annual Reports of the universities and colleges, Ministry of Education, Youth and Sports of the Czech Republic and Center for Education Policy, Faculty of Education, Charles University

The inputs are:

- I1: full-time equivalent number of professors (workloads)
- I2: full-time equivalent number of associate professors
- I3: full-time equivalent number of assistant professors
- I4: budget for 2012 in thousands CZK

The outputs are:

- O1: number of admitted students
- O2: total number of students
- O3: number of graduated students
- O4: number of accredited study programmes
- O5: students' employment rate
- O6: RIV points

### 3 Results and Discussion

As discussed by [9] it is hard to measure and compare the quality of HEIs. Our study is aimed at the efficiency comparison of 24 Czech public universities and colleges. It is possible to say that it is technical and research efficiency thanks to the selected inputs and outputs. The first three inputs contain the similar kind of information (about the quantity of employees) and so we face the problem whether to summarize them or not. It can be also interesting to see the results when only the budget is used as the input (with respect to the specifics in budgeting of each HEI). We know that the income side of budget is primarily determined by number of students and so it is correlated. But the correlation is not as high as it might seem, because for budgeting of current year is not relevant the number of students in current year, but the number from previous year. The highest correlation coefficient is between the number of professors and the number of associate professors, but it is logical. Other correlations are also significant – most of them are obvious (as number of RIV points with number of assoc. professors, number of students with all other inputs and outputs except of unemployment). We are aware that mentioned correlation of parameters might also influence the final results. Although we know this fact we have decided to prefer the complexity and comprehensiveness of analysis done in this moment, but we are ready to focus on further elaboration of narrower set of the most appropriate models in subsequent research. In this step we have tried different DEA models to see the dependence of the efficiency on the selected input or output. In all models the variable returns to scale are used. Models differ in inputs and outputs and correspond with the technical efficiency, research efficiency or both. Model A covers all inputs and outputs. Model B summarizes first three inputs into one (as DEA results can be influenced by the number of inputs, usually the more inputs we have the more efficient units the model gives).. Model C compares the number of academic staff and the quantity of students only (to compare the HEIs regardless of the budget and research), model D uses all inputs in condensed form and out of the number of student only the total number as output together with the last three ones (as the number of admitted students is highly correlated with the total number of them and also with the quantity of graduated). Model E uses only budget as input and students' characteristic as outputs (we test if there is a difference among HEIs in influence the budget usage not only to the number of students but also for their employment) and model F combines the total academic staff as input and number of students and RIV points as output (here again some HEIs might be handicapped because of different possibilities to obtain RIV points). The number of models seems to be high but the reason is the observation of the results change according to the model changes). Description of models:

- Model A: inputs: I1, I2, I3, I4, outputs: O1, O2, O3, O4, O5, O6
- Model B: inputs: I1+I2+I3, I4, outputs: O1, O2, O3, O4, O5, O6
- Model C: inputs: I1, I2, I3, outputs: O1, O2, O3, O4
- Model D: inputs: I1+I2+I3, I4, outputs: O2, O4, O5, O6
- Model E: inputs: I4, outputs: O1, O2, O5
- Model F: inputs: I1+I2+I3, outputs: O2, O6

**Table 2. Results of various DEA models**

HEI	model A	model B	model C	model D	model E	model F
AMU	1	1	0.264992	0.370556	1	0.236387
AVU	1	1	1	1	1	0.818855
CVUT	1	0.980792	0.56645	0.892146	0.579338	0.892103
CZU	1	1	1	1	1	1
JAMU	1	0.941322	0.628525	0.717807	0.608822	0.706795
JCU	1	1	1	1	0.889843	0.67208
MUNI	1	1	1	1	1	1
MZLU	0.933517	0.919824	0.84723	0.742918	0.809667	0.602417
OSU	1	1	1	0.998641	0.774113	0.545771
SLU	1	1	1	1	0.924618	0.856902
TUL	1	1	0.805689	1	0.838035	0.340354
UHK	1	1	0.936383	0.95639	1	0.637919
UJEP	0.974717	0.973546	0.905661	0.971872	0.801488	0.638878
UK	1	1	1	1	1	1
UPCE	1	1	0.787174	0.885899	0.872054	0.818512
UPOL	1	1	1	1	0.717183	0.634413
UTB	1	1	1	1	0.686781	0.804554
VFB	0.766873	0.663865	0.218193	0.650398	0.415393	0.650398
VSU-TU	0.922085	0.911087	0.815908	0.923799	0.782451	0.601749
VSE	1	1	0.954138	1	1	0.925705
VSGHT	1	1	0.506998	1	0.685852	1
VSPJ	1	1	1	0.912257	0.901276	0.637193
VSTE	1	1	1	1	1	1
VSUP	1	1	0.7299	0.849229	1	0.726427
VUT	1	1	0.73809	0.914012	0.86953	0.851439
ZCU	1	1	0.820088	0.855383	0.861017	0.552505

Source: Authors

Table 2 shows the results of all models. Some HEIs seem to be always efficient – two universities with high number of students and staff (UK, MUNI), one “middle” university (CZU) but also one of the smallest (and one of the two colleges) VSTE with the smallest number of academic staff. On the other hand there are some universities that are always inefficient: MZLU, VFB, VSB-TU, UJEP – the number of students of these HEIs differs so it is not possible to say that only those with small number of students are inefficient. For these HEIs we can say that the number of academic staff or the budget should be decreased to be comparable with others. For example if we compare MZLU and UPCE (they have very similar data), UPCE (efficient) has less academicians and lower budget than MZLU but nearly the same amount of students and nearly two times higher RIV points (the fact that UPCE has more faculties “research oriented” than MZLU is not included but it is evident from the results, especially RIV). On the other hand two of them (VFB, VSB-TU) have more specific orientation (veterinary, technical) and might be handicapped (different budget construction, different conditions). As for the budget construction we see (model E) that there are only few efficient universities especially “art” ones like AMU, AVU, VSUP, and “economic/life sciences” ones – CZU, MUNI, UHK, VSE, VSTE. We see again that the technical HEIs have some disadvantages in this comparison. From this point of view it could be better to separate the universities into the groups of the main fields of study

because the construction of the budget for technical study programmes is different (this will be a part of the next research).

When the budget is put aside and we compare only the academic staff and students (model C), some of the HEIs from model E are still efficient (AVU, CZU, MUNI, UK, VSTE) but some lose (AMU, UHK, VSE, VSUP) and others become efficient (JCU, OSU, SLU, VSPJ). So again we see it does not matter how big or small the HEI is (concerning the number of students). If we take into account all inputs and outputs (model A or B) there are only few inefficient HEIs but their efficiency level is relatively high. It is not possible to describe the situation of each HEI and the results of its efficiency/inefficiency – but it is clear that the efficiency is partly influenced by the scope of the HEI (different educational process costs) or by the research (RIV points) in comparison with the number of academic staff. For example VSCHT belongs to the efficient but when the RIV points are put aside it starts to be inefficient – so we may say that it is more “research oriented” university.

#### **4 Conclusion**

Higher education in the Czech Republic must face a demographic fall causing the decrease in the number of students who are going to enrol in the university/college. The measurement of quality of these institutions is nearly impossible as we should know more about the teaching process to be able to talk about the quality. DEA models offer some possibilities for the comparison and measurement. As the public universities/colleges are paid mainly from public resources the efficiency is very important. Our research shows that the efficiency is not dependent on the size of the HEI and it is influenced by the scope of the HEI and also RIV points play an important role. The results also suggest that the efficiency level of nearly all public universities and colleges in the Czech Republic is not so bad although there is some room for improvement in the decrease of the number of academic staff or the budget and increase of the RIV points. Further research including more factors or foreign universities with separation of them according to their main scope (and with respect to the budget creation and conditions given by the Ministry of education) should be made. As for the DEA models we can say that it is possible to use them for the comparison but there are some problems with HEIs that influence the results. The first one is the pairwise correlation of nearly all factors describing the situation of the given university/college which is not recommended because of higher weight of inputs/outputs with the similar data. But as all of them are highly correlated it is not so problematic than to include the only two correlated factors. The second problem lies in the point of view (macro, micro) - whether we see the HEIs as unique and comparable units or not (different scope). If we see them as public institutions they are comparable. The third problems is the number of efficient units tends to increase with the higher number of inputs and outputs (see model A compared with C). Regardless these facts it is useful to see a comparison of HEIs in the Czech republic from different points of view.

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# Ageing in the Countries of the Visegrad Group after 1960

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## Abstract

Demographic ageing belongs among the most discussed areas that have public and private sectors face to. Population ageing represents costs and burdens for public administration, policy, public finance. National policies and the public sectors have to develop strategies and measures of population ageing. It is a public interest not to burden the public sector with the high proportion of economically inactive people. In order to adequate response of the public policy and public administration, it is important to analyze the length of our lives and know the past, present and future demographic trends. Population ageing is most often measured by the indicator of life expectancy and we focus on modal age at death (also called normal length of life) and probable age at death too. Modal age at death is currently rated as more appropriate indicator to measure longevity than for example frequently used life expectancy. Model life tables were calculated and constructed on the basis of data published by the Human Mortality Database. The aim of this paper is to show the evolution of population ageing in the Visegrad countries after 1960 using traditional and less frequently used indicators describing population ageing.

Keywords: population ageing; life expectancy; modal age at death; probable age at death; Visegrad Group

JEL Classification: J110, J140

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## 1 Introduction

At present, the majority of developed countries deal with the phenomenon of population ageing. This process is accompanied by an increasing rate of elderly persons, especially in economically developed countries. Mortality rates are improving and people live longer. Over the last decades, life prolonging was mainly due to a reduction in old-age mortality. The ageing of population will have great impact particularly on the public administration. During a few years there is a shift of people from productive generation to post-productive generation, which will grow at the expense of productive and most likely of pre-productive generation. The public administration will have to deal with those problems and adjust appropriately healthcare, social services, etc.

In studies of longevity the most often used indicator is life expectancy. Length of life is usually expressed by the indicator of life expectancy at age  $x$ . Life expectancy at birth has been widely used, but recently an increasing attention is given to the modal age at death. Currently, the extension of life expectancy in countries with low mortality is mainly due to the improvement of conditions for survival to old ages. Under these circumstances, the modal age at death is a useful indicator of life expectancy because it is exclusively extracted from the mortality at older ages [6]. From the reason that modal age at death is determined only by the old-age mortality, adds this feature a special significance to this indicator. It is recommended to include modal age at death among the commonly used demographic indicators and widely use in the field of longevity research.

The values of life expectancy and modal age at death are different from  $m$  the view of time evolution. This is particularly because the life expectancy is the average age of deceased persons in the stationary population, whereas the modal age at death is the most common age at death. This paper focuses on the life expectancy at birth, life expectancy for 65-year-old person, modal age at death and probable age at death for 65-year-old and 80-year-old person for both men and women in the countries of the Visegrad Group (V4). We selected Visegrad countries to analyse the demographic evaluation in the countries of Central and Eastern Europe and to see the

demographic development in the Czech Republic simultaneously with other geographically, socially and politically close countries.

## 2 Material and Methods

### 2.1 Calculation of Life Expectancy, Modal Age at Death and Probable Age at Death

Life expectancy ( $e_x$ ) is the average number of years to be lived by the  $x$ -year-old person while maintaining the mortality like in the pursued period. The life expectancy of a person at the exact age  $x$  can be described as the ratio of number of remaining years of life ( $T_x$ ) and the number of survivors to exact age ( $l_x$ ):

$$e_x = \frac{T_x}{l_x}. \quad (1)$$

For highest ages it is usual to calculate the life expectancy with so called modified Gompertz-Makeham function, which will be explained below.

Modal age at death ( $e_M$ ) can be estimated as a rough estimate (age at last birthday with the maximum number of deaths). We are looking for an age when the number of deaths in mortality tables is the highest. However, this is only a rough estimate and more accurate results are obtained by using parameters of Gompertz-Makeham function. Calculation of the modal age at death was performed by [9].

Compensation of age-specific death rates at age 60 and above can be calculated by Gompertz-Makeham equation

$$\tilde{m}_x^{(GM)} = a + b \cdot c^{x+\frac{1}{2}}. \quad (2)$$

We select the beginning of the first  $x_0 = 60$  and the length of intervals  $k = 8$ . We calculate the summation of empirical death rates by age in each interval and mark them as  $G_1, G_2, G_3$

$$G_1 = \sum_{x=60}^{67} m_x, \quad G_2 = \sum_{x=68}^{75} m_x, \quad G_3 = \sum_{x=76}^{83} m_x. \quad (3)$$

Now we can calculate the value of the parameter  $c$  of Gompertz-Makeham function, whose eighth squared value can be expressed by using the sum of empirical death rates by age in each interval

$$c^8 = \frac{G_3 - G_2}{G_2 - G_1}. \quad (4)$$

Furthermore, it is necessary to calculate the value of the subexpression, by which we can express the remaining two parameters of the function

$$K_c = c^{60.5} \cdot (1 + c + \dots + c^7) = c^{60.5} \cdot \frac{c^8 - 1}{c - 1}. \quad (5)$$

We can calculate the parameters  $b$  and  $a$  by using next expressions

$$b = \frac{G_2 - G_1}{K_c \cdot (c^8 - 1)}, \quad a = \frac{G_1 - b \cdot K_c}{8}. \quad (6)$$

And according to these parameters of the Gompertz-Makeham function we can now calculate the modal age at death more precisely

$$\hat{y} = \frac{\ln \frac{\ln c - 2a + \sqrt{(\ln c - 4a) \cdot \ln c}}{2b}}{\ln c}. \quad (7)$$

In 1999 [7] published his modified Gompertz-Makeham function. In this modified model, there is a new parameter  $\gamma$  which provides a decrease in speed of increases of mortality rate with age. Modified Gompertz-Makeham function can be expressed as

$$\tilde{m}_x^{(GM)} = a + b * c^{x_0 + \frac{1}{\gamma} * \ln[\gamma * (x - x_0) + 1]} \quad (8)$$

Probable age at death is calculated very simply like the sum of life expectancy of the  $x$ -year-old person and number of  $x$  years.

$$e_p = e_x + x. \quad (9)$$

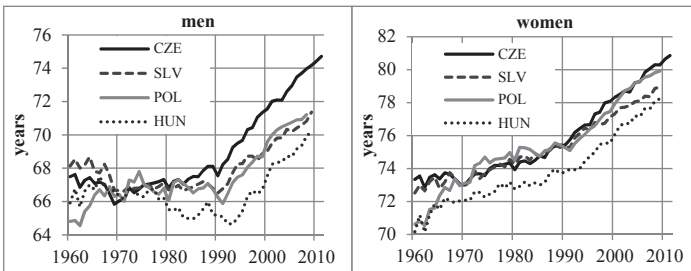
In this paper will be used calculation of probable age at death for 65-year-old and 80-year-old persons.

## 2.2 Development of Selected Characteristics

20<sup>th</sup> century brought significant improvements in health care, improving the health status of the population and reducing mortality. During the 20<sup>th</sup> century, life expectancy at birth has increased from 30 years in 1900 to 65 years in 2000.

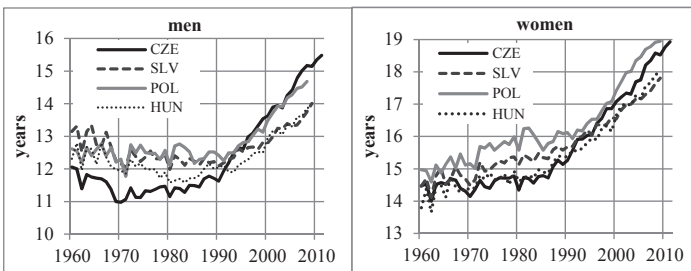
Over the last half century, the total fertility rate declined from 4.9 children in the 60s of the 20<sup>th</sup> century to 2.5 children today, with almost half the world's population is less than the value of simple reproduction (2.1 children). According to projections and assumptions, the 21<sup>st</sup> century will be the epoch of dramatic decline in birth rates and fertility.

**Figure 1.** Life expectancy at birth for men and women in Hungary (HUN), the Czech Republic (CZE), Poland (POL) and Slovakia (SLV) from 1960 to 2009 (2011 for CZE).



Source: Authors based on Human Mortality Database

**Figure 2.** Life expectancy for 65-year-old men and women in Hungary (HUN), the Czech Republic (CZE), Poland (POL) and Slovakia (SLV) from 1960 to 2009 (2011 for CZE).



Source: Authors based on Human Mortality Database



In this connection, we will focus on the development of selected demographic indicators in V4 countries. Life expectancy at birth was in all countries higher for women than for men, this is called the male excess mortality (Fig. 1). It is visible, that women in all countries had the similar development in life expectancy at birth. Hungary has the lowest value for women from these countries during the whole period. Great improvement in comparison to other countries is obvious for women in Poland. For men are differences between countries much higher. In the figure for men it is visible that in the 70s there was a convergence of values of life expectancy at birth.

For 65-year-old men and women the development of life expectancy was different (Fig. 2). For women the life expectancy increased in all countries during the whole period, men sometimes stagnated or declined little bit. However from 90s, there is a visible increase for men, too.

### 3 Results and Discussion

#### 3.1 Czech Republic

The Czech Republic was the prototype of a country that was in the pre-war period in their demographic behaviour closer to Western European countries. Immediately in the post-war years there was a relatively rapid increase in the life expectancy. However, due to the subsequent geopolitical arrangement of the world on the capitalist and socialistic bloc at the end of the 50s and 60s, this increase turned to the stagnation of this characteristic for approximately next thirty years. This development was different in comparison to Western European countries, among which the Czech Republic could be sort for a few more years before. Probable reasons for this deviation were artificial barriers, due to which there were not introduced modern medical methods as fast as in the Western countries [1, 12].

For breakthrough year in terms of development characteristics of mortality can be considered the year 1987, since which was the development of overall mortality very positive. However, in reality were all the changes mainly after 1990 in connection with the ongoing social transformation. The overall improvement in the level of mortality was then caused by a many factors, such as the growth of health spending, the increase in performance of health services, improving the quality of the environment or the availability of a wide range of quality food and other factors [2].

Due to the dynamic development of the mortality has decreased the number of deaths. In 2008 died about 12 300 persons, less than it was in 1987. This decline of the mortality was deserved the full measure by mortality decline at the age of 65 years or more, because the life expectancy of women in this age group increased by an average of 0.23 for a year, which was the same increase as for new-born girls. For men increased life expectancy by an average of 0.29 for a year by new-borns and seniors of 0.13 per year. In 2012 life expectancy of new-born boy was 75.1 years and for new-born girl was 81.2 years. The remainder of decreasing the mortality was affected by declining of mortality at younger age [3, 4].

[1] states that one of the most significant changes after 1987 was the decline in infant mortality, which the Czech Republic again returned to the West-European type of behaviour and in terms of infant mortality with value of 2.4‰ even best in the world.

So thanks for better health and better lifestyle there was a change in the structure of mortality by causes of death [3]. For men in the 60s of the 20<sup>th</sup> century prevailed mortality of neoplasms, endocrine, circulatory and respiratory system. However, in this time mortality of neoplasms has decreased and this was reflected in the decrease of the total gap in life expectancy. Then most women died of circulatory system diseases and to a lesser extent of the endocrine system, but even in these diseases occurred over the years in a decline in the number of deaths of women.

### 3.2 Hungary

As reported by *Hungary in the 20<sup>th</sup> century* [9] the evolution of mortality in Hungary in the 20<sup>th</sup> century was generally less favourable than in other Eastern European countries. In the 60s, mortality was increasing, mainly caused by stress and economic and social circumstances. In 1962, total fertility rate in Hungary was the lowest among all countries. Increasing number of abortions and the expansion of contraception meant that the level of fertility in Hungary in the 60s of the 20<sup>th</sup> century was at very low levels.

Differences in life expectancy at birth increased during the 80s. While in Western Europe during the 80s there was an increase in life expectancy (2–3 years), in the former socialist countries, especially in Hungary, life expectancy was typically decreasing. In 1980, the life expectancy of men was 65.5 years and the life expectancy of women was 72.7 years. The difference between the life expectancy of men and women in the period 1981–1985 was nearly eight years.

Until the end of the 90s, the differences in life expectancy in Hungary and other European countries were significant – on average, in almost each country men live 10 years longer and women seven years longer than people in Hungary.

Until 1995, the high mortality in Hungary was warning. Life expectancy of men in Hungary has never been as low as in 1994. Since 1996, there has been a visible increase in the life expectancy of men. Current situation is endangered by poverty rates – Hungary ranks 6<sup>th</sup> worst place among the EU member states. In case of seniors aged 65 and older, pension means in the majority of cases the only source of their income. That is warning from the view of public sector costs.

### 3.3 Poland

Poland was after World War 2 under the Soviet influence. The mortality rate in Poland was very high immediately after World War 2. Life expectancy reached 56 years for men, while 62 years for women. Mortality conditions and life expectancies were improving in the 50s due to the completed demographic transition. Poland was therefore closer in its values of life expectancy to Slovakia and Hungary than to the Czech Republic [8].

As [7] write, so in 1960 was life expectancy at birth 64.9 years for men and 70.6 years for women. The similarity with the Czech Republic can be found in the fact that the new geopolitical arrangement in Europe has led to the stagnation of these values for the next 30 years. Poland as countries of the former socialist bloc also experienced great improvement in mortality conditions at the turn of the 80s and 90s of the 20<sup>th</sup> century. In 1990, life expectancy at birth was 66.7 years for men and 76.3 years for women, which confirms with the very large increase during the socialist era [7]. In this period infant mortality decreased significantly. While in 1960 there were 56.1 infants on 1000 live births, in 1990 it was only 19.4 infants and in 2012 it was only 4.6 infants.

Central Statistical Office in Poland states in [8], that in Poland the most common causes of death are cardiovascular diseases and neoplasms. However, the proportion of deaths caused by cardiovascular diseases over the years falls (from 52% in 1992 to 45% in 2011). This positive development is related with the improvement of the lifestyle of the Polish population and better health care. However, it is still true that from cardiovascular diseases, more men than women die approximately 3.5 times more death from neoplasms grew during the period 1980–2001. Since 2012 the increase of deaths from neoplasms account for 25.6% of all deaths in Poland it is now on the second place, immediately after cardiovascular diseases.

Improved health conditions and environment and other factors led to the extension of life expectancy for men at 72.7 years and for women at 81.1 years in 2012, which is a value very close to the life expectancy of women in the Czech Republic [4,11]

### 3.4 Slovakia

As reported by [10, 14], Slovakia and other countries of Eastern Europe were marked by long-term unfavourable mortality conditions and low life expectancy at birth. Approaching Western countries was primarily due to the decline of the infant and child mortality and the decline of infectious deaths in Eastern European countries.

In the 70s, Slovakia experienced economic growth – the industrialization was proceeding, GDP was growing, families with children were supported. After the political transformation at the end of 1989, there was a significant break in the evolution of the health status of the population of Slovakia and an improvement of almost all health indicators [15]. The period after 1989 did not mean only the period of social and political change, but as [13] stated, after a prolonged stagnation, there was a reduction of mortality. Positive development after 1989 was mainly due to the reduction of mortality in young and middle ages. Interesting is the decline in the life expectancy of men in 1990. In 1989, the life expectancy of men was 66.8 years, while in 1990 only 66.5 years. It is assumed that if there was no change and no revolution, life expectancy would continue to decline.

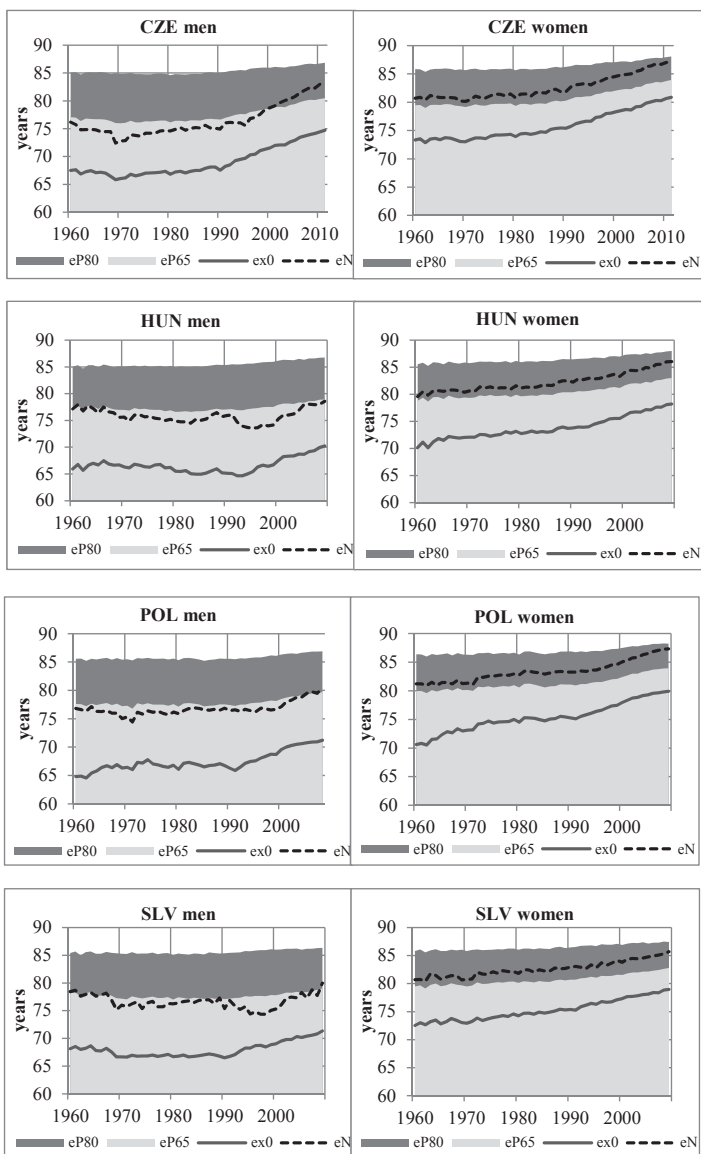
At present, for the convergence of the life expectancy between Slovakia and demographically developed European countries, the most significant age group are people aged 60 years and older. This component of Slovakia's population may contribute to the continued improving mortality trends – possibilities of younger age groups in the increasing life expectancy are already limited.

### 3.5 Visual Comparison of Selected Characteristics

From Fig. 4 it is visible that all investigated characteristics were during the whole period higher for women than for men in all countries. Here can be seen the male excess mortality again.

Development of the individual characteristics of women across countries is more or less similar. For men, there is greater diversity, which may be caused by other factors influencing mortality rates in the country. The graphs also show that men have a similarly high or lower the probable age at death for person 65-year-old and the modal age at death. It simply means that most men die at an age that approximates the probable age at death for 65-year-old man. For women, modal age at death is higher than probable age at death for 65-year-old women and there is also noticeable that during the period there was a distancing of these two indicators. Women with their modal age at death are approaching the probable age at death for 80-year-old women. It simply means that most women will die at the age approaching to the probable age of 80-year-old women.

Figure 4. Life expectancy at birth (ex0), modal age at death (eN), probable age at death for 65-year-old person (eP65) and 80-year-old person (eP80) for men and women from 1960 to 2009.



Source: Authors based on Human Mortality Database

## 4 Conclusion

Presented article analysed the development of selected characteristics associated with ageing and longevity in the Visegrad countries. We explored characteristics of the life expectancy of  $x$ -year-old person, modal age of death and probable age at death of  $x$ -year-old person. Life expectancy at birth was in all countries higher for women than for men, this is called the male excess mortality. All investigated characteristics were during the whole period higher for women than for men in all countries. Development of the individual characteristics of women across countries is more or less similar. For men, there is a greater diversity, which may be caused by other factors influencing mortality rates in the country. The aim of this paper was to highlight the importance of population ageing and indicators of life expectancy, modal age at death. Exploring of longevity creates an opportunity for national authorities to respond by appropriate measures to the economic and social consequences of population aging. In the period of human life prolonging, primarily due to a reduction in old-age mortality, it should be the object of interest for future research, studies and analysis of the public sector. Modal age at death might be a helpful and useful indicator due to its feature of focusing on the mortality at old ages. If future development will be corresponded to previous development, so this would mean a future burden for the public administration of V4 countries.

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# Care for Czech Republic's Ageing Population

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## Abstract

Population ageing is typical for developed economies and it brings about concerns about providing care in future. The aim of this contribution is to analyse chosen aspects of population ageing in the Czech Republic, particularly in respect to social and health care expenditures. The methods used are document analysis and the analysis of accessible sources indicating economic activities of the country. To do that, Czech Statistical Office and Eurostat databases are used. Furthermore, the PEST (Political, Economic, Social and Technological analysis) analysis of the external environment was done, followed by a summary of strengths and weaknesses related to care for the ageing population. There is presently a lack of both financial resources and workforce to manage care for the estimated future number of senior people. At the same time, at the EU and national levels the attention is paid to measures that should ensure this care in future. The problem may be seen optimistically, though, as there are a lot of opportunities. Firstly, in connection with the forecast positive development of health care, bigger senior population relates to better physical and psychological condition of the population. Secondly, the emergence of a new type of customer opens great opportunities to the private sector.

*Keywords:* ageing population; positive; negative impacts

JEL Classification: I1, I15

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## 1 Introduction

Population ageing is one of the most topical trends in the development of mankind. It is linked to economic and social aspects. Population ageing may bring about the increased costs of old age pension as well as costs of new job creation. As human lifespan prolongs, it is important to change habits and adapt to the change in the share of senior people in the population. It is important to use statistical data and estimate the pattern of population ageing in the coming year, to assess how it may influence the society, and to determine the possibilities how to react to this trend. Research into the essence of ageing may help to create prognoses and decrease economic threats linked to ageing. When assessing the population's demographic age, we consider a population old if more than 7 per cent of its members have been at least 65 years old. The population of the Czech Republic broke this limit more than sixty years ago (in 1950 the index reached 7.8%). Since then the percentage of 65-plus-year-olds has been growing. In the early 1980s it exceeded 10 per cent and in 2007 it was 14.4%, which represents more than 1.5 million out of 10 million people living in the Czech Republic. Future senior people will differ from their predecessors not only in their number. They will also be better educated and have higher demands for, among other things, their standard of living, and the range of services [17].

Studies related to this topic have been published in various countries [16]. Problems linked to population ageing are being solved in relation to health care expenditures, legislation, or the seniors' quality of living. For instance, [11] empirically legitimates the relationship between demography and unbalanced sectoral growth via demand channel. In theory, unbalanced growth can be driven by push and pull effects. The former stems from the differential growth of sectoral productivity [1], [14], while the latter stems from the differential income elasticity across products [5]. Another study evaluates the impact of demographic change on energy use [7]. [10] presents a dynamic Overlapping Generations Computable General Equilibrium model of Scotland. The model is used to examine the impact of population ageing on the labour market. More specifically, it is used to evaluate the effects of labour force decline and labour force ageing on key macro-economic variables. Another author, Burgess, analyses the

value of information and advice for older people in making decisions about housing and care, drawing on an evaluation of FirstStop, a new national information and advice service. The paper discusses the housing problems often faced in older age, and the pressures on public finances of housing an ageing population [3].

This paper describes the latest national and regional trends in care for senior people in the Czech Republic. Due to its limited range, only two research questions were established:

- What are the negative aspects of the increasing number of senior people in the Czech Republic?
- Is it possible to consider population ageing to be an opportunity for economic growth?

While searching for answers to these questions, the paper focuses on both domestic and foreign sources. The processed data are taken from official websites of various Czech Republic's statistical offices. The results are obtained by means of data analysis and synthesis and they are presented in the discussion and conclusion of the paper [12], [13].

## **2 Material and Methods**

The methods used are document analysis and the analysis of accessible sources indicating economic activities of the country. To do that, Czech Statistical Office and Eurostat databases are used. Furthermore, the PEST (Political, Economic, Social and Technological analysis) analysis of the external environment was done, followed by a summary of strengths and weaknesses related to care for the ageing population. The PEST analysis is an efficient tool to evaluate the influence of global environment factors on this problem. It aims at the wider environment and helps to analyse factors influencing this industry. It should generate answers to the following three questions: which external factors influence the market, what are the possible effects of these factors, which of them will be most significant in the near future.

## **3 Results**

### *3.1 Analysis of Czech Republic's External Environment*

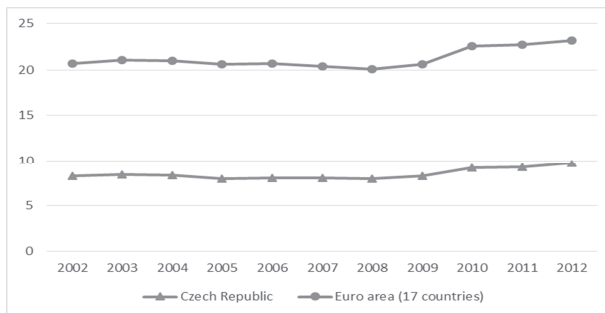
An analysis of external environment consists of economic, political, legal, social, cultural and technological factors. The method is called PEST analysis (Political, Economic, Social and Technological analysis). As the length of this contribution is limited, there will be analysed only chosen factors from each group. The analysed factors from individual areas will be related to economic and social aspects of population ageing in the Czech Republic.

#### *Economic Environment*

The basic characteristic of economic development is Gross Domestic Product (GDP). The development of many a factor, including old age pension expenditures, is related to GDP. Figure 1 shows that it has recently been growing. It is caused by a higher number of senior people and a negative GDP growth rather than by an increase in old age pension figures (Figures 1, 2).



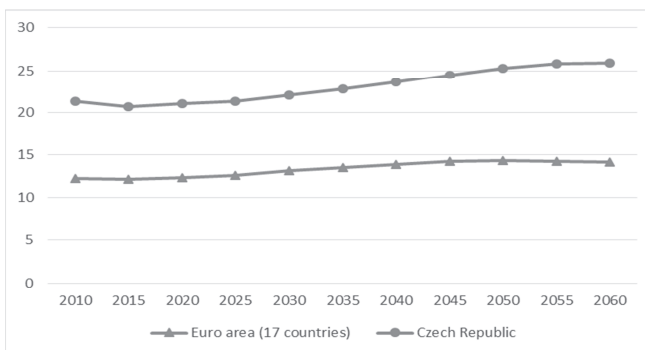
**Figure 1. Expenditure on pensions (current prices % of GDP)**



Source: Authors based on [6]

In the near future, an increase up to 15% GDP is to be expected in the Czech Republic, whereas in the EU it may exceed 25% (Figure 2). Around 2060, this figure will be high due to the number of senior people, despite efforts to prolong their presence on the job market.

**Figure 2. Pension expenditure projections (baseline scenario) (% of GDP)**



Source: Authors based on [6]

The pension system currently consists of three pillars that should ensure the continuity of paying old age pensions in future. The first pillar is a mandatory basic pension insurance. Old age pensions, disability allowances (including those for partly-disabled persons), and bereavement allowances (orphan's, widow's, widower's pensions) are all paid from this first pillar. It is financed from insurance fees paid by employers, employees and self-employed persons. All incomes are financed continuously on the basis of inter generation solidarity. The solidarity of the well-paid with the low-paid is applied for counting the income, too.

The second pillar of the Czech pension system was regulated by law only in the late 2011 and started to be applied in 2013. It is meant as a voluntary complementary additional pension insurance with state contributions, which uses capital financing.

The third pillar is voluntary, too. It is state-funded by means of direct state subsidies as well as by tax deduction for natural persons, which is an indirect subsidy. It uses capital financing, too. Since 2013 this system has been changing continuously. One of the most significant changes is the fact that pension funds have to guarantee positive valorisation of investments [9].

### Political Environment

Political environment determines factors related to legislation, government decisions and political stability of the country. Regulations related to care for senior people belong to healthcare, personal data protection, and social affairs:

- Current legislation valid in health care;
- Law No. 1/1993 Coll., Constitution of the Czech Republic
- Resolution No. 2/1993 Coll. Presidium of the Czech National Council on the Charter of Fundamental Rights and Freedoms as part of the constitutional order of the Czech Republic
- Convention for the protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine, CETS No.: 164;
- Act No. 20/1966 Coll., On care and health of people;
- Act No. 48/1997 Coll., On public health insurance;
- Act No. 101/2000 Coll., On personal data protection;
- Act No. 258/2000 Coll., On public health protection.
- Act No. 100/2007 Coll., On social security (this Act covers: The social security pension insurance, the social security occupational injury insurance)

In the EU this legislation is guaranteed by European Parliament and the related documents are:

- Charter of Fundamental Rights of the European Union
- The principle of equal treatment between persons irrespective of religion or belief, disability, age or sexual orientation
- Question for oral answer to the Commission, Rule 115 from 30 June 2010 long-term care for older people (0-0102/2010 – B7 0457/2010).

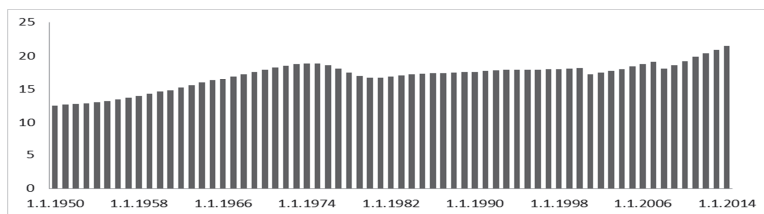
At the same time, in 1982 a special legislation for self-determination and the rights of senior people for social and health services came into effect. Currently, there are debates under way whether this regulation should be abolished and instead the right of senior people should be guaranteed by a general legal regulation.

### Social and Cultural Environment

Social and cultural environment is specified by the demographic development of population, changes in the life cycle, population mobility, education, access to jobs and free time. Due to the topic of this contribution, the focus is on the demographic development of the population with respect to senior people.

Data achieved from the Czech Statistical Office show changes in the share of senior people in the whole population till 2014. Figure 3 indicates a slow growth. The ebbs are caused by government interventions, not by natural development. Individual leaps since 2001 have been delaying retirements. The growth has accelerated in the 21st century despite higher retirement age.

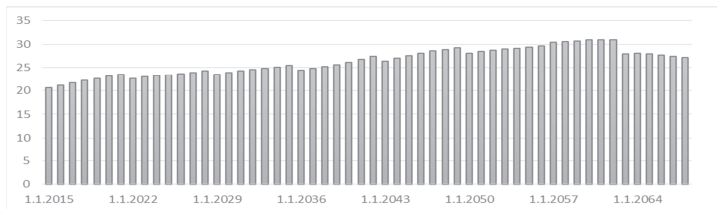
Figure 3. Percentage of retired people in 2014



Source: Authors based on [4]

Figure 4 depicts the estimated development of percentage of senior people in population, as it is suggested by data from the Czech Statistical Office. The share of senior people in population will peak between 2058 and 2061, although the number of retired people will not exceed 31% of population. Subsequently, the percentage of retired people will start to decline. The fall will be caused by the fact that the strong generation will be dying out.

**Figure 4. Percentage of retired people in population from 2015**



Source: Authors based on [4]

According to current estimates, people born in 2000 will retire at the age of 68. Consequently, as the retirement age is nowadays 62 years of age, the active period of life will be prolonged by 6 years.

In future, EU member states expect a lack of workforce in the field of long-term care. It will be necessary to support informal care, which may involve training, consultancy, financial support, assistance, or respite care. Among the main forms of support to informal care in the EU belong:

- Financial support;
- Tax credits and exceptions;
- Time off from work for dependants;
- Forming the career status and including it into social systems.

National governments try out various ways of solving the expected growth in demand for long-term services because the number of people capable of providing informal care has been diminishing, whereas, on the other hand, the number of dependent senior people has been growing [18].

#### *Technological Environment*

Technological environment looks into factors like: government support to research and development, infrastructure, development of innovation in the given area, and many more.

Investments into infrastructure development in the field of social care and services should lead to building low-threshold treatment programs, almshouses, day hospital, social rehabilitation centres. Social services in the Czech Republic include social consultancy, services of social care and social prevention. They are provided in in-home, and out-of-home forms. The main services are:

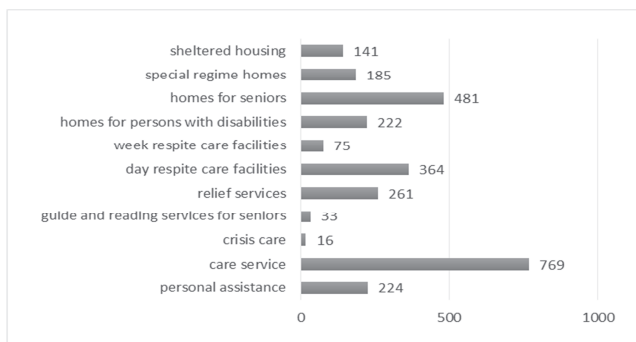
- Assisting the family members to enable a person with disabilities to stay at home;
- Providing appropriate care and supervision to protect that person's safety in the absence of a family member;
- Relieving family members from the constantly demanding responsibility of providing care;
- Attending to basic self-help needs and other activities that would ordinarily be performed by the family member.

All types of residential care facilities for the elderly abide by the Act No. 108/2006 Coll., On social services. They include, among others, nursing homes, convalescent homes, skilled nursing facilities, care homes, rest homes or intermediate care facilities. These institutions are public-benefit corporations, founded by regional governing bodies, or citizen-action publics.

They provide services for benefit. The cost for individual services differs. On payment, the persons who pay for these services still must have at least 15% of their income [8].

Social care services help the handicapped to ensure their physical and psychological self-sufficiency and their involvement in social life. In cases when it is not possible, these services provide dignified environment and treatment. Types of facilities accessible in the Czech Republic are depicted in Figure 5.

**Figure 5. Social service facilities in the Czech Republic**



Source: [24]

There are 141 of these services in the Czech Republic with 830 employees caring for 2,400 clients. The 2008 total costs of these services equalled €11.2 million. Clients themselves paid €4 million. In relation to the number of senior people in 2014 (see Figure 2), this figure is sufficient. It is the period around 2060 that looks the most formidable in relation to the care for senior people. At that time there is expected to be a high growth in the number of senior people. The current system of financing would be insufficient.

#### 4 Discussion

Based on the analysed documents, it is possible to observe that the negative aspects of population ageing are from the current point of view the lack of reasonably expensive space for providing services, fear of the future lack of hospital beds. In future, it will be necessary to focus on the following factors:

- Education of the cared-for and their families about services, informing them about services provided by doctors, teachers, and other experts;
- The currently insufficient cooperation among organizations providing activities for senior people;
- Insufficient prestige of social workers;
- There is no system of emergency assistance to senior people;
- Barrier-free cities;
- Lack of senior education;
- A large number of people suffering from chronic and degenerative diseases.

The above mentioned as well as other negative factors are mentioned in a number of studies published abroad [4], [7], [11]. The situation in the Czech Republic more or less corresponds to the situation abroad. Nevertheless, population ageing can be seen as an opportunity [2]. For example, the potential of investments into health care lies in a possibility to increase the mobility of an ageing population. If people live longer and can also remain physically active for a longer period of time, the adverse impact will be lower [15]. Population ageing generates market opportunities for companies across different sectors:

- Economic opportunities for making specialist products for the elderly;
- Growing job opportunities in care homes and sheltered accommodation either as a business or as a worker;
- Growing construction opportunities for building retirement homes and flats;
- Affluent pensioners can travel at all times of year, including 'off peak';
- The elderly are more than just one group. Young retirees are active in their 60s, slowing down in their 70s, and perhaps becoming needier in their 80s – there are marketing niches for each different age group;
- Young retirees as grandparents may help with child care of grandchildren whilst parents work providing an economic and a social benefit;
- Social benefit of reduced crime as the elderly are likely to be more law abiding;
- Elderly people have spare time and whilst fit they may offer volunteering help or special advice skills for free;
- Some companies are using the knowledge and experience of an older workforce;
- New migrants may move into the country to replace any skill shortages or to help care for the elderly;
- They may work for lower wages which is good for the economy and will pay taxes and national insurance which helps to pay for the costs of providing for the elderly;
- Falling birth rate means smaller class sizes and better education.

The aim of the paper was to analyse chosen aspects of population ageing in the Czech Republic, particularly in respect to social and healthcare expenditures. The paper describes facts related to population ageing in connection with current expenditures linked to the old age group. Nevertheless, this contribution sees possible benefits in this area as there are hidden new market opportunities. The problem of ageing population is important on the regional, national and international level. The above described analysis summarizes current information from this area, not only in terms of costs, expenditures and negative impacts, but it also introduces the potential of this problem for business. In a further study, the attention will be focused on ensuring the care of older people in the Hradec Kralove region in relation to business opportunities. These studies will also serve to several partner companies, which are already active in this area.

## 5 Conclusion

From the economic point of view the increasing percentage of senior people has an impact on all spheres of social and economic development. The most frequent concerns linked to the change of age structure relate to the growth of social security costs, a lack of workforce, and the sustainability of pension financing. A lot of concerns however spring from the pessimistic view of population ageing. This view sees ageing only as a long period of time when people are ill and powerless.

The optimistic view, however, emphasizes the fact that people live longer due to the higher standard of living and better medicine. At the same time, these facts prolonged the active age. This optimistic view supports and justifies the rise of the retirement age. The ageing population can bring about new business opportunities. There will be a new group of people on the job market, which will be characterized by both higher age and active involvement in social life. If companies react sufficiently and in time by adjusting their business strategy, they may gain a competitive advantage in this market segment.

The follow-up research will focus on expenditures and care for citizens with chronic and degenerative diseases, which are linked to the old age. Presently, communication with university hospitals and insurance companies is under way. It should generate data for more detailed analyses and predictions.

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# The Transformation of Czech Public Health Insurance to Earmarked Health Tax

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## Abstract

This paper is based on three different approaches to health care provision based on different position of the patient in the system – or to be more precise, different incentives for health care provision. In reality, their specification is always a little bit blurry; however they are highly useful for theoretical analysis of the subject and discussions about the health system configuration and financing. Czech system of public health insurance has been established at the beginning of the 1990s as a compromise between the institutional framework and aims, which were highly relevant in the early parts of transition to democracy. Currently, it is not suitable anymore and conceptually has little sense. The paper aims to analyze the possibilities of transforming of this system to financing health care with the health tax rate on personal income, at the same time preserving the current fiscal capacity of the resources for health care. This seems to be a simple and fair method of gaining public resources for health care. Simultaneously, the paper will deal with attributes of such a system from the economic, social and health policy point of view.

*Keywords:* health insurance, health tax, health policy

JEL Classification: I310, H800, H00

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## 1 Introduction

Financing health care is a complex task solved differently worldwide. Thus it is worth discussing various methods of this financing, especially because health care is one of the industries which is currently under fiscal pressure and faced by the risk of ever rising costs. Simultaneously it has to deal with the progress of medicine, e.g. availability of new methods of treatment (medical inflation) and diagnostic techniques, especially in civilization diseases. It also has a strong and highly visible social dimension in a view of illness as an undesired state of distress and suffering [5] and knowledge of social medicine as a discipline [7]. Demand for health care is segmented and includes both realized and explicitly expressed demand, as well as implicitly hidden demand, and even the need for unwanted health care [11]. The demand for health care suffers from market failures [1] and adverse selection when purchasing health insurance [3].

The main aim of this paper is to provide arguments and discuss possibilities of transforming the Czech public health insurance system utilizing health tax rate on personal income. Current system of health insurance, as being run now, is a result of an experiment with return of multiple employer based health insurance companies in the nineties. It is however clear now, that the principle of employment based health insurance currently does not comply with the reality of current labor market with high mobility of employees, even among industry branches. Simultaneously it is true, that in the system the patients consume health care based on their needs. It means that their consumption is universalistic and does not have general systemic limitation.

Currently, the health insurance contributions into the Czech Republic are at the level of 13,5 per cent paid from the health insurance base, which is different among social groups. They

- Employers and employees – gross wage
- Self-employed – 50 per cent of their profit, e.g. income minus the costs related to their achievement (or the fixed percent of “presumed costs” could be applied).
- Persons without taxable income – minimum wage

- “State-insured” persons – fixed amount set and changed arbitrarily based on public choice (by the government)

This typology means, that different social groups pay different contributions and this differentiation serves also as a factor of social policy measures for the burden placed on them. This is especially prominent in the case of self-employed persons, who appeared in the 1990s and this differentiation was one of the key factors of supporting their existence in national economy.

Generally, several possibilities for financing health care exist. These include

- general taxation,
- earmarked taxation (hypothecation of taxes for health),
- social insurance,
- two-tiered health insurance (income related and nominal premiums, currently only in Netherlands),
- private health insurance,
- prepaid financing schemes,
- out-of-pocket payments.

They are used differently in different countries and health systems financing models [13]. Every of them has its own logic, in reality, they also, at least sometimes, overlap or are used in parallel. This is a reality of health systems financing, because no “one size fits all” or “most effective” approach exists [15]. Also, each of them has significant shortcomings that have to be minimized in order to gain a chance to their successful implementation. It also means, that their theoretical anchors are sometimes modified when actually used.

## 2 Material and Methods

This paper is based on theoretical analysis of the attributes of health care systems and selective comparative analysis of different mechanisms health care provision and financing, including careful view of the subjects that are financing and providing those services. Theoretical literature used is summarized in the included reference list. Also indirectly, the results of international cross-country analysis of the methods if financing used for health care is utilized. As for the theoretical background material, general social policy [9], health policy and health economics theories apply for this paper. The standard principles of health economics [1] are valid even for discussing the reform steps and more prominently for the borders which should not be crossed to maintain the system sustainable and socioeconomically rational. On the specific principles of health insurance, the works of Némec provides the typology of health insurance systems available [14]. The health expenditures also are not just consumption, but at least significant parts of them could be considered as an investment [18, 6]. As for the specific discussion of tax hypothecation for health, the contributions of [4] and the discussion of public policy at WHO [17] should be accounted. Also the current situation in the Czech health care system is being assessed [10].

## 3 Results and Discussion

It seems that the classic “social health insurance” approach is not suitable for the health care system financing anymore. This is facilitated by the universal character of health care consumption. Simultaneously, the ceilings for the social health insurance have no sense because of the health consumption universality [21]. So we can postulate that we can abandon the concept of specific social health insurance as it was introduced in Germany at the end of the 19th century as a useful tool. The conditions were different then, we can note that it was combined with sickness insurance and it was meant primarily as a limited financial reimbursement for health care expenditure [20].



At the same time, our goal is to preserve the solidarity based financing of the health care system. For this purpose, a theory of public finance gives us a standard tool – taxation. This has significant advantages for the financing of the health care system, irreplaceable by any other method. Most important ones are equal financial burden according to disposable income and no risk selection when entering the system.

In the Czech health system, this can be achieved by abandoning the categories of health insurance payers and transforming the health insurance contributions into the health tax rate on personal income. Generally, there are two possibilities how to do it.

First one is the general taxation, which could be achieved by increasing the general tax rate on personal income by amount required for public health financing. This is better according to the classical theory of public finance, because specific tax income rates are usually avoided here. Also, this results in maximum simplicity of the system, because there will be just one general tax rate on personal income.

Second one is the earmarked taxation. While it could be seen financially as similar to the current social health insurance approach, there are significant differences which should be noted. First, no specific ceiling known from social insurance exists. Second, the tax base could be the same as the tax base for the personal income. And third, this health tax on personal income does not have to be a part of progressive taxation, if not wished.

There are several factors that should be taken into consideration when making a decision. Some of them are purely economic; others are socio-psychological and public choice theory based. We can also attribute some of those factors to behavioral economics. Some of those factors were analysed in literature, even if the focus was primarily on indirect taxes and the examples of Finland and Portugal have been cited [4]. The factors can be summarized in the following table:

**Table 1. General vs. earmarked approach to health tax**

<b>General personal income tax</b>	<b>Earmarked health tax rate on personal income</b>
Simple and compatible with standard taxation schemes	More complicated, separate tax rate/mechanism exists
High “total” tax rate, e.g. general+health one	Two “lower” tax rates, general and health income tax separated
Ability to be included in progressive taxation schemes	Ability to be separated from progressive taxation schemes
Hidden in general taxation, ability for the government to change health expenditure out of sight of people	Transparency to citizens, ability to be changed independently of general taxation and visible to people
One tax base	One tax base, or some categories of income could be excluded

*Source: Author*

It is up to the policy makers which variant will be picked up. Empirically, we can see, that in some countries such as Great Britain, the health care system is financed from general taxation. In other countries, such as Germany, a single rate of social health insurance currently exists, which is getting close to the condition of earmarked taxation on income from the payers point of view. The social health insurance approach, while it has lost its original meaning because of the universality of health care provided, can keep one of its key attributes: the visibility of allocating a specified share of income into health care system. As an evolution of this system, there has been an ongoing debate in Germany [16], resulting in the suggestions of so-called *Bürgerversicherung* as one of the two viable proposals for the health care financing in the future (the second being “*Kopfpauschale*”, which is actually a poll tax for health care).

For the Czech Republic, the earmarked tax approach seems to be more suitable than increasing the general tax rate on personal income. We will summarize later which are the reasons for this approach, but beforehand, we will show the technique on how the transformation could be done.

As stated before, currently health insurance contributions are paid as 13,5 percent from the health insurance base. This mechanism should be abandoned as a whole and replaced by the

health tax rate on personal income. So, the tax base could be the same as the current tax base for personal income, this would provide maximum compatibility and simplicity. The resulting tax rate could be even slightly lower than the current 13,5 percent in order to maintain the current fiscal capacity, because in the unified tax base variant, the tax base will be slightly higher than the current base for the contributions to health insurance.

Specific problem is the transformation process for the employees, where currently the health insurance contributions are divided between employer and employee. If we want to do this operation maintaining fiscal neutrality, the following transformation mechanism could be potentially used.

Currently the employee pays 4,5 % health contribution and 6,5 % social contribution (11 % total), and the employer pays 9 % health contribution and 25 % social contribution (34 % total). After the transformation, the employer pays just a health tax 11%, and the employee pays whole 31,5 % social contribution and „remaining“ health tax 2,5 percent.

This was strictly neutral transformation that could be done immediately without any fiscal or individual impact. Further tax reform could abandon the remaining 2,5 percent at the employer side and put the health tax rate to the employee as a whole. As stated before, the resulting health tax rate could be – theoretically – even slightly lower than 13,5 percent, e.g. 13 percent, because of the increased tax base in the new scheme, however it really strongly depends on the construction of the new hypothecated tax.

The tax could be collected simultaneously with general taxation, with the method that the desired tax rate will be applied to the tax base. The gained revenue could be then distributed to the central fund of health insurance, from where it will be distributed to health insurance companies according to the cost indexes the same way as it is done now.

Additional important component could be introduced – the health tax relief. This could be important from the health policy point of view. If desired by policy makers, the positive health behaviour (e.g. prevention) could entitle a tax payer for health tax relief, which would lower the amount of health tax paid. The criteria are open for discussion, however the behavioral economics clearly shows that the motivation should be positive in general, not negative. As an example could serve the participation on prevention, proven absence of smoking or participation in disease management programs. These criteria, when applied properly, could provide positive motivation for effective behavior.

The result of applying those techniques will be the presence of health tax rate on personal income, transparent both to the government and the tax payer, with optional introduction of tax relief based on positive behavior in the system. Administratively, the system will be only slightly more complicated than the general tax approach, and surely much more simplified than the current system, where specific health insurance contributions are collected directly by health insurance companies and separate mechanisms are used.

The general tax approach would also result in a relatively high single tax rate on personal income, somewhere between 33–38 percent of personal income. This is probably currently politically unfeasible, because such a tax rate would psychologically work against the acceptance of such a reform. This calculation is based on current real tax rate for employees being 20,1 % (15 % „flat“ tax \* 1,34) + adding adequate percentage (12–14 percent) of health tax rate. Of course, when utilizing progressive tax schemes, this „final number“ could change: it is however primarily the public choice that can decide about it. This can be seen, by the way, on the current discussion (and implementation) of so-called “solidarity contribution”, which is effectively a second tax rate (7 %) on personal income.

Moreover, the earmarked health tax rate could be changed independently of the general tax rate. This is important from the health policy and social policy point of view. The people will be able to see the changes in health expenditure in the tax rate number and the political parties can even argue about the rate height with relationship to the national expenditure on health, preferences of people and the quality and accessibility of health care in society, together with analytical tools and techniques such as Health technology assessment (HTA) and cost indexes of health insurance companies that could provide rational insight into the level of expenditures

needed. Also, in the times of economic downturn, the health tax rate could preserve the fiscal revenues allocation for health care system, while generally the politicians currently have strong tendencies to manipulate the expenditures and/or revenues gaining required fiscal austerity, including the social systems settings and benefits [12]. For example currently in the Czech Republic, there are suggestions that pensions could be frozen or even lowered because of fiscal pressure and reform of social insurance is discussed [8]. The hypothecation of taxes for health could prevent this, or at least, make those changes visible to the public and make them inevitable part of public debate, which makes it more resistible to those pressures.

So even if some arguments for the earmarked health tax are “soft”, they surely have their rationality. To make the proposal consistent, we have to deal with one more problem of the current system, e.g. the “state insured persons”. The abandoning of health insurance system would also abandon the concept of insurance contributions “for those persons insured by state” as well as artificially fixed contribution base for the government. However, the existing fiscal capacity should be preserved.

The technique for doing this could be twofold, thus the analytical approach could be similar to the health tax rate on personal income.

First, the fiscal capacity could be maintained just by sending the same amount of money as now from the government budget to the central health care fund, just abandoning the evidence of the people who are “state insured” and make it a pure subsidy from the government budget. This is compatible with the general taxation approach, but has all the advantages and disadvantages already described.

Second, the fiscal capacity could be maintained by hypothecation (earmarking) part of the excise taxes for health care. While the relationship between consumption of goods subject to excise taxes (tobacco, alcohol, gasoline etc.) and especially individual health care status is not strict, on the other hand it is evident, that macroeconomically their consumption increases health care expenses (side effects of smoking, drinking, traffic). So the concept of negative externalities in health could be assessed here.

At the current state of construction of excise taxes, however, it would not be suitable to construct specific health tax e.g. on tobacco or alcohol. So it makes sense to hypothecate the share of excise taxes for health, at the level of current fiscal capacity of the contributions for “state insured persons”. This equalled, in 2010, cca 52 billion CZK [19], whereas in the same year the revenue from excise taxes was approximately 130 billion CZK. So we can compute the share as  $52/130 =$  approximately 40 percent of the excise taxes revenue for health care.

This approach has one more advantage, when revenue from excise taxes changes, e.g. because of inflation, the hypothecated revenue for health will be changed accordingly. So the fiscal capacity from indirect taxes will not be as dependent on public choice as was current system of state contributions for “state insured” persons, which has been purely based on the decision of politicians and has been losing its value when economic conditions changed.

Analysis of the hypothecation of taxes for health surely has its theoretical implications both to the public finance and the public and social policy field. It is clear, that the pure logic of public finance works against such an approach; it is mainly because this concept breaks the basic principle of taxes as a general tool not being tied to particular branch of economy. Also the tax techniques, such as tax base, tax reliefs, tax rates etc. generally work better when having, considering income taxes, just one personal income tax which they are applied to. This is why in this paper a general taxation approach has been assessed, too. Even the transformation going this way is, we can see, more suitable for current health systems financing than the “health insurance” approach as currently implemented. Even if, as already stated, it emerged from the conditions at the beginning of the nineties, and then it was perfectly rational, currently it calls for a change.

The hypothecated approach, both as an evolution of social health insurance and a “supplement share” from excise taxes, keeps the advantages of specific social health insurance “vehicle”, while simplifying its crucial disadvantages as they have been discussed. The price of keeping those advantages is incompatibility with including into the general taxation

mechanisms flawlessly. The actual implementation would thus require a discussion of how this mechanism should be implemented, so that the tax collection system would be compatible with its existence. This includes the mechanism of health tax reliefs, which, as the tool for positive motivation of health care behavior, should be implemented in an “user friendly” way.

Somewhat weak spot of the introduced approach is also the share of excise taxes: while the proposed solution is clearly more suitable than the “state insured persons” method of subsidy from government budget, further analysis should be done how the system will behave, when the actual excise tax rates (or revenues) will substantially change, asking for possible change of the share rate accordingly. It can be even abandoned in favour of increasing the rate of earmarked tax above the current levels of 13–14 percent. On the other hand, there are significant theoretical discussions on the share of direct and indirect taxes in economy, the tax burden placed on work etc., so the ability allocation a share of indirect taxes alone into health care is a strong argument for its usage and should not be ignored just because the direct taxes on personal income could be easier to implement on the first sight. I even discovered that in the African country Ghana an earmarked share of VAT is used as one of sources for financing their health care system [2].

#### 4 Conclusion

This paper presents arguments and techniques for the transformation of Czech public health insurance to the earmarked (hypothecated) health tax. A fiscally neutral variant is shown, rooted in the abandoning of public health insurance mechanisms as being known now and replacing them with earmarked health tax rate on personal income, initially at similar rate (13–14 %) as the current one. This would solve the situation by using common taxation techniques for collecting public resources. Because of the presence of fiscal subsidy for “state insured” persons, if we want to maintain existing fiscal capacity, it can be replaced by a share of revenue from excise taxes. This would also put a clear share of indirect taxes into financing of health care.

As for the international experience, the following approaches have been assessed: first, the process of transformation of social health insurance, primarily in the country of its origin, Germany, is important for consideration; especially the concept of *Bürgerversicherung*. Second, based on the study of [4], the arguments for and against hypothecated taxes (primarily indirect) are subject to interest, at the same time, only a few number of countries have currently implemented them in the form of specific hypothecated tax. This is one of the reasons why the approach in this paper is different and does not construct specific indirect hypothecated tax, rather it suggests allocating a predetermined share of excise taxes to health care.

As for the fiscal impact and cost and benefits of shown solutions, the proposed solutions are generally fiscally neutral as they are rooted in changing the parameters of a current system so that the overall health care budget is not changed directly at the time of transformation. After changes, the fiscal manipulation can be more transparent utilizing the newly available tool – health tax rate.

The advantages and disadvantages of proposed solutions have been discussed. To summarize the reasons that favour the earmarked solutions, the transparency, ability to be changed independently, relationship to negative externalities in health and certainty of allocation for health care are the main reasons to follow this way. Also a health tax relief on personal income could be present, facilitating positive behavior in the health care system and/or life style. The health tax rate on personal income is compatible with current health insurance contributions principle, while it is radically simpler and administratively easier, especially when single income tax base is utilized. Thus it can be also seen as an evolution of current public health insurance principle based on real characteristics of health care system as we see it now.

At the same time we have to recognize, that the concept of earmarked taxes is a novelty in the Czech scientific and public discourse. While the theoretical thinking was facilitated by the fact that fiscally neutral variant was considered, eliminating the need of making exact calculations, if this concept is introduced into reality, the exact and more thorough evaluation

would have to take place. This includes the law aspects of taxation procedures etc. Also, this concept would require some understanding and sympathy for its qualities, especially related to public policy and behavioral economics arguments. It is based on the fact that health system poses attributes that call for earmarked financing. While it is true that some other branches would like to have this status too (construction of specific fiscal funds etc.), health system is, we can believe, such important that it strongly justifies for it. As stated in literature [4] especially sectors of health and education have such a status, that they can generate public support for specific hypothecated tax introduction and changes.

Moreover, it is presumed, that the citizens and politicians will appreciate the fact that they will have a new public and social policy tool – health tax rate on income that changes if the public debate requires to do so. Of course, this also means that this tool should not be misused or underestimated.

Those aspects are without doubt a field for further research. It can be only desired that this research is done with open mind for the idea and trying to make a positive use of it. One thing, however, can be said already – the proposed system is surely more suitable for current socioeconomic conditions than the current one, which has shown significant shortcomings. At the same time, the proposed system maintains important aspects and values of Czech health care system in terms of solidarity, accessibility and high quality, while bringing new possibilities such as earmarked tax rate, tax reliefs, equal position of all the citizens as health tax payers and allocating a share of excise taxes into the health care system.

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# Shortening Waiting Times in Slovakia for Total Hip Replacement and Cataract Surgery: Development of Waiting Times in 5 Years

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## Abstract

The waiting list is a list of patients with the indicated health care that cannot be provided from financial, capacity or other reasons. The factors that may influence the length of the waiting period are demand, hospital resources, management of waiting lists and patient characteristics. The aim of our research was to find out how long patients have to wait depending on their diagnosis and health insurance company and also how has changed the length of waiting times in comparison with 2008 and 2012. In 2013 was weighted average waiting time for total hip replacement around 10.5 months, which is among all surveyed years the lowest. In comparison with 2008, when it was 14.5 months, it is a decrease by 4 months. The length of the waiting period on total hip replacement between 2012 and 2013 fell down by 5.3 months. Waiting period for cataract surgery between 2012 and 2013 did not change. Further research is needed to answer the question that what kind of knowledge resulted in the adoption what kind of measures that reduced waiting times for total hip replacement.

*Keywords:* health care; waiting times; total hip replacement; cataract surgery; health insurance companies

JEL Classification: I11

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## 1 Introduction

The waiting list is a list of patients with the indicated health care that cannot be provided from financial, capacity or other reasons. Usually, the list contains patients who do not require acute care and the postponement of treatment will not impair their health. The inclusion of a patient on the waiting list is decided by the responsible physician after assessing the urgency of the case. Waiting on the waiting list, i.e. the waiting time, refers to the time between the enqueuing and dequeuing a patient on/from the waiting list. In elective health care, this is generally the time between the approval and implementation of the procedure.

From the economic theory perspective, demand for elective surgery is determined mainly by the health status of the population and state of medical technology. There exist other factors as well, such as financial incentives (e.g. extent of cost sharing by public patients; the proportion of the population with private health insurance; the price of private surgery) or managing – regulation control mechanism (e.g. the thresholds for referrals and for additions to the list; presence or absence of ‘gatekeeping’) that are influencing demand [7]. The supply of elective surgery depends on public (and private) surgical capacity (e.g. number of beds and doctors) and the productivity with which capacity is used. Productivity is likely to depend, among other things, on the way in which surgeons and hospitals are paid (fee for service vs. salary vs. fixed budget; presence or absence of activity-based funding as DRG) [7].

[8] divided the factors influencing the length of the waiting period into 4 groups:

- *demand* - as the patient’s interest in services, for which waiting list is kept
- *hospital resources* - such as surgeons, anesthesiologists, nurses, operating theaters, special equipment, beds and the like,
- *management of waiting lists* - such as setting priorities, based on which patients are selected and assigned on the waiting list
- *patient characteristics* - such as health status, comorbidity, age, gender and place of residence.

Waiting lists are serious problems in many OECD countries [2, 6, 7], including Slovakia. Long waiting times for elective treatments generally tend to be found in countries that combine public health insurance with zero or low patient cost-sharing and constraints on capacity. Conversely, long waiting times are found less often in countries with social insurance that allow choice of provider. However, there are some social insurance systems with below average spending that do have waiting times for elective care. Countries with no waiting times tend to spend more on health and have higher hospital capacity [6].

According to [7], one of the reasons for an increasing number of patients on the waiting lists is a significant progress in surgical techniques and anesthesia during the last two or three decades, what significantly improved the scope, safety and efficacy of surgical procedures. At the same time, numbers of procedures are carried out at a lower cost per unit. Inconsequently, dramatic increase in demand for surgical procedures has occurred, particularly elective ones, such as cataract surgery, hip/knee replacement and bypass.

The aim of this paper is to find out the length of waiting time for individual procedures in 2013 and compare it to 2008 and 2012, respectively. The paper wants to make also methodological contribution for new research, the results of which might help to reduce the waiting times.

## 2 Material and Methods

According to the data from Health Care Surveillance Authority, most patients on a waiting list are patients with gonarthrosis, coxarthrosis and cataract. Therefore, our goal was to find out the length of the waiting period for treatments related to these diseases, namely for total hip replacement and cataract surgery. The length of waiting time in selected health care providers utilizes research method "mystery shopping". The same method has been utilized also in previous research conducted in 2008 and 2012, as discussed in our previous paper [5] and reports [3, 4, 9]. In 2013, in accordance to this method, we have contacted individual providers and pretended interest in the surgery. Mystery shopper followed the specified scenario as follows: "My mom/dad needs surgery (total joint replacement surgery or cataracts). Where she/he was at hospital they offered her/him the term not until XY months. When she/he could get the term for surgery in your hospital/facility?" Each provider we have asked on term for each health insurance company (HIC), pretending unfamiliarity of our parents' HIC.

In terms of data sources, our sample contains of all providers who have signed a contract for the provision of health care in orthopedics (for constitutional care) and ophthalmology (constitutional and one-day health care), according to the websites of General Health Insurance Company and Dôvera Health Insurance Company. This provided us a list of almost all providers on the market with respect to the studied phenomenon. The total number of respondents was 72:26 providers for total hip replacement (THR), 46 providers for cataract surgery. We contacted 19 hospitals for both diagnoses, only for cataract surgery we contacted 27 providers and only for THR we contacted 7 providers. Number of response differs by HIC (Figure 1).

Figure 1. Number of contacted respondents and number of response by diagnosis and HIC

Diagnosis by HIC	Contacted respondents	Response by respondents (number, percentage)
THR	26	25 (96.2%) <sup>1</sup>
- GHIC	26	25 (96.2%)
- Dôvera HIC	26	21 (80.8%)
- Union HIC	26	19 (73.1%)
Cataract surgery	46	36 (78.3%) <sup>1,2</sup>
- GHIC	46	36 (78.3%)
- Dôvera HIC	46	33 (71.7%)
Union HIC	46	31 (67.4%)
Total number	72	59 (81.9%)

Source: Author

Note: 1 – data from at least 1 HIC; 2 – 8 do not provide asked treatment and 2 did not answer



The research was conducted via phone interview from May 7th, 2013 to June 26th, 2013. This type of research has serious limitations, since we could not verify whether the interviewed doctor/nurse was sufficiently knowledgeable, did not mislead or deliberately lied. The data obtained thus reflect information available to the public when making choices. They may differ from the "real" waiting period, depending on the qualities of a person who provided the information relating to certain disease.

The data have been analyzed for average (arithmetic) for each provider for certain treatment and for average (weighted) for all insurance companies by the size of the insurance company portfolio. The size of portfolio we have drawn from The Healthcare Surveillance Authority as of January 1<sup>st</sup>, 2008 (for year 2008), as of January 1<sup>st</sup>, 2012 (for year 2012) and January 1<sup>st</sup>, 2013 (for year 2013).

### 3 Results and Discussion

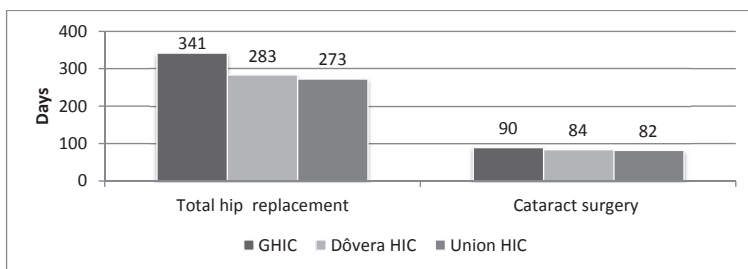
#### 3.1 Comparison of Insurance Companies and Providers

For THR, there are the longest waiting times in Teaching Hospital of J.A. Reiman in Prešov, Teaching Hospital in Nové Zámky and Teaching Hospital in Trenčín – about two years. The shortest period (max. 3 weeks) is at a private clinic; however, there are high patient fees in place. Short waiting times were found at major state owned hospitals and also at smaller hospitals administrated by Higher Territorial Unit or a private company. Overall, regardless of the type of equipment and insurance, the waiting time for THR is approximately 9.5 months.

Average waiting time for cataract surgery is 2.8 months. Period differs among HICs, as well as among healthcare facilities. The longest time for cataract surgery is in a Teaching Hospital in Trenčín – 8.5 months. In 10 facilities (26%) waiting times range between 4-6 months, in 18 facilities (47%) range between 1-4 months, and in seven (18%) facilities is it less than 1 month.

The shortest average waiting time for THR is with the Union Insurance Company (8.9 months), followed by Dôvera (9.3 months) and the longest wait is to be found with General Health Insurance Company (11.2 months). The difference among insurance companies is smaller for cataract surgery, notably only one week. Policyholders of Union, Dôvera and General Health Insurance Company (GHIC) are waiting for surgery on average 82, 84 and 90 days, respectively. From all insurance companies on the market, the shortest waiting periods for all diseases has the health insurance company Union (Figure 2).

Figure 2. Comparison of waiting times for each disease by insurance companies in 2013



Source: Authors

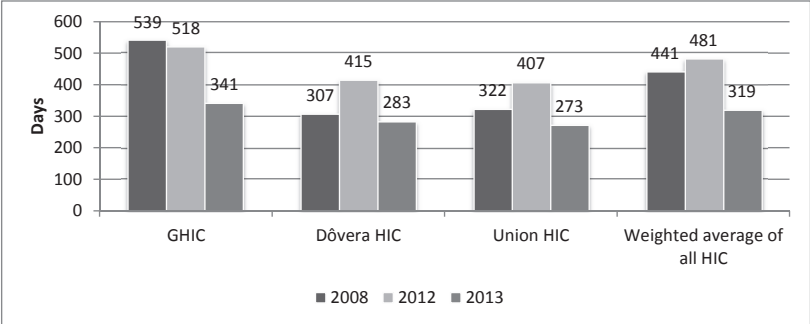
#### 3.2 Comparison over Time – Health Insurance Companies

The average waiting period for THR has increased since 2008 by about 6 weeks. In 2008, policyholders had to wait for THR on average of 441 days; in 2012 it was 481 days. Over the past four years the huge differences between health insurance companies has been reduced.

The length of the waiting period on total hip replacement between 2012 and 2013 fell down by 5.3 months. In 2013, the weighted average waiting time was around 10.5 months, which is among all surveyed years the lowest. In comparison to 2008, when it was 14.5 months, it is a decrease by 4 months.

Thus, all three insurance companies have significantly lower waiting times than in 2012, while GHIC managed to shorten the waiting time by 5.8 months, Union and Dôvera HIC by 4.4 months. Waiting times for THR are the shortest at Union HIC (273 days) and the longest are at GHIC (341 days). Compared to 2008, the differences among insurance companies decreased significantly. In 2008, the difference between the longest period (GHIC) and the shortest (Dôvera HIC) was about 7.6 months. In 2012, it was only about 2.2 months (Figure 3).

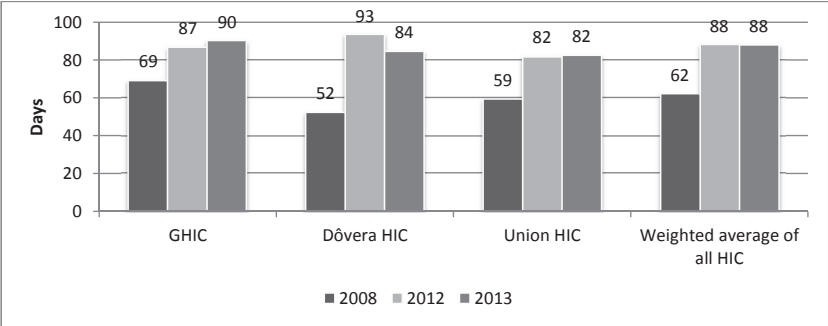
**Figure 3. Comparison of waiting times for THR by insurance companies**



Source: Authors

The waiting times for cataract surgery from 2008 to 2012 increased by 26 days. The waiting times for cataract surgery between 2012 and 2013 remained unchanged at 88 days. The waiting times at GHIC statistically insignificant increased (by three days) compared to the previous year. The waiting period at Union HIC did not change. At Dôvera HIC, period decreased by 9 days. For cataract surgery the shorter wait policyholders of Union HIC (82 days) and the longest policyholders of GHIC (90 days). The difference between insurance companies in 2013 has a minimum – 8 days. In 2008, this difference was 17 days (Figure 4).

**Figure 4. Comparison of waiting times for cataract surgery by insurance companies**



Source: Authors

### 3.3 Comparison over Time – Providers of Health Facilities for THR

State-owned General Health Insurance Company (*Všeobecná zdravotná poisťovňa*) totally managed to reduce waiting times by about half a year in average. Several hospitals showed only minimal changes. The waiting period increased in only 1 hospital. Most significant shortening occurred in University Hospital Bratislava in Ružinov, where the waiting time was shortened by 3.3 years.

Dôvera HIC on average managed to reduce the waiting time of about three months. For comparison we included only providers for which we managed to get the data in 2012 and also in 2013, namely 10 providers. This fact can affect the average values, which do not take account data from necessary number of providers and cannot be authoritative for the overall change in the length of waiting time for THR for this HIC.

For Union HIC we included in the comparison only providers for which we managed to get the data in 2012 and also in 2013, which was in this case, only 8 providers. Therefore, the average value is not appropriate to globalize. For providers whose data we have obtained, we have reported three cases of shortening the waiting time. By the four providers the difference was minimal. Waiting time was significantly (122 days) increased only in the University Hospital in Bratislava in Ružinov.

### 3.4 Comparison over Time – Providers of Health Facilities for Cataract Surgery

The average waiting time for policyholders GHIC for cataract surgery in comparable subjects remained almost unchanged from 2012 to 2013 (an increase of only 5 days). The most observed reduction was 83 days by Neovízia Ltd. The highest increase between 2012 and 2013 was 77 days by University Hospital in Bratislava.

The average waiting time of policyholders of Dôvera HIC for cataract surgery, similarly to the GHIC, has unchanged (decrease of 6 days). The most observed reduction was at Teaching Hospital in Nitra (89 days) and the highest increase was in the University Hospital in Bratislava (77 days).

Union HIC has reduced the waiting time for cataract surgery most significantly (by 22 days). However, this result cannot be general at all. Eight providers (of 22) could not be compared across the years. So, on the result have serious influence increasing of waiting period in Teaching Hospital in Trenčín (0.5 year) and almost no shortening of waiting times at 6 of 14 providers, which could be compared with each other.

### 3.5 Lessons Learned

Change of the length of waiting times among insurers and providers is visible across the time, although, the average value is not sufficient to generalize. Therefore, we conclude that between the measurements in 2012 and 2013, several measures had to be undertaken that have led to the reduction of waiting list times. There is a need to ask very important question: (1) What kind of knowledge resulted in the adoption (2) what kind of measures reduces the waiting times. To answer these question(s), further research is needed.

Research should be carried out in two levels: (1) the formation of health policy focused on shortening waiting lists and (2) the implementation of health policies with the aim of shortening waiting lists. The implementation itself should be monitored at two levels: (1) the level of health insurance companies and (2) the level of health care providers.

Research should primarily compare all measures adopted and implemented which directly are related to wait times between year 2008 and 2012 with all measures adopted and implemented between year 2012 and 2013. Part of the research should include analysis of the external environment, which could affect the change in the length of waiting times (aging population, availability of new technology and methods, referrals, surgical capacity, etc.). Consequently, it is necessary to determine what information led to these measures focusing on:

1. What was the source of knowledge (domestic or foreign scientific publications; interest groups; knowledge from experts, NGOs or other stakeholders; ordinary knowledge delivered by population or knowledge was generated by some civil servant), which was incorporated in the design/implementation of measures affecting waiting lists and times?
2. Who was in the process of knowledge transfer key facilitator/broker of knowledge (if present) and how and when it showed its role in the knowledge transfer?
3. In what form was knowledge received by individual actors (printed material, personal interviews, media, etc.) and in what form was utilized (Act, Ordinance, services)?

Answers from such research could yield valuable knowledge about (1) who/what is the source of knowledge; (2) the form in which knowledge was given to the decision-makers and (3) in what particular form was this knowledge implemented. This knowledge may in the future help to create the right conditions for knowledge generation, adaptation, dissemination, reception, adoption and utilization [1], process known as knowledge transfer. Rapid and concrete knowledge transfer in the area of waiting lists will help to improve health outcomes and effectiveness of the health care system in the future.

#### 4 Conclusion

In 2013 was waiting time for THR around 10.5 months, which is among all surveyed years the lowest. In comparison with 2008, when it was 14.5 months, it is a decrease of 4 months. The length of the waiting period on total hip replacement between 2012 and 2013 fell down by 5.3 months. All three insurance companies thus have significantly lower waiting times than in 2012. Therefore, we conclude that between the measurements in 2012 and 2013, several measures had to be undertaken that have led to the reduction of waiting lists. There is a need to ask very important question: What kind of knowledge resulted in the adoption what kind of measures that reduced the waiting times. To answer these questions, further research is needed.

#### Acknowledgements

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# Social Innovations in Public Services: Co-creation in Slovakia

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## Abstract

This paper deals with social innovations in the public sector with emphasis on the plurality system of ownership forms in public service provision which can have several forms: public-private-civil sector mix, partnerships, cooperation and co-creation. The latter is the focus of our study. The objective of this paper is to identify different types of co-creation as the social innovations and relevant drivers and barriers that account for the success or failure of co-creation processes on local government level in Slovakia with focus on the fields of welfare and environment. The research in this study is realized as a part of LIPSE research project. In the qualitative analysis we used the document analysis of relevant policy documents, databases and websites and conducted interviews with various experts on co-creation processes. One of the main findings is that co-creation innovations are mostly proposed by other actors (NGOs and companies, sometimes informal groups of citizens) and not initiated by local governments themselves. Moreover, majority of local governments have usually neutral or even negative attitude to these co-creation innovations what might be due to the fact that Slovakia as a post transitional country has not fully implemented the principles of modern governance into public administration.

*Keywords:* social innovations; public services; co-creation; citizen participation

JEL Classification: H43, H44, L33

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## 1 Introduction

Historically, the economic theory paid attention to the macroeconomic dimension of innovation. Initially, the economic theory dealing with the economic substance of innovation was built on the work of [22, 23] who understands innovation as a technological change. [25, 26, 27] stated that innovation is a new combination of production factors by which new products and services are put on the market which increases productivity and economic growth. [28] expanded understanding of the capital for a human component. Thus education, research and development become important. The result of research and development is technological progress as an endogenous factor of economic growth. Current understanding of innovation in economic theory describe innovation as creation of a new or improved product / service that better reflects the needs of the consumer or the introduction of new production, management or marketing methods to increase the effectiveness and efficiency of the product or the provision of services [9, 15, 16, 24, 35].

In public sector the innovation is linked to the creation of "public value in terms of increasing the efficiency, quality and transparency of public services" [17]. When innovation in the public sector should be successful, there must be a consistency between the nature and the environment where innovation takes place. The innovation process requires legitimacy [35], political sustainability [17], strengthening democratic values [2] and respect for the needs of citizens [14]. Innovation in the public sector should bring in the provision of public services not only economic value but also legal and democratic values.

In relation to public services, the innovation can be understood as the development of public services towards better meeting of the needs based on the modification of the status of entities / actors in the system of public services provision [12, 18, 19, 30]. These entities are able and willing to learn, to improve their work and cooperate with each other [33]. The innovation of public service must meet the needs of the public or needs of society or a particular community whose members are involved in the process of creation and implementation of innovation.

A new concept of government is defined as the sum of interactions where there is a cooperation of actors from public and private sector in solving social problems [19]. The emphasis is on the citizen and on building the civil society [22]. The concept of governance also appears in the documents of the European Commission that define principles of good governance: openness, participation accountability, effectiveness and coherence [13].

Participation of citizens, as final consumers of public services, has an irreplaceable role in the innovation process. Innovation aims to “shape” the public service following the needs of its consumers – citizens. Therefore the direct participation of citizens in the innovation process and consequently its introduction into practice is of great importance in respect of the success of the innovation process [6, 11, 33]. From this point of view we speak of so-called co-creation and the innovation becomes social innovation.

Social innovation has framed transformation within the public sector in order to enhance public values, such as effectiveness, efficiency and legitimacy [4]. In social innovation the production process of public services is considered as 1) an open process, with the involvement of end-users in the design and development of goods and services [8, 33] and 2) a change of the relationships between involved stakeholders [5]. One of the central elements in the concept of social innovation is active participation of citizens and grass roots organizations in order to produce social outcomes that really matter [2]. Hence, social innovation can be considered as a process of co-creation.

Co-creation is regarded as a promising concept against austerity, ageing and the erosion of legitimacy of public institutions [21]. There are three types of co-creation:

- Co-initiation, in which citizens act as initiator,
- Co-design, in which citizens are invited to co-design and
- Co-implementation in which citizens are ‘just’ invited to implement public services (instead of public organizations) [34].

According to Sørensen and Torfing, public innovation takes place through collaboration with different stakeholders. As a result, innovation is always relative to its context [31]. This context consist of elements such as 1) the political and administrative context, 2) the legal culture within the public sector, 3) state governance and civil service tradition and 4) resource allocation and resource dependency [5].

According to theories of decentralization [1] local governments that are closest to citizen are expected to serve to local needs. This should mean that in the area of social innovations local self-governments are the level where a lot of co-creative innovations happen.

Therefore we focus on the on the participation of different stakeholders in public services provision at the local self-governments level, i.e. the focus of our study is co-creation as a social innovation in public services provision at local level. The objective of this paper is to present the analysis of partial results from a research on social innovations on local government level with focus on co-creation in the fields of welfare and environment in Slovakia. As for methodology we employed several methods, e.g. document analysis of relevant policy documents, databases and websites and interviews with various experts as described closer in the next part.

## **2 Material and Methods**

The objective of this paper is to identify different types of co-creation as the social innovations and relevant drivers and barriers that account for the success or failure of co-creation processes on local government level in Slovakia with focus on the fields of welfare and environment. The research in this study is realized as a part of LIPSE research project - "Learning from Innovation in Public Sector Environments", project studying the drivers and barriers of successful social innovation in the public sector. The study research methodology is given by the project research methodology

We used qualitative methods to analyse co-creation during innovation in public services delivery. To develop the inventory of relevant practices in which either citizens or other actors

are involved we conducted an extensive document analysis of relevant policy documents, databases and websites and more than ten expert interviews, which led us to compiling of list of 10 case studies as this was a number set by leaser researcher in LIPSE project (5 examples of co-creation in the welfare sector and 5 in environment - see table 1).

**Table 1. List of co-creation cases on the local government level**

Case	Goal of co-creation initiative	Main actors/stakeholders
1. Conciliation councils	Help citizen to solve any kind of conflicts, especially ethnical conflicts	Citizens, NGO PDCS, C.S.Mott Foundation, municipalities in given areas
2. Social housing Kojatice	Provide social housing for Roma with certain guarantee of its maintenance thanks to Roma co-financing and co-building	University students, Roma citizens, local self-government and its mayor, NGO ETP Slovakia
3. Godmothers	Provide material and non-material support to young mothers in social need for their inclusion into the society	NGO "Sanca pre nechcenych", SPP Foundation, VUB Foundation, Orange foundation, municipalities that decided to support the project
4. Electronic Guard	Improve life of elderly citizen with disabilities by telecare and related assistive technologies	Involved local governments, private IT company YMS, private telecommunication company Orange
5. Relax path Martin	Improved life for elderly by building barrier free public relaxation infrastructure – nature path	Municipality of Martin, several citizen initiatives (Joga v dennom živote, DIAMART – club of people with diabetes and a Club of pensioners Martin)
6. "Green Patrol" in Bratislava	Increased citizen participation and responsibility for clean green areas, better quality of environment in the city	Citizen initiative "Green Patrol", municipality Bratislava and its local parts, inhabitants of Bratislava
7. Interactive portal "Green Patrol"	Improve and maintain the quality of environment in the city, improve collaboration between citizen, participating organizations and city	Citizen initiative "Green Patrol", municipality Bratislava, citizens on social network
8. Trash out	Improve physical environment and collaboration of all sectors	Involved local governments, environmental NGOs (Greenpeace, Let's do it, Enviweb cz, Emerald Planet, Priatelja zeme, Greenoffice sk), waste management companies, Ministry of environment of the Slovak Republic and Environmental fund of the Slovak Republic
9. City in mobile	Facilitate citizen participation and improve physical environment	Private company Datalan, a.s, municipalities in Bratislava self-governing region and their inhabitants
10. PrieStory	Realization of low cost investment projects of physical infrastructure executed by volunteers living in the area, improve collaboration between sectors	Ekopolis Foundation, citizens, participating municipalities, CSOB bank, local companies (as sponsors providing additional funding)

Source: Authors

The purpose of these case studies or inventory was to create a long-list of eligible cases which can be compared to each other (cases within the public welfare domain and cases within the rural/urban regeneration domain). We followed three main selection criteria when identifying eligible cases:

- *Citizens involved as co-designer or initiator*: From the systematic review of co-creation and co-production within the public sector, we concluded that in the literature on co-creation/co-production three different types of citizen involvement can be distinguished: 1) citizens as co-implementer, 2) citizens as co-designer and 3) citizens as initiator. Since we are interested in co-creation during social innovation processes we focus our research on the involvement of citizens as initiator and as co-designer. This implies that within the selected cases citizens were at least involved at the start of the co-creation initiative.



- *Cases from policy sectors public welfare or rural/urban regeneration:* We conducted our research into two different policy domains: 1) welfare sector and 2) the rural/urban regeneration sector. With innovation within the 'welfare' sector we mean innovations which are aimed at improvements within the social infrastructure. This can imply an innovation aimed at a specific target group (elderly, juveniles, immigrants etc.). With the rural/urban regeneration sector we focused on innovations within the physical infrastructure. In these cases, innovations are primarily aimed at improving the liveability of neighbourhoods/boroughs by innovations in for instance housing or the (re)decoration of the public space. With 'urban regeneration' we meant (topographical) areas which have to deal with a changing population, due to social and economic developments (e.g. growing number of elderly).
- *Possible to specify the outcomes of co-creation processes:* As our systematic review has revealed, it is relatively unknown what kind of outcomes co-creation processes have in social innovation. In order to draw some conclusions about these outcomes, this implies that selected cases should involve co-creation initiatives which are not anymore in the starting phase but have delivered (some) results.

The list of cases suggests that there are several interesting co-creation innovation initiatives in Slovakia on local government level. On the other hand, this list of cases is close to the full enumeration of existing co-creation based innovations on the local government level in Slovakia.

### 3 Results and Discussion

Based on analysis of investigated cases we summarise the role of different actors who participated on the selected cases (table 2). We capture their role in three different stages based on three different types of co-creation as defined above: Initiation (marked as 1 in the following table), Design (2) and Implementation (3).

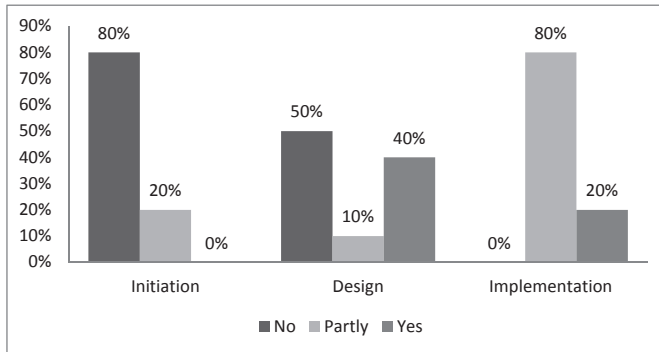
**Table 2. The role of different actors in co-creation based initiatives in different stages of the co-creation**

Role	Citizen initiative(s)			Formalized NGOs			Private sector			Local government		
	1	2	3	1	2	3	1	2	3	1	2	3
<b>Conciliation councils</b>	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Partly
<b>Kojatice</b>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Partly	Partly	Yes
<b>Godmothers</b>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	Partly
<b>Electronic Guard</b>	No	Yes	No	No	No	No	Yes	Yes	Yes	No	Yes	Partly
<b>Relax path Martin</b>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
<b>Green Patrol BA</b>	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Partly
<b>Interactive portal GP</b>	Yes	Yes	Yes	No	No	No	No	No	No	No	No	Partly
<b>Trash out</b>	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Partly
<b>City in mobile</b>	No	No	Partly	No	No	No	Yes	Yes	Yes	No	Yes	Partly
<b>PrieStory</b>	No	Yes	Yes	Yes	Yes	Yes	No	No	Partly	Partly	No	Partly

Source: Authors

Answer Partly in the table means that from many contacted local governments only few of them participated, or that their involvement during the project realization phase changed from positive to indifferent or negative. Data collected in our comprehensive research study indicates that local governments usually do not initiate co-creation and are not very active in design and implementation phase. To stress this point we compiled Figure 1 when this fact is even more visible.

**Figure 1. Participation of local governments in Slovakia in co-creation**



Source: Authors

Figure 1 demonstrates that from the list of analysed cases none of the local governments fully participated in the initiation of co-creation, only 2 municipalities (20 %) were partly involved. In the design stage the situation is very similar although slightly better, at least half of the municipalities participated in co-design of innovative solution of public service participation either fully (4 municipalities) or partly (1 municipality – 10 %). In the implementation of social innovation 2 level governments participated fully and 8 of them were partly involved but we must say that in cases of Green Patrol Bratislava and Interactive portal Green Patrol the municipality involvement was very limited.

Interviews with representatives of involved actors/stakeholders from the cases showed a problem that “participating” municipalities usually answered that they were not aware about the project we examined although in the documents or on the websites we found information about their participation.

We feel the core problem lies in a very limited interest of municipalities to participate in activities proposed and designed by other partners/actors. These actors who initiate co-creation in Slovakia can be divided into two types: 1) formal or informal third sector structures (NGOs or citizens) and 2) private sector. Private sector is active especially in IT (information technologies) area as implementation of co-creation initiatives also improves their sales and profit.

Despite existing research abroad [5] that among other factors shows that local governments are expected to use the quality of services as a source of competitive advantage in order to be attractive, in Slovakia this does not work.

As [32] states accountability and responsibility are not very well developed characteristics of good governance on any level of governments in Central and Eastern Europe. This fact combined with the habits of communist era may serve as an explanation for the behaviour of local self-governments in Slovakia. The values and principles of local politicians and bureaucrats are still influenced by the socialist understanding of the state on every level, national or local, as a “ruler” and not as a “servant” (see also [7]). Co-creation is not perceived as an innovation or progress but as a burden for too many local politicians and bureaucrats, especially if it reveals some existing flaws of the system in which local government function and way in they are organized.

To sum it up, in Slovakia the problem of limited will is not the consequence of legal and financial status of municipalities in the country. On the contrary, in Slovakia the local self-government law almost fully respects all principles of the European Charter for Local Self-Government and municipalities are legally and financially viable institutions [10]. In such situation, where type of governance and state tradition in the country influence the innovation process, any short term measures are not very capable to cope with the limited will of municipalities to develop and support co-creation. A possible solution seems to be in long term changes based on changes in the roles of participating actors:

- citizen should change from passive consumers of public services (in whatever quality and/or quantity) to active subject of local and national democracy,
- politicians and bureaucrats need to change from “rulers” to real policy makers and service delivery institutions.

If we want to have a look on these results from the overall LIPSE project view, the leader of the research team (Erasmus Universiteit Rotterdam) has developed a cross-country cross-sector comparison. This comparison study will be discussed in focus group and a report based on the inventory, the cross-sectoral and cross-country comparative case study analysis and the focus group findings will be prepared. As Slovakia is only one of the partners in this research we can use our partial results of the analysis for Slovakia but we are not eligible to use any other data to compare with other countries at the moment (until the research project is officially finished – part of the project agreement) which was a big limitation in preparing of this paper.

#### 4 Conclusion

In this paper we brought ten examples of co-creation based innovations on local government level in the fields of welfare and environment in Slovakia. Thus we fulfilled our goal which was to identify different types of co-creation as the social innovations and relevant drivers and barriers that account for the success or failure of co-creation processes on local government level in Slovakia with focus on the fields of welfare and environment. On the base of our analysis of investigated cases we can state that the role of local self-government in co-creation in Slovakia is rather limited. Our opinion is that the main problem and reason of this situation lies in the traditions and type of governance inherited from previous socialist history of Slovakia and cannot be treated immediately.

In Slovakia, however, it has been shown that social innovation predominantly comes from third party organizations or citizens themselves. It is quite obvious as bureaucrats and elected politicians, who mostly decide on such thing as innovations in public sector, tend to reject risk [20], political thinking does not match the economic [18] and last but not least, problem regarding the implementation of the innovation process is a short term political cycle [6]. In other words, politicians/municipalities promote any innovative initiative or co-creation project during the local election campaign as important result but after elections their interest very often disappears. But citizens living in particular municipality do not change their preferences after election campaign, their needs remain the same and therefore the citizens and/or various NGOs (formalized groups of citizens) are the initiators of social innovations in public services provision in Slovakia.

Another interesting point shown in our research was that many innovations in public services provision are based on use of information and communication technologies (ICT). Potential for innovations based on ICT is determined by politico-social environment [3]. Information and communication technologies may contribute significantly to the fulfillment of one of the key conditions for successful implementation of innovations to the system of public services, and the direct participation of citizens as consumers of public services in the service innovation process [33]. The ICT driven innovations in public services may therefore be an incentive or driver for social innovations and co-creation process in Slovakia and as such we will

focus our future research on this linkage between ICT and social innovations on the local government level.

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# Sport Grants and their Transparency: The Case of Information Available on Web Pages of Czech Regions

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## Abstract

Support of the sport at regional and municipal level has a long tradition in the Czech Republic. The principle of subsidiarity enables development of a broad spectrum of grant systems and principles including different level implementation of e-government principles. Transparency of allocation of public grants is the topic of the day in many European countries. Nowadays we consider a publishing of relevant information on websites as inseparable part of the transparency. Although it is generally expected that all important information will be available on the regional websites it is not always truth and approaches to publish information vary among regions. The aim of the paper is to investigate how regional self-governments publish information on sport policy, particularly grants. We surveyed information accessible at the websites of 13 Czech regions (Prague was excluded from the survey).

*Keywords:* e-government; accountability; transparency of sport policy; sport grants

*JEL Classification:* H83, L38, L83

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## 1 Introduction

Support of the sport at regional and municipal level has a long tradition in the Czech Republic. The principle of subsidiarity enables development of a broad spectrum of grant systems and principles including different level implementation of e-government principles. Transparency of allocation of public grants is the topic of the day in many European countries. Nowadays we consider a publishing of relevant information on websites as inseparable part of the transparency. Although it is generally expected that all important information will be available on the regional websites it is not always truth (e.g. [5], [8]).

E-government is a one of tools how can be a transparency increased or keep at appropriate level. In general terms, e-government is defined as a use of modern ICTs in order to improve internal as well as external governmental processes in various ways. Among other things, e-government is perceived as a tool which may enhance accountability particularly through greater openness and transparency of public sector organizations. Here, the central question is “to what extent and how does e-government promote public accountability?”. For example, this was discussed by [15], who followed the approach of The Cyberspace Policy Research Group in which government websites openness is a function of transparency and interactivity. For instance the role of publicly available information is discussed in the literature – e.g. [13] points out that more information about available administrative resources, stakeholders may be more realistic and acceptable about administrative capacities, performance standards, and decision limitations. Also e-participation as an instrument for enhancing inclusion in public decision-making, opening the decision-making processes and active obtaining of input from citizens has been under vast debate in the last decade, because in many OECD countries a gap exists between the polity and the community [3]. According to [13], the interaction helps administrations better identify, assess, and thus satisfy public needs.

The role of the region as a supporting body of sport is considered as important and also the total amount of resources allocated on sport is important in the context of all public resources (see table1.). This paper summarizes the main findings of our research in which we concentrated on transparency of sport grants on web pages of Czech regions.

The aim of the paper is to compare transparency of sport support system in regions and discuss roots of noticed difference. To fulfill the aim of the paper we:

- 1) examine what is an extent of published information related to sport grants on their web pages
- 2) compare differences in approaches of regions to publishing the information(3) identify good practices that support transparency of sport grant processes.

To fulfill the aim we use theory review, analysis of previous researches and our own research results. We check information about sport grants and sport policy at websites of all regions in the CR.

The paper is organized as follows: First it outlines the role of regions in Czech administrative system and in sport policy". Second, it introduces to the methodology used. The last points contain short discussion and summary together with main challenges for the future.

### *1.1 The Role of Regions in Czech Administrative System and Sport Policy*

In the Czech administrative system, regions ("kraje") represent higher self-governmental units staying between municipal self-governments and central authorities. A region is a legal corporation under public law 129/2000 about regions, it owns assets and has an income laid down in the law and it manages resources on terms laid down in the law and according to its own budget. A region acts in its own name in legal relations and bears the responsibility. The act on regions defines the self-governmental responsibilities mostly in the open, demonstrative manner.

To describe the role of a region in the system of sport support we may use the law 115/2001 about the sport support. The region has responsibility in the field of sport support through grants from the region's budget; an investment into sport facilities which are property of the region and also support of youth talented athletes. However this law does not mention how to do it. The principle of subsidiarity may affect differences in following areas:

- Different approach to the formulation of sport policy – whether or not particular region formulates its own sport policy. What is the sport policy in comparison with other issues in the region
- The importance of the sport in regional strategic document - If the sport policy is the part of "wider" strategic document (i.e. leisure time strategy, education or health plans)
- The importance of sport during decision-making process – The process of allocation of public grants involves a part decision-making; although the final decision is always made by the regional council the process of inner evaluation may be significantly different. At one side we may notice existence of a special sport committee which includes experts outside the members of the regional council to the opposite extreme represented only by evaluation of formal aspects of the request made by officers while the decision is made by the board of councilors based on unclear criteria.
- Different approach to the transparency issues – how often and when is information available, how easily can be information found etc. The "web transparency" may be affected by a direct influence of a regional council, by the activity of officers as well as the activity of specialists who are responsible for web (webmasters).
- Different approach to the role of a supporter for cities and municipalities. Theoretically, regional governments should have more knowledge and capacities to provide advisory and technical support for cities and municipalities. The advisory role of regional governments seems to be more accentuated in regions where the sport policy is formulated; those without a sport policy are usually less transparent (see results).

To better describe the role of regions during policy formulation and implementation; we identify important actors in the region. Whole sport policy including grants allocations is affected by regional council, board of councilors, advisory committee (if established), officials from the



department of the regional office which is responsible for sport and sport clubs (professional as well as non-profit) if they are member of advisory committee.

Regional Council ("Zastupitelstvo kraje") is the most important political body of self-administration with the authority to make decisions and it is elected by citizens directly. In the field of self-government, the Council may establish legal entities and organisation units, pass generally binding regulations, co-ordinate development of the region (by development programmes and their implementation, including the tourism, environmental protection, crisis management and basic transport service). It shall also approve the regional budget and the financial statement of the region. Various aspects of disposal with region's property are prescribed in the act, but the definitions leave the group of self-governmental activities open. Although the Regional Council makes a "final" decision; many of important decisions and discussions are executed in Board of councilors. Based on the logic that the majority in the Board of councilor is almost always conditioned by the majority in the Regional council. As the more important actor we consider the the Board of Councilors.

Board of Councillors (Regional Board, "Rada kraje") is an executive body according to the act on regions and is accountable to the regional council for its activities; it shall give a report on its activities at every meeting of the Council. This body consists of the President, his/her deputies and other persons elected from among members of the Regional Council. From among its members, the Council elects the President ("hejtman" in Czech, and his / her deputies) who represents the region externally and who is also responsible for informing the public of the activities of the region.

Advisory committee may be established solely for the sport or sport is just a part of its agenda (usually Committee for education, youth and sport). Members of this committee are nominated by political parties represented in the Regional council. Usually members are recruited from member of the Regional council and optionally from experts from the region including representatives of sport clubs or institutions in the region. This committee usually participate the process of formulation regional sport policy and may establish evaluation rules for grants evaluation. As the grants request are submitted by sport club, the committee formulate recommendation for the Board of councilors.

The Regional Office ("krajský úřad") is the fundamental executive body of a region, which carries out tasks from the both fields of responsibilities (state administration and self-government). The Office consists of a President and employees of the region. This body shall also arrange for the development and operation of an information system compatible with the information systems of public administration. From the sport point of view, there is always a person or a department which is responsible for a sport at least at the level of a grants policy. These officials are usually responsible for checking of formal aspects of grant requests but they may be important actor during the policy formulation and also in the context of transparency. They publish information associated with regional sport policy and they often decide in which way certain information will be displayed (e.g. locked pdf document in comparison with excel table with more information)

There is an important difference among the regional council and board of councilors and advisory committee in the transparency point of view. While meetings of the Regional council and associated records are open to public; the other two institutions negotiate in privacy and record of this negotiation are never published. Hence the real inner decision-making process remains hidden from the public. In the context of this information we consider as important to know at least criteria of evaluation of grants request.

Finally to provide complete information about the role of regions we briefly mention financial system of sport support. The Czech system of public financial support for sports involves three governmental levels. The role of each level is determined by the law (Act No. 115/2001), however this law is considered as insufficient and there is a discussion about future revisions recognized even by the [11], [12], [10]. According this law, Regions should look after regional sport facilities, support sport activities and formulate their own sports policy.

The regional grant systems for sports are different; resources are mainly allocated on the basis of grant requests. Regional self-government budgets (thirteen regions) - each region's

responsibilities are defined by law No. 219/2005. Based on self-government principles each region has a right to organize its sport policy according its need and preferences. Financial resources from the regional budgets represents approximately 11% of total public resources (see table 1).

**Table 1. Public expenditures on sports, Czech Republic, 2008- 2011**  
(thousand EUR, recalculated, 1EUR=25 CZK)

	2008	2009	2010	2011
Ministry of Education	104 200	84 520	82 360	91 440
Other ministries	69 120	54 120	26 800	27 960
Municipalities	440 000	514 280	540 320	399 040
Regions	50 840	51 640	48 360	54 040
Regional councils	800	16 360	16 280	14 120
Total	664 960	720 920	714 120	586 600
% of GDP	0,43	0,48	0,47	0,38

Source: Authors based on [4]

## 2 Material and Methods

As outlined in the Introduction, in our pilot analysis we want to catch and compare differences among regions in the context of availability of information. As the main resource of information we consider web pages of Czech regions. We investigate what information on sport grants are available to users and evaluate the transparency of allocation of regional resources to this area. We consider this pilot survey as a first step for deeper analysis of transparency in allocation process of sport grants. For this purposes, we conceptualized the transparency dealing with the following web survey criteria:

1. Is there clear information of who is responsible for organization of allocation of sport grants available in organizational documents of a region?
2. Are there web pages on regional websites that are dedicated to the sport? If yes, the availability of the following was surveyed
  - a. Clear information about bodies/units responsible for sport policy and its funding.
  - b. Document summarizing sport policy of a region
  - c. Document specifying main principles and procedures for allocation of sport grants.
  - d. Document containing clear methodology on evaluation of applications submitted for grants (what criteria are used, what is their weight in decision-making).
  - e. Transparent information of what was allocated to whom.
  - f. Help desk - Information for applicants support (like Frequently asked question, Guides, Contact persons etc.)
  - g. E-participation instruments (like e-discussion which can be used by potential applicants to initiate communication with a region / its unit responsible for organization of sport grants allocation),
  - h. Information specifying the amount of grants allocated in the previous time period.
  - i. Links to other relevant web sites (like those dedicated to grants allocated by central authorities etc.).
  - j. Is the web adjusted to mobile devices (smart phones, tablets).

We take into consideration two main sets of criteria (1) “essential criteria” which is a set of criteria directly connected with transparency – without those we cannot consider the environment as transparent (a-e; h) and (2) “supportive criteria” which improve a transparency (f; g; i; j). Our original assumption was more optimistic in the case of transparency that’s why we put a focus also on tools spreading the transparency (e.g. adjusting web for mobile devices).

The websites of the regions were accessed by the authors in person and the survey was not automated. The authors visited the websites in the beginning of October, 2014 (in the period from 1st to 4th October), and print-screened the sources which entered the analysis of which the

main findings are presented below. For the purposes of our analysis we do not count with the capital city Prague, the city has a different political and economic conditions in comparison of the rest of regions [e.g. 5].

To evaluate previously mentioned criteria we used following methodology: (1) we follow the logical structure of web and seek for information based on "user logic"; (2) we use search engine implemented in websites to catch other relevant or missing information We didn't use direct interview or phone call because the aim of the paper is connected with a transparency issue and we examine the extent of easily accessible information. To avoid normative issues and an influence of the evaluator's opinion we only count yes/no/partially value. The value "partially" was used in the case when we find incomplete information. We did not evaluate normative issues e.g. the number of pages of the sport policy, the quality of the sport policy, how easily we found information etc.

The comparison among regions was done through points assessment based on presence/absence of previously mentioned criteria. To determine sum of point we use following formula: Yes=1; partially=0,5; no=0 and maximum achievable points is 10. The interpretation of results was based on theoretical knowledge as well as practical experience of authors.

### 3 Results and Discussion

Sport is a phenomenon which affects the majority of every society; even the EU also believes that "*grassroots sport, equal opportunities and open access to sporting activities can only be guaranteed through strong public involvement*" [2]. We can simply say that it is expected that the public sector will be supportive of sport organizations through many tools like grants, cooperation, investment in sport facilities etc. Public support for sport has a long tradition in the Czech Republic [6]. However the transparency of whole support process is crucial for prevention of misusing public resources as well as crucial for achieving of sport policy goals.

We evaluate the level of transparency at regional level though analysis of available information provided by regional websites. The lack of basic information inevitable leads to the lack of transparency.

#### 3.1 Units Responsible for Allocation of Sport Grants

Tasks related to regional development of sport are often divided between more units of the regional offices. Usually a department for regional development is responsible for an overall strategy of a region and more specific tasks are assigned to special units of departments for education which is responsible for strategic documents in the area of sport. Sport is approached together with education and development of projects focused on leisure time activities. Occasionally sport is connected with health and environmental issues (e.g. handicapped athletes). Publication of information on regional sport policy and its funding is thus fragmented and can be found on variety of sources (see Appendix 1 for more information). This also raises a need for larger coordination of sport strategy and its implementation.

Seeing that, we are not surprised that only two regions have a separate document dedicated to sport policy. Only one region has presented the analysis of situation in sport and four regions mentioned sport in other conceptual document. Even though there is an absence all regions allocate financial resources on sport grants. They establish grants challenges based on tradition or their own preferences but rather connected with declared sport policy.

We were not able to identify tendency in grant challenges. Some regions split grants challenges, similarly as Ministry of Education, youth and sport, into two main categories: professional athletes or clubs and "sport for all". Inside these two categories can be some sub-challenges. Other regions choose their own structure e.g. grants for non-profit organizations (sometimes not only for sport NPO), grants for facility investment, grants for handicapped athletes, grant for organization sport events, ad-hoc grants (including grants on request).

The lack of transparency is caused by the absence of the sport policy at first moment. The second is the lack of available information about sport grants. Sport actors (i.e. sport clubs, athletes, public, donors, municipalities in region, etc.) do not know what the future perspective is. From the local municipality point of view the situation is unclear and they approach to the own sport grand regardless of regional activity. This enable also a paradox of double support to one purpose (there is no database of supported project hence NPO can request money from municipality and region for the same purpose).

### 3.2 Web Pages of the Units and Transparency of Information

Information on availability (and transparency) of information on sport policy and its funding is summarized in the table below. When one looks for information on sport and its regional economy, he/she can follow a structure of web pages of a region which reflects specific themes rather than organizational structure of regional government. He/she can also check a document like "organizational order" (organizační řád) to get information on what department is responsible for sport policy.

**Table 2. Accessibility of information on regionals websites**

Research question	Number of total (13)	Comment
Clear information about responsible bodies/units	12	1 region doesn't mention sport in the main organization document but in appendix we can identify responsible sub-department.
Webpages with information about sport policy and sport grants	13	Often only the list of employees
Document summarizing sport policy of a region	3	5 other regions mentioned sport in other documents, or the document is out-of-date
Document specifying main principles and procedures for allocation of sport grants.	11	2 other regions fulfil this condition partially
Document containing clear methodology on evaluation of applications submitted for grants	6	Other regions usually states that the evaluation will be made by the evaluative committee
Help desk i.e. FAQ, Guides, Contact persons etc.	8	Usually is enlisted the responsible persons and their email (phone) contact. None of regions use FAQ or guide books
E-participation instruments	0	The structure of websites usually doesn't allow any discussion. Facebook if exists serves as tool for promotion of regional events
Information specifying the amount of grants allocated in the previous time period.	10	Sum of allocated financial resources can be found in the budget, however it is not considered as sufficient. Most regions publish the list of grant recipients and sum of money. Few regions also publish requested amount and the description of grant
Links to other relevant web sites	8	If other regions provides these links, than they are not displayed on findable or logical places
Is the web adjusted to mobile devices	2	Only two regions have m.domain interface suitable for mobile devices. The rest of webpages is accessible but in the case of two region it is almost impossible to gain all information (they use confusing structure and upload zip files instead of direct links)

Source: Authors based on [14]

More information can be found particularly on web pages of specific units of departments responsible for education and leisure time activities, rather than on web pages of departments for regional development. Our pilot web survey clearly shows that particularly these parts of websites of Czech regions contain more specific information. However regions differ in their

approach to publish information on sport policy and its funding as summarized in following Table 2. The table with detailed result for each region is in the Appendix 1.

The transparency can be caught through availability of clear methodology of grant request and through accessibility of details about previous decision-making process. If region receive points according the fulfilling of each examined criteria, then we can establish ranking of regions. To determine sum of point we use following formula:

Yes=1; partially=0,5; no=0. (The list of values is in the Appendix 1). The Region can gain maximum 10 points. The results are presented in table 3.

**Table 3. Comparison of regions based on set of criteria**

Region	Score	Region	Score
South-bohemia region	7,5	Pardubice region	4,0
South-moravia region	8,0	Plzen region	5,0
Karlovy Vary region	5,5	Central-bohemian region	3,0
Hradec Kralove region	6,5	Usti region	7,0
Liberec region	5,0	Vysocina region	8,5
Moravian-Silesian region	7.5	Zlin region	4,5
Olomouc region	7,0		

*Source: Authors*

To answer the question why we can see such huge difference we can suggest following factors most of which should be subjected to further research:

- The sport policy is not priority in regions and because of that the region (regional council) has not capacity to prepare, implement and keep sport policy
- The sport policy is not implemented because non transparent environment is convenient for strong interest group in region
- The lack of provided information is a result of understaffed Regional office. The employees are overloading by administrative tasks
- The lack of provided information is caused by un-skilled staff. They don't know that they should provide such information and nobody told them
- The lack of provided information is a result political will (or an absence of political will to change status quo).
- Inconvenient websites are caused by limited budget on IT services

The connection between a transparency level and the amount dedicated on sport (expressed as relative value e.g. as a percentage of total regional budget) is an apparent question from the economic point of view. Long-term analysis shows that regions allocate maximum 1% of total budget of sport [1]. Therefore the fluctuation in relative values is minimal although the absolute amount can be quite high in the case of "rich" regions. Seeking the correlation between expenditures and transparency may be misleading. The transparency is the matter of principle (and decision of the region independent of financial resources) while the absolute amount of resources allocated on sport is affected by economic situation of the region, its priorities including an investment decisions (e.g. if the region builds a sport stadium it will probably invests in other non-sport areas during next few years).

As we obtained in the methodology part we define two sets of criteria (1) essential for the transparency and (2) supportive for the transparency. Inside the first set of criteria we noticed two important failures: most regions have not a sport policy as well as clear methodology on evaluation of applications submitted for grants is absenting. The supportive criteria showed an absence of e-participation tools.

To identify good practices we conclude that the Vysočina is the region the closed the ideal transparent environment even though this regions still has "a space" for improvement. From our point of view the more important findings is which regions are failing in the transparency issue. Seeing Central-Bohemina region, Pardubice region or Zlin region with less than 50% of fulfilled

criteria is alarming. The reasons of this situation were mentioned above. An absence of a political will to be transparent is the most dangerous reason and the one which is most difficult to change. Nontransparent environment is always profitable for those who are inside the system and they protect themselves against the new unwilling requesters of grants.

#### 4 Conclusion

We investigated the level of transparency of sport grants at regional level. Our research results show huge differences among regions and we conclude that the average level of transparency is insufficient. Considering the financial and knowledge capacity of the region; we assumed that the region should be leader in transparency in comparison with municipalities. However our findings are not different from results at local level ([5], [6]). In this paper we also suggested possible explanation of this situation but the validation is the challenge for the next research. We believe that research of transparency is one of tools of how to push the transparency as a topic of the day. As soon as regional and local municipalities would be pushed to transparency, we should see more positive outcomes of allocated financial resources.

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# Benchmarking in Higher Education

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## Abstract

The article deals with the use of benchmarking in universities. On the basis of research which was conducted among academic officials of economic faculties of Czech public universities, state universities and private universities of economics and seeks to describe the experience of using benchmarking in the Czech environment. The result is the identification of the strengths and weaknesses of benchmarking and barriers to the implementation of benchmarking. The survey results are compared with existing theories regarding the use of benchmarking in the field of higher education and research results of the European Centre for Strategic Management of Universities.

*Keywords:* benchmarking; higher education; strength; weakness

JEL Classification: H75, H79

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## 1 Introduction

Benchmarking can be understood to be a systematic, ongoing and planned process performed to measure, compare and assess the processes, products, services, or performance parameters between selected organizations, partners or competitors from which the selected parameters can be considered in order to better define opportunities for self-improvement[13]. The essence of benchmarking is therefore the systematic collection of data (especially qualitative) to identify the strengths and weaknesses of one's own performance and processes. Upon the identification of the specific gaps in performance, search tools for improvement soon follow, along with the follow-up implementation of these tools, measuring self-improvement and in the last stage, taking the necessary steps to maintain positive changes. Benchmarking can be very well characterized by the phrase "*continuous self-improvement*"[4]. Earlier the concept of benchmarking was mainly related to process improvement, a newer approach focuses on strategy and systems[8].

When applying benchmarking in the public sector, there are several very important differences from the private sector. Specifically, creating a large space for the application of benchmarking, which in some cases creates very strong barriers to implementation. In the above-mentioned specifics it is a critical and crucial benefit for the public sector that benchmarking, in fact, brings elements of market competition into the public sector[11], [22], [14]. The authors Hellden and Tillema perceive benchmarking as an alternative to the application of market forces in the public sector, and also as a tool for performance measurement as a substitute for the decisions of consumers. Performance measurement is one of the few ways to bring about change for the benefit of customers in a monopoly environment in which public sector organizations operates. Low performance in the public sector does not mean extinction of the organization, but in order to achieve at least some basic parameters of efficiency in the public sector, it is necessary that the gap in performance between public sector organizations decrease. In the short term, the public sector organizations must, therefore, demonstrate a reasonable degree of achievement in performance to achieve the support from various groups of stakeholders. Another option is to increase oversight by the central authorities, or the use of contracting out. According to the economic theory of benchmarking we see the benefits of this tool, in particular, in the following points: "*benchmarking increases the average performance of organizations, benchmarking is a powerful motivator for increasing the*



*efficiency of institutions of lower initial performance and of those organizations of higher performance, benchmarking reduces the differences in performance between organizations* "[22].

Something which is very beneficial for the analysis of the importance of benchmarking for the public sector is the view of the New Institutional Economics and Resource Dependence Theory, which argues that organizational behavior is affected by various kinds of pressures from the institutional environment, for example, governments, professional groups, interest groups and the general public. The New Institutional Economic theory, in particular, its application in sociology emphasizes the need to comply with external regulations. Resource Dependence Theory, by contrast, asserts that organizations are dependent on resources. Power and resource dependency are closely interrelated and organizations have the opportunity to influence their surroundings. Institutions can, therefore, react to the pressure of the external environment by conforming their behavior, which means making efforts to achieve the standards defined by the external environment, or by non-conformist behavior, which means conflict among institutional rules. From an institutional environment there are ensuing barriers for the implementation of benchmarking which, are specifically, efforts to maintain authority that is manifested purely by the formal implementation of benchmarking, or a focus on the demonstration of "good enough". It is even possible to be identified in the efforts to maintain budget authority, as well as, the prestige of the public offices. Responsible officials and politicians are not interested in disclosing information regarding the results of benchmarking and may hinder the implementation of the results. An effort at rent seeking can also be considered to be a barrier [20], [12]. Rent seeking occurs in organizations that are operating in a monopolistic environment and is the creation of restrictions preventing competitors from having access to the sector. For rent seeking, we can also consider such administrative actions to be in a static equilibrium model equivalent to the imposition of a blanket tax therefore causing a transfer of the surplus from consumers and producers toward selected groups. The utility function of consumers does not enter into. The cost of this measure and may often be greater than the actual transfer of the surplus. They therefore spend inefficiently.

Another problem related to the use of benchmarking as a tool for performance measurement in the public sector stems from the very nature of any performance measurement. In this sense, the authors introduce [23] the notion of a performance paradox in the public sector. *"A performance paradox describes a weak correlation between the performance indicator and performance alone"*[23]. This paradox is caused by the tendency of performance indicators over time to lose their predictive value. Due to this fact it is difficult to distinguish between good performance and bad organizations. There is also a difference between the actual and reported performance.

Benchmarking can be considered a tool that can very effectively measure the efficiency of the public sector, which maximizes the functional effects and minimizes the dysfunctional effects. Benchmarking in the public sector has applications to provide an objective examination of procedures, methods and systems in ensuring the production of public goods and services partially or fully financed from public sources. This method also helps to evaluate the quality of publicly provided services especially in an environment where there are no defined standards of quality[10]. *"Implementation of this method to the system of public management contributes to the development of a competitive environment not only in the public sector, but also between public authorities and private institutions in providing public services"*[10]. *"Despite the high potential of benchmarking it is not used regularly and correctly due to implementation barriers, which are primarily the lack of accountability, rent seeking and an inefficient system of public service"*[11].

### 1.1 Benchmarking in Higher Education

The growth of benchmarking in higher education reflects the pressure on the continuous improvement of quality, the pressure on performance improvement and the increased diversity in higher education [2], but also a change in national policy on education, for example The Bologna process and the need for the efficient evaluation of public policies in the field of education. The fundamental affect also has moved to a mass-oriented education system in

different countries, the globalization of education systems and the resulting increased competition in the industry. Last but not least, the increased influence of universities themselves, which have become major players in the global economy. Benchmarking in some of its implicit forms has always been a part of performance management in universities, such as various forms of peer review or peer review sites, all these activities can be seen as some form of benchmarking. But what is the real essence of the explicit formalization process of benchmarking is a structured comparison. Burquel, Van Vught also note that so far there is no comprehensive theory concerning the application of benchmarking in higher education. Most of the concepts are taken from other industries and adapted to the needs of a particular application.

Even foreign literature describes this issue in some depth. Through our research we identified approximately 165 publications dealing with benchmarking in higher education, they can be sorted in following way: 122 scientific papers, 14 monographs, 2 proceedings, 27 audit reports and manuals. For our study, following sources are the most important [19], [24], [7], [1].

Another important source of information is the methodology for the implementation of benchmarking as well as audit reports concerning the implementation of this tool in the management of universities [9], [19], [6], [4] and [5].

The above publications offer the following definitions of benchmarking, which are very similar to the definitions that we have stated in the section describing benchmarking from the general view.

The publication NQA[3] defines benchmarking in universities as follows: "*Benchmarking is a learning process, whose basic assumptions are trust, understanding, selection and adaptation of good practice for the purpose of self-improvement.*"

The European Centre for Strategic Management of Universities uses the following definition of benchmarking: "*Benchmarking is an internal process, which aims to increase organizational performance through learning about how to improve keyword or ancillary processes from organizations with better.*" [4]

The implementation of benchmarking in the field of university education often faces barriers to implementation, which often result from the nature of the sector, or its specifics. The European Centre for Strategic Management of Universities in its publication University Benchmarking Handbook [6] defines these 5 main implementation barriers to benchmarking as: 1) Lack of a comprehensive theory regarding benchmarking in higher education 2) The university is a comprehensive institution with a large degree of variability between individual institutions, as measured for example by sizes, missions, profiles, or in the intermediate, where it is located. It should also be noted that universities are heterogeneous even within individual institutions, ie. consisting mostly of several faculties with different emphasis, sizes and performance. 3) Most universities operate in a quasimarket environment, among universities, thus, there is relatively strong competition. It is necessary to take into consideration the relatively large control by the central authorities. 4) Universities traditionally do not focus on professional management, ie. instead of the description and management of individual descriptions, they emphasize their traditional functions, ie. teaching, research, etc. Traditional functions, however, cover a very small part of the processes that take place within the university, and which should meet the needs of key stakeholders. 5) Universities have a different strategic orientation, which predetermines interest in a particular field of process improvement and performance measurement.

To overcome implementation barriers should be properly implemented by to bring organizations according to ESMU the following benefits: better understanding of the processes, new ideas, improved reputation, obtaining data for effective decision making, self assessment institutions, possibility for quick comparisons with other countries, setting standards, setting goals for improvement, and strengthening institutional identity.

The aim of this article is to analyse the results of a survey among selected academic staff at economically oriented universities in order to identify and describe the differences in the perception of benchmarking, the strengths and weaknesses of benchmarking and the barriers to

implementation for the use of benchmarking in higher education. The results are compared with existing theories and research.

## 2 Material and Methods

The main method used is an analysis of the results of a survey. The questionnaire survey was performed using electronic questionnaires. The target group of the survey was the management of public, state and private tertiary institutions providing economic education. Academics who were approached were from the position of dean, vice-dean, and secretary of individual economic faculties of universities. The main objective of the survey was to map the existing experience with benchmarking in the field of higher education. The survey lasted a month and 22 economic faculties of public universities were contacted, 1 faculty of a state university and 22 private universities. The questionnaire contained 24 questions. In total 146 academics were polled. The survey was filled out by 41 academics, the return rate of the questionnaire was 28.08%. At a 95% level of influence, the margin of error was calculated at 13.02%. The relatively large value of the margin of error is the weak part of this study. For verification of the reliability of the answers we count the Cronbach's alpha. There was utilized Pearson's chi-square test and two proportion test as additional analytical instruments. Selected results are compared with research of the European Centre of Strategic Management of Universities (in the following text ESMU).

## 3 Results and Discussion

In the first question, we examined the perception of benchmarking among the academic functionaries, 62.5% of respondents consider benchmarking as a continuous process involving others in collaboration and an exchange of information in order to improve their processes and mutual learning. The remaining 37.5% perceived it as an internal benchmarking tool for comparison with the competition. From these respondents the definition of benchmarking did not include an emphasis on continuity and their own process improvement. This situation can be explained by the low degree of formalization of the benchmarking process and the inconsistency between the concepts of benchmarking. The research by the ESMU also pointed to a lack of theoretical foundations [5]. According the p value of Pearson's chi square test we can note that the perceptions of benchmarking are not dependent on type of school (public vs private, p value 0.414), or positions of respondents (p value 0.195).

One very positive thing we can consider is the fact that not a single respondent considers benchmarking a tool for defending their own performance before a superior authority. In the benchmarking theory, this situation is called the "*Good Enough*" [17], and is also a characteristic in the Czech environment, where we record this usage, for example, in the municipal environment[17].

In the next issue we tried to identify the benefits of benchmarking in terms of individual respondents and the respondents level of agreement with the present statement. The results have shown the following:

**Table 1. Benefits of benchmarking in terms of academic administration**

Statement	Strongly Agree	Somewhat Agree	Not Sure	Somewhat Disagree	Strongly Disagree
Identification of own position	57.50%	42.50%			
Process Improvement and Performance	32.50%	57.50%	2.50%	2.50%	5%
Mutual learning	27.50%	42.50%	17.50%	2.50%	10%
Setting goals	20%	60%	12.50%	20%	7.50%
Allocation of responsibility	15%	45%	5%	17.50%	5%
Mapping own processes	37.50%	35%	5%	17.50%	5%
Cost savings	5%	17.50%	20%	37.50%	20%
Stimulation of changes	15%	67.50%	5%	5%	7.5%
Establishing cooperation	10%	30%	15%	25%	20%
Identification of best practices	25%	42.50%	15%	10%	7.50%

Source: Authors

Cronbach's alpha range of responses within this question is 0.79, thus it can be considered to be sufficiently producing reliable answers. The greatest degree of agreement was achieved by the claim that the benefit of benchmarking is to identify one's own position, which is in contradiction with previous results. The respondents deem benchmarking as a tool for continuous improvement, but the biggest benefit for them is the identification of their own position. Improvement is only the secondary. An important benefit identified by respondents was considered to be mutual learning. These benefits can be identified as the so-called ancient benefits [16], these benefits have also been frequently reported in research according to ESMU[5]. In contrast, relatively few respondents identified with the so-called Benchmarking new benefits [16], which may indicate the activity focused on networking and cooperation, transparency and internal dialogue. A separate chapter covers the cost savings in other areas, for example municipalities found this benefit to be very significant[17], while in tertiary institutions benchmarking the main objective is saving costs avoided according to ESMU [5].

In the next issue, we attempted to identify weaknesses in benchmarking. Respondents expressed their level of agreement with the present statement. The results are shown in the following table:

**Table 2. Weaknesses of benchmarking from the perspective of academic officials**

Statement	Strongly Agree	Somewhat Agree	Not Sure	Somewhat Disagree	Strongly Disagree
The high cost	7.50%	22.50%	15%	35%	17.5%
The uncertain outcome	10%	30%	15%	30%	15%
Duration	12.50%	57.50%	2.50%	22.50%	5%
The low efficiency	5%	37.50%	12.50%	30%	15%
The necessity of gathering large amounts of data	17.50%	37.50%	5%	32.50%	7.50%
Demanding implementation	15%	40%	7.50%	30%	5%
Strong emphasis on Qualitative indicators	10%	32.50%	7.50%	37.50%	12.50%

Source: Authors

Cronbach's alpha range of responses within this question is 0.75, thus can be considered as sufficiently produce reliable answers. Most respondents agreed with the statement that the weaknesses of benchmarking are large time demands, the need for collecting large amounts of

data and complex implementation These results do not differ from foreign experience according to ESMU[5] nor from the experience described in the municipalities in the Czech Republic [17].

The aim of the last question was to identify the barriers to implementation of benchmarking in colleges of economics in the Czech Republic. Respondents expressed again a level of agreement with the present statement. The results are shown in the following table:

**Table 3. Barriers of benchmarking from the perspective of academic officials**

Statement	Strongly Agree	Somewhat Agree	Not Sure	Somewhat Disagree	Strongly Disagree
Lack of information on benchmarking	7.50%	37.50%	5%	27.50%	22.50%
Distrust of management	0	20%	7.50%	47.50%	25%
Lack of financial resources	0	37.50%	7.50%	40%	15%
Lack of human resources	10%	52.50%	7.50%	22.50%	7.50%
Difficulties in obtaining data	25%	47.50%	7.50%	7.50%	12.50%
The difficulty in identifying a suitable partners	12.50%	27.50%	17.50%	30%	12.50%
Duration	25%	50%	7.50%	15%	2.50%
Lack of standardized procedures as well as methodologies	17.50%	40%	17.50%	17.50%	7.50%

Source: Authors

Cronbach's alpha range of responses within this question is 0.789, and thus can be considered as sufficiently producing reliable answers. In ESMU's survey, the results stated that the biggest implementation barriers are still the lack of information and comprehensive theory. We use the two proportion test to prove it in Czech case. The P value (0.139) shows that the proportion of respondents which consider the lack of information and lack of standardized procedures and methodologies as an implementation barrier are not statistically significantly greater than in other items. These results are interesting in context with the results of the first question. Although the respondents do not deem the lack a theoretical foundation as a barrier, 37,5% of them consider benchmarking only as a tool for making comparisons with competitors. This definition is not coherent to actual theory.

Respondents consider the lack of human resources, difficulties in obtaining data, time consumption to be the most important. This could be explained by the situation where members of the benchmarking team have its time capacity in addition to the project itself allocated to other activities such as research as well as teaching. Another important barrier identified by the respondents was the reported difficulties in obtaining data. Universities operate in quasimarket environment [4] and therefore are reluctant to provide their internal data. Abroad, this problem is solved by benchmarking initiatives, for example NACUBO, HESA. For positive findings, we can perceive that a distrust of management is not considered to be an implementation barrier, which may explain the fact that the management of universities is aware of the importance of benchmarking.

#### 4 Conclusion

The article describes the experience of academic officials regarding benchmarking in tertiary institution economics. Survey respondents have a fairly clear idea about benchmarking and their perceptions of benchmarking are not influenced by the type of school or position of the respondents. Despite this fact, there still a large proportion of respondents, whose interest is directed only on comparisons with competitors, not at improving processes. This approach is not coherent with actual benchmarking theory in higher education and foreign cases. Among the

benefits the so-called Benchmarking new benefits were mentioned less often, which are seen in the research results of more developed countries such as Sweden and Denmark [16]. The weaknesses of benchmarking have been reported in that it is time-consuming, and problematic regarding implementation because of the need to collect large amounts of data. In comparison with ESMU results, in order to identify barriers we show that our respondents do not consider the lack of information, the lack standardized procedures and methodologies as a main problem.

We can therefore conclude that academic officials realize the importance of benchmarking. The benchmarking process, however, has not been fully formalized in most workplaces. For successful implementation, however, there is a lack of a coherent theoretical framework [5], [2]. The limiting factor is also the quasimarket environment, in which the university operates, which is seen in the unwillingness to share data. For these reasons it is necessary to underline the role of the Ministry of Education, which could initiate and moderate greater cooperation in the field of benchmarking among universities. The ministry has conducted the IPM Quality program and is currently conducting the Kredo program focused on the strategic management of universities. The outcome of this project should be an information portal focused on universities and on university governance, which could be modeled after international initiatives such as HESA or NACUBO published indicators, and benchmarking data. Another possibility is to establish benchmarking as compulsory tool for public and state universities.

For further research it is important to find the most effective way how to motivate universities to cooperate in collaborative benchmarking and develop models which are suitable for the Czech case.

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# Stakeholders and Corporate Social Responsibility in Tertiary Education: The University's Perspective

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## Abstract

Community partnership and social responsibility are a growing trend around the world but quite a new phenomenon in the tertiary education. Social, educational and research performance of universities influence the quality of life of local and global community. Universities developed educational programs and courses in corporate social responsibility, but devoted little attention to this area. The aim of this article is to explore social responsibility not from the organization's perspective, but from the university's perspective. In the face of the growing interest in corporate social responsibility and stakeholders, this paper analyses connection between university stakeholders and social responsibility activities of universities. Results of the research show that universities include social responsibility activities mainly to their mission statements, but the marketing communication of social responsibility activities toward key internal and external stakeholders is very weak.

*Keywords:* stakeholder; corporate social responsibility; university

JEL Classification: I29, M39

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## 1 Introduction

Today competitive environment of tertiary education brings lots of challenges to universities. Universities have to focus on satisfying their customers and many stakeholder groups. Customer satisfaction, public opinion etc. are very often connected with corporate social responsibility of the organizations. Common strategies of conventional universities focus on using a diverse portfolio of varying study programs through modern channels of delivery, hence in a competitive and rapidly changing environment it is necessary to look at different ways and possibilities of attracting key stakeholder groups. One of these ways is effective corporate social responsibility (further only CSR). CSR has been treated mainly as a corporate issue connected with the profit sector and management perspectives. These days not only a profit sector, but a non-profit sector, too has to face lots of requirements of variety external stakeholder groups. Stakeholders are more and more involved in CSR activities [22], [6]. Based on the researches of McKinsey Company it is evident that a large number of executives believe that CSR contributes to stakeholder value and builds strong reputation [9].

The fact that lots of existing CSR researches and studies primarily deal with profit and mainly product-based industries makes this article topical. Universities have considerably changed in recent years. These changes reflect their position in social, political and economic life. Since universities are recognized as one of the most prominent social actors, they start to focus on social responsibility (further on SR) activities, too. There are not many authors focusing on SR of non-profit organizations and even fewer authors deal with SR of universities. Vidal and Torres developed a model of SR of non-profit organizations that is based on the coherence of seven main areas [30] - people within the organization, stakeholders, values and mission, environmental management, transparency, communication and social involvement.

This article builds on the author's research concerning mapping of stakeholders of universities that was published in the article Application of power-interest matrix and influence-attitude matrix in stakeholder mapping of universities and focuses on the interconnection of CSR and key stakeholder groups.



## *1.1 Theoretical Background*

The evolution of the CSR concept dates back to the 1950s [11]. The first definitions were established in the 1960s and 1970s and first researches were performed in the 1980s. In spite of the fact that researches and literature have been dealing with CSR for more than 50 years, the clear and accepted definition is still developing [1] and comparative studies of CSR are relatively rare as contrasted with other fields. The field of empirical research of CSR is affected by a lack of a consistent construct and CSR definitions [31]. These problems (lack of consistent construct, lack of consistency of definitions of CSR) make it very difficult to compare and evaluate findings of researches because different authors refer to different CSR definitions and dimensions of CSR.

Bowen defines CSR as “the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society” [2]. This is one of the first definitions of CSR that was first published in 1953. CSR can be defined for example as “actions that appear to further some social good, beyond the interest of the firms and that which is required by law”, too [21]. There are lots of dimensions of CSR [12], [6], [7], [16]: economic, ethical, philanthropic, social, environmental, legal, stakeholder, etc. The concept of CSR used by the author reflects all dimensions of CSR mentioned above. For a detailed analysis the author will also use the CSR concept based on the framework that was developed by Carroll. This concept defines CSR as social obligations towards stakeholders and proposed four dimensions of CSR [6] - economic, legal, ethical and philanthropic. Carroll defines CSR in several ways – one of these definitions is through CSR's dimensions – “The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time” [5].

The economic dimension of CSR is connected with product, product quality, price fairness, jobs, competitiveness, operational efficiency, profitability, etc. [6], [15]. The ethical dimension of CSR is measured in terms of ethical, social and moral standards, norms and expectations [10], [16]. The legal dimension of CSR is based on regulations and laws (Carroll 1999) and the philanthropic dimension of CSR is based on the charitable and philanthropic expectations of society and customers [6], [17].

## *1.2 Stakeholders Perception of CSR*

CSR is a concept that is closely connected with stakeholders. In the 1980s and 1990s first alternative theories of CSR concerning stakeholder theory and business ethics began to mature [7]. Effective CSR activities aim to satisfy all stakeholders [8]. Nevertheless, the lack of sufficiently sophisticated and adequate support for models explaining CSR activities led to developing and expansion of framework for predicting CSR on a stakeholder theory [26]. A comprehensive framework of CSR that describes main factors, issues, drivers, strategies and stakeholders of CSR was developed mainly on the work done by Wood, Wartick and Cochran and Carroll [19].

The Stakeholder theory proposed that CSR should consider the interests of all stakeholders not only customers – that is employees, suppliers, shareholders, owners, public groups, government, community, etc. Freeman's idea of the stakeholder theory provides an important link between stakeholder management and CSR. Freeman categorized the stakeholder concept into three models – business policy model, corporate planning model and CSR model for stakeholder management. The CSR model for stakeholder management discusses stakeholder influence on organizations and includes external stakeholder influence that may result in an adversarial position [14]. Ullmann developed a conceptual model of CSR activities based on the Freeman's CSR model for stakeholder management and studied CSR activities in a stakeholder framework [26].

Interconnection between stakeholder management and CSR is clear from several definitions of CSR, too. For example, Brown and Dacin define CSR as “a company's activities and status related to its perceived societal or stakeholder obligations” [3]. Ruf uses CSR as an equivalent to „meeting the demands of multiple stakeholders“ [27]. Stakeholders are the first

concern of management and marketing of any organization. Any organization both, profit and non-profit, have to identify and analyze their key stakeholders to be successful. After identification of key stakeholders it is necessary to identify their demands, interest, needs, expectations as well as social problems [1]. McWilliams and Siegel claim that stakeholders (employees, suppliers, customer, etc.) encouraged firms to undertake investments in the field of CSR [20].

In the stakeholders perception of CSR a detailed analysis of stakeholders is important, it can be based on several types of matrixes composed of several attributes of stakeholders – for example influence, support, legitimacy, power, interest, attitude, etc. [25], [23], [4], [13]. Maignan and Ferrell propose to expand CSR activities beyond customers to include all key stakeholder groups through bundling together various different CSR initiatives. It has become evident that CSR programs help to achieve long-term benefits of increased employers' motivation, loyalty of customers and brand [18].

### *1.3 Social Responsibility and Universities*

This article focuses on the social responsibility in the tertiary education, where the SR concept is not yet fully exploited. Vasilescu pointed out that SR has increasingly been recognized as an important part of the tertiary education system [29]. The concept of social responsibility of universities was first mentioned in the OECD document "Higher education and regions". OECD (2007) focuses on the contribution of universities to regional development in three areas:

- economic development,
- development of human capital,
- social, cultural and environmental development.

SR of universities is based on ethical concepts of universities that correspond with satisfying the needs of stakeholders. SR of universities can be defined as "reflected in the need to strengthen responsibility and active citizenship and in ethical approach and volunteering by encouraging students and academic staff to provide social services to community" [29].

## **2 Material and Methods**

This article focuses on the interconnection between stakeholders and SR of universities. The aim of this article is to analyze CSR in tertiary education, to identify the main SR dimensions of higher education institutions and on the basis of the above chosen approach Carrol identifies main dimensions of SR for different groups of stakeholders.

For the author analysis primary and secondary data will be used. In order to investigate SR and the relationship between SR and stakeholders of universities at the Czech market of tertiary education, the present study initially selected ten public and ten private universities in the Czech Republic. The author used desk research for identification of key dimensions of SR of selected universities. The author analyzed web sites of universities, internal documents, press releases, etc. in the desk research. The author analyzed more than 100 documents concerning SR of selected universities. Secondary research focused on the identification of key dimensions of SR from these documents and websites and communication of SR with key stakeholders of universities. SR dimensions were identified on the basis of content analysis of different documents.

Primary research was based on interviews and questionnaires carried out with representatives from the selected universities (from marketing departments, or vice-rectors for external relations). To determine the selection of the sample a combination of design techniques, a quasi-representative method was used. In the field of quasi-representative techniques quota sampling was used, which was combined with a judgmental selection, since data on stakeholder are considered sensitive and previous researches clearly showed that for this reason some universities will not be willing to participate in our research.

Respondents were asked to identify key SR dimensions for each stakeholder group based on their professional judgment. Respondents received a questionnaire, in which they were asked to assign particular SR dimensions to various groups of stakeholders.

The concept of SR used by the author is based on the combination framework developed by Carroll that defined CSR as social obligations towards stakeholders and proposed four dimensions of CSR – economic, legal, ethical and philanthropic [6], [16] and other important dimensions of SR and dimension of SR typical for universities – for example pedagogical, scientific, etc. The author added the stakeholder dimension of the CSR, too, since the article focuses on the interconnection of CSR and stakeholders.

As input data for our stakeholder analysis the data from previous author's research focusing on the stakeholder mapping of universities are used [28]. Stakeholder mapping is used as a fundamental tool for understanding the stakeholder's community and stakeholder analysis. A number of diverse approaches to stakeholder mapping can be found in theory. In this research two methods were used – the power-interest matrix and the influence-attitude matrix. The power-interest matrix is used in order to identify ten most important stakeholder groups, on which the Carrol approach will be applied and individual SR dimensions for these stakeholder groups will be determined. On the basis of the influence-attitude matrix ten most important stakeholder groups will be divided into three groups – indifferent, supportive and opposite.

From this research ten most important stakeholder groups based on the assigned priority will be used for further analysis. These stakeholder groups are: prospective students, current students, the media, The Accreditation Commission of the Czech Republic, competitors, employees, Ministry of Education, Youth and Sports, management, alumni and grant organizations.

The author's primary research focuses on these stakeholder groups and their connection to the CSR activities of universities. The methodology used for the research and main research problems are summarized and described in the following steps:

1. Identification of 10 key stakeholders for universities based on the power-interest matrix.
2. Identification of SR activities of selected universities and their communication.
3. Statistical analysis – correlation between the type of university and a number of SR dimensions identified – based on the desk research.
4. Questionnaire - identification of key dimensions of SR for each stakeholder group.
5. Identification of stakeholder attitude.

### **3 Results and Discussion**

The research sample involved ten private and ten public universities. The author analyzed websites of all universities and more than five internal documents and press releases for each university. The most important source of information was university websites and their annual reports. Since all universities considered information of their stakeholders as sensitive data, the names of universities will be replaced by numbers. The following table summarizes the results of the author's desk research.

**Table 1. Summary of desk research**

Number	Type	SR section on www	SR in press release	SR in mission	SR in annual report	SR courses	dimension of SR (concept of Carroll)					Other dimensions of SR					total number of identified dimensions
							Economic	Legal	Ethical	Philanthropic	Social	Environmental	Stakeholder	Volunteer	Scientific	Pedagogical	
1	Public	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7	
2	Public			✓	✓	✓	✓		✓	✓		✓		✓		5	
3	Public		✓	✓	✓	✓	✓		✓	✓	✓	✓				5	
4	Public		✓	✓	✓	✓			✓	✓	✓			✓	✓	5	
5	Public			✓	✓	✓			✓		✓					2	
6	Public			✓	✓	✓			✓		✓	✓			✓	5	
7	Public		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	9	
8	Public				✓	✓					✓				✓	2	
9	Public			✓	✓	✓	✓		✓		✓				✓	3	
10	Public			✓	✓	✓			✓	✓		✓			✓	4	
11	Private		✓	✓		✓										1	
12	Private		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	9	
13	Private	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	7	
14	Private			✓		✓			✓	✓	✓		✓		✓	6	
15	Private	✓	✓	✓		✓										0	
16	Private					✓	✓		✓	✓	✓		✓	✓		6	
17	Private				✓	✓									✓	1	
18	Private		✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	6	
19	Private		✓	✓	✓	✓	✓			✓	✓				✓	4	
20	Private				✓	✓	✓			✓		✓		✓		4	

Source: Author

As can be seen from Table 1 only one public and two private universities have an SR section on their websites. Nine universities (6 private and 5 public) communicate their SR activities in press release. Most of the universities (80% of public and 70% of private universities of all respondents) include several dimensions of SR to their mission. The most cited dimensions of SR in universities' mission are ethical, scientific, pedagogical and social. 15 universities (90% of public and 60% of private) have some information of their SR activities in their annual reports. All of these universities have information on social, pedagogical and scientific dimension of SR activities in their annual reports. Lots of universities communicate their support for disadvantaged students and several universities claim to have activities in the area of environmental protectionism – for example waste sorting. Three public and four private universities are also interested in philanthropy and their students usually play an active role in these SR activities, too. The most frequently mentioned stakeholder groups to which SR activities are directed are employees, current students and alumni and two universities also mentioned communities at their websites. One university cooperates with a nonprofit government organization – People in Need and one university participates in SR activities connected with the program “Seahorse (Mořský koník)” with the biggest health insurance company in the Czech Republic - General Health Care Insurance Company (Všeobecná zdravotní pojišťovna).

Freeman found that there is a positive correlation between the number of stakeholders identified by managers and the hierarchical level of these managers [14]. The author is trying to discover whether the type of university (private or public) has affected the identification of SR

dimensions. The author will analyze whether there is any correlation between the type of university and the number of identified SR dimensions.

**Table 2. Correlation**

Correlation Coefficient	R-square	Standard Error of Est.
0.061	0,372%	2.587

Source: Author

Since the p-value is greater to 0.10; there is not a statistically significant relationship between the type of university and the number of identified dimensions of SR at the 90% or a higher confidence level. R-Squared statistics indicates that the model as fitted explains only 0.372% of variability in identified dimensions; therefore there is not a relationship between variables.

Table 3 summarized the results of primary research, interviews and questionnaires. For the analysis of identification of SR dimensions of each stakeholder group absolute frequency is used, since the author's research involved 10 public and 10 private universities.

**Table 3. Stakeholder-responsibility matrix**

Key stakeholder groups <sup>1)</sup>	Dimension of SR (concept of Carroll) (public/private)					Other dimensions of SR (public/private)					Attitude
	Economic	Legal	Ethical	Philanthropic	Social	Environmental	Stakeholder	volunteer	Scientific	pedagogical	
Prospective students	10/10	4/2	10/10	7/5	8/5	9/6	10/10	4/5	10/10	10/10	Indifferent
Current students	10/10	9/6	10/10	9/8	10/10	9/6	10/10	8/7	10/10	10/10	Support
Media	0/0	5/2	10/10	0/0	0/2	7/9	9/10	0/0	8/4	8/9	Opposite
Accreditation Commission Czech Republic	0/0	10/10	0/0	0/0	0/0	0/0	7/5	0/0	10/10	10/10	Opposite
Competitors	7/10	0/2	7/8	0/0	0/4	0/0	4/6	0/0	0/0	0/0	Opposite
Employees	10/10	10/10	9/10	5/6	10/10	8/9	7/5	10/8	0/0	0/0	Support
Ministry of Education, Youth and Sports	8/6	10/10	4/4	0/0	0/0	0/2	9/9	0/0	10/10	10/10	Indifferent
Management	10/10	10/10	8/9	2/0	8/7	4/8	4/9	0/0	0/0	0/0	Support
Alumni	0/0	0/0	8/6	0/0	0/0	4/5	9/9	2/4	8/7	8/7	Support
Grant organizations	10/8	4/6	6/4	0/0	0/0	0/0	5/4	0/0	10/8	2/4	Indifferent

Source: Author

<sup>1)</sup>Key stakeholder groups were identified on the basis of the power-interest matrix [28]

As can be seen from Table 3 a stakeholder dimension of SR was assigned to all key groups. The most important dimensions of SR are legal, ethical, economic, stakeholder and scientific and pedagogical. These dimensions of SR are closely connected with the mission of education. The social dimension was identified for students (both prospective and current) and employees and, partially, for the management. There are slight differences between answers of public and private universities. Indifferent stakeholders are groups that are least risky for schools providing higher education, they neither affect them nor show much interest in their activities, and therefore in terms of SR it is not necessary to focus a lot on these groups. Support groups are

groups that support schools of higher education and at the same time they may also affect them to some extent, and therefore it is necessary to properly communicate SR activities, which are of high importance to them. Opposite groups are negatively tuned to a particular school of higher education, and therefore they can have a negative impact on it, too.

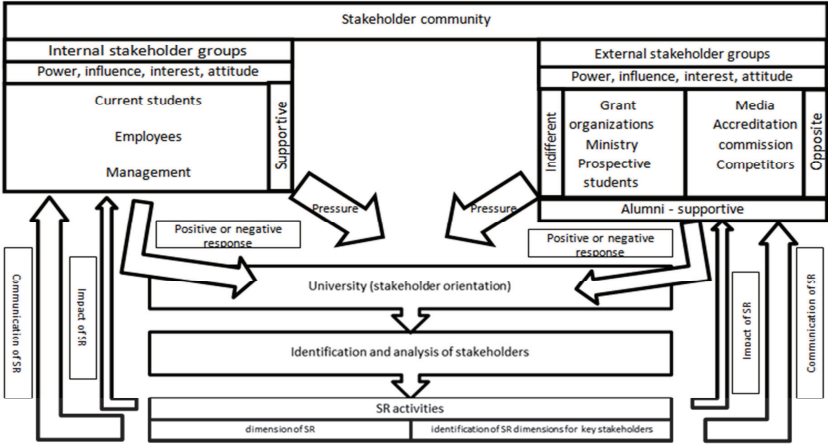
**4 Conclusion**

In the existing fierce competition it is necessary to look for opportunities to gain a competitive advantage over other universities. Nowadays, it is the CSR that is considered to be the area that often affects clients when deciding on products and services. Therefore, both public and private schools of higher education should not ignore this area.

Based on the author’s research it can be stated that lots of universities started to integrate CSR in their activities. Several universities in the research sample declared adoption of the Principles for Responsible Management Education that are connected with all stakeholders and include purpose, values, method, research, partnership and dialogue. In spite of the fact that all universities involved in the research sample offer courses on CSR to their students; only three universities have an SR section on their websites and nine universities mentioned SR activities in press release. Nearly all universities involved several dimensions of SR into their mission, vision or code of ethics. Nevertheless, the marketing communication support of SR activities is very weak for internal as well as external stakeholder groups. Mission statement and visions of universities usually involve pedagogical and scientific dimensions of SR, codes of ethics, an ethical dimension of SR and the annual reports mention the social or philanthropic dimension at most. Concerning ecology, the most universities focus on activities in the field of waste sorting. None of selected universities communicates this activity to its stakeholders.

Marketing communication of SR activities is very important, since this communication can recall a positive or negative response from stakeholder groups and a well-designed marketing communication campaign can influence the image of universities. The scheme of interconnection of stakeholders and CSR activities and the whole process has been summarized in the following figure.

**Figure 1. Interconnection of SR and stakeholders at university**



Source: Author

The above the line scheme shows the connection of SR activities with the community of stakeholders, which is very important to all universities. The scheme shows the fundamental impact of stakeholders' groups on university and vice versa the impacts of SR activities on different stakeholders' groups. Based on the author's research all internal stakeholder groups have supportive attitude to university, therefore it is more important to focus on the marketing communication to external stakeholder groups that are mainly indifferent or opposite to universities with the aim to change their attitude to indifferent or supportive.

This marketing research focused on the SR activities and SR dimensions of key stakeholder groups from the universities' perspective. None of the universities in our research sample conducted any research of SR from the stakeholders' perspective. Therefore the next author's research will focus on the SR activities from the stakeholders' point of view and the aim of this research will be identification of the key SR dimension influencing stakeholders. For further research the author selected two stakeholder groups – current students and employees.

The aim of the follow-up research is to reveal how important SR activities are for a selected group of stakeholders and their decision to use the services of universities (in the case of students) and how important they are to employees as such in terms of job satisfaction and selection of a potential employer. The outputs of that research will be compared with the outputs presented in this article and will lead to creation of appropriate SR activities for different groups of stakeholders and their communication to these groups.

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# Challenges of the Mixed-Method Ecosystem Service Research

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## Abstract

Ecosystem services are widely explored within the current socio-ecologic research. The promoted interdisciplinary of this research demands for the deeper combination of different types of methods. Within the paper, we combine the choice experiment method and the IAD Framework in order to show how the robustness of policy recommendations and their acceptance could be increased in comparison with their isolated applications. We apply both the methods in the territory of the Eastern Ore Mountains in the Czech Republic. The goal of the field research is to find ways of more sustainable management of small-scale ecosystems, such as mountain meadows, streams and clearance cairns. Based on this case study, it was confirmed that preference calculations regarding aesthetic values of ecosystems need to be complemented with facts about institutional settings and barriers in order to better address locally relevant recommendations for decision-makers.

*Keywords:* mixed-method research; IAD framework; choice experiment; ecosystem services

*JEL Classification:* H23; Q26; Q51

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## 1 Introduction

The concept of ecosystem services has dominated the agenda of the socio-ecologic research over the past decade. Among many others, Boyd and Banzhaf [4] understand ecosystem services as components of nature, directly enjoyed, consumed, or used to yield human well-being (cited in [5]). The concept is viewed as interdisciplinary, bringing together natural and social scientists and requiring the combination of various research methods to reach meaningful results.

Combination of multiple research methods in order to properly address complex environmental problems has been advocated by numerous scholars ([1], [15] and [20] among many others). Generally, the feature has been surveyed within the fields of economics [23] and sociology and psychology [7]. The debate is traditionally centered on the complementarities of quantitative and qualitative research methods [14].

However, the conscious mixed-method environmental research is rarely applied in research practice and if so, the qualitative method often represents just a supplementary tool for verification of quantitative results. This is, for instance, the case of Powe et al. [21], who use post-questionnaire focus-group analysis to increase the relevance of stated preferences revealed through the choice experiment method. A similar approach was taken by Clark et al. [9], except using the contingent valuation method. Contrarily, Ahlheim et al. [1] used so-called Citizen Expert Groups for the survey design to justify the contingent valuation method undertaken via mail.

Within our paper we advocate benefits of mixed-method environmental research and we apply a quantitative and qualitative method in combination without declared superiority of one method over another. We try to show what is the value added of the mixed-method application regarding the formulation of final environmental policy recommendations. In particular, we combine the choice experiment and Institutional Analysis and Development Framework (further referred as IAD Framework) in order to describe and solve problems with natural resource mismanagement in Eastern Ore Mountains in the Czech Republic.

## 2 Material and Methods

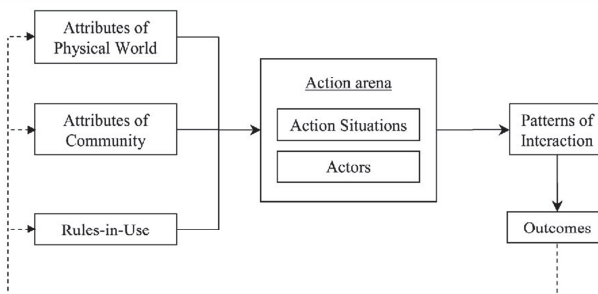
The choice experiment method is used for the economic valuation of natural resources. Currently, it represents the most reliable stated preference method [3] and it is widely applied to numerous environmental issues by both environmental and ecological economists (see, e.g., [8], [10] among many others). It makes a respondent to repetitively choose among sets of alternatives within which levels of attributes are changed. Discrete choice models are used for the choice experiment data analysis.

Regarding the theoretical background of the method, discrete choice modeling complies with Lancaster's approach to the individual utility maximization problem in consumer theory and with the random utility theory. The random utility theory then postulates that utility is a latent construct that exists in the consumer's mind and cannot be observed directly. It further assumes that this latent utility can be partitioned into two components: a systematic or representative utility ( $V$ ) and a random, unexplainable component ( $\varepsilon$ ). This random component arises from the randomness in the individuals' preferences and the attributes do not cover all of the individuals' preferences.

If we consider random sampling of the respondents, then  $\varepsilon$  can be interpreted as a random term. Because of this random component, the problem is inherently stochastic and an individual's preferences cannot be understood perfectly. It naturally leads to formulation of expressions for probability of choice. Based on repeated observations of choices, one can examine how the levels of various attributes affect the probability of choice. Furthermore, the random utility theory assumes a utility maximization principle, i.e., if an individual chooses one alternative over another, then the utility from the chosen alternative is greater than that from the unselected alternative. According to this theory, the decision-maker will choose the alternative that provides the greatest utility  $U$ , so that the individual  $i$  chooses the alternative  $j$  among  $n$  alternatives if and only if  $U_{ij} = V_{ij} + \varepsilon_{ij}$ . The derived estimates of the model parameters are used to calculate the willingness to pay (WTP) caused by different levels of attributes (see e.g. [24] or [26] for further specification).

The IAD framework is applied in order to homogeneously analyze empirical data of different natural resource problems and to enable comparability of particular case study results. It is focused on the analysis of institutions, in particular different types of rules and external factors that drive the behavior of resource users [12], [17]. The description of the analyzed situation fills the standardized set of categories (see figure 1).

Figure 1. IAD Framework scheme



Source: [6, 18]

Subject of analysis are *common-pool resources* (CPR), also called a common property resource. CPR is a type of good consisting of a natural or human-made resource system (e.g. an irrigation system or fishing grounds), whose size or characteristics makes it costly, but not impossible, to exclude potential beneficiaries from obtaining benefits from its use. IAD

Framework is used to schematically describe both - the resource (bio-physical) and the institutional (social) situation – that together constitutes the essence of the (potential) environmental problem. The key unit of analysis is the *action arena* that contains *actors* and their mutual *interactions*. An example might be the community living around the lake (where problem is e.g. the eutrophication of the lake). We search for the identification of *context factors* that influence the individual and group behavior. Further, we define *patterns of interaction* (people with the resource, people themselves) and their outputs.

Both described methods are applied in the territory of Eastern Ore Mountains that is situated in the northern part of the Czech Republic. Our field research was designed in order to solve *problems with mismanagement* of valuable small-scale ecosystems situated in mountains. Ecosystems in focus were mountain meadows, mountain streams and so-called “clearance cairns”. These cairns are strips 2-4 meters wide and 1 meter tall that historically arose in the 18<sup>th</sup> and 19<sup>th</sup> centuries as stones were shifted away from fields. The ecological quality (but also aesthetic beauty) of small-scale ecosystems mentioned above is dependent on regular management, such as grass mowing (often with scythes) and clearing of the cairns. Channelized mountain streams need to be renaturalized. Therefore, financial resources and/or peoples’ goodwill are needed to support management practices to increase the mountain biodiversity. Eastern Ore Mountains are not subject of the nature protection as a whole, but there are numerous natural reserves and other kinds of protected places.

Our goal was to capture the *preferences and attitudes* of local people and tourists toward small-scale ecosystems and (based on research results) to form recommendation for their more sustainable management. Within this paper we present results of the field research, but we also discuss methodological challenges of the mixed method-research.

### 3 Results and Discussion

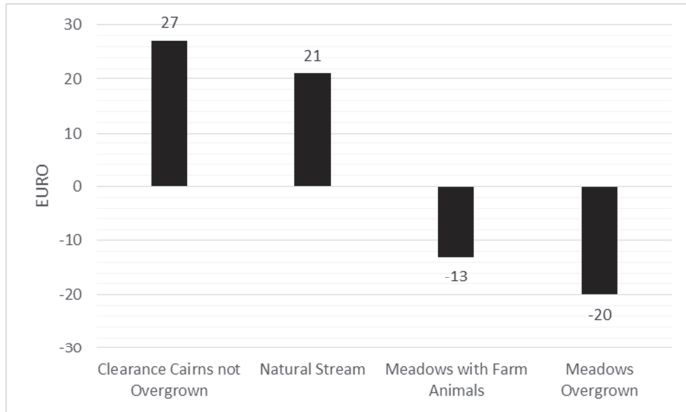
Within the choice experiment application, answers of 214 respondents were captured. They were visitors interviewed on crucial tourist points in mountains. Respondents chose among different sets of alternatives that included:

- a) travel costs people are willing to spend to get to a particular site (one-way/per strip/per person),
- b) attributes of a particular site represented by combination of 3 pictures: mountain meadows (in blossom, with cows, overgrown), clearance cairns (maintained, overgrown), mountain streams (with natural channels, with regulated channels).

At first, different types of ecosystems and their possible shapes were introduced to respondents. Then, they were asked to imagine that they are at home and deciding where to go for a weekend trip to the mountains. They had several alternatives that differed only in terms of the shape of the ecosystems discussed and, of course, the distance to the site (and therefore the cost of transportation). Each respondent was then asked to make a choice among three possible alternatives: Site 1 (described with particular ecosystem shapes and travel cost), Site 2 (described with different ecosystem shapes and travel cost) and the opt-out option. The opt-out option was presented as choosing neither of the possibilities offered. Each respondent made nine decisions in a row, based on changing specifications of Site 1 and Site 2.

The *multinomial logit model* was used for the purpose of data analysis (see [25] for the full model performance). The subsequent calculation of WTP caused by attribute level changes brought following results (see figure 2).

**Figure 2. Marginal willingness to pay for the attribute change (in €/one-way trip/person)**



Source: Authors

Legend: Respondents indicated WTP in Czech crowns (CZK); the value was converted to Euros for the purpose of the paper (1€ = 28 CZK).

Results show that visitors are willing to pay € 27 per weekend trip more to see maintained clearance cairns (in comparison to overgrown clearance cairns). Similarly, they are willing to pay additional € 21 to see streams with natural channels instead of regulated streams. Contrarily, their WTP is € -20 if mountain meadows are overgrown without flowers in blossom. The survey data analysis clearly showed that respondents distinguish among different shapes of small-scale ecosystems. They prefer such shapes that are consistent with high fauna and flora diversity – i.e., regularly mown mountain meadows, maintained clearance cairns and mountain streams with natural channels.

The choice experiment results brought the evidence that small-scale ecosystems in the Eastern Ore Mountains should be managed so as to keep their high aesthetic (as well as ecological) value. Since there are many cases of mismanagement in the area (especially regarding the poor clearance cairns maintenance), the question is what institutional changes to adopt to reach better status that is in line with visitor preferences.

Traditionally, when positive WTP is revealed entrance fees or other economic instruments are proposed to gain financial resources for the ecosystem service provision [2]. Valuation studies in general help to promote user-pays or polluter-pays principles and enable to calculate the amount of particular payments [11], [22]. For the appropriate policy design, however, detailed knowledge about the socio-ecological system in focus needs to be gathered. Without it the new policy design can negatively interfere with (in-formal) institution-in-use and it can even deepen the mismanagement problem (for more evidence see [16]). Such information contains e. g.:

- history of ecosystem evolution and history of human settlement in the area (both usually evolve in close interaction),
- current socio-economic characteristics of the population (such as employment, voter preferences, but also including traditions and other sources of values),
- real attitudes of people toward ecosystems that are shaped by formal and in-formal institutions.

This type of knowledge represents external conditions within which the valuation technique is applied. The IAD Framework is one of approaches that help to capture such knowledge and to sort it out into categories. Within our case study, the information for the IAD Framework application was gathered through desk studies of available documents (acts of law,

management plans of nature reserves, regional yearbooks on nature protection, etc.), observations on a case site and interviews with open-ended questions made with key stakeholders (together 8 interviews with mayors, nature protectors and NGO representatives have been undertaken).

For the purpose of this paper, we do not present the full scale of the information gathered. We focus on two patterns of interactions revealed that, according to our opinion, directly influence the acceptance of potential policy reforms. Patterns of interactions are defined as repeated action situations – i.e., how different actors behave regarding ecosystems in focus and how they can influence their quality [12]. The following crucial patterns have been identified:

- **LOW PARTICIPATION:** The decentralized effort of local people (e.g., local NGO representatives, local entrepreneurs) to jointly address the environmental, economic and social sustainability of the Eastern Ore Mountains is apparent. Private resources and volunteering are important factors supporting this effort. This is in a strong contrast with plans of municipal representatives that view large (subsidized) infrastructural projects – such as skiing resorts – as the only means of development. There is also low communication between the state/regional nature protectors and local people's initiatives although they often have similar goals regarding the protection of aesthetic beauty and biodiversity of small-scale ecosystems.
- **BAD IMAGE:** There is a general bad image of state/regional nature protectors in the views of municipal representatives. They are not willing to continuously disseminate information or to work with the public to gain the support for the nature protection in the area.

The IAD Framework application confirmed choice experiment results regarding preferences of visitors toward small-scale ecosystem shapes. These preferences are implicitly contained in the spontaneous decentralized effort of local people (NGOs, individuals) that complement the state biodiversity protection and initiate sustainable development activities outside of natural reserves and other protected territories. The involvement of private resources and volunteering in the area is another piece of evidence. It was also revealed, however, that the public administration does not support these activities much. Superiority is given to development of larger infrastructural projects (which can potentially be funded on an external basis). Furthermore, there is a strong miscommunication among the nature protection representatives and local people's initiatives despite the fact that they often have similar goals regarding the protection of aesthetic beauty and biodiversity of small-scale ecosystems. This miscommunication results in a waste of the goodwill of local actors who have a clear sentiment toward the specific countryside of the Eastern Ore Mountains. This goodwill is crowded out by the centralized decision-making.

Based on the interpretation of results of both the methods in combination, the following recommendations for the future environmental policy arise:

- Decision-makers at various levels should pursue a policy focused on small-scale ecosystem protection based on people's stated preferences.
- Due to the visitor's clear sentiment toward the specific Eastern Ore Mountains countryside, local resources for biodiversity management support should be activated (especially regarding those small-scale ecosystems situated outside of nature reserves and therefore enjoying no protection).
- The biodiversity protection model in the area should be built on participatory principles – local people should be treated as insiders of the planning and management processes.
- Proposals for traditional top-down instruments of environmental regulation (administrative or market-oriented), if any, should be treated with care and with respect to the local context.

The last point also refers to the use of economic instruments. However, based on the socio-ecological characteristics of the area and local people's perceptions, we can conclude that the introduction of such instruments in the Eastern Ore Mountains would worsen the current

situation. Firstly, there is a very low tradition regarding the use of such instruments in biodiversity protection in the whole Czech Republic. Secondly, with respect to the visitor profile such measures would be understood as “taking the mountains away” from the people living nearby. As a result, the people’s expressed strong affiliation to the area could be distorted. These results confirm previous findings of numerous other authors (such as [13], [16] or [19] among many others).

#### 4 Conclusion

The mixed-method research introduced in the paper explores a new way of combining quantitative and qualitative methods that is considered a useful practice for reaching better environmental governance. We combined the choice experiment method and the IAD framework in order to show how the robustness of policy recommendations and their acceptance could be increased.

We applied both the methods in the territory of the Eastern Ore Mountains in the Czech Republic. The goal of the field research was to find ways of more sustainable management of small-scale ecosystems, such as mountain meadows, streams and clearance cairns. Based on this case study, it was confirmed that preference calculations regarding aesthetic values of ecosystems need to be complemented with facts about institutional settings and barriers in order to better address locally relevant recommendations for decision-makers. Particularly, the introduction of new economic instruments (such as fees or taxes), which could hypothetically solve the problem with the mismanagement, was proven as rather unacceptable because of cultural and social reasons.

Therefore, future mixed-method research could investigate more deeply how monetary valuation may support institutional analysis results and vice versa.

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# The Municipal Choice of Waste Collection Companies

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## Abstract

This paper is based on an analysis of factors influencing the selection of waste collection companies by municipal authorities in selected municipalities in the Czech Republic, and their impact on the cost efficiency of current municipal expenditures. The aim of this paper is analyzing the factors influencing the choice of waste management company and the influence of these factors on the decision making process, and discussing the relation of these factors to the cost efficiency of municipal waste management. The study uses a quantitative approach to investigate the research questions and analyses original collected qualitative survey data obtained during our own research. A survey was conducted for a selected local public service (waste management) in order to collect data about factors influencing the selection of waste collection companies by 115 municipalities in the Czech Republic. The results show that the most powerful factors that influence the selection of waste collection companies at municipalities in the Czech Republic are *the price and the quality of services*.

*Keywords:* municipalities; waste management; waste management companies; factors influencing municipal decisions

JEL Classification: H76

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## 1 Introduction

Defining the processes by which public resources are utilized is an essential precondition for increasing efficiency and effectiveness in all municipal activities, including activities related to waste management. Due to the fact that municipal expenditure on solid waste management in 2012 was more than 60% of current expenditure on environmental protection, and accounts on average for 3% of total current municipal expenditure in the Czech Republic, it is obvious that the area of waste management is an integral and indispensable part of municipal budgets. The area of waste management is therefore also a suitable target for measures aimed at saving public resources. This is one of the many reasons why it is very important to describe all the factors influencing the selection of waste collection companies by municipalities. These factors could play a significant role as factors determining the efficiency and effectiveness of municipal waste management expenditure.

Within this context, the concept of effectiveness has to be discussed. According to Boyne [7], the main purpose of theorists such as Weber, Taylor and Barnard was to develop models of effective organizations, but by the early 1980s the term 'effectiveness' began to be replaced by narrower concepts such as 'quality'. According to many authors [20], [23-24], [26-27], [36], the effectiveness of public services is determined by the level of rational behavior exhibited by municipal representatives.

It is obvious that municipal representatives play the role of responsible guarantors securing waste management services in municipal areas. Municipal representatives should also act according to the tenets of economic rationality and attempt to achieve efficiency and cost effectiveness. However, the choice of a waste management company is affected by many factors. These factors make economically rational behavior very difficult. It is therefore clear that finding and defining these factors can increase the level of economic rationality, or at least reveal the limitations that make such an increase impossible.

The economic literature frequently focuses on two important aspects of waste management: the factors influencing the effectiveness of the provision of waste management services [1-6, 5-15, 26, 31-34], and the role of specific factors such as the form such service provision takes [19-26], [28-29].

This paper investigates both aspects in the conditions of the Czech Republic. Our research questions were:

- a) Which factors have a significant influence on the selection of waste management companies by municipalities (and what is their role in terms of measuring effectiveness, and their impact in relation to measuring effectiveness)?
- b) Are there any differences in the significance of these factors from the perspective of the form of service provision (public and private companies)?

The aim of this paper is evaluating the importance of the factors influencing the choice of waste management company and the influence of these factors on the decision making process, and discussing the relation of these factors to the cost efficiency of municipal waste management.

The paper is structured so as to present the answers to our research question. The first part of the paper provides data about municipal preferences when engaged in the process of choosing a waste management company. The second part presents the results of analyses of the influence of these factors on the decision making process. The final part discusses the results and formulates conclusions.

### 1.1 Factors Influencing Effectiveness of the Provision of Waste Management Services: The Theoretical Framework of the Paper

A lot of research has been conducted regarding factors influencing the effectiveness of the provision of waste management services, e.g. [1-6], [5-15], [24], [26], [31-34]. One of the first research papers on the factors influencing the cost of waste management was published by Hirsch in 1965 [15]. He summarized five basic factors: the level of technology, the quantity and quality of the services, the price level, and the impact of a combination of other factors, such as legal restrictions, political restrictions, population density and the location of landfills and incinerators [15]. Soukopová and Malý [31] consider that municipal expenditures are affected by different factors: the amount of municipal waste, the price of the equipment used for municipal waste recovery or disposal, the distance to facilities where municipal waste is recovered or disposed of, transport costs, competition, and the form of waste management company ownership. Similar conclusions were published by [22] and [28]. There are many other relevant factors influencing the efficiency of the provision of public services which have been already investigated by many authors [1-6], [5-15], [26], [31-34], see Table 1.

**Table 1. Factors influencing the cost-effectiveness of municipal waste collection**

Factor	Research
Output - Quantity of service (amount of waste, number of pick up points, etc.)	[1-4], [8-9], [10-12], [15-17], [22], [24], [28-29], [33]
Quality of service	[15], [18], [23], [29], [33]
Density or Housing density	[1], [8-12], [15],[22], [28-29], [33]
State of technology and productivity	[15-17]
Frequency	[1], [8], [9-10], [12], [15], [22], [28], [33-34]
Political influence	[11], [13], [15], [36]
Recycling	[1], [8], [17], [28]
Competition	[2-3], [6], [11], [29], [31], [33]
Form of company ownership (private/public)	[1-6], [8-12], [14-15], [18], [22], [24-25],[28-29], [33-34]
Effects of economies of scale	[6], [10], [29]
Number of bids	[13]
Inter-municipal cooperation	[1], [3], [5-6], [11],[14]
Distance to landfill (incinerator)	[8], [22]

Source: Authors

Most of the papers in Table 1 focused especially on the form of ownership of waste management companies, as well as their contracting activities and performance. There is also a lot of solid new evidence that form of ownership and contracting are among the most significant factors influencing efficiency, e.g [3-4], [6], [11], [14] and [22].

Even if the relevance of the examined issue is high on international research agendas, research in the Czech Republic remains scarce [16], [20-21], [23], [30-32], [35]. Ochrana et al. [23] have carried out research which was aimed at ensuring the effectiveness of selected public services by analyzing factors influencing the effectiveness of organizational forms providing public services. The findings of this research [23] show that *“providing quality public services depends significantly on a systemic approach to the provision of public services. Selection of the appropriate method of securing public services depends on the type of public service as well as the conditions under which this service is provided.”*

These papers state that it is necessary to research factors influencing the selection of a waste management company by municipalities. This is one of the main reasons why factors influencing the selection of a waste management company are the subject of the first research question and the public and private ownership of waste management companies and competition as the main factors defined by international research are dealt with in the second research question investigated in this paper.

## 2 Materials and Methods

Data was obtained via an electronic questionnaire-based survey. The survey was carried out from November 2013 to the end of January 2014, with the questionnaire repeatedly being sent to 1,888 randomly-selected municipalities. Communication with representatives of municipal authorities is often associated with the reluctance of questionnaire recipients to cooperate. Expectations regarding a low response rate were justified. In the end, only 215 properly completed questionnaires could be used.

Further information was acquired from the waste management companies SITA, a. s., RESPONO, a. s. and van Gansewinkel, a. s.

Based on the analysis of foreign literature and discussions with representatives of municipalities and waste collection companies we selected the following twelve factors for examination:

1. price;
2. frequency of services;
3. capacity of transport (capacity of waste collection vehicles);
4. quality of services;
5. political influence;
6. previous experience;
7. ownership of an incinerator or landfill;
8. conditions of contract (contract termination options, contractual penalties, etc.);
9. technical equipment of company;
10. form of company ownership;
11. provision of other waste management services (operation of waste yard, etc.);
12. form of payment for services.

For the assessment of the impact of selected factors we chose the following point scale: 1 – not important at all, 2 – unimportant, 3 – important, 4 – very important.

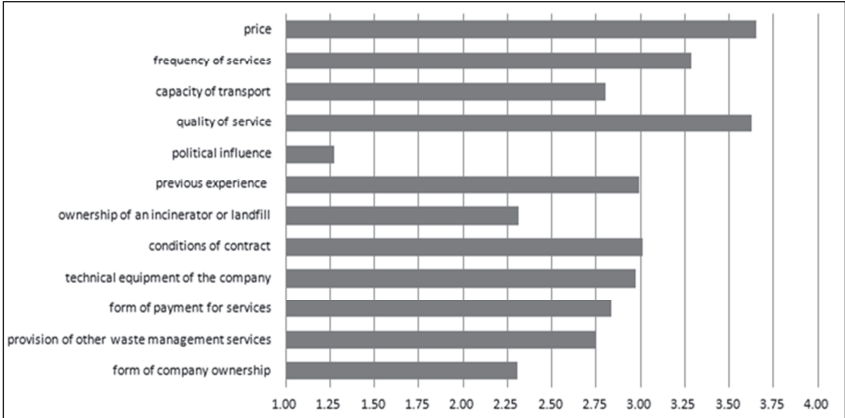
We then divided up the data primarily according to the type of ownership of waste collection companies (private and public). In this paper, public waste management companies are considered to be companies in which municipalities have a majority share of at least 50%, while waste management companies which have a mixture of owners (less than 50% are public owners) or whose owners are only private are classified as private waste management companies. In the other part of this research, the strength of the factors was researched

separately. After creating two groups based on company ownership, we performed a statistical analysis and compared data concerning the point scale average, median, standard deviation and coefficient of variation.

### 3 Results and Discussion

The results of the analysis of the factors influencing the selection of waste management companies by selected municipalities in the Czech Republic are shown in Figure 1.

Figure 1. The importance of the selected factors that influence the selection of waste collection companies



Source: Authors

The most important factors are *price*, *quality of service* and the *frequency of services*. There are also other important factors: *technical equipment of the company*, *conditions of contract* and *previous experience*. Factors which were described as being of medium importance are: *form of payment for services*, *capacity of transport* and *provision of other waste management services*. The factor concerning *ownership of an incinerator or landfill* was unimportant for representatives of municipalities. However, this factor has a higher standard deviation. The last factor, *political influence*, is of negligible importance to municipal representatives.

The selection of factors *price* and *quality* confirms the rational behavior of municipal representatives while answering the survey questions. The ranking of the factor *frequency of services* shows how important this factor is for the decision-making process. This factor is considered one of the key factors for use when researching effectiveness, and not only by municipal representatives, but also by a number of studies [1], [8-10], [12], [15], [22], [28], [33-34].

It is interesting that factors such as the *form of company ownership* and the *ownership of an incinerator or landfill* don't play an essential role in the decision-making process as is presented in the context international research [15], [19], [23], [29], [33].

A particularly interesting factor is the *form of company ownership*, which, according to a large amount of research, has an influence on the cost efficiency of municipal waste management ([1-4 [6], [8-10], [12], [14-15], [18], [22], [24], [28-29], [33]).

However, the results presented in the above studies are often different. Most of the results from research in Canada [18], England and Wales [34], Ireland [28] and Spain [6] suggest municipal expenditure savings will be achieved if a private company carries out refuse collection services. Other results from research in the USA [33], the Netherlands [9-10] and Spain [2], [4] show that there is no significant difference between public and private companies. In contrast to

the aforementioned research, Ohlsson [22] indicated that public production is cheaper than private in Sweden.

If we think about the factor *form of company ownership* and the rationality of municipal representatives during the decision- making process, we cannot draw any conclusions because the results are ambiguous.

This is the reason why we have focused on the following question in the next part of this paper: Are there any differences in the significance of these factors from the perspective of the form of provision (public and private companies)?

If we focus on the form of waste management company ownership, we can see that private waste collecting companies strongly dominate in the collected data. There are 141 private companies and only 74 public companies. The dominant share of the private companies is not limited only to the regions involved in the survey. This fact demonstrates the superior position of the private sector in waste management in the Czech Republic, which is confirmed by the results of research by [19] and [31-32].

The results of the analysis of the importance of the selected factors that influenced the selection of waste collection companies displayed according to company ownership type are shown in Table 2.

**Table 2. The importance of the selected factors that influence the selection of private waste collection companies**

Selected factors	Private waste collection companies			Public waste collection companies		
	Rank	Average	Standard deviation	Rank	Average	Standard deviation
Price	1.	3.66	0.54	1.	3.64	0.48
Frequency of services	3.	3.28	0.53	3.	3.31	0.59
Capacity of transport	8.	2.79	0.73	8.	2.82	0.64
Quality of service	2.	3.62	0.54	2.	3.62	0.56
Political influence	12.	1.28	0.56	12.	1.26	0.57
Previous experience	5.	2.96	0.74	6.	3.05	0.70
Ownership of an incinerator or landfill	10.	2.36	0.88	11.	2.22	0.92
Conditions of contract	4.	2.99	0.75	5.	3.07	0.79
Technical equipment of the company	6.	2.90	0.69	4.	3.11	0.67
Form of company ownership	11.	2.28	0.84	10.	2.35	0.91
Provision of other waste management services	9.	2.67	0.78	7.	2.91	0.76
Form of payment for services	7.	2.84	0.72	9.	2.82	0.70

Source: Authors

Again, the most important factors are *price*, *quality of service* and *frequency of services*. Comparison of significance factors between private and public companies indicates very similar results, especially for the factors *price*, *quality of service* and *frequency of services*, and for the factor *political influence*, which was also consistently ranked as the least important factor for both types of companies. More significant differences can be seen for ranks 6. – 11 (see Table 2).

The most significant difference in the perception of the importance of the factors includes: the *technical equipment of the company*, the *provision of other waste management services*, and the *form of payment for services*. The factors connected with service quality, such as the *technical equipment of the company* and the *provision of other waste management services*, are more important for municipalities where public waste management companies provide their services. In contrast, the strictly economic factor of the *form of payment for services* was more important for municipalities where private waste management companies operate.

The analysis results confirm previous results in relation to the factor *form of company ownership* where the perception of the importance of individual factors is not too different.

Overall, we can say that differences in the significance of selected factors from the perspective of the form of provision (public and private companies) don't exist. From this point

of view, conformity can be found with studies that did not point to significant differences between private or public companies such as [2], [4], [9-10] and [33].

#### 4 Conclusion

The analysis results bring up interesting questions. If we think about the importance of factors influencing the choice of waste management company, then from the perspective of the rationality of municipal representatives the most important factors that were chosen were *price* and *quality of service*, while the unimportant factors were *form of company ownership* and *ownership of an incinerator or landfill*, the most unimportant factor of all being *political influence*. Other factors were considered important. Outside the factors which in foreign research were seen as affecting the efficiency of spending on waste management, the most interesting result is the factor *form of company ownership* that's according to the results of our research, only a small influence on the decision-making process. Moreover it has been shown that municipal representatives do not have appreciably different requirements from public companies and private companies.

However, the objective of this case study was not to demonstrate which companies (private or public) are more suitable for lowering municipal expenditure. The main objective was to determine which factors are important for municipal representatives when selecting a waste collecting company.

It can be assumed that the agreement on the importance of selected factors in the selection of waste collection companies is caused by the uniform requirements of municipal representatives. However, a more significant conclusion might be the confirmation of the fact that no differences are perceived between private and public service providers by municipal representatives.

It is clear that the real factors determining the involvement of collection companies have to cover the specific conditions and requirements of each specific municipality. In this case study, several factors of varying strength that influence the selection of waste collection companies in municipalities in the Czech Republic have been covered. These facts suggest that this is an area with interesting potential for further research.

We realize that this analysis does not cover all the factors with an impact on efficiency that could be included, but we wanted to look at the issue of the factors influencing the choice of waste management company from a different perspective in order to perform a comprehensive analysis of the cost-effectiveness of waste management using advanced statistical and mathematical methods.

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# Estimating Municipal Solid Waste Expenditures: The Case of South Moravian Region

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## Abstract

Presented study examines current solid waste expenditures of municipalities in the South Moravian Region in the Czech Republic and estimates a model, which explains these expenditures by publicly available sociodemographic statistical data. Focus of the study is especially on the public availability of the data and other possibly relevant factors without publicly available data are not considered in this particular study in order to secure the possibility of reproducing such model. These models can prove useful when predicting expenditure in this area, when analyzing effects of included explanatory variables on the expenditure, or when comparing actual expenditure of the municipality with a model based on the large sample of other municipalities. Presented models estimate both absolute and relative expenditure levels, including explanation of observed effects of various considered variables. Results show that presented models are able to explain total expenditures relatively well based on the age or housing structure of the municipality. Second set of the models further estimates how various variables affect per capita expenditures on municipal solid waste and find the size of the municipality and housing structure to have significant effects.

*Keywords:* municipal expenditures; solid waste; MSW; public services

JEL Classification: Q53, H76, C31, J19

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## 1 Introduction

Solid waste generation represents an important socioeconomic issue of today and due to the nature of waste as a by-product of human consumption that keeps increasing it will become even more important. Together with increasing population it might seriously threaten the sustainable development of society. One of the most problematic kinds of waste is municipal solid waste (MSW), because unlike other kinds of specific waste with developed processes for dealing with, MSW can contain basically anything, as it consists of whatever people dispose of. Although there has been notable progress in past years in terms of increased availability of recycling options, remaining MSW still represents a significant mass that has to be dealt with. And it is the municipality who is typically the one responsible for dealing with MSW.

Municipal solid waste management (MSWM) is a kind of public service that is today often perceived as something automatic, or something that is somehow taken care of with little to no participation by the municipal population. But as with any kind of public services, there are expenditures connected with it that need to be at first raised (usually from taxes or fees), or subsidized from other municipal revenues. But even before that, it is more than appropriate to have some idea of how much resources should be raised in order to cover these municipal solid waste expenditures (MSWE).

This raises a question of how to determine how high these MSWE will be? In practice this is determined primarily by the amount of generated MSW that can, due to the typically very high correlation with MSWE, be often used as a proxy for MSWE. Available literature offers substantial evidence of approaches for estimating MSW, but usually does not pay much attention to the MSWE. Nevertheless, with high correlation between the two we do not perceive this as an essential problem. Now considering the studies that examined MSW generation, a good start is [1] offering a review of 45 MSW modeling approaches. These approaches are mainly based on identifying important factors of waste generation and their correlations with the amount of produced waste [7], regression models [9], various other econometric approaches [2, 11],

mathematical modeling [3], or methods like system dynamics [8] that are able to overcome data scarcity that happens often when predicting future MSW generation. In case of the Czech Republic prediction model for MSW generation has been created as well [10, 12].

Besides these, other approaches focused directly at estimating MSWE. However, literature regarding this is much scarcer. We mention for instance [5], who estimated and compared cost functions for MSW disposal and MSW recycling with possible extension into a municipal decision support tool based on various parameters. Second approach that could be mentioned [16] decomposed the process of MSWM into individual steps and created a model that calculates theoretical “minimal value” of MSWM by inputting individual municipality parameters.

The goal of this study is to use the available historical data from selected region in the Czech Republic and through the method of linear regression examine which sociodemographic variables can be utilized in estimating MSWE. Subsequently, presented methodology can be utilized in other areas of municipal expenditure and can serve as a tool for estimating either total or relative expenditures in given area, together with identifying the effects of various examined variables on the expenditures, and of course is not limited to be used just in the conditions of the Czech Republic. Moreover, in this initial study we specifically use just those data that are publicly available and thus can be used basically by anyone. Although the exact cost relations might be different in other countries, identified trends should be comparable. Furthermore, we are aware that in case of MSWE there exists some other relevant factors such as the collection frequency, MSW company ownership, MSW collecting company charging scheme, presence of competition, availability of recycling possibilities for population or amount of cottages used for recreation, etc., but data on these variables are generally not publicly available or not available at all at some central level and thus we do not use it.

In this study we utilize available sociodemographic data that are published by the Czech Statistics Office (CZSO). We use data on population (age structure), housing structure, economic status of the population and the data on MSWE published by the Ministry of Finance.

## **2 Material and Methods**

Goal of this study is to estimate models for MSWE by specifically using publicly available data. In following subchapters we provide description of the used technique and the necessary description of the data we use in the analysis and why we have chosen specifically these data.

### *2.1 Regression Analysis*

In order to estimate the prediction models we use standard OLS regression method approach and calculate linear regression from available data, like [9] or [13]. In the first set of models we work with absolute values and we estimate total annual MSWE. In this set of models we work with absolute data, as the goal here is to estimate total MSWE. Calculated coefficients can be then basically used in a scalar product operation with the actual data of a specific municipality in order to calculate total MSWE. Calculated coefficients are then further discussed.

In the second set of models we work with mostly relative data as the goal of these models is to estimate how various considered variables affect per capita MSWE. In regression we then use mostly relative values of the variables, usually a portion of a certain variable from the main variable (for instance portion of people of certain age from the whole population of the municipality). By doing this we can estimate whether and how much does change in the proportion of some variable affect the level of per capita expenditure. Choice and calculated effects or considered variables are again discussed.

### *2.2 Used Sociodemographic and Economic Data*

As was stressed earlier, goal of this paper is to create estimation models of MSWE based purely on publicly available data. Data about expenditures was acquired from the portal of the

Czech Ministry of Finance, ÚFIS [17], which provides complete information about revenues and expenditures of each Czech municipality. We focus specifically on category of current municipal expenditures related to MSW collection, transportation and subsequent waste treatment.

Out of the large list of municipal sociodemographic data published by the CZSO [6] that are publicly available for download at the CZSO's website with detailed description of the methodology and what these data actually represent, we find following to might have a possible effect on the level of MSWE:

- Population and Area covered
- Age groups of population
- Economic in/activity
- Student status, Retired status
- No. of flats in houses/condominiums
- No. of flats used for recreation

All analysed variables are related to the year 2011, which was chosen specifically, as it was the year when national census of population and housing occurred. This resulted in collection of more exact data regarding both population and housing than during a standard non-census year, together with making these data publicly available not just at aggregated but also at a single municipality level. Data acquired from a census are usually the most precise data collected, as they do not come from some representative sample but cover literally whole population.

Considering analysed sample, we use data from municipalities in South Moravian Region, which included 672 municipalities with population of 1,163,508 during the time of the census. Distribution of municipality size follows rather Poisson than normal distribution with majority of municipalities being relatively small compared to the mean of the whole sample. Due to the nature of utilized OLS technique, including several large municipalities would cause biased results of regression analysis with extremely high  $R^2$ . To at least partially avoid that we dropped 10 largest municipalities with population above 10,000. We also dropped 3 municipalities without available MSWE data, and finally, 5 more municipalities due to a specific factor of having very large amount of recreational cottages with no permanent residents (variable not covered by the CZSO), that on the one hand cause increased MSWE, but on the other hand are not listed among the municipal population and cause biased results. Therefore our final sample includes 654 municipalities with average population of 930 and covering 52% of the whole region.

### 3 Results and Discussion

Table 1 presents results of linear regression estimations of annual MSWE (in thousands CZK) based on data from 2011. Two sets of models are presented. For clarification we mention that presented coefficients are to be interpreted as MSWE generated by a single additional unit (person or flat) in given group, but, and we stress this, if taken into account the whole model.

First set of models is based on age structure of the municipalities separated by decades. Due to the CZSO methodology, people under 20 years are reported in age groups 0-14 (age when students usually finish primary school) and 15-19, and thus we merge them into one group.

Model 1 presents results of OLS regression based solely on the age structure. Decreasing effect on MSWE is observed by 0-19 age group. This can be interpreted as that young people generally do not produce that much MSW, resulting in lower related costs. If we divide this age group into 0-14 (coefficient value  $\sim -0.512$ ) and 15-19 (coefficient value  $\sim -2.481^{***}$ ) groups, results show that people aged 15-19 tend to have strong decreasing effect on MSWE while people under 15 have weaker, although still decreasing effect on MSWE, but in latter case the result is not significant. Next two age groups, 20-29 and 30-39 tend to increase MSWE, which makes sense as these people generally become economically active, therefore having increased income and subsequently increased consumption (which results in MSW production). However, next age groups, 40-49 and 50-59, seem to decrease their consumption and have little to no effect on MSWE, but results are not significant. Interesting results are in the next age group 60-

69. People in this group seem to have the strongest increasing effect on MSWE. The reason for that is unclear, although people in this age category usually retire and thus possibly, once they retire (usually in their early 60s), suddenly have more free time and perform something like a “clean-up” and dispose of things they will not use anymore, resulting in suddenly increased MSW production. Further split into groups 60-64 (coefficient value ~5.800\*\*\*) and 65-69 (coefficient value ~1.824\*) shows even more a sudden shift in waste-related behavior of people in early 60s. This finding has strong significance in all examined models and it becomes another research question for the future. Age group 70-79 has similar results as groups 40-59. Possible interpretation here is that this group contains both retired people with decreased consumption and thus lower waste production and MSWE, but also people still economically active, together resulting in overall unclear contribution to the MSWE. Finally, people aged 80+ have strongly decreasing and statistically significant effect on MSWE. Generally, people in this group tend to produce rather little waste, which was also confirmed by several municipal authorities. Overall, 70+ age groups in all considered models decrease MSWE. This has been observed also by [12]. With the ongoing population ageing this might eventually lead to the gradual decrease in MSWE.

**Table 1. Estimation models for expenditures on municipal solid waste**

Model	(1) MSWE (kCZK)	(2) MSWE (kCZK)	(3) MSWE (kCZK)	(4) MSWE (kCZK)
0-19 yrs.	-1.091*** (0.400)	-1.209*** (0.393)		
20-29 yrs.	1.791*** (0.551)	3.662*** (0.671)		
30-39 yrs.	1.890*** (0.404)	4.087*** (0.610)		
40-49 yrs.	-0.567 (0.542)	1.615** (0.675)		
50-59 yrs.	-0.015 (0.402)	1.439*** (0.556)		
60-69 yrs.	4.027*** (0.473)			
60-64 yrs.		6.006*** (0.767)		
65-69 yrs.		1.590* (0.939)		
70-79 yrs.	-0.373 (0.672)	0.147 (0.674)		
80+ yrs.	-1.646** (0.767)	-1.213 (0.763)		
<i>Economic. active</i>		-2.312*** (0.476)		
<i>Flats in houses</i>			1.641*** (0.038)	1.836*** (0.155)
<i>Flats in condos</i>			2.150*** (0.050)	2.327*** (0.126)
<i>Recreational flats</i>			0.961** (0.490)	1.147** (0.492)
<i>Unemployed</i>				0.785** (0.372)
<i>Retired</i>				-0.467** (0.223)
<i>Constant</i>	-49.900*** (11.366)	-56.543*** (11.299)	-25.011* (12.867)	-26.792** (12.839)
Adj. R <sup>2</sup>	0.928	0.931	0.938	0.939
RSS	30644128	29237015	26330015	26057993.4
Observations	654	654	654	654
AIC	8908	8881	8816	8795

Source: Author

\*, \*\*, \*\*\* stand for a result valid on 10%, 5% and 1% significance level, standard errors in parentheses

Model 2 modifies Model 1 by splitting age group 60-69 into groups 60-64 and 65-69 and including number of economically active people (according to the CZSO methodology a person

that is neither student nor retired). As was mentioned, age 64 is approximately when people retire and therefore it acts as a proxy for distinguishing between working and retired people. Compared to previous models we can see even stronger effect of age group 60-64 (coefficient value 6.006\*\*\*). Second age group 65-69 has notably less increasing effect on MSWE, which supports our "early 60s clean-up" suggestion. Concerning economic activity, it affects basically only of age groups 20-59. This makes sense as people under 20 are typically students and people over 60 typically begin to retire. Overall, Model 2 provides more accurate MSWE estimation.

Next pair of models represents a different approach to the MSWE estimation. Instead of population we use data about housing structure containing number of flats either in a family house or in a condominium. In Model 3 we use information about how many flats in houses and flats in condominiums are in a municipality. These data are highly correlated with population and can serve as a certain kind of proxy. Additionally we consider also number of recreational flats. The reason behind this is simple – people using recreational flats are not necessary permanent residents of a municipality (they do not show up in municipal population) but they do produce MSW and MSWE. Including the number of recreational flats therefore acts as a proxy for identifying additional population causing MSWE. Model 3 shows that flat in a house generally causes less MSWE than a flat in a condominium. First possible explanation is that flats in condominiums are much more likely to occur in larger municipalities and not in small ones, where it is in the Czech Republic very common to have only regular family houses. This is connected with usual observation that people in larger municipalities tend to have better income opportunities and thus consume more, and by doing that they produce more waste and implicitly cause more MSWE. Second possible explanation is that people with a house have usually much better options for storing the goods and thus "postpone" such MSW generation, which is less possible for people living in condominium, who usually lack storage space. Last variable, number of recreational flats with no permanent residents, has lower coefficient compared to previous two, which is in accordance with the simple fact that these residences are not permanently used for living and thus logically cause less MSWE than flats with permanent residents. All three coefficients in the model are statistically significant.

Model 4 extends previous model by adding significant variables of number of retired and unemployed people. Coefficients show that each unemployed slightly increases total MSWE, while each retired does the opposite. While the decreasing effect of retired people on MSWE has basically the same explanation as the effect of age group 65+ in the previous models, effect of unemployed might be explained by the fact that while being unemployed people are more likely to stay at home and thus consume and subsequently produce waste at home (where it becomes actual MSW), while employed people usually spend significant portion of their time at their workplace and create waste there. This kind of waste should legally be treated as so called "business waste" for which municipality is not responsible and does not finance its treatment.

As we are dealing with a sample of municipalities with notable variance of municipality size, calculated  $R^2$  need to be taken with a reserve, as such high  $R^2$  values are primarily result of the presence of municipalities with high population, although we have already limited analyzed sample by considering only municipalities with population under 10,000.

Table 2 presents results of linear regression estimation of per capita MSWE (in CZK) based on the data from 2011. Compared to the models in Table 1, we use per capita measure and robust standard errors in order to deal with the problem of heteroskedasticity that is obviously present in models from Table 1. On the other hand, this results in rather low  $R^2$ , which is primarily caused by using just public data and thus omitting some important variables. Coefficients in Table 2 are to be interpreted as how considered variables influence per capita MSWE. Total expenditures are then calculated by simple multiplication with population count.

Model 5 shows there is something like a base level of per capita MSWE of approximately 500 CZK per capita represented by the constant. Then, with more population, average MSWE tends to decrease slightly. On the other hand, more population has also small geometric effect on increasing MSWE. Municipal area has basically the same effect on MSWE, just with the opposite sign in both cases. Overall, Model 5, as well as following models, estimate lower MSWE per

capita in smaller municipalities with higher population, suggesting some kind of economies of scale with more population and increased costs (probably from transportation) with increasing municipal area. Last variable included in this model is the share of flats in condominiums (with the rest of the portion being generally flats in houses) on the total amount of flats, suggesting that with higher portion of flats in condominium average MSWE tend to increase as well. Possible interpretation is that living in a house offers generally more possibilities for dealing with the waste and thus causing subsequent reduction of MSWE, or alternatively that average flat in a house simply produces less MSW than average flat in a condominium. Although R<sup>2</sup> of this model is rather small, all considered coefficients are statistically significant.

**Table 2. Selected factors affecting per capita expenditure on municipal solid waste**

<b>Model</b>	<b>(5) Ø MSWE (CZK)</b>	<b>(6) Ø MSWE (CZK)</b>	<b>(7) Ø MSWE (CZK)</b>	<b>(8) Ø MSWE (CZK)</b>
<i>Population/100</i>	-9.367*** (1,745)	-8.312*** (1,789)	-6.513*** (1,837)	-6.419*** (1,822)
<i>(Population/100)<sup>2</sup></i>	0.116*** (0,023)	0.103*** (0,022)	0.085*** (0,022)	0.083*** (0,021)
<i>Area</i>	11.601*** (2,538)	11.321*** (2,552)	10.503*** (2,536)	10.324*** (2,525)
<i>Area<sup>2</sup></i>	-0.170*** (0,046)	-0.168*** (0,046)	-0.155*** (0,045)	-0.155*** (0,045)
<i>Flats in cond. (%)</i>	2.790*** (0,727)	2.905*** (0,709)	2.705*** (0,698)	2.806*** (0,682)
<i>Recreational flats (%)</i>		3.884** (1,676)	1.982*** (0,618)	1.658*** (0,616)
<i>0-14 yrs. (%)</i>				-6.814** (2,668)
<i>Constant</i>	513.841*** (15,442)	415.756*** (40,268)	481.595*** (17,179)	587.352*** (48,352)
Adj. R <sup>2</sup>	0.075	0.084	0.097	0.107
RSS	17380248	17177728	16934026	16727395
Observations	654	654	654	654
AIC	8531	8525	8516	8510

Source: Author

\*, \*\*, \*\*\* stand for a result valid on 10%, 5% and 1% significance level, robust standard errors in parentheses

Model 6 adds variable with the share of retired people in total municipal population. Coefficient for this variable is significant and can be interpreted as that increasing share of retired people in the municipal population also increase average MSWE by a little. If we connect this finding with Models 1 and 2, we can see that this increasing effect on MSWE is caused primarily by the youngest group of retired people, as in age groups 70+ is the effect rather negative. We can also see that, compared to Model 6, the constant has decreased notably. However, this is levelled back by “standard” share of retired people in the population.

Model 7 extends Model 5 by adding variable with the share of recreational flats on the total amount of flats in a municipality. Coefficient for this variable has increasing effect and is significant. Again, as in Models 3 and 4, this variable can be interpreted as a proxy for amount of people that consume, produce waste and subsequently cause additional MSWE for the municipality without showing up in the municipal population count as permanent residents.

Model 8 extends Model 7 by adding the share of people in the age group 0-14 in the municipal population. This statistically significant effect is analogous to the effects of youngest age groups considered in Models 1 and 2 and can be interpreted as that higher share of children among the population tends to decrease average level of MSWE per capita. Nevertheless, even this last model has rather low explanatory power caused most likely by not including some of the relevant variables that are not publicly available.

Presented models consist of statistically significant variables that can, to the certain level, explain either total or per capita MSWE for individual municipality. On the other hand, there has been most likely some omitted variables that will be included in the next stage of the research.

Nevertheless, goal of these models was to show the explanation power of publicly available data and provide information about what kind of effects on MSWE considered variables have.

Acquired results can also initiate discussion regarding MSW collection fee differentiation. Typical situation today is that there exists one flat fee for any permanent municipal resident, with occasional discounts for small children or old people. Any attempts to increase MSW collection fees thus affects basically everyone in the municipality and often becomes politically impassable. In many municipalities this results in the necessity to subsidize MSWM from municipal budget, leaving smaller amount of resources for other expenditure areas. More differentiation in fees can result in higher efficiency in terms of charging more those who statistically cause more MSWE, while on the other hand charging less those who cause less MSWE. Such differentiated charging scheme might be perceived by people as more "fair" even though the overall payments collected by the municipality will increase.

#### 4 Conclusion

Our study presented several models estimating current MSWE using just publicly available data. South Moravian Region in the Czech Republic with over 650 municipalities has been chosen as the sample for our initial study. First set of models estimated total annual MSWE. We have identified that this can be calculated relatively well by using data with age structure of the municipal population and their economic activity, or alternatively by using data with the housing structure of the municipality. Interesting finding that had high statistical significance in every model where it was used is notable increase in MSWE caused by the age group 60-69, and specifically by the subgroup 60-64. This creates a new research question of what makes this specific age group act that differently in terms of MSWE.

Second set of models estimated level of per capita MSWE. We have identified that variables such as population, area and housing structure have significant effects on the level of average MSWE per capita and can be used for its estimation by inputting individual municipality data. Coefficients for estimating relative levels of expenditures are in coherence with coefficients for estimating absolute levels of expenditures, although overall explanation power of the models estimating average MSWE is rather low. Still, findings like this can be utilized by municipalities in forecasting their MSWE and taking necessary steps like adjusting local fees or even segment the fees based on sociodemographic characteristics of municipality.

This research could be further extended by additional variables like education or household composition as in [4], or effects of available competition in the field of MSWM like in [15]. Probably much could be further explained with the data about income, but CZSO estimates such information only based on a sample survey with generalization for larger territorial units and not at the municipal level. Therefore such data would have to be collected by, for instance, a special survey that would notably limit the size of examined sample. Nevertheless, including non-publicly available data like those about MSW generation and additional parameters of MSWM has notable potential for increasing the precision of the estimation and will be examined in our future research.

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# Assessment of Population Air Pollution Burden in the Surroundings of D1 Motorway

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## Abstract

It is the goal of this article to identify the health impacts of the PM<sub>10</sub> dust particle air pollution on population caused by the D1 motorway route location between Brno and Prague. This identification shall be performed using our proprietary population air pollution burden assessment methodology and subsequently the European ExternE methodology. Territorial analysis has been used to identify the affected municipalities and residential zones; the territorial analysis has been followed by statistics usage and processing. The second part of the article identifies and enumerates the health impacts on population caused by air pollution from traffic on the D1 motorway using a synthesis of results from the preceding section and results from foreign studies performed in the field of health hazards. About ten thousand inhabitants are affected at the specified section of the motorway; increased levels of air pollution can be identified for about five thousand of them due to the motorway's route location, or rather traffic intensity. Possible recommendations for transportation and health policies and for territorial planning are defined in the final section of the article.

*Keywords:* transport infrastructure; express transport; environmental impact evaluation; air pollution

JEL Classification: Q51, R42

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## 1 Introduction

Atmospheric pollution from transport has been a growing problem especially in developed countries due to the growing demands of both passenger and freight transports. A rather dense network of high-speed roads and motorways exists in the Czech Republic and these roads are frequently located in the vicinity of residential areas. High traffic intensity in the vicinity of residences generates external costs in the form of noise [e.g. 13], construction materials damage [e.g. 19] and subsequently real estate prices decline [e.g. 15]. Road transport air pollution is the greatest hazard for human health, though, and this article shall focus on the assessment of this issue. It is therefore our goal to perform an assessment of the air pollution burden on population health state due to road transportation in the vicinity of the D1 motorway, which connects the capital city of Prague with the second largest city in the country - Brno; a proprietary methodology for quantification of the affected population and the European methodology ExternE shall be used to achieve this goal.

Nitrogen dioxide, ozone and other photochemical oxidants, particulate matter and sulfur dioxide belong among the classical pollutants from transport according to [20]. In our paper we focus on the evaluation of air quality considering pollution by PM<sub>10</sub> particulate matter (defined as particles below 10 µg in aerodynamic diameter), which is considered to be the most important pollutant [14].

Negative health impacts of excessive exposure to the PM<sub>10</sub> particles have been demonstrated by many epidemiological studies, for both children and adult populations [e.g. 12, 7, 6, 17, 16, 1, 9].

Two principal studies at the European level have been performed in the field of assessing transport air pollution damage including the impacts on human health: HEATCO - Developing Harmonised European Approaches for Transport Costing and Project Assessment [3] and CAFÉ CBA - Clean Air for Europe Cost Benefit Analysis [10]. Both studies apply the Impact Pathway Approach (IPA), which has been developed as a part of the ExternE project - External Cost of Energy with its proprietary "ExternE Methodology" calculating environmental external costs (for additional information about this methodology see [8]).

## 2 Material and Methods

Four basic data sources have been used for the purposes of this article. The first source is the 2011 Census performed by the Czech Statistical Institute [5]. Data on municipality sizes, numbers of inhabitants and population densities in the individual cadastral districts at the municipality level were drawn from this source. Statistical data from the Czech Hydrometeorological Institute on air pollution were the other source; historical data from 2012 on PM<sub>10</sub> particle air pollution [11] were drawn from this source. The third key data source was the INSPIRE National Geoportal in combination with the ESRI ArcGIS software, specifically the ArcČR 500 service [2], which were used to establish the intersections of the individual motorway sections with the cadastral areas of the individual municipalities and especially their intersections with the residential areas of the nearby settlements. A publication describing the individual sections of the D1 motorway, surroundings of which are the subject of this article, provided by the Road and Motorway Directorate of the Czech Republic, was the last data source from which we drew detailed information about the route location and types of the motorway in all motorway sections between Prague and Brno [18].

Identification of cadastral districts of municipalities intersected by the D1 motorway in its section between Prague and Brno was the basic methodological approach; the motorway intersects the following regions of the Czech Republic: Prague, Central Bohemia, Vysočina and South Moravia. Identification of residential zones intersected by the D1 motorway route location at the above-specified territory was performed as a part of this procedure. Two related issues are described in the following two sub-chapters of this article.

The first one includes identification of municipalities and populations of the affected residential zones in these municipalities intersected by the D1 motorway route location. Methodology in this section is based on the analysis of cadastral districts in municipalities intersected by the motorway (the motorway can intersect them or it can be located at the boundary of the cadastral district). Orthophotomaps from the Czech National Geoportal [4] have subsequently been used to identify the affected residential zones. Therefore this is not an intersection with the built-up territory since industrial and commercial zones are excluded. The subsequent issue of identifying the numbers of relevant inhabitants affected by the D1 motorway route location is based on the presumption that the highest concentration of pollution is located within 500 meters from a motorway. This section therefore includes also municipalities whose cadastral districts are not intersected by the D1 motorway route location but whose cadastral districts include residential zones which are located within the distance of 500 meters from the motorway. Data from the 2011 Census [5] were used to calculate the numbers of the affected inhabitants. This source was also used to acquire the sizes and populations of the municipalities; population density was derived from these numbers. Calculation of the number of inhabitants by multiplying the affected residential area within 500 meters from the motorway and the population density in a particular municipality was a logical following step. The result is considered to be an estimate of the affected population in a municipality.

The second part builds upon the above-described identification and analyzes potential health impacts on the inhabitants due to the increased air pollution burden caused by the proximity of their residences to the D1 motorway. These health impacts are strictly limited to the PM<sub>10</sub> particle air pollution since transport can be assumed to be the pollution source of these particles (this strict limitation to a single pollutant is also necessary to observe the size limit for this article since inclusion of more pollutants would result in a significant growth in the study size). Each municipality was included in one of three pollution categories corresponding to annual average PM<sub>10</sub> concentrations to demonstrate increased PM<sub>10</sub> particle burden on the inhabitants (the complete cadastral district of a municipality is included in the prevailing category). These three categories correspond to the following scale (µg/m<sup>3</sup>): 14.1 to 20.0; 20.1 to 30.0 and 30.1 to 40.0. Only those municipalities where air pollution is at least one category higher than at the above-defined scale in comparison to adjacent municipalities are included in

the analysis to identify the number of inhabitants with demonstrable impact of the PM<sub>10</sub> air pollution burden due to the D1 motorway. The cities of Prague and Brno are also excluded since it is impossible to unequivocally demonstrate a connection between air pollution and motorway traffic there.

### 3 Results and Discussion

The following sections describe the results of two partial studies - identification of inhabitants affected by the D1 route location and analysis of the health impacts on population caused by motorway traffic represented by the PM<sub>10</sub> particle burden.

#### 3.1 Air Pollution in the Surroundings of the D1 Motorway Analysis

Table 1 presents the results of identifying municipalities with cadastral districts intersected by the D1 motorway route location and with intersected residential zones. The table implies that less than 80 municipalities are affected between Brno and Prague and residential zones, and therefore also populations, are affected in about 50 of them (65% of the affected municipalities).

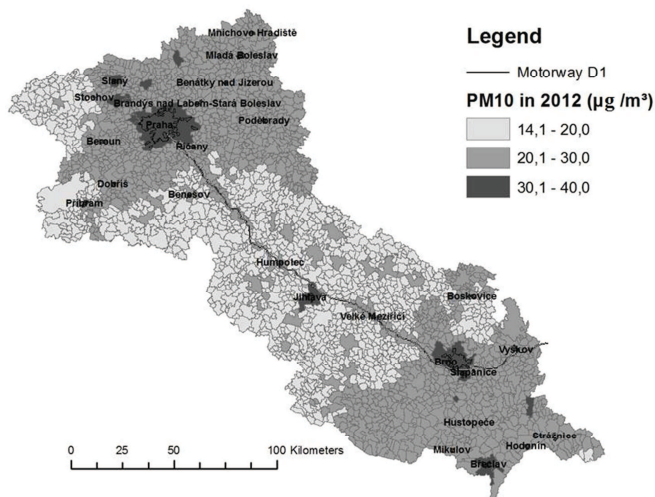
**Table 1. Municipalities affected by the D1 motorway route location**

Municipalities with residential zones affected by the D1 motorway (distance within 500 m from the motorway)	Total number of municipalities	Number of municipalities with affected residential zones	Municipalities with affected residential zones (%)	Average population size of municipality
Total	78	51	65.38%	34,985
Total (excluding Prague and Brno)	76	49	64.47%	2,644

Source: Authors

The Figure 1 presents a map of all municipalities in the above-defined four regions, including the PM<sub>10</sub> particle pollution levels and including the D1 motorway route location.

**Figure 1. PM<sub>10</sub> air pollution in municipalities in regions of Prague, Central Bohemia, Vysočina and South-Moravia**



Source: Authors based on [2, 4, 11, 18]

The figure (Figure 1) implies that there is a line of municipalities along the D1 motorway with increased air pollution burden in comparison with adjacent municipalities; this line is not continuous, though. This line is interrupted at several places, especially in the Vysočina region section of the route, and increased air pollution levels can be observed in this section only in larger towns, such as Jihlava, Humpolec and Velké Meziříčí. Here, though, it would be rather problematic to claim that the D1 motorway is the main source of the PM<sub>10</sub> particle pollution.

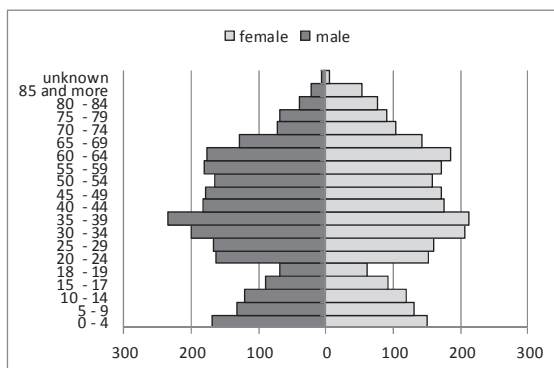
Table No. 2 presents the total number of inhabitants affected by the D1 motorway route location; the results are significantly influenced by the inclusion of Prague and Brno, where it is impossible to unequivocally identify the source of the air pollution since there are many relevant emission factors. This is the reason why the table contains also data after excluding these two cities. It is apparent that the motorway route location significantly affects about 10,000 inhabitants, which is less than 8% of all municipalities with affected residential zones. Nevertheless, the average share of the affected population in the individual municipalities exceeds 18% due to the presence of smaller municipalities.

**Table 2. Populations of residential zones affected by the D1 motorway route location**

Populations in residential zones affected by the D1 motorway (distance within 500 m from the motorway)	Surface area of the affected residential zone (km <sup>2</sup> )	Surface area of the affected res. zone (% of municipality surface areas)	Affected population	Affected population (% of the total municipalities' population]	Average share of affected population in a municipality
Total	94.438	6.71%	43,378	2.43%	17.51%
Total (excluding Prague and Brno)	77.934	11.44%	10,253	7.91%	18.79%

Source: Authors

**Figure 2. D1 motorway air pollution residential burden according to the population age**



Source: Authors based on [2, 4, 11, 18]

### 3.2 Air Pollution Health Impacts on Population In The Vicinity Of Motorways and Their Economic Valuation

Our assessment shall focus on the excessive burden on population in the residential zones (within 500 m from the pollution source) affected by the D1 motorway between Prague and Brno. The assessment shall therefore include only the population "demonstrably" affected by transport emissions. Motorway sections passing through large cities (Prague, Brno, Jihlava), where combined pollution from industrial facilities and city and motorway traffic can be assumed, shall be excluded from the following assessment.

The assessment has been performed according to the HEATCO methodology [3], which classifies health impacts of exposure to the PM<sub>10</sub> dust particles (Table 3). All types of impacts are represented by chronic diseases; a Concentration-Response Factor (CRF) was assigned to each of them. CRF is an indicator in terms of cases per year per average person per µg/m<sup>3</sup>, because then it can be applied directly to the entire population without worrying about affected subgroups. The CRFs for PM used by ExternE are assumed to be linear without any threshold [8]. PM<sub>10</sub> is given as annual mean concentrations. A Risk Group is assigned to each health impact; it defines a risk of health hazard in various ages of the population. Since only data on numbers and age structure of the municipality populations are available [5], the assessment doesn't include the Symptom Days and Days of Bronchodilator Usage parameters that describe risks for population groups with chronic respiratory symptoms or asthma. Monetary values are listed in € of the year 2002 (European average) and they are based on European Commission (Project ExternE) using the willingness-to-pay (WTP) method.

**Table 3. Concentration-Response Functions (CRF) for human health due to air pollution (exposure to PM<sub>10</sub>) according to the most current recommendations of the ExternE team**

Health Effect	CRF	Monetary value (€ <sub>2002</sub> per unit)	Risk Group
Chronic mortality – Years of Life Lost (YOLL) due to chronic exposure	4.00E-04	40,300	All
New cases of chronic bronchitis	2.65E-05	153,000	Age > 27
Respiratory hospital admissions	7.03E-06	1,900	All
Attributable emergency cardiac hospital admissions	4.34E-06	1,900	All
Restricted activity days	5.41E-02	76	Age 15 to 64
Symptom days (Lower respiratory symptoms including cough)	1.30E-01	31	Age > 18 with chronic respiratory symptoms
Days of Lower respiratory symptoms, including cough, in children in the general population, i.e. extra symptom days	1.86E-01	31	Age 5 to 14
Days of bronchodilator usage	9.12E-02 1.80E-02	1 1	Age > 20 with asthma Age 5 to 14 with asthma

Source: Authors based on HEATCO

The following formula (1) was used to calculate the increment of the transport air pollution impact on the population [8]:

$$\Delta I = \sum s_i \Delta c_i \quad (1)$$

$I$  is case per year per average person. The  $c_i$  is concentration increment,  $s_i$  is slope of CRF.

**Table 4. Populations of residential zones affected by the D1 motorway route location**

Age group	Number
All	5,183
Age 5 to 14	501
Age 15 to 64	3,555
Age > 27	3,594

Source: Authors

**Table 5. Health risk estimate results and their economic valuation for inhabitants directly affected by air pollution by PM<sub>10</sub> particles from transport in the vicinity of the D1 motorway**

Health Effect	Number of affected population	Case per year per average person (20 µg/m <sup>3</sup> )	Number of cases in affected population per year	Total Monetary Value (€)	Case per year per average person (30 µg/m <sup>3</sup> )	Number of cases in affected population per year	Total Monetary Value (€)
Chronic mortality – Years of Life Lost	5,183	0.008	41.464	1,670,999	0.012	62.196	2,506,499
New cases of chronic bronchitis	3,594	0.00053	1.90482	291,437	0.000795	2.85723	437,156
Respiratory hospital admissions	5,183	0.0001406	0.7287298	1,385	0.0002109	1.0930947	2,077
Attributable emergency cardiac hospital admissions	5,183	0.0000868	0.4498844	855	0.0001302	0.6748266	1,282
Restricted activity days	3,555	1.082	3846.51	292,335	1.623	5769.765	438,502
Days of Lower respiratory symptoms	501	3.72	1863.72	57,775	5.58	2795.58	86,663

Source: Authors

Table 5 lists the numbers of cases in the affected population per year and their monetary values for the individual health effects according to the HEATCO methodology. Our assessment was based on the impact on the population due to the increased PM<sub>10</sub> emissions concentration caused by transport (i.e. municipalities where PM<sub>10</sub> imission concentrations are 20 – 30 µg/m<sup>3</sup>, see Figure 1). Values are thus calculated for limit values of this higher pollution and therefore the final assessment of health risks and their economic valuation can range within the limits of the individual estimates.

We interpret the results of the above-presented analysis for the individual health effects as follows: the high intensity of D1 motorway traffic results in increased PM<sub>10</sub> particle concentrations and this demonstrates in higher sickness rates of the population in comparison with populations living at territories without motorways in their close vicinities. Using our methodology for assessing the numbers of affected inhabitants by transport imissions and the HEATCO methodology we calculated the probability of case per year per average person for boundary imission concentrations 20 and 30µg/m<sup>3</sup> (the range of values represents an increased air pollution burden in comparison with adjacent municipalities to motorway D1). We can see, that the highest risk represents the excessive concentration of PM<sub>10</sub> for the age group 5 to 14. Multiplying the number of affected population we gain the possible number of cases in affected population per year and consequently the total monetary value. According to these results we can for example demonstrate that the occurrence of new cases of chronic bronchitis for individual humans ranges between 0.00053 and 0.000795 cases per year and totally in the affected population between 1.90482 and 2.85723 cases per year. On the other hand, the number of restricted activity days for an individual human ranges between 3.72 and 5.58 cases per year, thus an average person loses 3.72 to 5.58 days due to lower respiratory symptoms and in the total population between 1863.72 and 2795.58 cases per year. This value changes proportionately with the pollution level. The study also includes the monetary values used for economic valuation, which are of informational character only and they are not based on any actual expenditures since they are enumerated by the WTP method. They are listed only to compare the individual cases of health effects and the differences in their valuation.

A higher level of pollution therefore means a higher risk of population disease and subsequently higher public sector expenditures for the disease treatment. PM<sub>10</sub> particle imission burden increase of 10 µg/m<sup>3</sup> results in disease risk growth by 50%.

#### **4 Conclusion**

The main results of the analysis show that excessive pollution by PM<sub>10</sub> dust particles caused by excessive traffic intensity along the D1 motorway section (excluding Prague and Jihlava) affects approximately 5,183 inhabitants, thereof 501 in the age between 5 and 14 years. This situation results in higher disease risk, especially of respiratory character, proportionately with the pollution level increases, when an increase in the PM<sub>10</sub> dust particle imission burden by 10 µg/m<sup>3</sup> increases the disease risk by 50%. Increased population disease rates due to transport result in further expenditures, especially by the public sector, to finance the disease treatment and additional expenditures related to the restricted activity of the affected population, etc.

Finally, it is possible to declare, that despite methodological difficulties with identifying the air pollution sources it is possible, in a way, to identify at least selected locations where it is possible to rigorously monitor the impacts of transport and transport infrastructure on population, or rather on population health. The article above presents a method for analyzing transport impacts on population due to increased PM<sub>10</sub> particle air pollution using the example of the D1 motorway. The first part of the analysis rather logically implies the importance of selecting the right routes for highways in the vicinity of cities or in the territories of city agglomerations. These sections of highways can significantly influence the numbers of inhabitants that shall be subsequently exposed to higher environmental burden and could be affected by negative health consequences with the corresponding economic implications. Therefore it is necessary to emphasize coordination between the individual sector policies - transport and land-use planning. It is possible to design suitable bypass routes in the vicinity of urban areas as a part of the transport policy and the land-use planning policy at the level of regions and municipalities should respect the above-presented findings and attempt to limit residential construction in the vicinity of motorways and heavily used roads since long-term neglect related to this process could have serious health and economic consequences for the population.

Results emerged from the study above have very close relation to strategic planning in development of highway and expressway network in the Czech Republic. It is obvious that according to used method of monetizing impacts of air pollution of PM<sub>10</sub> on relevant population the financial impact is significantly varying. With regard to new cases of indicators of chronic bronchitis, restricted activity days and chronic mortality (Years of Life Lost), the values range from 437,156 to 2,506,499 EUR per year. These results determine significance of potential impacts of expressway infrastructure on population health. Application of these results to transport policy planning emphasizes importance of new highway or expressway project routing. Taking into account level of potential financial burden on population health during the process of feasibility study (with the cost benefit analyses included) it disputes the thesis "the longer the highway project is, the bigger economic impacts it has". In the other words, routing longer way of highway project with respect to residential areas can be economically cheaper in the long-term horizon.

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# How to Design Human Capital Contracts and Where They Can Be Used

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## Abstract

The paper explain analyses the essence of human capital contract (HCC). It is usually suggested as a contract that can help people without sufficient amount of money to invest in their human capital and due to the investment receive higher future income. Although the idea of HCC is quite old its practice usage becomes quite rare. We try to find reasons why it is happen. One of the possible explanation could be that existed contracts works only in the field of education, But they can be used also in other areas, generally everywhere where a customer receive some services and quality of the service affects, at least partially, customer's future productivity. We therefore call such services as productive services and sector of all such specified services as the sector of productive services. The sector includes health services, spa, sport services, social security and so on. Key attention is further devoted to the main principle of human capital contract – transferred price. The paper analyses its characteristics and designs mechanism how transferred price should work as a convenient and useful tool of financing. The main point is that a customer of sector productive services pays through transferred price directly to its provider. At the end the paper shortly discuss main objections to transferred contract. It is shown that the objections serve as a pretext for hiding real reason that is that present systems of financing guarantees prevent providers of productive services privileges. Providers can so more easily achieve profit than in a system based on transferred price and human capital contract.

*Keywords:* human capital contract; transferred price; sectors of productive services

JEL Classification: H44, I11, I19, I22.

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## 1 Introduction

The idea of HCC (human capital contract) was first formulated in 1955 by M. Friedman The Role of Government in Education [7], it means even before he wrote A Theory of the Consumption Function (1957) [8], where he formulated the idea of productive consumption – i.e. such consumption that brings a customer not only immediate satisfaction and utility but it also generates him/her further income. The idea of HCC is usually connected with financing of tertiary education. For instance [20] defines HCC as a voluntary private contract between a student and an investor in which the student commits part of his future earnings to an investor for a fixed period of time in exchange for capital to finance his education. The main parameters for producing an HCC are the percentage of income and the repayment period. Because of its voluntary nature it works best when market forces determine the contract parameters. The advantages of an HCC are that it decreases the risk of the investment for students by adjusting the payments they will have to make according to the amount they earn after completing their education. If a student's investment in education does not result in higher earnings afterwards, the payments required for financing the education are small. Conversely, if a student can earn a higher income after his education, the payments are much higher. On average, those students who can pay, because of the higher earnings they obtain as a result of their education, cover the costs of those who do not obtain higher earnings.

Since the 1960s, we have seen many attempts of applying the HCC in practice. It must be generally summarized that using HCC in practice is quite rare. The existing systems as Australian HECS/HELP system or English system of deferred tuition (for details about both systems see [26]) are usually organized by government. There were some attempts to establish some private systems but they were not generally successful. The most remarkable systems seemed to be US My Rich Uncle that worked for some years in the first decade of 21<sup>st</sup> century but it failed during

financial crisis that started in 2007 (details in chapter 2.3). The idea is still discussed on the theoretical level – for details see e.g. [2], [3], [4], [5], [10], [11], [12], [13], [14], [15], [18], [19], [20], [25]. In the Czech Republic, the main contributions belong mainly [16], [17], [21].

Theory knows some important obstacles preventing from using of HCC. Already M. Friedman in 1962 [9] clearly wrote: “an investment in human beings cannot be financed on the same terms or with the same ease as investing in physical capital. It is easy to see why there is such a difference. If a fixed money loan is made to finance an investment in physical capital, the lender can get some security for his loan such as a mortgage or a residual claim to the physical asset itself and he can count on getting at least part of his investment back if necessary by selling the physical asset. If he makes a comparable loan to increase the earning power of a human being, he clearly cannot get any comparable security; in a non-slave state, the individual embodying the investment cannot be bought and sold. But even if he could, the security would not be comparable. The productivity of the physical capital does not ... depend on the cooperativeness of the original borrower.” But we believe that there are also other reasons why HCC using of HCC is quite limited. The paper tries to find the reason and to suggest such design of HCC that enable its wider applications. It is organized as follows: the general characteristic of HCC and transferred price is given in the first part of the second chapter (Material and Methods). Its second part analyses characteristic of productive services and its effects. The third part of the second chapter suggests a design of HCC and transferred price that is able satisfied needs of customers to give or to preserve them appropriate level of human and social capital. The third chapter discusses main objections to the HCC and tries to prove that they serve as a pretext for real reason that is here revealed.

## **2 Material and Methods**

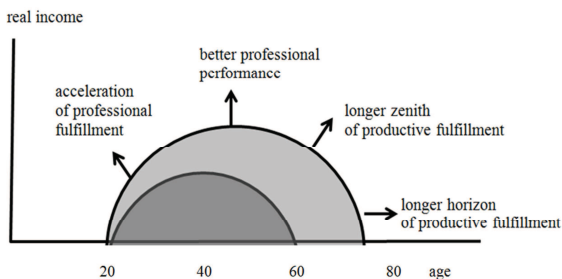
### *2.1 The General Characteristic of Human Capital Contract and Transferred Price*

HCC is based on the idea that investment in human capital can generate an investing person some flow in income in future, usually after the end of the investment. HCC is usually suggested as a way how to finance or co-finance university education as graduating university is generally connected with higher income as compared with income of people without university education. Concentration on university education is so strong that authors do not consider other fields where HCC can be used. E. g. [18] writes: “Human capital contracts are “equity-like” financial instruments used for financing higher education. These instruments are better suited than student loans to attracting the private capital needed to finance higher education. Further, since repayment depends on earnings and thus adjusts to the student’s capacity to pay, human capital contracts should be more attractive to students than traditional student loans. Finally, by making transparent the relative economic value of certain fields of study or the value of degrees from competing institutions, human capital contracts would improve the efficiency of the higher education market as a whole. Under a human capital contract, a student receives funding in exchange for a percentage of his or her income during a fixed period of time. Human capital contracts are equity-like instruments because the investor’s return will depend on the earnings of the student, not on a predefined interest rate. The effects of these arrangements are, among others, less risk for the student, transfer of risk to a party that can manage it better, increased information regarding the economic value of education, and increased competition in the higher education market.”

We believe that one of the reasons why HCC is used quite rare comes just from the fact that its suggested application is limited only on financing university education. University education is only one of many ways how people develop their human capital. They should, after finishing their education, continue in maintenance of achieved level, in obtaining other skills, etc. University education without other steps is not able to guarantee long run success of a person who is thinking about starting university studies and looking for some finance resource. Providers of the resources are logically afraid of possible failure of their loan. If they do not

know a debtor behavior after graduation whether he/she will continue in investment in maintenance of achieved level it is quite obvious that they are reluctant to lend money in form of a HCC. Generally HCC contract could be used everywhere when it is provided some service (as university education) and quality of the service affects, at least partially, future income of a customer of the service. Beside university education examples of such services can be health care, spas, sport activities, activities preparing for ageing, etc. Providers of the services should cooperate with the aim to guarantee a customer of quicker professional fulfillment, better professional results, as well as longer zenith and horizon of productive fulfillment; see the figure 1:

**Figure 1. The Economic Effects of HCC**



Source: Authors

The significant characteristic of HCC is the fact that the contract uses the transferred price principle. The principle means that:

1. A lender provides funds to a borrower today as an investment in acquiring, developing, applying, and preserving the borrower's human and social capital.
2. The borrower only makes payments from the earnings generated from the funds provided by the lender and invested in a defined manner.
3. The borrower makes payments based on the amount generated from the funds provided by the lender.
4. The borrower makes payments directly to the person that provided the given funds (i.e. to the lender, see chapter 2.3).

The transferred price principle is the most important part of HCC. This is why we given this principle such significant attention. The transferred price can eliminate the borrower's budget constraints, making investments in human and social capital possible even for those entities that currently do not have sufficient funds. Moreover, the transferred price can increase the number of entities that are involved in the borrower's success. It is no longer only the investor – currently acting as the borrower – but also his creditor. The creditor (lender) provided funds to the borrower and in case the borrower fails to repay such funds, the lender incurs a loss. In case an investor might, for various reasons (e.g. lack of information, his personal qualities, etc.), prefer investments in such structure of human and social capital that does not lead to successful investments, the lender shall also act as the borrower's corrector. Obviously, even the lender may be wrong. However, if there are several lenders or in case one lender has several borrowers, the pressure on the elimination of error further increases.

## 2.2 Sectors of Productive Services and Its Effects

We call the sector offering services connected with obtaining, maintaining and prolonging using of human capital (it means the sectors where transferred price can be used) as the sector

of productive services. Why did we choose this title? We believe there are the following reasons for this:

1. The production of these sectors may lead to sharp and long-term increase in the productivity of labor employed within industry and personal services associated with industry. In other words, this sector offers services that make it possible to increase the productivity of human activity.
2. The production of these sectors may lead to sharp and long-term increase in the productivity of all resources originating from land as the factor of production as well as resources in the form of capital goods in the area of industrial and agricultural production. Similarly as in the previous subsection, it holds true that the given sector offers services that make it possible to increase the productivity of human activity.
3. The sectors may gradually employ the decisive quantity of labor or human capital, as appropriate.
4. The production of these sectors may predominantly be applied within the sector itself. It also comprises the innovations' center of gravity.
5. The sectors may significantly expand the range of people's needs. At the same time, this concerns needs that are more and more met by the production of the educational sector. The substance of such needs consists in the fact that the meeting thereof as well as the utility associated therewith, including the pleasure associated with such utility, immediately relates to the development and preservation of human capabilities. The given needs may then be referred to as the capability needs.
6. As a result of the above mentioned, these sector has a predominant share in the overall production and economic growth, the form of which is determined by the nature of its production (i.e. production, which is in the form of educational and other services aimed at the development and preservation of human capabilities).

In most subsections, we knowingly use the term "may" (e.g. "The production of this sector may lead to sharp and long-term increase in the productivity of labor employed within industry..."). The reason for doing this will be explained in Chapter 2.3. We believe the term "sector of productive services" is more precise than the normally used term knowledge society. The term sector of productive services is wider, encompassing not only the area of acquisition of knowledge, but also areas leading to their preservation (e.g. through medical and spa care, sports) and longest possible application (by extending the period, for which people can be economically active). At the same time, the term "sector of productive services" emphasizes that these sectors offer production, which is aimed at increasing the productivity of other sectors. Since the production is most frequently in the form of services, the given word is emphasized. We should also note that the given characteristics of the sectors of productive services are based on an analogical role, which was played by the industrial sector during the 18<sup>th</sup> and 19<sup>th</sup> centuries, i.e. the period of the Industrial Revolution – for see [22]):

### *2.3 How to Use Transferred Price in Sector of Productive Services*

Economic theory (e.g. [23]) points out that in case the transferred price principle works on the basis of a three-way relation of the lender, borrower, and entity that provides productive services to the borrower, the lender is in a difficult situation. It is in his interest to monitor, whether the service provider really provides high-quality services, on the basis of which the borrower would get such human capital structure that would ensure the borrower's earnings are sufficient to repay his debt to the lender. Nevertheless, such monitoring is quite costly for the lender, whereas he may not be sure, whether his ideas about the borrower's investments are in fact met. This situation is referred to as information asymmetry (e.g. [1]). In case the lender cannot eliminate such information asymmetry, he may not provide the funds to the borrower at all. Alternatively, the lender may request high interest rate during the period such funds are not being repaid or high share from the borrower's future earnings. The given conditions may

discourage some potential borrowers, particularly the low-risk ones, who may find the repayments unbearable.

The situation discussed in the previous paragraph does actually occur in real life. The “My Rich Uncle” (MRU) program offering loans to students in the USA covering their tuition fees and other costs of studying is one of the most remarkable examples. The company started its operation at the beginning of the 21<sup>st</sup> century, lending money covering the cost of university education directly to debtors (university students) at an annual rate of 7.85%. Borrowers had to return the principal and the interest over 10 to 15 years after the completion of their education. They had to pay a fixed rate of 0.1% to 0.4% of their gross annual income. Naturally, the owners of MRU did not have enough money to lend. MRU obtained funds from financial investors, who were not willing to continue financing MRU after the start of the financial crisis in 2008. As a result, the company filed for Section 7 US bankruptcy in February 2009 and suspended all its operations. The financial crisis was not the only problem that worried MRU. Even before the crisis its interest rate was higher than the rate of unsubsidized government loans. The company faced adverse selection: especially people who could not get government loans, i.e. people with a higher risk, were interested in borrowing from MRU. The delinquency rate of MRU clients was higher than the rate MRU investors were prepared to accept. The experience of MRU shows that the success of an HCC as a private market instrument depends heavily on the investors’ willingness to give money for an appropriate time. Credit failure is quite probable in the time discrepancy between the period that investors are willing to lend money for and the period in which borrowers pay their loans. This was the case with MRU: investors gave the company money for a shorter period than the borrowers needed – borrowers could start paying money back after finishing their education (leaving school). MRU had to revolve its financial resources and could not do so during the crisis because of insufficient resources to continue revolving. For details about MRU

However, the solution of above mentioned problems does not have to be complicated. The only thing that needs to be done is to directly involve the providers of productive services in their customers’ success. How? It is necessary to ensure that the providers receive some of their customers’ earnings. Therefore, customers should pay for the productive services by transferred price, i.e. certain percentage of earnings generated by the productive services, directly to the providers of the service. The contract between a customer and a provider may also define other parameters, such as: a) moment (together with other conditions), from which a customer shall start his payments (e.g. a customer must reach certain income level); b) period, for which a customer is required to repay his debt; c) circumstances, under which it is possible to suspend or discontinue the repayments, including a situation where the customer’s earnings drop below a certain threshold; d) whether the payment is calculated from the customer’s total earnings or only their part (e.g. difference between the customer’s earnings and a minimum wage), etc. Therefore, the transferred price concept we propose comprises the following:

1. Provider of productive services acts as the primary lender. The provider may be an educational institution, medical facility, spa resort, etc. It is further possible to assume that individual providers of productive services, who finance their services by means of transferred price, operating in different segments (e.g. one of them in education and another one in healthcare), will start cooperating, because the earnings of one provider also depend – to some extent – on the services offered to customers by the other provider.
2. Buyer “pays” for the provided service scheme based on the benefits of the acquisition, development, application, or preservation of his capabilities through the productive services system – i.e. he pays certain amount (e.g. 3 to 5% of his earnings) from his earnings after the service is utilized and usually after some income threshold is exceeded (a multiple of statistically expressed average earnings) either for a predetermined period of time (10 to 15 years), which settles the obligation (irrespectively of how much and when was actually paid), or until the full settlement of the debt.

In case the provider of product services is involved in the amount of earnings to be generated by his customers, whereas the amount of earnings is an effect of acquiring, developing or preserving human capital, as a result of which the customer has more and better capabilities, the provider will also try to provide the customer with such services that would develop and preserve his human capital and ensure the customer actually reaches the given income level. Naturally, some customers may fail to reach the given income level, thereby making no or only very low payments to the provider. However, in case the provider has many customers, the risk of the given loss (costs incurred by the provider in connection with providing the services to a customer) will be covered by the customers, who generate such earnings that would not only cover the provider's costs, including opportunity cost – i.e. including the provider's alternative returns, associated with the successful customers, but also the provider's costs associated with the unsuccessful ones. It is also necessary to underline the aspect of the long-term horizon. In case the provider of productive services receives returns from his customers for a relatively longer period of time, he will be committed to ensuring that the customers' knowledge, skills, and capabilities may be used for such prolonged period of time. This partly contributes to a long-term growth, and partly limits efforts aimed at short-term profits that may have negative effects in the long-run. In case the customers of the productive services providers repay such services for a longer period of time using the transferred price, the following will happen:

- The given system allocates funds to the service providers associated with the acquisition of human capital, whose production is the most successful on professional markets. The providers' clients will logically prefer those providers, who will ensure the highest returns possible for them in respect of their investments.
- The given system "bridges" the specific "lender – borrower" relationship, which arises in connection with investments in human capabilities (e.g. a student / graduate, who "purchases" educational services and also acts as a borrower/debtor, and a university that acts as a "seller" and a lender/creditor simultaneously), and a capital market. Subjects of capital markets may be interested in lending some resource to a provider of productive services and receiving from the payments of its customers. However, subjects of capital market will only invest in contracts based on the transferred price, if they believe it might be beneficial. This will further promote the interest of the providers of productive services in ensuring that their customers maximize their earnings. It is less costly for a third subject who is interested in lending a provider of productive services to monitor a provider (one entity) than the provider's customers (many entities). Providers can also easily inform about success of their customers than customers. To some extent, the scheme mitigates the problem of information asymmetry and the associated adverse selection problem. But it must be emphasized that the problem cannot be totally removed.
- In case the productive services providers are truly involved in the success of their customers, it is safe to expect the characteristics of the sector of productive services described in Chapter 2.1 will be fulfilled. In other words, it will no longer be necessary to use the term "may" (e.g. "The production of these sectors may lead to sharp and long-term increase in the productivity of labor employed within industry..."), but the theory will describe actual events (e.g. "The production of this sector leads...").

### **3 Results and Discussion**

We tried to prove above that using transferred price as the key element of the HCC in sectors of productive services can lead to quicker professional fulfillment, better professional results, as well as longer zenith and horizon of productive fulfillment. If we tell it than it is necessary to ask: why do not various entities operating within the sector start using the transferred price mechanism? After all, the implementation of the mechanism is an innovation. In case the given innovation is prospective, individual entities should be motivated to use it. Why

is it not the case? Standard objections to the transferred price mechanism are following (for details see [24]):

1. Effects generated by productive service customers will be reflected in their earnings in a long period of time. This weakens the ties between the services and the relevant earnings. Moreover, in case of prolonged repayment of the given debt of the customer to the provider of productive services, the provider of such services will recover its costs and generate its profit a long time after the provision thereof.
2. The amount of client's earnings results from a number of factors. It is difficult to estimate the impact of each factor, including the productive services, in advance. The impact of productive services may easily be overestimated or underestimated. Clients, for whom the impact of productive services was overestimated, will pay too much, thereby reducing their interest in productive services. On the other hand, clients, for whom the impact of productive services was underestimated, will pay too little, with the productive services providers not being able to cover their costs. Therefore, the easiest way is for clients to pay right away.
3. In case the productive services customers generate higher earnings in the future, and such increase is not related to the productive services, it seems unfair for those customers to pay anything from the given earnings to the service providers. Customers may try to conceal the given earnings or to ensure their payments are made in a way that prevents the need to pay the relevant share to service providers. This is associated with high transaction costs. Some customers may not even accept the higher earnings, including a situation, where they do not start performing activities that are directly associated with higher earnings.
4. Future repayments require high-quality monitoring system to limit the motivation of the productive services customers to hide their earnings. Moreover, it is necessary to ensure an effective debt collection system in respect of the providers' receivables from their customers. All this is difficult and costly. It is not clear whether the costs associated with the aforementioned would not outweigh the benefits.

Some objections may also be ideological. Let us at least mention two of those:

5. The application of the transferred price would result in an increased role of the market in areas that are traditionally viewed as areas ensuring public goods, providing positive externalities that contribute to the socialization of people, ensure interpersonal solidarity, raise individuals to citizenship, their involvement within the society, etc. This increased role of the market will lead to further moral devastation of the given segments, which have already been stigmatized by substantial commercialization and cease to serve their original purpose. As a result of such commercialization, some entities are already unable to consume public goods and goods and services with positive externalities, because of the barriers arising from the commercialization.
6. The proposed model works with the idea that people are able to think long-term and can be motivated by long-term expectations. This is not the case in reality. Most people prefer immediate benefits to long-term ones.

We believe that most objections may be resolved - both the practical ones (points 1 through 4 of this Chapter) and the more or less ideological ones (points 5 through 6 of this Chapter). How it is possible is discussed in other papers [24]. We think that main reason why using of HCC and transferred price is quite rare is caused by currently limited competition in many parts of the sector of productive services. Present providers are not forced to use HCC contract and they prevent from its using as it could reveal their lower efficiency. Areas such as university education, healthcare, spa sector, etc. are subject to strict regulation, with barriers to enter these sectors. Let us, for now, disregard the fact that some regulation makes sense to ensure at least minimum quality of the offered services and to prevent some risks. The public choice theory (e.g. [6]) points out that regulation may also serve in favor of the regulated entity - it may be set up in a way that limits (and sometimes even eliminates) competition of the regulated entity. Moreover, the existing system insufficiently discloses, whether the services



provided by such entities in fact have the required quality. Since customers pay at the moment a service is provided (if they pay at all, i.e. the costs of providers of productive services are covered from public budgets), there is no feedback that would clearly reveal/disclose the quality of a service. The existing system is thus beneficial for existing providers. The application of the transferred price principle – even to a limited extent – would impair such benefits – this is why they prevent it.

#### 4 Conclusion

The paper described the main element of human capital contract – so called transferred price. It emphasized that the transferred price can be used not only in financing of university education but also in other sectors of productive services, i.e. healthcare, but they may also include family upbringing, provision of housing for young families, culture, some areas of relaxation and recreational activities, spa industry, professional (work-related) consulting, etc. The paper further explained why we use the term “sectors of productive services” and how the principle of transferred price should be designed to achieve appropriate results. The main point about the design of transferred price is that a provider of productive services must be a person who gives a customer of the service without its direct payment and that the customer pays for the services from his/her future income directly to the provider of the services.

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# Modelling of Spatial Accessibility of Acute Bed Care in Terms of the Czech Republic

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## Abstract

The subject of this paper is modelling of sub-issues of efficiency and quality in healthcare, namely spatial accessibility of acute bed care with a focus on basic medical branches – internal medicine, surgery, gynaecology and paediatrics. The aim of this paper is modelling the spatial accessibility of all basic medical branches of acute bed care providers (Model 1) and of all providers of acute bed care (Model 2) according to selected time zones in terms of regions of the Czech Republic. The access time was investigated in time zones of 20, 30, 60 and 120 minutes for 91 acute bed care providers of basic medical branches and for 156 acute bed care providers. The data was drawn from the Institute of Health Information and Statistics of the Czech Republic and the Road and Motorway Directorate of the Czech Republic. For the analysis of the accessibility of Network Analysis method and Dijkstra's algorithm were used. The key outputs of modelling are the maps of the access time. On the basis of the conducted modelling the level of time accessibility of providers and key factors influencing the spatial accessibility were also deduced. These factors include the status and extent of institutional network of providers and road networks.

*Keywords:* spatial accessibility; acute bed care; basic medical branches; regions

JEL Classification: C10, I18

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## 1 Introduction

The healthcare as a system has been undergoing developmental changes over the last decade concerning in particular the system of payment for health care, a change of ownership of health establishments and the implementation of different measures aimed at improving the performance of the whole system.

Besides other parameters, accessibility is the significant factor of health services quality and efficiency. Generally, cohesion of quality and efficiency elements on the grade of system, organizational units, processes and activities is a condition of the Total Quality Management. Accessibility significantly goes towards determination of the health equity level in health services. This significantly accents in terms of bed care. The importance of these issues highlights the valid legislation, largely based on Art. 31 of the Charter of Fundamental Rights and Freedoms [4] and Art. 3 of the Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine [1].

Basic forms of acute bed care accessibility are spatial (geographic, local) accessibility, time accessibility, institutional accessibility, financial accessibility and information accessibility. The spatial accessibility is determined by access time, i.e. the distance that the patient must overcome to achieve the necessary of health care. The patient must overcome the distance in a certain time through traffic infrastructure of which quality is also a general limiting factor.

Conditions of territorial and time accessibility have been defined parametrically In the Czech Republic since January 1, 2013 by Government Decree No. 307/2012 Coll., on local and time accessibility of health services paid from public health insurance. In case of spatial accessibility this is setting of an ultimate access time (minutes) for defined branches or services of both out-patient care and in-patient care.

*The aim of this paper is modelling the spatial accessibility of all basic medical branches of acute bed care providers (Model 1) and all providers of acute bed care (Model 2) according to selected time zones in terms of regions of the Czech Republic.*

The primary attention of this article is devoted to modelling the accessibility of acute bed care in all four basic medical branches (Model 1). The overall survey of the level of the accessibility of the acute bed care in the Czech Republic is illustrated by the second model.

The first model hypothesis was formulated as follows: *"The maximum access time to the acute bed care providers in the basic medical branches is 30 minutes in the Czech Republic"*. This hypothesis was formulated with regard to the fact that the basic medical branches of acute bed care should be accessible to patients in the same extent and, if possible, in a comprehensive form.

The issue of the accessibility of health services and in particular bed care is dealt with Czech and foreign authors within their national conditions, focusing on institutional and time accessibility, for example: Ivanová [5]; Dobiášová, Hnilicová, Simandlová, Havá, [2]; Mužik, Szalayová [9]. In contrast, this paper deals exclusively with the spatial accessibility and is inspired by the works that use in modelling of spatial accessibility geographic information system (GIS) and quantitative models such as Modified two-step floating catchment area (M2SFCA). Delamater [3]; Mao, Nekorchuk [6] show examples of using M2SFCA in the urgent bed care conditions in chosen USA regions. These authors specialize in bed care traffic accessibility in conditions of a chosen US state.

## **2 Material and Methods**

### *2.1 Material*

According to the reported statistics of the Institute of Health Information and Statistics of the Czech Republic (hereinafter IHIS CR) 188 hospitals were registered. 156 out of them were acute care hospitals and 32 hospitals out of them provided of subsequent care to 31st December 2012. The file of acute care hospitals also included university hospitals. In 2012 56 262 beds were registered in acute care hospitals (49 181 acute care beds, 7 460 after-care beds and 2 191 newborns' cots), which represent 95.6% of the bed fund.

For the purposes of modelling the spatial accessibility (Model 1) acute care providers were selected and they provide all basic medical branches – internal medicine, surgery, gynaecology and paediatrics. The selected set of acute care providers decreased to 91 hospitals. Table 2.1 documents the number of acute care providers of all basic medical branches (hereinafter the providers) and the number of beds in basic and other medical branches according to the regions to 31st December 2012.

**Table 1. the number of all basic medical branches of acute bed care providers and the number of beds in medical branches according to the regions to 31. 12. 2012**

Name of Region	Number of beds in medical branches of acute care					
	Number of providers	internal medicine	surgery	gynaecology	pediatrics	other medical branches
Capital City of Prague Region	5	793	523	573	319	4 092
Central Bohemian Region	10*	786	581	429	427	1 150
South Bohemian Region	7	553	499	341	332	1 269
Region of Pilsen	5	439	398	242	189	1 209
Region of Karlovy Vary	4	216	216	169	178	418
Region of Ústí	10*	274	238	166	183	184
Region of Liberec	4	287	378	193	172	918
Region of Hradec Králové	6*	570	360	222	274	1 232
Region of Pardubice	5*	136	107	117	123	643
Region of Vysočina	5	438	395	252	294	999
South Moravian Region	8	690	576	418	379	2 169
Region of Olomouc	7*	436	304	206	274	1 092
Region of Zlín	5*	464	324	200	221	909
Moravian-Silesian Region	10	815	689	446	529	2 465
<b>Total</b>	<b>91</b>	<b>6 897</b>	<b>5 483</b>	<b>3 974</b>	<b>3 894</b>	<b>19 316</b>

Source: Authors based on IHS CR, Kardexes

Note: \* The information about selected hospitals is not available with the following hospitals: Central Bohemian Region (Městská nemocnice Čáslav); Region of Ústí (Krajská zdravotní, a.s., Masarykova nemocnice Ústí nad Labem; Krajská zdravotní, a.s., Nemocnice Děčín; Krajská zdravotní, a.s. Nemocnice Teplice; Krajská zdravotní, a.s., Nemocnice Most; Krajská zdravotní, a.s., Nemocnice Chomutov); Region of Hradec Králové (Česko-německá horská nemocnice Krkonoše, s.r.o.); Region of Pardubice (Chrudimská nemocnice, a.s.; Orlickoústecká nemocnice, a.s.; Litomyšlská nemocnice, a.s.); Region of Olomouc (Šumperská nemocnice, a.s.); Region of Zlín (Nemocnice Valašské Meziříčí, a.s.)

All acute bed care providers were also selected for the purposes of modelling the spatial accessibility (Model 2). Table 2.2 shows the number of acute bed care providers in the Czech Republic and the total number of beds in acute bed care hospitals.

**Table 2. the total number of acute bed care providers and total number of beds in medical branches according to the regions to 31. 12. 2012**

Name of Region	Number of beds in medical branches of acute care					
	Number of providers	internal medicine	surgery	gynaecology	pediatrics	other medical branches
Capital City of Prague Region	20	1 043	812	809	319	5 482
Central Bohemian Region	21	1 195	843	598	477	1 445
South Bohemian Region	7	553	486	341	332	1 269
Region of Pilsen	10	689	512	300	224	1 257
Region of Karlovy Vary	5	243	248	169	178	446
Region of Ústí	11	792	691	483	507	1 573
Region of Liberec	8	393	378	228	172	918
Region of Hradec Králové	9	647	439	263	294	1 357
Region of Pardubice	6	356	285	239	258	856
Region of Vysočina	6	438	417	252	294	1 023
South Moravian Region	20	1 226	999	499	379	3 352
Region of Olomouc	8	637	434	259	324	1 324
Region of Zlín	7	544	427	274	257	961
Moravian-Silesian Region	18	1 073	849	474	529	2 730
<b>Total Czech Republic</b>	<b>156</b>	<b>9 829</b>	<b>7 820</b>	<b>5 188</b>	<b>4 544</b>	<b>23 993</b>

Source: Authors based on IHS CR, Kardexes

The spatial accessibility of health care is investigated and evaluated in terms of access time and own selected time zones. For the purposes of spatial accessibility of providers were determined four access times. Basic classification was set to 20, 30 and 60 minutes. For university hospitals was further determined access time up to 120 minutes. The basis for modelling was complete addresses of hospital care providers taken from the document

"Directory of Health Establishments in the Czech Republic" by the Institute of Health Information and Statistics of the Czech Republic, to 30th June 2012.

## 2.2 Methodology of Spatial Accessibility Modelling

Evaluation of spatial accessibility is realized using access time maps of the acute bed care providers. For the purpose of time maps creation the Network Analysis has been processed (The ESRI ArcGIS 10.0 software, and its function Service Area). Theoretical basis for creating of our network analysis was the mathematic branch called the Graph Theory [11]. By using such graphs we made an abstraction where particular objects were replaced by vertices (nodes) and links were replaced by edges. Volek, Linda[11]in this theory a graph is defined as (1):

$$G = (V, E, \epsilon) \quad (1)$$

and consists of finished set of vertices ( $V$ ), edges (arcs,  $E$ ) and of relation of incidence ( $\epsilon$ ) that is featured  $E \rightarrow V^2$ . This feature allocates an ordered pair of vertices to each edge. In the accessibility analysis this numeric value represented time needed to overcome a given passage.

Using the network analysis we set the so called service ranges to a specified time distance from a given place, in this case a hospital was the given place. The service range analysis that was enabled by using Network Analyst extension was based on the Dijkstra's algorithm [7] for searching the shortest path in a graph. The Dijkstra's algorithm solves the problem of the shortest path in a continuous, undirected and non-negative labelled graph. According to the Dijkstra's algorithm we have the  $G$  graph and inside this graph we look for the shortest path. The  $V$  value means the set of all the  $G$  graph vertices and the  $E$  value consists of all the  $G$  graph edges. For each  $v$  of the  $V$  set the algorithm stores the length of the shortest path that is possible to get to it. This value is reported as  $d[v]$ , wherein all vertices begin with value  $d[v]=\infty$ , except for the source vertex  $s$  that begins with  $d[s]=0$ . Infinity symbolizes that we do not know the route to a vertex.

Dijkstra's algorithm also contains sets called  $Z$  and  $N$ . In the  $Z$  group there are all already visited vertices and in the  $N$  group there are the not yet visited vertices. The algorithm operates until the  $N$  set is empty. During each cycle one of the  $v$  min moves from the  $N$  set to the  $Z$  set. Only the  $v$  vertex with the lowest  $d[v]$  value from the whole  $N$  set always moves.

For each  $u$  vertex, to which an edge leads from  $vmin$  (the edge's length is marked as  $l(vmin,u)$ ), is done the following: if  $(d[vmin] + l(vmin,u)) < d[u]$ , then assign value  $d[vmin] + l(vmin,u)$  to  $d[u]$ , otherwise do nothing.

At the end of the algorithm the shortest path's length from the source vertex  $s$  to each vertex  $v$  of  $V$  is saved to  $d[v]$ .

Importantly, this algorithm has been modified to be able to be used in context of the real world. It respects e.g. one-way restrictions, turn restrictions, delays at the intersections or obstacles on the road.

This methodology of the network analysis was based on a road and street network. We also have transformed distance to time stamp. For this purpose it was necessary to value particular network graph's edges/road sections by average speed at which a car can overcome them. These values were then introduced to a time calculating formula to find out the time that a car needs to overcome the distance corresponding to the network section's length.

The road and street network data were provided by the Road and Motorway Directorate of the Czech Republic and the data were subsequently evaluated by the higher mentioned methodology. Four basic areas were determined for the purpose of examining the accessibility of the acute bed care providers (hospitals). They were determined according to their time distance from a given hospital. Basic division was to 20, 30 and 60 minutes. For the university hospitals, given their importance, the 120 minutes availability area was defined. Hospital location was geographically located and displayed using the full addresses. On this basis the network analysis was made. Thanks to the performed network analysis that used the Dijkstra's algorithm and thanks to the subsequent defining of time intervals (20, 30, 60 and 120 minutes) the polygons were made. They show the service areas of particular hospitals.

### 3 Results and Discussion

The spatial accessibility of 91 providers was defined by the access time in time zones of 20, 30, 60 and 120 minutes, which is related to the seats of the acute bed care providers. The crucial output of realized modelling is the access time map of providers (see Figure 3.1 (Model 1)). The most crucial areas, in terms of the access time, are those located in the frontier parts of districts and regions as shown on the map in Figure 3.1 (in appendix). We may assume that in these areas the access time will be more favourable, as we can see it from the whole Czech Republic point of view. The citizens living in areas with longer access time to acute bed care providers in their district or region may use, health establishment of providers residing in neighbouring regions to shorten access time. It is evident that for most of the Czech Republic the access time is within 20 and 30 minutes. Only the frontier parts of some regions have the access time within 60 minutes. From this point of view it is mainly the area of regions of South Bohemia, Pilsen, Karlovy Vary and Central Bohemia. To a lesser extent, the 60 minutes access time is in the area of regions of Moravia-Silesia and Vysočina.

When patients in these territories are served by the acute bed care provider, which offers all basic medical branches of neighbouring region, then as a result the access time in some parts of districts is shorter in the following regions:

1. the Central Bohemia Region - Praha-West, Mělník;
2. the South Bohemia Region – Písek and Strakonice;
3. the Region of Pilsen – Klatovy;
4. the Region of Karlovy Vary – Karlovy Vary;
5. the Region of Ústí – Louny;
6. the Region of Liberec – Česká Lípa;
7. the Region of Pardubice – Ústí nad Orlicí, Svitavy;
8. the South Moravian Region – Hodonín;
9. the Region of Olomouc – Prostějov, Přerov;
10. the Moravian-Silesian Region – Bruntál, Frýdek – Místek.

Figure 3.2 (in appendix) shows structure and numbers of acute bed care providers (Model 2) in particular regions. The total numbers of 156 acute bed care providers operating in the Czech Republic to December 31, 2012 were divided as follows:

- 91 providers (i.e. 58.7%) provide acute bed care in all basic medical branches (in maps see marks - ●, ●);
- 52 providers (i.e. 32.9%) provide only acute bed care in chosen medical branches (in maps see mark - ⊖, ⊖);
- 13 providers (i.e. 8.4%) provide acute bed care in most (3 of 4) basic medical branches (in maps see mark - ⊖, ⊖).

Unlike Figure 3.1 (in appendix) further shortening of access times in Figure 3.2 (in appendix) is at the expense of institutional accessibility, because in this case the map shows those providers who do not have one or more basic medical branches in their offer.

Yet the access time has improved for example in the Region of Pilsen (District of Cheb and Tachov), the Central Bohemia Region (District of Beroun, Příbram and Benešov), the Region of Liberec (District of Liberec), The South Moravian Region (District of Blansko, Brno-Country) and the Moravian-Silesian Region (District of Nový Jičín and Bruntál).

Above mentioned should be added to the facts resulting from the provisions of the Act No. 372/2011 Sb., on health services and the terms and conditions for the providing of such services, as last amended, which govern the right of the patient to receive healthcare services at an appropriate level of expertise and possibility to choose a provider authorized to provide health services which corresponds to the patient's health needs, and health establishments. This Act also states when the patient as a consumer of health services doesn't have this right. This is e.g. emergency medical services and provider, to which the provider of emergency medical services outweighs the patient; compulsory isolation, quarantine or protective medical

treatment; persons remand, imprisonment. The provider of hospital care may in certain cases refused the patient. These cases are defined in § 48 of the Act No. 372/2011 Coll., on health services and the terms and conditions for the providing of such services, as last amended, as follows:

- if the patient acceptance has been exceeded acceptable workload or its acceptance is not possible due to operational reasons, personal security or technical and material equipment of medical facility;
- if the distance of place of staying the patient did not allow performance of visiting services in case of providing health services in the field of general practice medicine and practitioners for children and adolescents, or
- if a person is not insured with a health insurance company, with which the provider has a contract according to the law on public health insurance. This right does not apply to insured persons from other countries of the European Union, European Economic Area, Swiss Confederation or other states with which the Czech Republic has concluded an agreement on social security, including the claim to the health care in factual scope [6].

From results of modelling of the access times of the Czech Republic acute bed care providers in the 20, 30 and 60 minutes time zones, in case of university hospitals also the 120 minutes time zone, we can draw key factors that affect level of the spatial accessibility of acute bed care providers. These are the following factors:

1. the institutional network of providers and
2. the road networks.

The institutional network is given by the number of providers and by the structure of the provided acute bed care in the sense of the medical branches in the given districts and regions. The status and level this network is not defined only by the demand for health services, but also by the political and economic factors that qualify preferences and procedures of founders of particular acute bed care providers. The road network is defined by the level and capacity of the public road system in the given area that is the result of traffic services provided by the state, region and municipalities. Besides the economic factors, the traffic service is limited mainly by geographic conditions and habitation density of a particular area. The common denominator of institutional and road networks are the economic and political conditions and interests.

Problems of accessibility and quality of hospital bed care initiates questions concerning this branch key actors' action. These actors are at least state, regions and the health insurance companies. State acts as a regulator, guarantee and hospital bed care provider. Regions act as guarantees and also hospital bed care providers. Health insurance companies act as payers of health care provider for the insured and guarantees of accessibility of health care on the basis of Act No. 48/1997 Coll., on public health insurance and on changes to certain related laws, as last amended.

#### **4 Conclusion**

Accessibility is a significant factor of public services quality and performance. The same holds good to healthcare with the acute bed care. The importance of ensuring rational and efficient healthcare services accessibility is emphasized by the interest of the WHO and the national governments. The acute bed care accessibility is one of the quality healthcare services attributes under the conditions of the Czech Republic.

The paper dealt with the modelling of the spatial accessibility of health services. The accessibility is modelled from the road traffic point of view. The model does not cover the possibilities of the public mass transportation. The spatial accessibility is defined by the access time that is related to the seats of the 91 acute bed care providers. These are providers who ensure all basic medical branches – internal, surgery, gynaecology and paediatrics. The access times were determined in time zones of 20, 30, 60 and 120 minutes. The basic premise



established by hypothesis: "Maximum access time to the providers of acute bed care in the basic medical branches is 30 minutes in the Czech Republic" - was confirmed by the map of access time of providers in most of the regions and in the Czech Republic as a whole. Only the border parts of some regions have the access time within 60 minutes. From this view it is mainly the area of regions of South Bohemia, Pilsen, Karlovy Vary and Central Bohemia. The level of accessibility in individual regions, which implies Model 2 and include all the providers of the acute bed care improved only in some regions of the Czech Republic. The reason of this partial improvement is the fact that only 30% out of 65 acute bed care providers have a seat in other municipality that the providers presented in Model 1.

## Acknowledgements

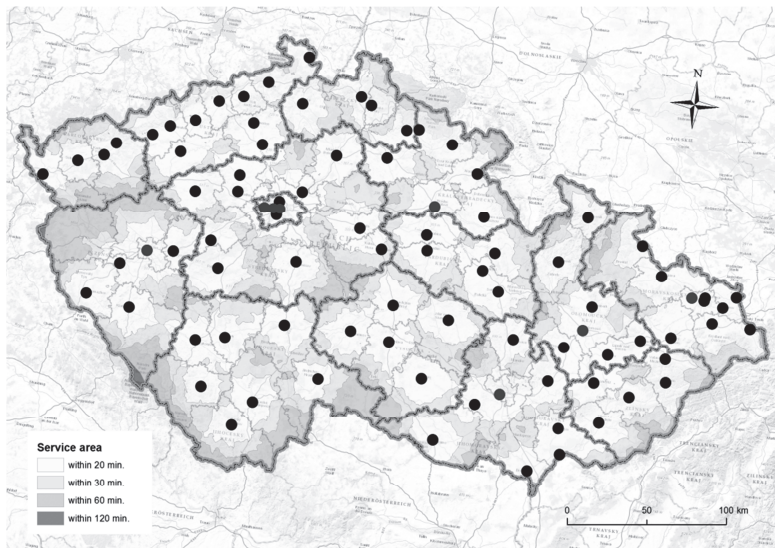
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**Appendix 1. Access times of providers of acute bed care in all basic medical branches in the Czech Republic**



Source: Authors

Key: ● - seat of a provider of the acute bed care in all basic medical branches; ● - university hospital.

**Appendix 2. Access times of providers of acute bed care in all medical branches in the Czech Republic**



Source: Authors

Key: - provides all basic medical branches; E - provides major part of basic medical branches; □ - provides chosen medical branches, - university hospital (provides all basic medical branches), E - university hospital (provides major part of basic medical branches), □ - university hospital (provides chosen medical branches)

# Day Care: What to Do with This Tool of Elderly Care?

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## Abstract

Social services are currently at the centre of interest amongst experts, in terms of both the providers of services and the clients, the consumers of social services. On the national level, social services are an important part of state, self-government, and non-state activities. The most widespread tool of social services in the Czech Republic is day care; it is mostly used by seniors. In light of the current problems that are the result of an ageing population, the efficiency of this tool is frequently discussed, mainly at the local level. The aim of this paper is to assess the current situation in providing social services at the municipal level, using the city of Brno as an example, and to consider future trends in developing this significant social services tool.

*Keywords:* social services; providers; clients; financing; community care services

JEL Classification: H71, I38

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## 1 Introduction

Social services are an important part of state, self-government, and non-state activities. They are connected with the problems of individuals, families, and groups of citizens. Social services can positively affect the social climate of the whole society. The majority of citizens could not participate in all the aspects of life in society without the influence of social services. [8].

The research for this paper examines the importance of this problem in terms of the clients, i.e. the consumers of social services, and also in terms of the gaps in financing with which providers of this service must struggle. When researching social services, it is possible to use data from official information systems, when available, or to conduct primary research [19]. Various institutions and authors have conducted research in senior care (Kuchařová, 2002, in the Czech Republic [10]; Frcalová, 2007, also in the Czech Republic, specifically in České Budějovice [2]; and Glaser in the whole of Europe [4]). However, we were interested in research of specific local issues. The primary method of qualitative data collection was the best means of achieving the aims of this paper, by evaluating the current state of social services provision in the city of Brno. The research was based on data collected from social services providers in Brno, the second largest city in the Czech Republic.

Social services are going through the major reformative changes – that’s why it’s necessary to focus on the local partial studies. Research that was done in Brno dealing with problematics of social care is the source for conception of next development of social services in Brno city and wants to show the local problems. This paper, apart from the leading into the context of social services on the national level and day care in Brno city, tries to point at the possibility of using this in future, as a major tool in providing care for seniors.

### 1.1 Context of Social Services

Social services are legislatively delimited as a part of social assistance that includes the social services themselves as well as their financial and material benefits. Social services need not be provided only as a part of the state social assistance: they can be fully covered by the consumer/recipient of social services on a contractual basis if the service provider is commercial. The service provider can also be a non-state subject providing the service for free

(commercial contractor of service). The aim of social services is mainly to improve the quality of life for clients [11].

Social services exist in various forms and can be divided by many criteria. They can be divided by the need, duration, and type of service, and by other categories [18] such as whether the service is provided by a state or non-state organisation and whether the provider is a professional or non-professional service. They can also be divided according to the types of tasks performed and the care provided, whether the care is compulsory or optional, whether it is provided for an individual or a group, and whether it is a one-time, time-limited, or unlimited care situation. [7]

From an economic point of view, there is a question of whether social services are necessary. As Mertl [12] states, in connection with demographic progress and the decrease of informal social services, there are increasing numbers of people who could demand this care. Social services is specific by touching integrally the personality of consumers and is bound to local aim (municipality problem). One problem with social services is the information asymmetry: social workers and social service providers have much more information than their clients. Social services are not an optional good but people are left to the need of it. [13].

Social services have been called goods of experience or goods of trust. The true face of these goods is seen at the moment of consumption [12]. One possible way to satisfy the need for social services is the family environment itself: According to Godet [5], family is not only a private concern; it is also a matter of public concern, determining social cohesion and sustainable development through its connections to many externalities that are positive for society. Godet states [6] that if the family properly fulfils its function, these positive externalities are the health and upbringing of children, care for the elderly, and social integration. These positive factors contribute to growth and well-being for the family and the whole society.

### *1.2 The Current Structure of Social Service*

One of the most used social services is day care (see Table 1: The Number of Registered Providers of Social Services). The law (Act no. 108/2006 Sb., On Social Services) defines social services as a field or ambulant service provided to people with low self-sufficiency because of age, chronic illness, or disability, and to families with children whose situation requires the assistance of another person [9].

Day care includes these activities:

- assisting with basic self-care;
- assisting with personal hygiene or providing conditions for managing personal hygiene;
- providing food or helping with diet;
- helping with household maintenance;
- mediating contact with social surrounding.

**Table 1. The number of registered providers of social services in the Czech Republic (as of 9 Sept 2014)**

Social Services	Number of Providers in CR	South-Moravian Region	City of Brno
<b>Social Services</b>	<b>883</b>	<b>80</b>	<b>20</b>
Relief Services	326	41	29
Day Care Centre Services	103	19	12
Day Care Centres	327	39	21
Halfway Houses	49	5	4
Homes with Special Regime	282	57	31
Senior Homes	547	65	38
Professional Social Consultancy	796	116	93
Protected Living	197	18	10
Social Activation Service for the Elderly	279	38	21
Personal Assistance	275	24	12

Source: [14]

Dohnálek [1] defines one role of social services as helping elderly people, or those whose state of health resulted in low self-sufficiency in basic life skills, by providing the possibility of staying in the home with the assistance of a kind staff. People are thus enabled to live a full and happy life, with respect for their social and individual needs and with the active help of their family.

The following factors are the main influences on the intensity of social service demands:

- municipal level (dimension of space),
- the ageing population,
- and the number of social service providers in a concrete region.

The demographic prognosis presents an unequivocal conclusion: the population in the Czech Republic is ageing. If the current rates of reproduction remain steady, this process will only continue in the coming years. The ageing population is connected with insufficient economic productivity and will also undoubtedly result in very specific and demanding conditions for the whole of society, with particular pressure on social services for seniors [15].

Participation of every financial source is different according to the sort of social services. Day care is a major diagnostic service which protects client interests with a “reimbursement limit”. This is partially financed from public sources; the amount of reimbursement for the individual services is set by the provider. Providers have different price levels for different cost calculations. For example, there can be different prices for meals that are distributed in a city and meals distributed in a village because of varying costs for fuel and for the time of carers. Setting prices on the basis of a client’s salary is not possible. It is, however, possible for the service provider to set different prices for weekdays and weekends, although these prices should not exceed the legally established maximum reimbursement. The consumer must be familiarized with the prices beforehand.

As a part of social services, day care is intended for people in difficult social situations and is funded by other sources. According to Act No 108/2006 Coll., On Social Services, any registered provider of social services may ask for a grant for providing the basic social services. After the applicant’s budget and the effectiveness of the provided service are considered, the social service provider will receive a grant in accordance with the available funds [15].

As of 2010, state grant applicants can submit their requests only through an internet application of OK service – provider. The application is an extension of the Registry of Social Service Providers. The application collects information about the applicants, resulting in a much easier process for completing applications.

## 2 Material and Methods

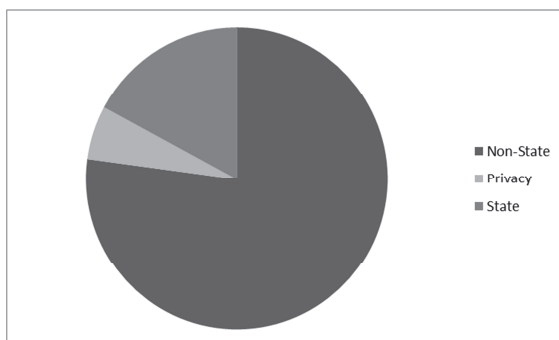
The aim of this text is to evaluate the present situation of social service providers on the municipal level, both in terms of the social services offered and in terms of the financial stability of these companies, using the example of the city of Brno. We also discuss future trends in the development of social services on the basis of primary data collected from a survey of a sample of social service providers in Brno.

### 2.1 Sampling File

In Brno, there are many social service providers. Some providers are from the statutory city of Brno, some are non-governmental companies working in the Brno region, and some are private companies providing social services. These providers offer various services, from day care through day care centres to long-term day care services. In Brno, there are six state social service providers.

The non-state social service companies have the largest representation: 27 companies. There are only two private social service providers (see Figure 1).

Figure 1. Percentage of social service providers in brno



Source: Author

### 2.2 Methods

The research was addressed to all providers of social care in Brno city, it's the method of specific choice of respondents – providers. Data was collected using a survey questionnaire. The questions were open in order to collect individualized answers. A total of 35 questionnaires were sent in an electronic format. From the 35 respondents that were asked answered 19 – the rate of answers was till 1month from sending the questionnaires (sometimes there was a phone demanding used). We deal with the 54% of returning the questionnaires back – we can consider these results as representative though, we can bear them as relevant in next discussion.

## 3 Results and Discussion

There are 35 social service providers in Brno (Table 1 indicates that there were 20 social service providers in Brno as of 9 September 2014. This difference is because some companies are not listed as registered providers on the Ministry of Labour and Social Affairs web site).

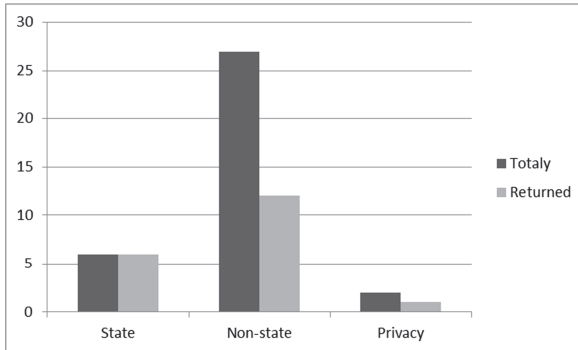
The questionnaire used for the survey had eight open questions:

- What services do you provide?
- What service is the most frequently used?
- How many seniors do you provide your service to?

- What services are the seniors interested in that it is not possible to provide?
- What are the difficulties in providing these services?
- Is there enough money to provide your services?
- In what specific areas do you see room for improvement?

Figure 2 shows the questionnaire return rate.

**Figure 2. The total number of addressed providers and the questionnaire return rate**



Source: Author

The data was assessed based on information from nineteen social service providers, which is more than 54% of the social service providers in Brno.

The survey showed that in addition to day care, the companies provide other services that are mentioned in the Act on Social Services. The most frequently used services are lunch delivery and help with personal hygiene. The providers agree that these services are used approximately equally and there is a major interest in them.

The capacity of clients that can use social services varies greatly. While the state providers each care for more than one thousand clients on average, in non-state companies the number of clients is much lower. The private companies serve the lowest numbers of clients.

The most frequently used service is assisting with personal hygiene. The state providers report that this service is used by 65% of their clients; non-state providers claim it is used by around 72% of their clients. On average, when looking at the providers altogether, personal hygiene services are used by more than 79%.

Services in which clients are interested but that cannot be provided for various reasons include administering medication, accompanying clients on walks, and providing evening supervision. The main reason these services are not provided is financial. With some services, such as social services that have not yet been defined, there are legal problems.

In addition to financial problems, the number of employees and their qualifications can be a reason that services are not provided. Social service providers differ in their opinions of their financial situation: the state providers claim to consider funding sufficient but simultaneously assert that they are unable to extend their services with the present funding; private and non-state providers criticize the amount of funding, which they connect with their inability to extend or improve their services even in the face of increasing demands.

The better quality of service sees the providers mainly in the higher amount of finance. Some providers see a potential for improving and extending their services with a higher number of employees.

The survey indicated that social service providers have the biggest problem with funding, regardless of the type of provider. Most providers admitted that the funding is balanced, but stated that financing is sometimes difficult.



A possible trend in providing social services can be seen in experience. One possibility for making services more attractive for clients and providers is the use of service packets, by means of which the client will be given a discount if using multiple services at once (for example using food delivery and assistance with personal hygiene or help with housework). There would be a certain financial savings with employees shifting. This system is already working in some places (e.g. Plzeň region). In Prague, there are service packets ranging from “basic” (assistance with hygiene, food delivery, and shopping) to “comfort” (escort to doctor, help with contact with authorities, and doing the laundry).

Another way to make social services more effective is shared living. Shared living among the elderly is based on the standard concept of flat sharing: each senior has a private room and they all share the other parts of flat. Seniors pay for the rent, utilities, and social services. Social services are provided around the clock. The concept of shared elder living was introduced in Switzerland in response to the increasing cost of separate living. Research that was conducted in 2013 [3] showed that seniors do not use available social services mainly for financial reasons, but also because they do not know where to find such services. The research results showed that seniors who are dependent on regular assistance are not willing to move to long-term care. Seniors are often suspicious of professional carers, due to distrust, economic reasons, and the fear of the loss of dignity. However half of the 1537 responders said they could imagine professional care in their homes [3].

If we set the question of validity of the data (return 54%) and the chosen method of collecting the data, we can verify the collected facts and assess this research and find the concrete possibilities of solving. “The method of verification was used mainly in assessing the research. Statements contained in questions were taken for quotation and there was verification searched, and it was verification direct and indirect. We were of course aware of trouble leading from this issue (principle) incomplete verification. That’s why we accepted the principle of confirmable conclusions.” [16]. On the base of this method the conclusion can be expressed.

#### **4 Conclusion**

The aim of this entry was to assess the present state of available social services in Brno according to the companies that offer these services, to assess their funding, and to outline future trends in these services. The research clearly showed that the social services in Brno are on an acceptable level; companies provide many services. Social service providers deal with many problems, both legislative and, primarily, financial. The number of clients is growing, but the providers still have to deal with distrust on behalf of the clients and with the economic reasons that can lead to the refusal of available services.

One of the ways to fund social services (and day care) is to have the client be able to combine finances from his own income/pension, from insurance money, and from the system of social services. Then the client would be self-sufficient and the system would not operate at a loss. As a result of social service providers being dependent on grants, the system might have a problem with European legislation. The solution to this problem may be cancelling the direct grant system. Social services for entitled clients should not be supported by direct grants to providers, as direct grants contradict European legislation, but based on the other tools. One way would be to transition from the system of grants for social service providers to a system of payment support directly to the entitled client [17].

The trend in social services is to keep the client in familiar surroundings as long as possible. If a person is not able to take care of himself and has nobody to take care of him, it is time for that person to have day care. Day care is a tool enabling people to stay in their familiar surroundings. Day care is provided for payment but the law sets the acceptable maximum price for seniors and they have decent life conditions. According to the population ageing, the level of social income, or pensions, the low capacity in houses of elderly is day care the future trend in caring about elderly. The question is the effectiveness of financing day care the way so it can be offered to seniors in quality and appropriate extend so they are able to finance the service form

their income; and the stability of providers both in the financial and providing the qualified employees way.

The results are important mainly for the funders and social service providers and the deputy of civil service. The benefit of this article is mainly in pointing out the financial balance of social services providers according to the legal structure and to the quality of service provided according to the funder. This article was designed to reflect the local level; the research was based in Brno, the second largest city in the Czech Republic. The results can be transferred to the regional civil service level and should be useful for the Ministry of Labour and Social Affairs.

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**SESSION IV:  
NON-PROFIT SECTOR**

# Rural Non-profit Organizations and their Functions in Communities and Local Governance: Survey Results from Vysočina and South Moravia Regions

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## Abstract

Motivated by constrained public good delivery and social cohesion-weakening tendencies in rural areas, this paper examines rural nonprofit organizations and their contribution to communities and local governance. We analyze three functions of the nonprofit organizations - service, community-building and advocacy functions - and their variation among municipalities characterized by varying degrees of rurality. Using survey data (interviews with mayors) from 179 rural municipalities in the Vysočina and South Moravian regions of the Czech Republic, we find an overall positive perception of the nonprofits' role for communities and local governance. The rural nonprofits provide services that mainly relate to fire protection, sports, and other leisure activities, while nonprofits' provision in fields requiring more specialized expertise and professionalization are frequently missing or insufficient. Although rural nonprofit organizations are predominantly service-oriented, they are greatly recognized for their community-building function. These organizations' advocacy function was assessed as being significantly weaker; nevertheless, the organizations are considered mostly active in local governmental affairs, and their relationship to local governments is assessed as being mainly cooperative. These results, however, show systematic variation among rural municipalities, where municipality size and proximity to district towns are found to matter for the nonprofits' potential to serve the community and play an active role in local governance.

*Keywords:* rural nonprofit organizations; local governance; Czech Republic; rural development; service function; community-building; advocacy

JEL Classification: L31, R19

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## 1 Introduction

In numerous studies, nonprofit organizations have been recognized for their vital role for civil society and democracy [3], [7] as well as for providing public goods and services [10], and contributing to community-building [6], [9]. The latter two roles are arguably more crucial in geographic areas where the market and state are more limited in providing locally-demanded public goods and services, and where communities' social cohesion has weakened as a consequence of modern developments. Rural areas and communities represent such a case. The low concentration of demand, weaker infrastructure and other rurality-related factors increasing transaction costs can be expected to make these areas less attractive for private for-profit providers of public goods and services [8]. The local governments' delivery of public goods can also be constrained by a limited budget or by a low population density that increases the delivery's per-capita fixed costs. Furthermore, rural areas have been greatly affected by past and current trends in the agricultural sector, which used to represent the main rural employer. The hasty restructuring of the farming sector and abolishment of subsidiary productions in the early transition period resulted in a dramatic outflow of labor from the sector that did not find alternative local employment. Current trends in agricultural technologies lead to further diminishment of the demand for labor. The resulting outmigration and increase in commuting rate both reduce the frequency of local interactions, which weakens social cohesion and communal life. All of these rurality-specific conditions suggest the importance of the nonprofit

sector when it comes to the provision of public goods and services, maintaining social cohesion, and thus for the quality of life in rural areas.

Moreover, as reflected in the formulation of current public policies ranging from the local to the European levels, the nonprofit sector is considered an important partner in the governance system. The political interest in nonprofits' engagement in local governance is mainly based on the nonprofits' abilities to identify, communicate and implement local responses to community needs (mainly through their advocacy function) and to undertake collective actions for public or mutual benefit as discussed above. The nonprofit sector's contribution to the effectiveness of local governance can, again, be greatly important in rural areas dominated by very small municipalities with administrative autonomy that makes them prone to leadership by a few local elites.

These issues frame our interest in rural nonprofit organizations (NPOs) and their impact on communities and local governance. Using data from a survey conducted in 2013, this paper aims to illuminate the rural NPOs' functions of service providers, community-builders and local advocates (see the Triangle Model of NPOs' Functions by Neumayr et al. [2]), and to contribute to the understanding of the nonprofits' role in local governance. Moreover, we are interested in how the degree of rurality, measured by municipality size and distance to urban center, influences these functions and role.

## **2 Material and Methods**

For this study we chose a primary research approach and conducted a survey using a structured questionnaire with mayors or vice mayors of rural municipalities (with up to 2,000 residents), primarily in two regions of the Czech Republic, Vysočina and South Moravia (plus selected neighboring districts in the Zlín and Olomouc regions). For the selection of the regions, we consulted a typology of rural municipalities developed by Perlín et al. [4]. Our objective was to choose two regions that would be representative for rurality in the Czech Republic, optimally one from Bohemia and one from Moravia. This resulted in the exclusion of municipalities that were categorized as recreational, structurally affected industrial municipalities, municipalities in the former Sudetenland, or rapidly developing rural municipalities strongly influenced by urban centers' gravity. The most representative for the Bohemian territory were rural municipalities categorized as "non-developing neighborhood-based municipalities". The Vysočina Region exhibited the greatest density of these municipalities. The most representative municipalities in the Moravian territory were "equipped Moravian municipalities", most of which were located in the South Moravian Region.

The selection of municipalities in these regions included further criteria: less than or exactly 2000 residents; a share of agricultural land greater than or equal to 40 %; distance to the national border and the region capital of at least 20 km. The municipalities were randomly drawn from two strata - municipalities with (i) less or equal to than 200 residents, and (ii) larger than 200 residents. The rationale behind the stratification was to slightly reduce the share of extremely small municipalities, which were expected to have a rather weak formal nonprofit sector.

As mentioned above, the survey respondents were mayors or their deputies (in the remaining text we speak of mayors only). This approach has its cons and pros. One weakness of interviewing mayors about the local nonprofit sector is the possible lack of precise answers to more concrete questions such as the number of members of the individual NPOs. Furthermore, the answers may be influenced by the mayors' subjective judgment. The main reason for this approach was to obtain information on all active nonprofit organizations (formal and informal) in selected municipalities to capture the sectors' size. We rely purely on formal databases to include non-active and fictive NPOs. The second reason for this approach is the need to optimize the number of visits to selected municipalities due to budget constraints.

NPOs considered in this study are formal and informal NPOs active in rural municipalities. Formal NPOs are defined by the Civic code No. 89/2012, Coll. In rural areas this mostly concerns

associations, public benefit companies, charitable funds, local political groups and associations/alliances, and local offices of political parties. Informal NPOs are nonregistered ongoing groups of residents involved in public benefit activities (sometimes acting under a joint name). The final database consists of 699 NPOs in 179 municipalities. Thus, on average there are four NPOs per municipality. Respondents indicated that of the 699 NPOs, 550 NPOs were formal and 101 were informal (respondents could not classify 48 NPOs as formal or informal).

The survey questions directed at the local NPOs' functions were formulated mainly as comparative rating scale questions. A constant sum question was used for the comparative weighing of the functions. In addition to a descriptive analysis of the main statistics, we perform an analysis of the differences in the NPOs' functions between municipalities' varying degrees of rurality. We concretely compare municipalities with less than or equal to 500 residents and more than 500 residents, and municipalities closer than or exactly 20 km far from a district city with those less proximate. Both benchmark numbers - 500 residents and 20 km - are values close to the sample median. Using the two-group mean comparison test, we explore if any systematic differences occur between the defined municipality groups. The data was processed and analyzed in IBM SPSS Statistics and Stata software.

### 3 Results and Discussion

#### 3.1 Rurality-related Variation in the Non-profit Sector's Size

Before describing and analyzing rural NPOs' functions, this section aims to characterize the rural nonprofit sector. Similar to Curtiss et al. [1], we chose to characterize the sector by means of its size approximated by two measures - number of NPOs per 100 residents and number of NPOs' members per capita - both on the municipality level. The measures will not be used to state whether the sector is small or large; it will be used for comparative purposes mainly.

The municipalities in the sample have, on average, 1.02 NPOs per 100 residents, with a standard deviation of 0.66. This measure varies from zero NPOs per resident to 3.8 NPOs per 100 residents. When considering the membership in the measure, the average municipality-level nonprofit sector size is 0.48 NPO members per capita, with a standard deviation equal to 0.60. This corresponds to approximately every second resident being a member of an NPO. This measure has a weakness in that it does not consider that a person can be a member of multiple NPOs. This is revealed by a maximum value equal to 3, which implies that every resident in that municipality is, on average, a member of three NPOs. Table 1 further compares these measures between above-defined groups of municipalities.

**Table 1. Comparison of the nonprofit sector size between groups of rural municipalities**

	Comparison of smaller and larger municipalities			Comparison of municipalities closer to and more distant from the district town		
	Mean for municipalities with <=500 residents	Mean for municipalities with >500 residents	t-value of two-group mean comparison test	Mean for municipalities <=20 km to district town	Mean for municipalities >20 km to district town	t-value of two-group mean comparison test
<b>Number of NPOs per 100 residents</b>	1.21	0.70	5.30***	1.24	1.02	1.86*
	1.31 <sup>1)</sup>	0.67 <sup>1)</sup>	4.61*** <sup>1)</sup>	1.31 <sup>3)</sup>	1.12 <sup>3)</sup>	1.35 <sup>3)</sup>
	1.13 <sup>2)</sup>	0.73 <sup>2)</sup>	3.03*** <sup>2)</sup>	0.74 <sup>4)</sup>	0.69 <sup>4)</sup>	0.37 <sup>4)</sup>
<b>Number of NPOs' members per capita</b>	0.41	0.68	-1.87*	0.53	0.38	1.40
	0.53 <sup>1)</sup>	0.53 <sup>1)</sup>	0.02 <sup>1)</sup>	0.53 <sup>3)</sup>	0.31 <sup>3)</sup>	2.01** <sup>3)</sup>
	0.31 <sup>2)</sup>	0.64 <sup>2)</sup>	-2.71*** <sup>2)</sup>	0.48 <sup>4)</sup>	0.59 <sup>4)</sup>	-0.40 <sup>4)</sup>

Source: Authors

Note: \*\*, and \*\*\* indicate statistical significance at the 10%, 5% and 1% significance levels, respectively; <sup>1)</sup> Value for a subgroup of municipalities closer than or exactly 20 km far from the district city; <sup>2)</sup> Value for a subgroup of municipalities farther away than 20 km from the district city; <sup>3)</sup> Value for a subgroup of municipalities with less than or exactly 500 residents; <sup>4)</sup> Value for a subgroup of municipalities with more than 500 residents.

Results presented in Table 1 imply that there are statistically significant differences in the size of the nonprofit sector between smaller and larger rural municipalities, as well as between municipalities varying in proximity to the district town. The former differences are, however, statistically more significant. While smaller rural municipalities have, on average, significantly more NPOs per 100 residents than larger municipalities, they also have significantly smaller membership bases. This is particularly so when comparing smaller and larger rural municipalities that are farther away from the district town, which indicates that the more remote and smaller (most rural) municipalities have the least NPO members among their residents.

Further results show that municipalities located closer to the district town have a significantly larger nonprofit sector. Most significant location-related differences are found in the number of members per capita when analyzed on the subgroup level of smaller municipalities. Smaller municipalities closer to a district city have a higher share of NPO members among their residents than smaller municipalities that are more remote from the district town. The distance to an urban center thus affects more smaller than larger rural municipalities.

### 3.2 Distribution of Rural NPOs' Functions

This section presents results regarding the distribution of the rural NPOs' main functions as assessed by mayors or their deputies. For each NPO in the municipality, the respondents distributed a value of 100 among the three functions, while the third, community-building function is subdivided into social cohesion building within the organization and beyond the organization. On average, service delivery is found to be the NPOs' prevailing function (45 %; see Table 2). The second most important function is invigorating relationships and trust among organization members (27 %). This is followed by the NPOs' contribution to community-building beyond the organization (20 %). In the mayors' opinions, the advocacy function of rural NPOs is marginal.

**Table 2. Relative distribution of rural NPOs' functions**

	Service function	Advocacy function	Community-building within the organization	Community-building beyond the organization	
Sample mean	45.0%	8.5%	26.6%	19.9%	100%
Mean for municipalities with less than or equal to 500 residents	47.9%	6.6%	25.2%	20.3%	100%
Mean municipalities with more than 500 residents	44.3%	11.8%	26.0%	17.9%	100%
t-value of two group mean comparison test	0.86	<b>-2.49**</b>	-0.25	<b>0.98<sup>2)</sup></b>	
Mean for municipalities located closer than or exactly 20km to the district city	50.1%	6.3%	25.9	17.6%	100%
Mean for municipalities located farther away than 20km from the district city	45.3%	9.7%	24.4	20.6%	100%
t-value of two group mean comparison test	1.10	<b>-1.42<sup>1)</sup></b>	0.49	-1.12	

Source: Authors

Note: <sup>1)</sup> This difference is statistically significant at the 5% significance level when estimated for municipalities with less than 300 residents. <sup>2)</sup> This difference is statistically significant at the 10% level when estimated for a subgroup of municipalities located closer than 20km to the district town.

The group comparison analysis reveals only minor differences in the NPO functions' between municipalities grouped based on size and distance to the district city. Most significant differences are found in the share of the advocacy function. Mayors of municipalities with more than 500 residents identify the share of the advocacy function of local NPOs as being almost



twice as large than mayors of smaller municipalities. This could either imply that NPO representatives in smaller communities are less concerned and engaged in local governance or their advocacy function is due to the affinity and frequency of interaction between community members and local government representatives being less formal and thus more latent.

Although the difference in the advocacy function is not found to be significantly different between municipalities closer and farther away from the district town, this difference is found to be significant when analyzed on a subgroup of municipalities with less than 300 residents. This could imply that in small municipalities the distance to an urban center matters for people's engagement in local governance. The reason for this observation could be that in more remote and small municipalities, supply of public goods and services from district city is less of a substitute to local public supply.

Furthermore, the community-building function that outreaches fostering relationships and trust among the organization members is slightly greater in smaller municipalities. The difference is further found statistically significant when testing on a subgroup of municipalities closer to the district city.

### 3.3 Rural NPOs as Service Providers

Since providing services is, together with the community-building, the main function of rural NPOs, the follow-up question is what sort of services do the NPOs provide. As illustrated in Table 3, the most common rural NPOs (24 %) are NPOs providing public services represented mainly by local volunteer fire departments. The second most common type of NPOs are sport clubs, mostly unions for physical education and football clubs, which make up 21 % of all rural NPOs. These are followed by other special interest and hobby clubs (16 %) - mainly gardeners' clubs, fishermen clubs and beekeepers' clubs. Moreover, NPOs dealing with culture and cultivating traditions represent a notable share (12 %) of rural NPOs. NPOs engaged in environmental activities also play a considerable role (9 %); these are, however, mostly represented by local hunters' associations, whose environmental role may be limited compared to other NPOs with more environmental missions. Other organizations active in the social, educational, health care, or developmental spheres are seldom represented in rural areas.

**Table 3. Frequency of rural NPOs' main field of activity**

<b>NPO's field of activity</b>	<b>Frequency</b>	<b>Share (%)</b>
Health, care for elderly and handicapped	10	1.4
Public service (e.g., volunteer firemen departments)	169	24.2
Culture and traditions	83	11.9
Education and youth	16	2.3
Social (e.g., support of families and mothers with small children)	15	2.1
Ecological	65	9.3
Protection of rights	3	0.4
Innovation and development (e.g., support of entrepreneurial development, trainings)	0	0.0
Sport	149	21.3
Other interests and hobbies	111	15.9
Municipal and regional development	5	0.7
Political agenda and increasing political awareness/engagement	17	2.4
Other	1	0.1
Do not know the activity/not filled out	55	7.8
<b>NPOs in total</b>	<b>699</b>	<b>100.0</b>

*Source: Authors*

Our analysis of mayors' answers regarding nonprofit sectors' field of activity that are to varying degrees missing in their communities revealed that the communities most frequently lack support for entrepreneurial development, help and care for elderly and handicapped people, and educational activities for adults and seniors. Also, the protection of rights (e.g. by increasing awareness of human rights issues or supporting minorities' integration), support of family and mothers with small children, and the development of tourism are noteworthy as fields of NPOs' activity that were identified as partially needed but not supplied. The structure of

the most missing services suggests that it is difficult for rural areas to attract NPOs that require a specific level of expertise and a greater degree of professionalization. Surprisingly, it is the mayors of larger municipalities (with more than 500 residents) closer to the district centers (closer than 20 km), who identify the selected NPO services as being significantly more missing. This raises the question of whether the mayors' answers reflect a degree of awareness or include the consideration of the size of the demand in their own and neighboring communities along with the service provision feasibility. Due to space limitations, these results are presented in a narrative form (without statistics and respective statistical tests) only.

3.4 Rural NPOs as Community-builders

This section examines mayors' perceptions of the role of local NPOs in the community. The perception is by and large very affirmative, as shown in Table 4. The local NPOs' most positively assessed overall contribution was their contribution to community development. The second-most positively evaluated role regards the NPOs' impact on young people. In 87 % of all cases, the mayors agree or rather agree with the statement that integrating younger people in the NPOs' activities increases their sense of belonging and improves their relationship to the community. With an average score of 4.24 out of 5, the mayors mostly agree with the opinion that members of local NPOs participate more actively in the municipality's social life than do non-members. On average, the mayors rather agree with the statement that members of local NPOs are more willing to volunteer than non-members. This statement received the least support.

Table 4. Mayors' perception of the NPOs' community-building function

	Dis-agree (1)	Rather dis-agree (2)	Neither agree not disagree (3)	Rather agree (4)	Agree (5)	Do not know/ no answer	Average score <sup>1)</sup>
Members of local NPOs are more willing to volunteer than non-members.	6	6	30	63	67	18	4.04
Members of local NPOs participate more actively in social life of the municipality than non-members.	3	4	24	59	83	17	4.24
Local NPOs have an overall positive contribution to the development of the community.	2	0	8	43	120	17	4.61
Integration of younger people in the NPOs' activities increases their belonging and improves their relationship to the community.	3	3	17	46	104	17	4.42

Source: Authors

Note: <sup>1)</sup> The values are the mean values of the answer scales - they range from 1 (disagree) to 5 (agree).

Comparing the mayors' perception of the NPOs' community-building function between size and distance-related groups of communities reveals additional noteworthy information. Mayors of larger municipalities in the sample view the NPOs' effect on youth significantly more positively than mayors of smaller municipalities. Furthermore, in more remote municipalities with more than 500 residents, the NPOs' contribution to social cohesion and community-building is considered significantly higher than in same-sized municipalities located closer to the district town.

3.5 Rural NPOs as Local Advocates

In this section, we explore the local NPOs' advocacy function. In congruence with the weights of the three functions discussed in Section 3.2, the rating of the NPOs' advocacy role is weaker than the rating of their community-building role presented in the previous section. From

the presented statements (see Table 5), the respondents most strongly agree with the notion that local NPOs facilitate and spread positive societal values. The NPOs' influence on the public thus appears stronger than their impact on local government. The second-most positively viewed statement by mayors regards the NPOs' function as a partner in executing public events. The mayors agreed that they would definitely approach a local NPO should the municipal government need volunteers for helping with a public event; this was true for a majority of the NPOs in the sample (57 %). The statement that the local NPOs have mostly supported plans and decisions of the municipal government met with slightly less agreement. This was also true of the statement that local NPOs contribute to better informedness of the municipal government regarding residents' needs. The mayors agreed least with the statements that the local NPOs have actively observed plans and decisions of the municipal government, and addressed local government with their own initiatives and proposals. Hence, the NPOs' direct involvement in local governance - the initiative and monitoring activity - was assessed as being weaker than their cooperative activity.

**Table 5. Mayors' perception of local NPOs' advocacy function (Source: Authors)**

Statements approximating NPOs' advocacy function	Dis-agree (1)	Rather disagree (2)	Neither disagree nor agree (3)	Rather agree (4)	Agree (5)	Do not know/ no answer	Average score <sup>3)</sup>
Local NPOs facilitate and spread positive societal values (e.g., in the area of environmental protection, cultural heritage, rural traditions). <sup>1)</sup>	2	2	21	51	97	17	4.4
Local NPOs contribute to better informedness of municipal government regarding residents' needs. <sup>1)</sup>	7	9	43	54	59	18	3.9
NPO representatives have addressed local government with their own initiatives and proposals. <sup>2)</sup>	77	72	128	176	229	17	3.5
NPO has actively observed plans and decisions of the municipal government (e.g. through participation in municipal board meetings). <sup>2)</sup>	70	87	142	159	231	10	3.6
NPO has mostly supported plans and decisions of the municipal government. <sup>2)</sup>	31	39	180	197	235	17	3.9
Should municipal government need volunteers for helping with a public event, it would definitely approach the NPOs. <sup>2)</sup>	53	33	81	126	393	13	4.2

Source: Authors

Note: <sup>1)</sup> Statements regard all NPOs on the municipality level; <sup>2)</sup> Statements regard individual NPOs in the surveyed municipalities; <sup>3)</sup> The values are the mean rankings - they range from 1 (disagree) to 5 (agree).

Using a more detailed analysis we further found that in more remote, smaller municipalities, mayors believe that the NPOs facilitate and spread positive societal values significantly less than do mayors in larger, remote municipalities or in smaller municipalities closer to the district town. The only other significant differences in the advocacy performance were found among municipalities closer than (or exactly) 20 km from the district town. There, mayors of smaller municipalities (i) find that local NPOs are more active in their role of a "watchdog" over the local governments' plans and decisions (i.e., NPOs observe the plans and decisions of the municipal government more actively), and (ii) are more favorably view the statement that, should the municipal government need volunteers for helping with a public event, it would definitely approach the local NPOs (compared to the mayors' perception in larger municipalities).

## 4 Conclusion

Based on our analysis of original survey data, this paper delivered new insights on rural NPOs and their role in local communities and governance. Moreover, the paper generated new knowledge of the differences in NPOs' functions among communities that vary in their degree of rurality as captured by their size and distance to district town.

The results shed an overall positive light on rural NPOs' role in the communities and their impact on local governance. NPOs' services mainly deal with fire protection, sports and leisure activities, while NPO activities that require more specialized expertise and professionalization, such as care for the handicapped and elderly, or support to entrepreneurial development, are frequently found to be missing or insufficient. Despite their mission being strongly service-orientated, these organizations were recognized by the mayors for their community-building function. Although their advocacy function was assessed as being significantly weaker, rural NPOs and their representatives are considered mostly active in local governmental affairs. Similar to Prouzová [5], we found that the relationship to local government is mainly cooperative.

The results were further found to systematically vary among different types of municipalities. In smaller and geographically more remote (more rural) municipalities, the nonprofit sector was characterized by significantly weaker NPO membership per capita. As remoteness is often accompanied with lower income levels and weaker human capital, this finding suggests that the existence of a rural nonprofit sector depends not only on the local demand for nonprofit services but also on the sufficiency of available human and financial resources. The size of the nonprofit sector among larger municipalities was found to be unaffected by the distance to an urban center. This distance was, however, found to matter for the NPOs' impact on communities. Larger and more remote municipalities were found to contribute more to social cohesion and community-building than the same-sized municipalities located closer to the district town. This may imply that proximity to an urban center results in a reduced need for secondary (community) functions of the nonprofit sector. Further, the advocacy function of local NPOs differs between municipalities of different sizes and remoteness. Proximity to a district town increases the NPOs' function of advocating local societal values and, in small municipalities, their "watchdog" role in local governance.

As this is the first attempt to analyze the rurality effect on the nonprofit sector and the sectors' functions in communities and governance, more in-depth research is needed to find more elaborate explanations for the current observations.

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# How to Measure the Effect of Public Income on the Structure of Resources and Production of Non-profit Organizations

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## Abstract

Non-profit institutions are characterized by their multi-source funding. There are numerous publications on this issue, including discussions on the public financing impact on the NPO behaviour. The question is to what extent do the Czech official data capture the financial flows to NPI and their real structure. The aim of this paper is to point to insufficient state of knowing in the context of the CR, especially concerning the structure of revenues of NPOs. After we explored these absent places in the realm of existing data on non-profit sector, we designed a project proposal for mapping the scope and structure of all resources of the Czech NPI. Our paper also introduces in short the main objectives and research strategy of our survey-project which will allow us to test theories on the ratio of public and private revenue of NPOs. The project has a potential to become a significant contribution to understanding the role public income play in total income of NPOs.

*Keywords:* non-profit organizations; public finance; income structure; research project

*JEL Classification:* L31, L38

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## 1 Introduction

Public financing of NPO currently belong to the key issues in mutual relationship between state/public administration and non-profit sector. Of course, it is not a subject matter that would be “something completely different” within the nonprofit literature, but it is still topical. Moreover, in the environment of the post-communist countries, the topic is totally unexplored. It is surprising that in this environment we find no efforts to deepen the understanding of the structure of resources and their mutual substitution.

The most frequent issue in this context is the issue of the acceptance of commercial sources. And, of course, public finance and their effects on the behavior of non-profit organizations, too. Public finance can thus be seen as causing the phasing out the efforts of non-profit organizations to obtain additional private resources (crowding-out effect). And vice versa, we can expect positive impact of public finances (crowding-in). See [11].

Space for alternative sources of income may generate public institutions themselves, simply by ceasing to subsidize certain types of services. According to Kerlin, Pollak [10], “the nonprofit literature suggests that increases in public funding in earlier decades set the stage for the large impact of government cuts later on. Starting with Great Society programs of the 1960s, the federal government invested billions of dollars in poverty programs, education, health care, community development, the environment, and the arts, channeling many of these funds through nonprofit programs spurring the expansion and creation of these organizations ([6]; Salamon, 1995; Young, 2003). However, the economic downturn in the late 1970s brought welfare retrenchment and large cutbacks in federal funding in the 1980s.”

Source of problems in this context is a strong connection to many non-profit organizations, and it seems especially service providers, to any public budgets. By the Salamon’s estimate, social welfare cuts in the 1970s and 1980s resulted in the loss of US\$38 billion for nonprofits outside the health care field ([17]). Other authors noted that hopes that private contributions would fill the gap were not realized as private contributions dropped from 26% of nonprofit revenue in 1977 to 18% in 1992 ([6].

One of the reasons why the NPO reach for commercial sources of income, is represented by constraints and cutbacks of public resources. Even here, however, there is not unanimous consensus among the authors.

Scholars have tried to prove that nonprofit organizations relying on government funding turned to commercial activities as a way to fill the gap left by cutbacks ([1]; [7]). Salamon [16] states, "Between 1977 and 1989, nearly 40 percent of the growth of social service organization income and 51 percent of the growth of civic organization income came from fees and other commercial sources" (p. 24). However, Foster and Bradach [9] argue such statistics are taken out of context: "Fees and charges grew no faster in that 20-year period than other sources of revenue; they represented nearly half of the sector's total revenue in 1997, just as they had in 1977" (p. 93).

There can be identified two research streams examining the phenomena of the public financing impact on the NPO behaviour. See Kerlin, Pollak [10] :

"Researchers who claim an increase in commercial revenue often use resource dependency theory to explain their findings. According to this theory, organizations depend on outside resources to operate and use "proactive strategies that can be pursued to deal with environmental constraints" (Jaffee, 2001, p. 218). Thus, resource dependency proposes that nonprofit losses in government grants and other traditional funding (like private giving, both individual and corporate) may prompt an increase in commercial revenue as a replacement. Indeed, drawing on this theory, Eikenberry and Kluver maintain that, when public and private funders falter, one of the strategies nonprofits pursue is the use of market approaches to generate revenue. LeRoux (2005) similarly concludes that nonprofits "adopt [entrepreneurship] activities as a coping strategy when financial circumstances threaten to limit the scope of their service provision" (p. 360)."

This line of thinking considers commercial activities as an alternative that comes into play after the previous major financial source fails. But there is an alternative approach, which argues that more gradual rising costs to nonprofits and increased competition for private and government dollars may be the reason behind a continuing rise in commercial activity [3]; [19]. Rather than resource dependency, this line of reasoning is more compatible with institutional theory which broadly examines the effect of an operating environment on an organization [13].

In this case, this is coping with the external pressures. This means that for surviving (or sustainability) of the organization it is necessary to adapt to the institutional environment in which it operates. This is illustrated by the research of Flood, Fennel, [8] or Rao [14]. They, in their conclusions, even speak of "mimetic and isomorphic" tactics adopted by nonprofit organizations. Of course, this line of thinking would mean that the tendency to commercial behavior is higher in countries with higher commercial environment. The increase in the commercial activities of non-profit organizations can then be understood as a kind of passive acceptance of the situation and response "to a number of outside pressures rather than a deliberate effort to subsidize declining revenue from discreet sources." [10]).

Here we've found a space for our research project which academic (theoretical) ambition is to test relevant theories in the Czech environment. We shall examine whether in the Czech context the public finance cutbacks really lead to increasing effort of obtaining commercial income.

The aim of this paper is:

1. To summarize the current knowledge in the field of financing non-profit sector in the Czech Republic. Simultaneously, to identify so far existing knowledge and data gaps. All this should be presented in the internationally comparable structure.
2. To introduce our project survey strategy: main objectives, core research questions and methodology.

## 2 Material and Methods

For the purposes of the project we are working with the definition of non-profit institutions in a way that allows international comparisons. We use the definition of non-profit institution according to the standards of the European Accounting System (ESA 1995) where the non-profit institution is being defined in para 3.31 as “a legal or social entity created for the purpose of production of goods or services whose status does not permit them to be a source of income, profit or other financial gains for the units that establish, control or finance them. In practice, their productive activities are bound to generate either surpluses or deficits but any surpluses they happen to make cannot be appropriated by other institutional units” [5].

This definition of NPI corresponds both to the definition according to SNA 1993 (para 4.54) and the definition being used in Handbook on Non-Profit Institutions in the System of National Accounts [2].

Non-Profit Institutions Satellite Account of the Czech Republic, published annually by the Czech Statistical Office, provides the series of basic aggregates that are comparable in terms of time periods since 2005 for NPIs in all institutional sectors. The National Accounting of the Czech Republic, published in annual time series by the Czech Statistical Office, provides the series of basic aggregates that are comparable in terms of time periods since 1993 for the institutional sector of S.15-NPISH.

Our analysis has to deal with some limiting factors. Very limited ability of the Czech national accounting to capture economic characteristics of the non-profit sector in internationally comparable form is only one of them. In order to proceed further, consider first some basic data.

### 2.1 Pre-survey Data

The first macroeconomic indicator is the share of the non-profit sector on the gross domestic product and share of paid labor. It is evident that these indicators are still at relatively low levels in the Czech Republic. This is very evident especially in international comparison. [15].

**Table 1. Third sector's share on GDP (PW)**

Year	2005	2011
Share of GDP (in %)	1,48	1,63
Share of paid workforce (in %)	1,52	1,96

Source: [15]

To ensure that our results are internationally comparable, we decided to accept ICNPO. This classification has many benefits. For us, however, it will be difficult to fill it by the Czech data. This is illustrated in the following two tables.

Unfortunately, Czech Statistical Office doesn't follow the ICNPO definition. The only available are the data according to the NACE classification. Year 2012 data according to COPNI will be available in the end of 2014.



**Table 2. Third sector's fields of activity**

<b>Year</b>	<b>2005</b>	<b>2011</b>
Measure	Number of NPIs	Number of NPIs
Culture and recreation (= Arts, entertainment and recreation : NACE, R)	21803	27053
Education and research (=Education : NACE, P)	697	1051
Health (=Hospital activities, Medical and dental practice activities, Other human health activities : NACE, 861; 862; 869) 87A	111	225
Social Services (=Residential nursing care activities and care activities for mental retardation, mental health and substance abuse, Residential care activities for the elderly and disabled and other, Social work activities without accommodation : NACE, 87A; 87B; 880)	327	785
Environment	n/a	n/a
Development and housing	n/a	n/a
Law, advocacy and politics	n/a	n/a
Philanthropic intermediaries and voluntarism promotion	n/a	n/a
International	n/a	n/a
Religion	n/a	n/a
Business and professional associations, unions	514	1878
Not elsewhere classified	46885	83193
<b>TOTAL</b>	<b>70337</b>	<b>114185</b>

Source: [2]

Another important figure is the income structure. Unfortunately, we have the data for NPISH (NPIs in S.15) in total only. We haven't got income structure in NACE, COPNI or ICNPO classification, we haven't got sources of income for NPIs in S.11 – S.14. In the table, private giving includes voluntary work (appraised according to the methodology of Eurostat).

One of the project objectives is to create NPIs' resources data map. Following table demonstrates the urgent need of such a step.

**Table 3. Third sector's sources of income**

	Public sector payments	Private giving	Earned income	Public sector payments	Private giving	Earned income
Year Measure	2005 Mio CZK			2011 Mio CZK		
Culture and recreation	n/a	n/a	n/a	n/a	n/a	n/a
Education and research	n/a	n/a	n/a	n/a	n/a	n/a
Health	n/a	n/a	n/a	n/a	n/a	n/a
Social Services	n/a	n/a	n/a	n/a	n/a	n/a
Environment	n/a	n/a	n/a	n/a	n/a	n/a
Development and housing	n/a	n/a	n/a	n/a	n/a	n/a
Law, advocacy and politics	n/a	n/a	n/a	n/a	n/a	n/a
Philanthropic intermediaries and voluntarism promotion	n/a	n/a	n/a	n/a	n/a	n/a
Philanthropic intermediaries and voluntarism promotion	n/a	n/a	n/a	n/a	n/a	n/a
International	n/a	n/a	n/a	n/a	n/a	n/a
Religion	n/a	n/a	n/a	n/a	n/a	n/a
Business and professional associations, unions	n/a	n/a	n/a	n/a	n/a	n/a
Not elsewhere classified	n/a	n/a	n/a	n/a	n/a	n/a
<b>TOTAL</b>	<b>10757</b>	<b>16959</b>	<b>18597</b>	<b>15952</b>	<b>16315</b>	<b>19624</b>

Source: [2]

Organizational/institutional structure of nonprofit organizations in the Czech Republic is rather complex and as we can see, in examined period it included thirteen legal forms. Their numbers are recorded in the table. However, not all of these legal forms were the subject of analysis, mainly because of their quasi-nonprofit nature (public universities, hunting communities, etc.). Some others, especially foundations, represent very special part of the sector and will be given a special investigation later.

**Table 4. Organizational forms in the Czech Republic**

	Organizational (legal) form	2005	2011
117	Foundation	293	435
118	Endowment Fund	725	1195
141	Generally beneficial company	550	1968
601	Public university	25	26
641	School corporation	-	172
701	Civic association (union, club, movement, society, trade union, etc.)	37794	70540
711	Political party, political movement	46	142
721	Church organization	3428	4277
731	Organizational component of association	24114	30188
741	Professional organization/chamber	17	20
745	Other chamber (excl. professional ones)	109	185
751	Association of legal persons	520	1008
761	Hunting community	2716	4029

Source: [2]

### 3 Results and Discussion

Our research project is based on the survey method; thus focusing research has not been in this range implemented in the Czech context. At the most general level, we will examine whether resp. how the changes from public sources revenues affect the functioning (and sustainability) of the Czech non-profit organizations.

Main research questions of our survey:

- Does the share of public resources in the total income of non-profit organizations indicated by themselves correspond to the level indicated by the available official data sources?
- Do the revenues from the central government institutions represent the most important income component of non-profit organizations?
- What is the significance of indirect and commercial resources in terms of total income of non-profit organizations?
- What type prevails in indirect sources of non-profit organizations: public or private?
- Does the internal organization structure of income change over time?

Furthermore, we are interested in whether answers to these questions will vary:

- According to the organizational type (organizational size, age of the organization, industry,...)?
- According to the total revenue (total budget) of the organization?

The research project is divided into two stages.

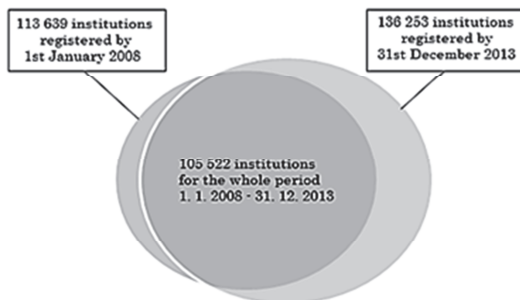
In the first phase, we want to map how the amount (and structure) of public funds of the nonprofit organizations develops, while using the retrospective method of study (cf. de Vaus, [4]). We shall compare the data from 2013 and then retrospectively for the years 2010 and 2008.

In the first part of the research we will be to determine:

- Whether and at what nonprofit organizations report changes in the overall structure of income between the years?
- Is there a relationship between the changes in the revenue structure of the NPO and the amount of direct public revenue?

Through a standardized questionnaire there will be directly from the NPO collected information relating to the amount of their total income. Special attention will be devoted to the division on public and private sources, and also on income from the capital and from economic activity incl. non-financial sources of income. Target file includes all non-profit organizations active on 31.12. 2013, which have already existed in 2008 (totally 105,522 units).

**Figure 1. Number of non-profit organizations in 2008 and 2013**



Source: [2]

For the research purposes, we exclude from this set churches, public universities, hunting communities, political parties, professional associations, chambers of commerce and housing organizations; all of them represent organizational types on the edge of the nonprofit sector. This means that some of the essential characteristics of non-profit organizations are being suppressed. This is valid for all the mentioned subjects except church organizations. Religious organizations are not included because they are given special investigation, due to their specific position in the segment of social services.

After exclusion of specified categories of non-profit organizations, we get a basic set of about 80,000 units. Because of the high heterogeneity of non-profit organizations, we decided to use stratified random sampling.

We divide the basic set of non-profit organizations into 6 subgroups according to the ICNPO principles. From each of these groups, 75-100 units shall be randomly selected. Data from the first phase will be evaluated. In the second phase, we will focus on a set of non-profit organizations in which we find relevant direct public sources changes between 2008 and 2013 (decrease or, conversely, increase). The aim of this research is to find how the nonprofit production and strategies change as a result of direct public sources change.

#### 4 Conclusion

To sum up, this paper presents our project survey strategy. It explains the main objectives of the research, including its justification, and especially research methodology. We also presented our efforts on treatment outcomes in an internationally comparable form. However, weaknesses/gaps in existing knowledge of Czech non-profit sector had to be identified first.

All research questions are linked with hypotheses whose testing will allow us to meet the project objectives. We believe that the project will make a significant contribution to the understanding of the roles played by public finance income. This role is generally considered to be essential, especially in those parts of the non-profit sector focused on providing public services. The project also responds to questions about the impact of public funding to the nonprofit sector production.

Overall, we believe that these are the issues that are in the Czech environment unduly neglected, respectively, desirable attention is not paid to them by researchers. We also hope that our empirical findings and conclusions will help to validate resource dependence theory and institutional theory.

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# Fundraising of Major Czech Political Parties

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## Abstract

Democratic states cannot exist without political parties and political parties cannot exist without financial resources. The way of political parties gaining their financial resources can have a direct impact on the democratic processes in the state. One of the traditional financial resources is fundraising from private donors. It is generally assumed that fundraising activities grow before major elections. However, this assumption has not been approved for the Czech political parties as well as the influence of the economic crisis is unclear. Therefore the aim of this paper is to analyse trends in fundraising of the major Czech political parties and discuss whether or not we can identify tendency in fundraising behaviour. We will analyse and discuss three research questions about fundraising of political parties which were identified in previous theoretical research. To fulfil the aim, we will analyse data, which were not published earlier. Those data (from 2008 to 2013) are accessible at websites of political parties and from reports of political parties that are available only in the Parliamentary Library of the Czech Republic.

*Keywords:* political parties; donation; financial resources; Czech Republic.

JEL Classification: D72, H81

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## 1 Introduction

Are we able to find any trends in the funding of political parties? What are the specifics reflected in the Czech Republic? What do we know about donations and fundraising activities of political parties? Democratic states cannot exist without political parties and political parties cannot exist without financial resources. The way of political parties gaining their financial resources has a direct impact on the democratic processes in the state. There are many options showing how important the role of public finance is in political competition. The range is wide - from quite essential Oswald Spengler's perception saying that "*money changing the election in the game of one's own*"; through Max Weber's opinion that money has limited power (he also emphasizes that the development of suggestive advertising has influence, too). On the opposite hand, there is a sceptical Alexander Heard's view, for whom the money is only one of factors influencing electoral success [10].

The state authorities in most countries regulate the funding processes. There are three basic principles which a democratic state may want to fulfil: the *equity, freedom and public control*. *The first principle – equity - means enabling the possibility* to have an equal competition among political parties and this principle is traditionally considered as an argument for subsidies for political parties from the state budget. The second principle, "freedom", represents an idea that each party has to have a chance to gain financial resources as a result of its own activity. And the "public control" represents the final principle. Besides details, the public should have an access to information about financial situation of political parties. In the Czech Republic we can see an extra specific principle: *enforcement*. This principle implements penalties in case of breaking the statutory rules [4, 10, 15].

The aim of this paper is to analyse trends in fundraising major Czech political parties and discuss whether or not we can identify tendency in fundraising behaviour. We will test and discuss three research questions concerning fundraising political parties, which were identified in previous theoretical research. To fulfil the aim, we will analyse not previously published data (from 2008 to 2013) accessible at websites of political parties and reports of political parties available only in the Parliamentary Library of the Czech Republic.

### 1.1 Political System of the Czech Republic

The Czech Republic is parliamentary democracy with a president as a head of state (He/she has been elected directly by citizen every five years since 2013). The Czech Parliament consists of two chambers – the Chamber of Deputies and the Senate. Every citizen of the Czech Republic who has attained the age of 18 acquires the right to vote in every election.

The Chamber of Deputies consists of 200 members who are elected every four years. The electoral system is based on the principle of proportional representation. Based on the result of the elections and the president's decision, a leader of successful political party is chosen and he/she forms the Cabinet. Consequently, the Cabinet needs to gain a support of the Chamber of Deputies. Every citizen of the Czech Republic who has the right to vote and has reached the age of 21 may be elected to the Chamber of Deputies. Deputies are elected as representatives of political parties.

The Senate is composed of 81 senators, who are elected by the single-member electoral system to a six-year-long period of service. Elections are held every two years, when one third of new senators is elected. Every citizen of the Czech Republic who has the right to vote and has reached the age of 40 may be elected to the Senate. The Senate was designed as a counterweight to the Chamber of Deputies, as well as an element of generating higher quality requirements of the legislative process, and as an element of continuity in case the Parliament would be dissolved by the Chamber of Deputies.

Besides election to the Czech Parliament, there are also elections to the European Parliament, to the regional municipality bodies (of 14 regions) and to the local municipality bodies. These elections are traditionally organized in turns every two years with four-year-long period of position. The last election to the regional municipality bodies happened in 2012 and the last election to the local municipality bodies was held in 2014. The elections to the European Parliament are organized every five years; the last one was in 2009.

### 1.2 System of Political Parties Funding

The basic financial principles for political parties are determined by the Czech laws No. 424/1991 and No. 247/1995. The authorized financial resources are following:

- allowance for covering election costs from the state budget,
- allowance for covering activities and subsidies for mandates from the state budget,
- non-state incomes as: membership fees, donations, and heritage; income from renting and selling properties; revenue from raffles; income from organizing cultural, educational and political events; debts and interests from debts; and income from selected business activities (publishing; radio or TV broadcasting; organization of cultural, sport, leisure-time and political activities; production of promotional items).

But as Šimíček [16] said: *“no funding model for optimal financing of political parties exists; ... in all democratic countries it becomes a matter of constant criticism and efforts to improve”*.

To present our results clearly we use abbreviations of political parties. The full list of political parties including their basic characteristics is a part of appendix No.1.

If we compare our data with data from 1996 or 2004 [12, 16], we can see increasing share of donations of total revenues of some political parties (ODS, ČSSD, KSČM). We can also see some other effects of donations, which are described in the literature as:

- increasing portion of state subsidies leads to decreasing portion of donations (of private sources) [10]. On the other hand, there exists an opinion that the donation is an expression of sympathy with the programme of a political party or something else (“hidden lobbying”) [3, 17].
- years, when the elections are held, show higher level of fundraising activities [14],
- fluctuation of the sum of donations is affected by the fact if the party enter the Cabinet or if it is in the opposition [6, 16]. Although Šimíček [16] adds that in Western countries some large companies support both sides to secure a stable position,

- forms of funding are affected by the economy and the financial status of the country [3, 20].

**Table 1. Donations of selected political parties (thousands CZK)**

	ANO 2011*	ČSSD	KDÚ-ČSL	KSČM	ODS	SZ	TOP09**	Úsvit***	VV	
2013	donations	7 912	4 065	15 322	8 821	78 292	2 888	38 472	269	N/A
	% of total revenues	3.36%	0.82%	14.28%	4.10%	27.82%	11.82%	25.24%	0.67%	N/A
2012	donations	63 982	47 636	10 355	5 647	95 366	3 580	28 467	-	122
	% of total revenues	99.88%	9.36%	13.28%	4.66%	31.31%	68.60%	33.46%	-	0.38%
2011	donations	-	36 580	2 893	5 625	93 387	892	6 809	-	38 424
	% of total revenues	-	10.42%	3.83%	4.49%	20.98%	54.65%	10.63%	-	53.50%
2010	donations	-	65 883	9 806	5 533	232 910	3 364	57 548	-	22 629
	% of total revenues	-	9.17%	7.85%	2.63%	38.00%	12.81%	31.85%	-	22.22%
2009	donations	-	24 561	7 549	4 508	97 001	1 461	40 863	-	11 147
	% of total revenues	-	4.68%	5.51%	2.35%	20.59%	6.78%	97.01%	-	86.20%
2008	donations	-	38 152	9 201	4 576	75 205	2 004	-	-	N/A
	% of total revenues	-	13.50%	7.50%	2.74%	21.73%	6.85%	-	-	N/A

Source: Authors based on [11]

\* ANO 2011 was founded in 2012

\*\* TOP09 was founded in 2009

\*\*\* Úsvit was founded in 2013

We can see some problems with a control of financing processes inside political parties in the Czech Republic. The public control is done through the obligatory annual reports submitted to the Parliament Library. All reports are accessible only by visiting the Parliamentary Library. Reports are not displayed on the websites [3, 16]. Today, the most of the strongest parties have the annual report displayed online, but some of them provide reports only for last few years and a few of the parties have a transparent bank account. Another problem connected to the parties' finance is mentioned by Čichoň, Šimíček or Pulzer [3, 14, 16]. It is "party tax" and its categorization into "–in" donations, membership fees or other resources. "Party tax" is an obligatory payment to the political party when a member holds a mandate.

To prevent a fraud there is a state regulation about donations (see the Czech law No. 424/1991). The political party must not accept a donation from:

- state (except for statutory state subsidies mentioned above),
- municipality and local governments (except for renting),
- state enterprises and legal persons with equity in state or municipality or district,
- contributory organization, public benefit organization,
- foreign legal persons (except for political parties and foundations),
- foreign natural persons who are not residents in the Czech Republic.

We can find discussions about the amount of donations setting some limits for donations or donor subjects in the literature [6, 14]. For example, Germany has got a relative limit on amount of state subsidies which cannot be higher than revenues from donations and membership fees [16]. The transparency and the funding of political parties are long-term dealt by the international organisation e.g. Transparency International, IDEA (Institute for Democracy and Electoral Assistance) or GRECO (Group of State Against Corruption). They have also published research studies and issued recommendations for regulation in this area [5, 7 - 9].



## 2 Material and Methods

As a research sample we chose 9 political parties which had been at least one year in the Chamber of Deputies. We narrowed down the research sample, because before entering the Chamber there had been huge differences among parties. There are at least two groups of parties: first group is represented by typical political party which has existed for a long period and has been growing slowly; the second group contains parties created shortly before the election and sponsored by their founders. The sources of data are information provided by political parties in an obligatory annual report submitted to the Parliamentary Library.

We set three research questions mentioned in previous research and theoretical studies. We used descriptive analysis and simple correlation analysis as the research methods. However, the short sample of parties disables the possibility of a full quantitative analysis.

- Q1: Can we assume that increasing portion of state subsidies leads to decreasing portion of donations?
- Q2: Is it true that the year with elections is the year with higher level of fundraising activities?
- Q3: Can we find a connection between a fluctuation of sum of donations and the fact that the party enters the Cabinet or it is in the opposition?

## 3 Results and Discussion

*3.1 Q1: Can we assume that increasing portion of state subsidies leads to decreasing portion of donations?*

This assumption has rational roots based on partial empirical evidence from another non-profit organization [1], where long-term state support often decreases own fundraising activities. The political parties are traditionally assigned to the group of non-profit organization; hence the research question seems to be legitimate.

As the method, we confronted changes from year to year as changes in percentage share of total revenues. The results can be seen in the following table. According to the Q1, the direction of changes would be opposite especially increasing share of revenues from state budget should be compensated by decreasing share of revenues from donation. On the contrary, increasing share of donations does not need to be compensated by decreasing share of state subsidies. Therefore we assume donations as dependent variable in state subsidy grow. Table 2 shows year-to-year changes in share of revenues from selected resources.

**Table 2. Changes in share of state subsidies and donations of total revenue between years 2009-2013**

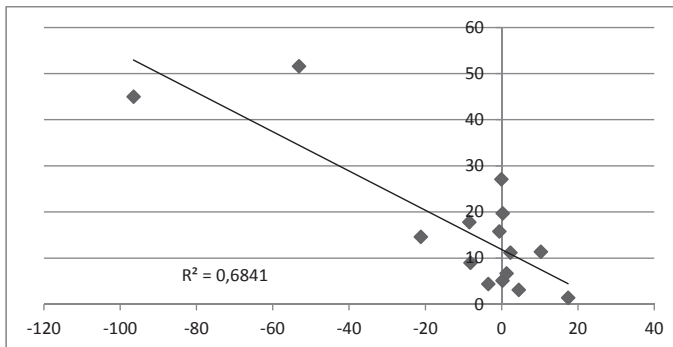
	ANO 2011	ČSSD	KDU-ČSL	KSČM	ODS	SZ	TOP09	VV
2013 Donations	-96,5	-8,5		-0,6	-3,5		-8,2	
2013 State subsidies	<b>45,0</b>	<b>17,8</b>		<b>15,8</b>	<b>4,4</b>		<b>9,0</b>	
2012 Donations		-1,1		0,2	10,3		22,8	-53,1
2012 State subsidies		<b>-14,7</b>		<b>5,1</b>	<b>11,4</b>		<b>-18,8</b>	<b>51,6</b>
2011 Donations		1,3		1,9	-17,0		-21,2	31,3
2011 State subsidies		<b>6,7</b>		<b>-10,2</b>	<b>-14,3</b>		<b>14,6</b>	<b>-34,1</b>
2010 Donations		4,5	2,3	0,3	17,4	6,0		
2010 State subsidies		<b>3,1</b>	<b>11,2</b>	<b>19,7</b>	<b>1,4</b>	<b>-8,7</b>		
2009 Donations		-8,8	-2,0	-0,4	-1,1	-0,1		
2009 State subsidies		<b>-10,3</b>	<b>-6,2</b>	<b>-5,2</b>	<b>-16,3</b>	<b>27,1</b>		

Source: Authors based on [11]

Note: value in cells is the difference between the value of given year minus previous year. The value is counted as a percentage share of total revenues.

By selecting only cases when state subsidy grows (15), we noticed decreasing trend of donations in 8 cases, but more important is the correlation analysis of sample. We counted only cases in which the state subsidies of year-to-year had increased. Results can be seen in figure 1. We are able to show basic level of correlation as the Q1 assumed. However, there is a need of having a larger sample to verify tendency in the Q1.

Figure 1. Correlation between state subsidies (increasing) and donations



Source: Authors

### 3.2 Q2: Is it true that the year with elections is the year with higher level of fundraising activities?

We counted donations and membership fees as a sum of fundraising activities. There were two major elections, but in 2008 - 2013 we noticed 10 elections in total. See appendix 2.

We identified the year 2010 as a “super election year” and hence we assume that in comparison with other years we should see significant differences. The results can be seen in the table below. We proved only tendency, but not significant results. Although it seems that for year 2010, 5 out of 7 political parties reveal maximum fundraising level, for the 2013 there is no such tendency. Explanation can be following:

- Tendency of the Q2 occurs only for “standard” political parties, and not for parties established shortly before election with strong sponsoring from founders (i.e., ANO 2011, Úsvit).
- We can see this tendency in a very long term of view and extrapolation of ad hoc donations gained e.g. from restitution or heritage.

Table 3. Resource from fundraising - sum of donations and membership fees (thousands CZK)

	ANO 2011	ČSSD	KDU-ČSL	KSČM	ODS	SZ	TOP09	Úsvit	VV
2013	8 294	23 897	<b>20 060</b>	30 985	90 327	3 439	43 204	269	0
2012	<b>64 058</b>	69 915	14 363	28 809	109 436	<b>4 132</b>	31 459		531
2011		56 105	0	30 011	107 962	1 507	10 945		<b>39 294</b>
2010		<b>89 167</b>	14 147	<b>31 825</b>	<b>248 712</b>	<b>4 038</b>	<b>59 815</b>		23 157
2009		42 346	12 358	<b>31 843</b>	113 403	2 030			
2008		55 209	15 250	30 688	90 912	2 765			

Source: Authors based on [11]

More detailed look on the parties can explain a little bit more than numbers. ČSSD and ODS have been two strongest parties during the whole period. Their sums of received donations correspond with the Q2. KSČM is the party with long-term stabilized accounting with almost no

changes regardless of election year. SZ is the party which had entered the Chamber of Deputies in 2006 but during time the party lost its preferences. Their extreme activity in fundraising in 2012 can be explained as an effort to keep the position in the Chamber of Deputies (this effort was not successful). KDU-ČSL gained about 2 mil CZK more from membership fees in 2008 in comparison with the next year. The explanation is simple - the party had lost its position in the Chamber of Deputies, therefore many members ran away. And the party returned to the Chamber of Deputies in the year 2013, which was accompanied by fundraising success. ANO 2011 is one of the new parties and during 2012 the party started a massive campaign, which would not be possible without extra resources. However, after the success, it seems that party does not need these resources any more. The leader of the party is one of the most successful businessmen in the Czech Republic and hence we assume that if the party needs more resources, it will receive more donations. Úsvit is the newest party in the list with no financial history. TOP09 is the party established in 2009 with an ambition to enter the Chamber of Deputies in 2010. The popularity growth is connected to the personality of the leader. Its fundraising activities correspond with the tendency precisely. VV is the party which has existed for a long time, but had been almost inactive until the party got a donor (successful businessman) and a new leader (well-known investigative journalist) in 2010. The following year, the party entered the Cabinet. It started to suffer from inner conflicts, which led to the situation, when the new party was established from members of Chamber of Deputies, and hence the Chamber of Deputies created a party (LIDEM) which was not elected by the people.

3.3 Q3: Can we find a connection between a fluctuation of sum of donations and the fact that the party enters the Cabinet or it is in the opposition?

We counted only with political parties, which were members of Chamber of Deputies. Although the term “opposition” could be understood widely as any party which is not a member of the Cabinet. Using the statistical methods in this Q3 would be problematic because of limited sample of parties and their specifics. Instead, we used qualitative - descriptive methods. Following table summarizes our findings.

The year 2009 was affected by the demission of the Cabinet and one year period of “un-parties” cabinet which led the country to the election (so called Fischer’s Cabinet). The same situation happened with the Rusnok’s Cabinet that led the country to the premature election in 2013. For the purpose of analysis we do not count with these “un-political” cabinets.

**Table 4. The influence of membership in the Cabinet on the sum of donations**

Political party	Description	Donations	Changes in sum of donations
ANO 2011	Since 2013 member of the Cabinet (established in 2011)	9x higher donations before the party entered the Chamber of Deputies	N/A
ČSSD	2008 - 2012 in opposition, since 2013 the leading party of the Cabinet	As the member of Cabinet the party has significantly low level of donations. Average sum of donations was 4 mil CZK/ year in comparison to 42 mil CZK when the party was in opposition.	Yes (higher in opposition)
KDU-ČSL	2008 - 2009 the member of the Cabinet, 2010 - 2012 not the member of the Chamber of Deputies and since 2013 the member of the Cabinet again	The level of donations is 2x higher in 2013 than average in 2008 - 2009	N/A (always member of the Cabinet)
KSČM	Always the member of the Chamber of Deputies and always in opposition	The level of donations is stabilized, average donation is about 5 mil CZK between 2008 - 2012, in 2013 the donations were almost 9 mil CZK	N/A (always in opposition)
ODS	2008 - 2012 the member of the Cabinet, since 2013 in opposition	As the member of Cabinet average donation was 118 mil CZK, in opposition to 78 mil CZK (However the party lost most of its popularity in election 2013)	Yes (lower in opposition)

SZ	2008 - 2009 the member of the Cabinet, since 2010 not the member of the Cabinet (after unsuccessful election in 2010)	During the cabinet period donations were stabilized - in average 1.7 mil CZK, in the election year 2010 they doubled the average sum	N/A (always a member of the Cabinet)
TOP09	2010 - 2012 the member of the Cabinet, since 2013 in opposition	The party shows high fluctuation of donation activities regardless of membership in the Cabinet. They fluctuate from 57 mil CZK in 2010 to 7 mil CZK in 2011.	No (changes are not related to the Cabinet status)
Úsvit	Entered the scene in 2013 and after the election it is in opposition	The party gained 0.3 mil CZK in 2013	N/A
VV	2010 - 2012 the member of the Cabinet, before that never the member of the Chamber of Deputies	The party shows high fluctuation from 38 mil CZK in 2011 to 0.1 mil CZK in 2012	No (changes are not related to the Cabinet status)

Source: Authors based on [11, 13]

The fragmentation of political parties and changes during the time disabled the possibility to catch the trend. Although Fisher or Šimfček [6, 16] assume that potential donors are more focused on the cabinet political parties, we suggest that the structure of donors is more important. The important ones include donations from members and their business companies in comparison with donations received as a result of other fundraising activities. This analysis can be partly done through analysis of the list of donors which has to be a part of obligatory annual report provided by political parties.

#### 4 Conclusion

In this paper we focused on one of the private resources of political parties - donations. Based on the previous literature review we set three research questions about trends of donations to political parties. We identify limited tendency in the Q1 and Q2 but not in the Q3. We assume that current theories are more suitable for traditional political parties and their explanatory potential is limited in case of quickly rising, sometimes populist, political parties. The challenge of future research is a wider exploration of fundraising activities focused not only on major parties, but also on the research of influence on economic situation of fundraising, which is still missing at least in conditions of the Czech Republic.

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## Appendix 1. Review of political parties and their membership in the Chamber of Deputies and the Cabinet

	ANO 2011 *	ČSSD	KDU-ČSL	KSČM	ODS	SZ	TOP09 **	Úsvit ***	VV
English name	ANO 2011	Czech Social Democratic Party	Christian and Democratic Union – Czechoslovak People's Party	Communist Party of Bohemia and Moravia	Civic Democratic Party	Green Party	TOP09	Dawn	Public Affairs
Orientation	Middle -right	Left	Right	Left	Right	Middle	Middle- Right	Issue oriented	Issue oriented (middle- right)
2013	y/y	y/y	y/y	y/n	y/n	n/n	y/n	y/n	n/n
2012	n/n	y/n	n/n	y/n	y/y	n/n	y/y	-	y/y
2011	-	y/n	n/n	y/n	y/y	n/n	y/y	-	y/y
2010	-	y/n	n/n	y/n	y/y	n/n	y/y	-	y/y
2009	-	y/n	y/y	y/n	y/y	y/y	n/n	-	n/n
2008	-	y/n	y/y	y/n	y/y	y/y	n/n	-	n/n

Source: Authors [11]

Note: y=yes; n=no, The first value means that the party is a member of the Chamber of Deputies and the second value means that the party is a member of the Cabinet

\* ANO 2012 is based on the former movement Action of Dissatisfied Citizens (in Czech: Akce nespokojených občanů). "Ano" means "yes" in Czech.

\*\* TOP09 name is derived from Tradice Odpovědnost Prosperita, meaning "Tradition Responsibility Prosperity"

\*\*\* Úsvit – the whole name is Dawn of Direct Democracy Tomio Okamura (in Czech Úsvit přímé demokracie Tomia Okamury)

## Appendix 2. Overview of the Czech elections between 2008 - 2013

Election	2008	2009	2010	2011	2012	2013
President (since 2013)						1
Chamber of Deputies of the Parliament			1			1
The Senate of the Parliament	1		1	1	1	
Regional representatives		1				
Municipality bodies			1			
European Parliament		1				
Total	1	2	3	1	1	2

Source: Authors based on [2]

# Why Do People Give: Motives for Charitable Giving in the Czech Republic

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## Abstract

Motivation is a central concept for psychology, sociology, as well as for the economy. Many researchers associate the issue of motivation with the act of giving money and they try to interpret it in the connection with the assumptions of neoclassical economics. The basic aim is to find answer not only on the theoretical question (if it is possible to explain charitable giving at the hand of homo oeconomicus), but on the practical question as well (how to increase the share of NGO funding through private sources). This article presents key results of research aimed at identifying the factors influencing individual giving in the Czech Republic to NGO's and at analyzing them in their mutual relations. Results are restricted to the issue of internal variables, called motives. Manners how we are thinking, what we feel, at so on, are an integral part of the variables that influence our decision about giving. The sources of various motives are formed by our political leanings, religious persuasion, social activities and values. The author based on theoretical economic model identifies three basic motives (altruism, egoism, investment) behind the decision of giving, whose resources/ incentives subsequently are empirically tested.

*Keywords:* altruism; charitable giving; motive

JEL Classification: C91, D01, D64

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## 1 Introduction

*Motivation* is a central concept for psychology, sociology, as well as for the economy. Neoclassical economics operates with the premise of homo oeconomicus, a man who is perfectly aware, can all information perfectly utilize and follow only their own interest. It is a concept that provides us with a logical sense and that captures through its neoclassical models graphically or mathematically people's decisions in various situations. In many cases, however, people do not behave according to the predictions of these elegant models. We can hear criticism of neoclassical economics as a mathematical apparatus that does not confirm to the actual behavior of the individual, does not take into account individual human action and does not create sufficiently accurate forecasts. In an effort to better understand human behavior modern economics collaborate with other disciplines such as psychology, anthropology, and sociology. Human behavior we can follow for example through experimental economics and behavioral economics, which integrate the economics and elements of psychology and which allows us to understand human behavior and decision making.

*Giving* enjoys increasing interest in behavioral sciences, psychology, economics, marketing, fundraisers and politicians. Many researchers [14], [13], [2], [6] are trying to answer the question how to increase the proportion of funding for NGO's through private sources. There is a fundamental question: Which variables have a positive or negative impact on donor behavior?

Probably the most important summary of selected affecting variables can be found in studies of Paul G. Schervish [14] and Sargeant [13]. These two researchers have offered to explore probably the most comprehensive summary of the various factors. We find, however, countless numbers of other studies that endeavor after presenting the most important variables. For example [8], [15], [1], [10].

The paper presents partial results of research conducted in the context of the thesis. The aim of the research was to identify factors that influence the individual's decision to donate money to non-profit organizations and analyze these factors in interrelationship. The survey did

not include questions related to e.g. areas of donor support, the manner of the giving, the type of supported non-profit organizations and others. Factors influencing donation in Czech Republic applied only to giving:

- to non-governmental organizations: respondents were familiar with the definition of the term NGO and examples of typical legal forms. Under the above restrictions (only formal and institutionalized donation) it was excluded giving money to friends, within families, giving outside the institute of NGO (eg. donation to a beggar), etc.
- from individual: research apply only to giving of individuals in society. The survey did not include a corporate giving.
- monetary form: respondents took into account only the donation of money, not e.g. the gift of his free time, material things (i.e. clothes), their skills, etc.

Factors that may affect donations were divided into internal variables, external variables and socio-economic determinants (age, education, gender, etc.). The aim of this paper is to present the most important internal variables - motives influencing individual giving in the Czech Republic and to analyze them in their mutual relations.

The author identifies on the basis of the economic models (Model Public Goods, Private Consumption Model, Investment Model and Impure altruism model) [16] three basic motives behind the giving decision, they are altruism, egoism and investment. These models provide us a theoretical basis for a more or less adequate explanation of human behavior in the process of giving to charity. According to foreign research the motives were systematically and subsequently divided and detailed analyzed. The categorization of these three main motives (internal variables) you can see in Table 1.

**Table 1. Categorization of internal variables - motives**

	<b>Altruism</b>	<b>Egoism</b>	<b>Investment</b>
<b>Incentive</b>	empathy	profit opportunities, rewards	personal contacts
	affection, sympathy	desire for power	skills
	compassion, solidarity	self-centeredness	socioeconomic status
	mercy, pity	awards	jobs opportunities
	esteem, appreciation, love	political influence	
	social rules	feeling of irreplaceable	
	faith in justice	fear, worry	
	conviction	good feeling (warm-glow)	
	social responsibility	substitution, reciprocity	
	moral obligation	conscience	
	religious duty	desire for self-sacrifice	
		reputation	
		psychological benefits	
	revenge to society		
	need to help		
	need to belong somewhere		

Source: Author

The paper presents the results of extensive research and give answers to these four research questions: What motivates individuals in the Czech Republic to give money to NGO's? Are these motives depending on each other? How can we describe the relationship between individual motives and the amount of giving? How can we describe the relationship between individual motives and frequency of giving? The results of the research may serve as the basis and incentive for public administration or non-profit organizations in the process of promoting of donor behavior.



## 2 Material and Methods

### 2.1 Operationalization

Measurement of individual variables was performed either through a scale that is appropriate for the characteristics (properties) that cannot be measured precisely, but also through other opened and closed questions. Operationalization of variables you can find in the following table.

**Table 2. Operationalization of variables**

Variable	Operationalization/indicator
1. <b>empathy</b>	I give money because I would not want to be in a place of the needy.
2. <b>affection, sympathy</b>	I give money to express my affection and sympathy to the needy.
3. <b>compassion, solidarity</b>	I give money of solidarity to the poor and the weak.
4. <b>mercy, pity</b>	I give money because I am sorry of the needy.
5. <b>esteem</b>	I give money out of respect for those I help.
6. <b>appreciation</b>	I give money to those whom I am grateful for something.
7. <b>social rules *</b>	I give money because it is required by a given social rules (conventions).
8.	
9. <b>faith in justice</b>	We have to help each other, because for someone the life was unfair. I give money to suppress injustice in the society.
10.	
11. <b>conviction</b>	NGO's activities are necessary for the society and therefore it is right to support them financially. I know that through giving money I can change the matter/situation/status.
12.	
13. <b>social responsibility</b>	NGO's are doing commendable work, but they should be financed by companies and entrepreneurs. I give money because people shall have the mutual responsibility and care about the welfare of others.
14. <b>moral obligation</b>	Donate money to the needy is morally correct.
15.	
16. <b>religious duty</b>	I give money because it arises from my religious beliefs.
17. <b>profit opportunities, rewards</b>	I give money because I can obtain economic benefits.
18. <b>desire for power</b>	When I give money I receive power and superiority over those who I have helped.
19. <b>self-centeredness</b>	Only those who can afford it, give money.
20. <b>awards</b>	I give money because I really expect the visibility or the awards from the society.
21. <b>political influence</b>	I can influence the decisions of political representation through giving money to NGO's.
22. <b>feeling of irreplaceable</b>	Giving money makes me feel irreplaceable.
23. <b>fear, worry</b>	I give money because I need help sometimes.
24. <b>good feeling (warm-glow)</b>	I give because I enjoyed it and I have a good feeling. Giving money brings to me a certain satisfaction.
25.	
26. <b>reciprocity</b>	I do not support projects, when I do not obtain some physical, financial or other benefits.
27. <b>conscience</b>	If I do not help, I feel guilty.
28. <b>desire for self-sacrifice</b>	Everyone should be able to sacrifice and help others.
29. <b>reputation</b>	If I give money, other people appreciate my more.
30. <b>revenge to society</b>	I give money because someone helped me already in the past.
31.	
32. <b>need to help</b>	I give money because I am doing well. It is necessary for the society to help needed.
33. <b>need to belong somewhere</b>	Through the giving money I belong to a certain group of people.
34. <b>personal contacts</b>	I give money because I can receive personal contacts useful in my work or personal life.
35. <b>skills</b>	I give money, because it allows me to acquire new skills (eg. efficient distribution of finances ...).
36. <b>socioeconomic status</b>	I give money, because it allows me to increase my position/status in the society.
37. <b>jobs opportunities</b>	I give money because I can receive some business demand or offer of jobs.

Source: Author

## 2.2 Interviewers and Respondents

The primary source of information was a survey, which was carried out with the help of full-time students and combined students in a course name Economy and Management of NGOs at the Faculty of Economics and Administration, Masaryk University. Total number of interviewers was 89. Field survey taken place in March and April 2014, we obtained completed questionnaires from 442 respondents. Interviewers contacted respondents with a request to complete the questionnaire. Respondents completed the questionnaire alone, there were instructions for processing.

The basic sample consisted of residents who live in the Czech Republic and are over eighteen years. We operated with so called available (occasional) selection (in a sample there are chosen persons who are "at hand"). Conclusions resulting from the analysis therefore refer only to the selection file. Questionnaires were completed in writing, in the case of significant deficiencies in the questionnaire (eg. unfilled half of the questionnaire) these were excluded from further processing.

## 2.3 Methods of Data Analysis

The data collection was followed by their analysis. The data were written to Microsoft Excel, where the data were analyzed using statistical methods, not only on the descriptive level, but also on inductive as well. We used for analysis: (1) Functions for descriptive analysis: distribution, absolute, relative and cumulative frequency, measures of central tendency (mean, mode, median), standard deviation, and standard error of the mean. (2) Functions for correlation analysis: Pearson's correlation coefficient, ANOVA (Analysis of variance) method based on F-test. The analysis determined the significance level  $p = 0.05$ , as usual in the social sciences.

## 3 Results and Discussion

The following section propounds results according to the set of research questions; submit answers and topics to muse.

*What motivates individuals in the Czech Republic to give money to NGO's? Are these motives depending on each other?*

In analysis of donors and non-donors behavior there were found out motives which determined (greater or lesser weight) the decision making process. The results were analyzed first for respondents who gave in 2013 the gift (the donors), but also separately for respondents who did not provide a gift (non-donors). The following table presents the results of mutual comparison, the difference between the percentages of individual responses acquired donors and non-donors one hand, but also mutual comparison of average values marked on the scale. A value of 1 was assigned to response "completely agree" value 2 to response "rather agree", value 3 to response "do not know" value 4 to response "rather disagree", value 5 to response "completely disagree". The lower the average value, the more respondents were identified with a given statement, the higher the average value, the less respondents were identified with a given statement.

The first half of the table through difference of the percentual points between donors and non-donors clearly shows that *donors identify themselves (in the case of altruistic motives) or don not identify themselves (in the case of some egoistic or investment motives) with the given statements to a greater extent than non-donors*. It is apparently from the positive differences exceeding ten or twenty percentual points. The most controversial in declaring attitudes between donors and non-donors appeared indicator no. 15 (*I consider giving money as moral duty*). Donors identified unambiguously with the statement (they answered positivity), but non-donors did not identify unambiguously with the statement (they answered negatively). Interesting findings also brought indicator no. 6 (*I give money to those whom I am grateful for something*). Although it is an altruistic motive, non-donors identified with him, while donors

answered rather negatively (they do not identify with him). An important finding is the further fact that among non-donors do not conscience weigh (*If I do not help, I feel guilty.*). The question was answered by more than 10 % non-donors than donors by label "completely disagree". Non-donors do not agree (in terms of percentage representation) much more than donors with the motives of *moral obligation* also or *religious duty*. For selfish motives play greater role among donors than non-donors motives such as *feeling good*, or *the desire for self-sacrifice*.

The second part of the table compares the average values which were chosen on the scale from the respondent. They submit similar results as the first part of the table, there are present from another point of view. Light boxes highlight the higher average value, dark boxes indicates a lower average value. The same average values achieve donors and non-donors in two motives: *appreciation and acquisition of skills*. The most significant difference between average values reaches the motive of *moral obligation*; its size is one percentage point.

*The most significant impact among donors have these motives: feeling good (average 1.7), moral obligation (1.8), the desire for self-sacrifice (1.9), conviction (1.9).* The donors identify at least with the motives: *the desire for power, profit opportunities and rewards, reciprocity*. Among the motives, whose influence could not the donors identify belong a *faith in justice* (injustice suppression) or *social responsibility* of entrepreneurs and companies. Donors do not completely identify with any investment motives.

*The most significant impact among non-donors have these motives: moral obligation (2.2), the desire for self-sacrifice (2.3), conviction (2.4), feeling good (2.4).* These are therefore quite identical motives as of donors; the degree of their influence is lower. At least the non-donors identify with the motives: *religious duty, desire for power, awards*. By non-donors we can capture much more unanswered questions. Non-donors do not have such a clear view of what influence their attitudes and opinions on giving. In the last year they did not provide a gift that is way they do not think about the act of giving as often as donors. Causality could also be reversed. Seeing that non-donors have not a clear view on what should stay in the background of the act of giving, they are less determined to give money.

**Table 3. A comparison of donors and non-donors motives**

Variable		Completely agree	Rather agree	I do not know	Rather disagree	Completely disagree	DONOR	NON-DONOR	GENERALLY				
									Difference between the percentage representation of donors and non-donors				
empathy	1.	14,3	0,3	-12,6	-0,8	0,1	2,4	2,7	2,56	2	2	1,20	0,06
affection, sympathy	2.	16,3	2,7	-5,2	-3,2	-9,3	2,3	2,9	2,61	2	2	1,19	0,06
compassion, solidarity	3.	12,2	0,0	-5,4	-4,0	-1,1	2,2	2,5	2,36	2	2	1,11	0,05
mercy, pity	4.	11,3	5,3	-5,3	-4,0	-5,5	2,2	2,7	2,46	2	2	1,17	0,06
esteem	5.	21,3	-0,6	-7,8	-6,1	-6,0	2,0	2,5	2,26	2	2	1,16	0,06
appreciation	6.	-2,7	-18,3	2,3	10,1	9,8	3,4	2,8	3,08	3	2	1,36	0,07
social rules	7.	1,9	5,5	-4,6	-1,8	0,3	3,9	4,0	3,93	4	4	1,01	0,05
faith in justice	8.	14,5	5,7	-5,0	-6,5	-6,1	2,0	2,6	2,30	2	2	1,07	0,05
	9.	5,8	4,6	-1,7	1,3	-7,9	3,1	3,4	3,27	3	4	1,19	0,06
conviction	10.	16,6	1,5	-9,8	-2,3	-4,2	1,9	2,4	2,18	2	2	1,05	0,05
	11.	7,9	13,2	-7,4	-6,5	-6,0	2,2	2,6	2,41	2	2	1,07	0,05
social responsibility	12.	-4,7	-9,1	-0,2	10,0	5,7	3,1	2,7	2,94	3	2	1,21	0,06
	13.	17,8	13,5	-11,0	-14,3	-4,7	2,1	2,9	2,52	2	2	1,11	0,05
moral obligation	14.	18,8	-5,9	-2,3	-5,1	-3,8	1,8	2,2	2,03	2	2	1,02	0,05
	15.	21,8	16,2	-8,9	-17,3	-11,0	2,4	3,4	2,92	3	2	1,29	0,06
religious duty	16.	6,6	5,8	-2,6	0,5	-10,0	4,1	4,5	4,29	5	5	1,15	0,06
profit opportunities, rewards	17.	2,4	-6,0	-6,3	-11,2	21,5	4,5	4,2	4,35	5	5	1,01	0,05
desire for power	18.	0,5	-4,3	-2,7	-6,5	14,3	4,6	4,4	4,50	5	5	0,88	0,04

<b>self-centeredness</b>	19.	-6,4	-14,3	0,2	6,5	14,9	3,6	2,9	3,23	4	4	1,36	0,06
<b>awards</b>	20.	0,5	2,6	-3,1	-9,8	11,6	4,4	4,4	4,41	5	5	0,91	0,04
<b>political influence</b>	21.	-1,7	-0,5	-6,0	-3,7	13,7	4,2	4,0	4,09	5	5	1,02	0,05
<b>feeling of irreplaceable</b>	22.	2,4	0,8	-6,3	-6,3	12,0	4,2	4,1	4,14	4	5	1,01	0,05
<b>fear, worry</b>	23.	8,1	-5,2	-0,6	0,9	-1,9	2,8	2,9	2,86	3	2	1,26	0,06
<b>good feeling (warm-glow)</b>	24.	21,6	4,1	-11,1	-7,2	-6,5	1,7	2,4	2,06	2	2	1,07	0,05
	25.	7,8	13,1	-5,0	-5,0	-7,5	2,3	2,8	2,57	2	2	1,22	0,06
<b>reciprocity</b>	26.	-0,7	-0,6	-7,5	-9,9	19,5	4,4	4,1	4,27	5	5	1,06	0,05
<b>conscience</b>	27.	-0,7	0,8	9,1	2,4	-10,7	3,8	4,0	3,91	4	5	1,14	0,05
<b>desire for self-sacrifice</b>	28.	17,3	-3,7	-3,4	-6,2	-2,6	1,9	2,3	2,13	2	2	1,02	0,05
<b>reputation</b>	29.	0,6	2,7	-7,6	-3,0	9,0	3,7	3,6	3,70	4	4	1,10	0,05
	30.	-2,5	-4,3	-1,7	1,9	7,9	4,2	3,9	4,05	4	5	1,13	0,05
<b>revenge to society</b>	31.	2,6	7,9	0,9	-2,5	-6,3	2,8	3,1	2,99	3	2	1,30	0,06
<b>need to help</b>	32.	6,7	-0,4	2,8	-5,3	-2,1	2,6	2,8	2,74	2	2	1,17	0,06
<b>need to belong somewhere</b>	33.	3,3	2,8	-2,4	5,3	-8,2	3,2	3,4	3,27	3	4	1,27	0,06
<b>personal contacts</b>	34.	2,9	-2,2	-7,3	-9,3	16,8	4,2	4,0	4,14	5	5	1,08	0,05
<b>skills</b>	35.	-1,3	1,5	3,6	-2,5	0,0	4,1	4,1	4,07	4	5	1,03	0,05
<b>socioeconomic status</b>	36.	1,5	-0,9	-5,3	-3,0	9,0	4,1	4,0	4,05	4	5	1,05	0,05
<b>jobs opportunities</b>	37.	0,1	-1,0	-9,6	-9,7	22,9	4,4	4,1	4,25	5	5	1,00	0,05

Source: Author

Table presents the results of descriptive statistics for individual motives. It is a calculation of the average / mean value ( $\bar{X}$ ), median, modus, standard deviation (SD) and standard error of the mean (SE).

The interdependence of the motives was examined on the basis of Pearson's correlation coefficient ( $r$ ). Evaluation of the correlation coefficient and the resulting effect/tightness relationship was as follows: small  $r \in (0,1; 0,3)$ , medium  $r \in (0,3; 0,5)$ , high effect  $r \geq 0,5$ . It was found high interdependence between investment and egoistic motives. Overview of dependence including the interdependence value provides the following table.

**Table 4. The distribution of motives pairs with high interdependence value into three basic groups of motives**

	<b>Altruism</b>	<b>Egoism</b>	<b>Investment</b>
Altruism	x		
Egoism	.505	.595	
	.502	.634	
		.569	.586
Investment	x	.541	.554
		.508	.504
		.503	

Source: Author

Among altruistic motives were represented *moral obligation* (once) *empathy* (once) *social responsibility* (once) between egoistic motives were represented *profit opportunities* (four times) *awards* (three times), *fear and worry* (once). High statistical dependence can we find among investment motives: *personal contacts* (three times), *socioeconomic status* (four times), *jobs opportunities* (four times).

Italics values are indicated by pairs of motives which have reached similar mean values of identifying with them, dark printing value present pairs of motives identified from respondents at least. The greatest degree of correlation can be found between the motives that have a minimal impact on individual giving.

Medium dependence between motives is represented in the results greatly. In summary, these motives belonged largely among altruistic motives. Other pairs are the pairs where one of the motives is a *good feeling (warm-glow)*. The low level of dependence is evident for example in pairs where one of the motives is a *religious duty*, *revenge to society*, *need to help* or *need to*

*belong somewhere. How can we describe the relationship between individual motives and the amount of giving? How can we describe the relationship between individual motives and frequency of giving?*

The results and findings present dependence of motives on the amount or frequency of the gift. The sample size was constructed from 214 donors, the average value of the gift was in the amount of 4 418 CZK (data exclusive of respondents who did not indicate the amount of their gift). These amount of gift is much lower than the average gift mentioned in the tax returns for 2012, which amounted to over 13 000 CZK [4]. The results of comparison may be due to the fact that in the survey failed to include also irregular donors whose donate a large amount to NGO's, and they administer these gifts in tax returns. It is likely that in the research were integrated rather smaller donors, even though they may belong to the regular or selfless donors (their frequency and willingness to donate is obvious).

Donors provided the highest average amounts of gifts are distinct by their identification with motives: *religious duty, profit opportunities and rewards, reciprocity, reputation, personal contacts, socioeconomic status and employment opportunities*. The results thus show that *the most generous donors are motivated more likely by selfish or investment motives*. In comparison with the average level of identification with a given motives from all donors, not just from the most generous, these are motives with much lower rate of identification. *Although the willingness of most donors is affected by altruistic motives, this is not valid for the most generous donors.*

*In connection with the frequency of the giving we can denote respondents as repetitive donors, but not regular donors.* Respondents who donated money to NGOs were asked in the questionnaire how often they provided the gift. Options offered (1) only once (2) number of time (3) regularly. For the second and third options, respondents could specify how many times they provided the gift, or how regularly they provided the gift. The answers showed that more than half of the respondents (55 %) gave a gift several times (most of them said 2x, 3x or 4x), more than a third (35 %) gave a gift only once. The remaining 10 % of respondents regularly provides gift (usually every month, i.e. 12x).

Most frequently offer gift donors who identify with the motives: *social rules, profit opportunities and rewards, political influence and need to help*, or do not identify with the motives: *empathy, compassion and solidarity or beliefs*. Similarly, as was presented in the analysis of the gift amount, *most frequently donors are affect egoistic motives*. These donors are distinguished by *her little identification with some significant* (in terms of willingness to donate money) *altruistic motives*.

#### 4 Conclusion

The issue of giving has not been studied until it was established the study field of the non-profit sector. In the Czech Republic still don not exist a general giving theory and theory of donor's behavior, which is caused by a lack of multidisciplinary research carried out, fragmentation of research questions and by a lack of a solid theoretical background. Literature related to the issue of donation can be characterized as largely empirical [4], [6]. Important foreign studies relating to internal variables are the following: [13], [1], [14], [3], [10], [9], [12], [2].

When processing research confirmed or discovered knowledge or assumptions that can be expected, these are: (1) In determining any data in an indirect manner (especially data related to human behavior), it is extremely important to operationalize the phenomenon under review. When interpreting the results obtained in the research it was important, how we interpreted understood given question. (2) Although it is possible in some way to measure and identify which motives influence the decision to giving, these influence, or willingness to donate, can we not equate with the level of donation (the amount of the gift). The research results show that amount some donors, who can be characterized by a high willingness to provide gifts; it is possible to simultaneously observe low level of gift amount as well. (3) Behavior is in its

direction and strength determined by motives, but it is determined by situational factors as well: behavior adapts to the situation, and so in different situations can be achieved the same goal [9]. (4) In a narrower sense, the motive can be seen as "a deliberate intention or objective of behavior," but in a broader sense as "target of behavior [9]. Thus, although respondents may respond to questions truthfully, their behavior may not be always fully identified. In fact, their decision about giving may influence the variables that an individual may not be aware, and which predetermine its behavior to be difficult to describe.

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# Determinants of the Success of NGOs' Accession to EU Funds in the Czech Republic

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## Abstract

The paper focuses on the determinants of the chances of NGOs to succeed with their project proposals to be funded from the EU funds in the Czech Republic. More specifically, we analyse the data on the allocation of resources within the Human Resources and Employment Operational Programme (HREOP), which was operated between 2007 and 2013 and belongs to the most important programs distributing EU resources in the Czech Republic. We draw on the insights of key economic theories of the third sector and test the hypotheses derived from them. The analysis suggests that the most successful are the project proposals that build on relatively large-sized budget, and are submitted by NGOs which have relied on public funding and on their own fundraiser.

*Keywords:* NGOs; EU funds; Czech Republic

*JEL Classification:* L31

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## 1 Introduction

EU funds have been one of the driving resources in the development of post-socialist nonprofit sector for more than a decade (see e.g. [18], [19]). In the paper we seek to discover the determinants of the success of Czech NGOs in obtaining the resources from EU funds on the national level.

Generally, the EU resources on the national level are allocated via funding of project proposals that are submitted to various public authorities (typically Ministry of Education and Ministry of Labour and Social Affairs). During the programming period 2007-2013 more than 61,000 projects (some of the still in the realization phase) were successfully submitted and the total amount of 25 billion EUR from EU funds were allocated. Quite surprisingly, a systematic empirical analysis of the selection criteria and the exploration of unsuccessful applicants have not been carried out so far and even less is known about the constraints for the EU funding of NGOs.

Based on the unique dataset covering the Czech EU fund recipients we focus on the effects of the attributes of NGOs and of their projects on the success of their project application. Our general research questions are: what organizational, contextual and project-related attributes are the most important for the successful project submission and EU money allocation to nonprofit organizations? And, what is the comparative effect of organizational and project-related attributes on the chance of having a successful project application?

While choosing the key determinants that could affect the NGO accession to EU funds, we follow the main economic theories of the third sector that seem to be relevant to the examined issue, particularly the government/market failure theory, supply-side theory, resource dependence theory, trust theories, welfare state theory and interdependence theory.

Serious work on the economic theories of nonprofits began only in the early 1970s. All of the theories can conveniently, "if somewhat artificially" [7], be divided into theories of the (economic) role of NGOs - failure theories; and of their behaviour - behavioural theories. These theories can be seen both as competing and complementary.

The first reconciling the persistence of nonprofit organizations with classical economic theory was offered by Burton Weisbrod [21]. His theory of government failure parallels the more well-established theory of market failure [13]. The failure based theories of nonprofits explain their ability to overcome two types of failures [20] - those involving public goods, and

information asymmetries. The basic assumption for this government failure/market failure theory is the limitation in the ability of market to provide “public goods” in sufficient amount. Classic economics argues that this shortcoming of market would serve as a justification for the state and government. But the government will tend to reflect the preferences of median voter, which causes the persistence of unsatisfied demand for public goods. This “government failure” makes people turn to nonprofit organizations “to supply the public goods they cannot secure through either the market or the state” [16]. The demand heterogeneity depends obviously on population heterogeneity [4]. Based on this theoretical approach we could expect that the government would tend to reallocate resources from EU funds to those NGOs, which could supply the public goods needed by the vast share of inhabitants of the country. This makes us conclude that the NGO project proposal for accessing the EU funds should follow the strategy and policies of the government to reach as large group of voters as possible and to satisfy their needs. Therefore the NGO’s (potential) reach and/or highly ambitious project shall contribute to proposal’s success. We formulate following expectations:

- *H1: The higher the number of NGO’s branches the higher its chance to succeed with the project proposal.*
- *H2: The larger the city NGO resides in the higher its chance to succeed with the project proposal.*
- *H3: The more project partners an NGO have in the project the higher its chance to succeed with the project proposal.*
- *H4: The larger the size of the project budget the higher its chance to succeed.*
- *H5: The longer the duration of the project proposal the higher its chance to succeed.*

Another theoretical approach treats the unsatisfied demand for public goods caused by failures of the state and the market as a necessary but not a sufficient condition to explain the existence and importance of nonprofits in socio-economic context. This, so called, supply-side theory argues that another condition is needed, namely “the presence of people with an incentive to create NGOs to meet such demand” [11]. This line of thought led Salamon and Anheier [17] to expect the nonprofit sector to be most highly developed where there is a religious competition, which implies that as the church is becoming an independent pillar of the third sector activity it becomes more alienated from the state compared to other third sector actors. Empirical findings on this relationship are not very clear (see e.g. [12], [2], [6]) and most studies have not included religious activity into their inquiry, so “the relationship between density of NGOs and religious activity remains an open issue”. On the other hand, religious activity strongly predicts the volunteerism [14]; [7] and other (not only) financial possibilities to survive without any government support which potentially broadens the gap between them and governmental policies. To conclude, we consider church as one of the important determinants of EU funds accession and hypothesize that:

- *H6: The church organizations have lower chance to succeed with their project proposal than non-church NGOs.*

The interaction mechanism between NGOs and government can be understood also via the resource dependence theory. “In terms of the interdependence between an NGO and the state, the level of NGO resource dependence on the government is systematically higher than the other way round, in other words, the interdependence of NGOs and the state is always an asymmetric one” (NGO has to endure the government control [22]). The unbalanced and bidirectional relationship (NGOs depend highly on government) should be thus turned from zero-sum into win-win strategy. When considering the element with the highest interdependence degree - i.e. capital - we can assume that whether an NGO could gain the EU funds from government, relies more on its operational capabilities, such as size of the budget and/or capacity to generate external public subsidies rather than the capability of offering public service [22]. Hence:

- *H7: The larger the size of the budget of an NGO, the higher its chance to succeed with the project proposal.*



- *H8: NGOs with a formally assigned function of a fundraiser have higher chance to succeed with their project proposals.*
- *H9: The bigger the share of external public subsidies within NGO's budget, the higher its chance to succeed with the project proposal.*

Trust theories base on the non-distribution constraint, which is a key structural feature of NGOs. The prohibition of profit distribution to owners is an issue of trustworthiness, since "those involved in nonprofit organizations are less likely to be in the field solely for the money" [8], [7]. Nonprofits can be perceived as a solution for another form of market failure arising from information asymmetries (consumers lacking the information they need to judge the quality of goods and services they purchase, mainly when the purchaser is not the same person as the consumer). The absence of trust in society towards the business sector would thus be associated with NGOs being "able to secure a larger share of its income from fees and service charges" [17]. Following these consideration, one might expect that authorities shall privilege those applicant NGOs which they perceive as trustworthy (e.g. because of its age, level of its internationalization or highly qualified personnel) themselves and/or as trustworthy for the citizens in order to secure the success and impact of the project. Hence:

- *H10: The older an NGO, the higher its chance to succeed with the project proposal.*
- *H11: The more international contacts an NGO display, the higher its chance to succeed with its project proposal.*
- *H12: NGOs managed by a person with university diploma have a higher chance to succeed with their project proposal.*

To complete the list of possible determinants we considered also the (basic) presumptions of welfare state theory. Generally speaking, the literature on welfare state treats nonprofit sector (if any) as a residual category [3], [15], [9], [10], [16]. Traditional welfare state theory would therefore lead us thus to expect that state privileges actors that act as its mouthpiece when deciding on allocation of EU funds. We could therefore assume that the more the NGO cooperate with the public institutions, the more they become accepted by public authorities and adjust better to their demands. Similarly in this regard - despite its refusal to conceptualize the relation between the government and NGOs as conflictual - interdependence theory acknowledges the possibility of cooperative relationship between the government and non-profit sector. Its specific version was proposed by Salamon and Anheier [16] and called "social origins theory". Hence:

- *H13: The higher the number of contacts with public/state institutions, the better chances for NGO to succeed with its project proposal.*

## 2 Material and Methods

The paper relies on the dataset provided by the department of project registration and monitoring of the Czech Ministry of Regional Development that comprise information about the project applications aiming at utilizing the EU resources. More specifically, we analyse data on the allocation of resources within the Human Resources and Employment Operational Programme (HREOP) which was operated between 2007 and 2013 (some of these projects are still being implemented) and belongs to the largest EU fund-distributing programs in the Czech Republic (allocating app. 7% of all resources dedicated to the Czech Republic), with 14,990 projects (as of July 2013). In the first step, we set aside projects submitted by private, business and state subjects and focus only on projects that were submitted by nonprofit subjects (foundations, associations, churches etc.) (N=4,481). In the next step, we created a random sample (HREOP NGO dataset) of projects submitted by non-profit organizations that comprises 424 units. Following variables were included in the analysis.

Dependent variable:

- Project evaluation: verdict on the project proposal (PP) - positive (project was accepted as eligible for funding) or negative (PP was rejected for various reasons)

Independent variables:

- Branches (whether an organization has any branches in other towns/cities)
- Town/city population (size of town/city where an NGO is based)
- Duration of the project (number of months)
- Size of the project budget (total sum in CZK)
- Number of project partners (number of organizations listed in the project proposal as project partners)
- Church (whether organization has a legal status of the church or of any other legal form of nonprofit organization - civic association, foundation, or public benefit company)
- External public subsidies (share of public subsidies within the budget of an organization)
- Size of an organization's budget (total sum in CZK)
- Fundraiser (whether or not the organization officially has a position of a fundraiser, i.e. this function is not hidden or dispersed among other positions)
- Age of organization (years)
- Internationalization (number of references of foreign organizations and associations that are listed on the web pages of the organization)
- Education of director (whether a director has or has not university diploma)
- Partnership with public institutions (number of references to the cooperation with the public/state institutions counted on the website of an NGO)

Part of the variables were retrieved from the database of the Ministry of regional development, the others were searched for on the websites of the organizations that were included in the sample (these are population of a city/town where NGO resides, size of its budget, age of an organization, number of its branches, education of its director, position of a fundraiser, number of its partners among public/state institutions as declared on the website of an organization, number of its foreign partners on the website, and the share of public subsidies within the budget of an organization). We apply logistic regression analysis in order to assess the impact of independent variables on the chance of the project proposal submitted by an NGO to succeed.

### 3 Results and Discussion

Results of the analysis are both expected and surprising (see Table 1). In terms of theories applied, almost all the theories that were applied to formulate our expectations contribute to some extent to the explanation of the chances of NGOs to succeed with their proposals within HREOP framework, except for the welfare state theory.

First, considering the strength of the effects, the single most important positive factor influencing the NGO's chance to succeed is the presence of an official function of fundraiser in an organization (stemming from the resource dependence theory) and having organizational branches (market/government failure theory). On the other hand, the most negative effects on the chance of having a successful project proposal seem to be having a church legal status (supply-side theory) and – quite surprisingly – having a director with university degree (trust theory). While the direction of the influence of the first three factors was predicted by particular theories, our interpretation of the trust theory seems to overestimate or even misunderstand the role of director's education for the success of NGO's project. On the other hand, such a strong negative effect is hard to explain by any other theories or specificities of the Czech environment and it is rather counter-intuitive. Generally, the rest of the results are rather expected in the Czech environment. Having a specialized position of a fundraiser indicates a certain level of NGO's professionalization and resources, and also may help the person that is preparing the proposal to become more identified with the goals and success of an organization and thus work harder on the project preparation. The same may apply for the existence of NGO's branches that

shall improve the importance of an NGO in the eyes of authorities seeking as large project impact (and a know-how for its implementation) as possible. The low chances of church organizations to succeed may be due to the number of reasons, one of them being a non-compliance with general goals of the funding framework and the other hostility between the church and the state that has grown over the process of restitution of church property in recent years.

On the other hand, when speaking not just about our sample but about the whole set of projects from which our sample was selected, most of the strong effects are not statistically significant (the only exception being the existence of an role of a fundraiser), and these are significant, their effects are marginal: these are the size of the project's budget (market/government failure theory), and the share of the public subsidies within an NGO's budget (resource dependence theory). Despite this fact, there is at least a weak signal that project aspects may be important and that previous experience of NGOs with public funding increases (even if very mildly) their chance to succeed with their proposals in HREOP framework. The weakness of the later factor may be rather surprising vis-à-vis the pessimistic narrative widespread in the Czech society that often sketches a rather gloomy picture of corrupted networks of NGOs and public institutions leading to the repeated allocation of the public resources to the very same groups of actors.

On the other hand, it's also worth mentioning that some important factors of NGO's capacity to pool public resources does not have effect here: these are especially the size of an NGO's budget, its age, and the size of the town/city it is based in. Even if this is a rather unexpected finding, it may (quite optimistically) point to some specifics of the EU (more particularly HREOP) money allocation, where old, central and resourceful NGOs are not favoured et the expense of the young, rural and more needy ones.

**Table 1. Determinants of the project proposal success (N=424)**

	B	S.E.	Wald	df	Sig.	Exp(B)
Branches	0.623	0.435	2.058	1	0.151	1.865
Town/city population	0.000	0.000	0.052	1	0.819	1.000
Duration of the project	-0.030	0.044	0.462	1	0.497	0.970
Size of the project budget	0.000	0.000	6.729	1	0.009	1.000
Number of project partners	0.104	0.153	0.464	1	0.496	1.110
Church	-20.881	27 398.638	0.000	1	0.999	0.000
External public subsidies	0.015	0.007	4.500	1	0.034	1.015
Size of an organization's budget	0.000	0.000	0.036	1	0.849	1.000
Fundraiser	1.886	0.589	10.268	1	0.001	6.594
Age of organization	-0.014	0.041	0.119	1	0.730	0.986
Internationalization	0.007	0.064	0.011	1	0.916	1.007
Education of director	-0.794	0.498	2.544	1	0.111	0.452
Partnership with public institutions	-0.036	0.026	1.906	1	0.167	0.964
<i>Constant</i>	-0.417	1.199	0.121	1	0.728	0.659

	Chi-square	df	Sig.
Model summary	36.634	13	0.000
Hosmer and Lemeshow Test	9.448	8	0.306

Cox & Snell R Square	0.212
Nagelkerke R Square	0.300

Source: HREOP NGO

To conclude, it seems that there are still significant gaps in both theoretical and empirical understanding on the particular selectivity criteria during the allocation of EU funds to NGOs via national authorities. Even if we combine the factors stemming from the key economic theories of non-profit sector that are related to the project proposal itself (duration of the project, its budget, number of project partners), to organization's resources (budget size, existence of branches, education of director, function of fundraiser, age of organization), or to organizational environment (population of a town/city where it is based, level of its internationalization), the analytical reflection of the multi-level and transnational dimension of the whole process of allocation is still not covered in a sufficient manner. At the same time, it seems obvious that the specific political, legislative and socio-economic conditions of the Czech Republic as a post-communist country requires further inquiry into other contextual factors that may also play an important role in determining the success of the NGOs' EU project proposals.

#### **4 Conclusion**

To briefly summarize the results, existing economic theories of the nonprofit sector enable us to explain the success of NGOs during the process of allocation of EU resources via nation-state authorities only to limited extent. The analysis suggests that the most important factor raising the chances of NGOs to succeed with their project is an officially existing function of a fundraiser within the organizational structure. Our sample reveals also an important positive role of an existence of NGO's branches, and negative effect of church/non-church legal status of NGO and the education of its director. More generally, share of external public subsidies and the size of the project budget have significant - even if marginal - positive effect within the HREOP framework. It is interesting that besides these facts, traditional inequalities within an NGO sector (budget size, age, population of the city) do not seem to play any role here.

We consider this to be an important contribution to the discussion on the allocation of EU resources to the third sector - which is the area that is still lacking systematic empirical but also conceptual analysis. At the same time, we are fully aware of the serious limitations of this study. First, the size of our sample and the number of valid cases that entered the analysis may pose a serious problem for the statistical significance of our results. Furthermore, we acknowledge that the variables entering the analysis and referring to different types of data collection may face both validity and reliability problems. Last but not least, there may be other factors that we have not controlled for in our analytical model. These are especially issue-related (i.e. the main issue that the project is dealing with, what is the issue-area that the NGO is active in etc.), or resource-related (detailed NGOs' budget structure that would reveal the influence of various types of resources on the success with the project aiming at EU resources).

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# Public Funding of Czech Agricultural NGOs in Times of Financial and Economic Crisis

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## Abstract

The main argument supporting the need for public funding of agricultural NGOs is that the intensifying relations between the government and NGOs bring significant benefits to sustainable agriculture and rural development. We address both the public funding of the agricultural NGOs in times of financial and economic crisis and the dynamics of the decrease of public subsidies, and then examine empirical evidence concerning their impact on agricultural NGOs with sustainable agriculture and rural development impact in the Czech Republic. We assume that the agricultural NGOs with significant benefit to sustainable agriculture and rural development can suffer less by the public subsidies decrease. The research was performed with respect to data collected for the five-year period from 2006 to 2012. The analysis was based on a sample of all 910 agricultural NGOs which obtained state budget subsidies, reflecting the general structure of agricultural NGOs in the Czech Republic. We used the theory of sets and cluster analysis that we applied to classify the agricultural NGOs into groups (sets) by main agricultural scope. The results of the analysis are ambiguous. One set of the agricultural NGOs with SARD impact have gained fewer public subsidies, furthermore the new group of agricultural NGOs with SARD impact has arisen. These ambiguous results suggest that this is an area with interesting potential for further research.

*Keywords:* agricultural NGOs; sustainable agriculture and rural development; financial and economic crises; state budget.

JEL Classification: L31

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## 1 Introduction

Sustainable agriculture and rural development (SARD) in many parts of the world are strongly supported by third-sector organizations (hereinafter referred to as NGOs). They are usually mentioned as 'rural third-sector organizations' [9], [19][16], [18]. Because they operate mostly in the field of agriculture and meet the structural-operational definition of Salamon & Anheier [14] (formal, private, self-governing, voluntary, and satisfying the non-distribution constraint) [8], we use the term 'agricultural NGOs' for generally beneficial company and civic association with the output in the agriculture field. We have no church organisation or funds in the Czech agriculture.

The Czech public administration uses definition of NGOs which contains only selected legal forms of the private nonprofit sector that meet the structural-operational definition of Salamon & Anheier [14]: *Foundation, Endowment fund, Public benefit corporation, Association (union, society, fellowship, club, etc., including trade unions) and Organisational unit of an association, and Church legal entities*. The concept of NGOs was introduced into the Czech terminology by the *Government Council for Non-Governmental Nonprofit Organisations (hereinafter referred to as GCNGO)* as part of defining the Czech government's subsidy policy towards NGOs [13].

In line with the overall trend towards the growing political relevance of the third sector in the modern world [14], the rural third sector enjoys increasing political recognition [18]. In developed countries, the role of rural third-sector organizations has been enhanced by the shift 'from government to governance' involving the transfer of responsibilities from the state to the private for-profit and third sectors [7], [15], [17-18]. Accordingly, a recent trend in the rural development policy in Europe has been towards increasing reliance on partnerships beyond the formal structures of government, as has been articulated in the Cork Declaration and a number of other European rural policy documents [7]. In developing countries, the importance of the

rural third sector has been appreciated primarily as a result of the relatively low effectiveness of both state-led and market-led policies of sustainable agriculture and rural development [11], [20][17].

In the Czech Republic in 2011 more than 5000 NGOs and an additional 4000 hunting organizations were conducting activities, mostly in the agriculture, forestry, and fishing sectors [2]. Czech agricultural nonprofit sector generated production in a value amounting to CZK 546 million [3], and the Czech agricultural nonprofit sector's share of the GDP in the agriculture, forestry, and fishing sectors was 0.56% [4]. In 2011, nearly 100,000 full-time equivalent natural persons worked in the Czech agricultural sector. The Czech agricultural nonprofit sector's share of the number of employees in the fields of agriculture, forestry, and fishing was 0.06 percent.

The role of the Czech agricultural nonprofit sector reside in the ability of NGOs to mobilize human resources and secure multi-source financing for needs to be fulfilled and assets and services created. In particular, the engagement of volunteers and, hence, work performed free of charge in the creation of assets and services, with the involvement of a minimum of paid employees and multi-source financing, distinguish the nonprofit sector from the profit or public sectors [12].

From 2006 through 2012, subsidies amounting to nearly CZK 1.2 billion were provided to NGOs from public funds of the Czech Republic in the agriculture, forestry, and fishing sectors. The most significant support was provided to Czech agricultural NGOs from 2006 through 2008, exceeding CZK 230 million annually. The sharpest slump, to CZK 85 million, nearly one third of the previous sum, occurred in 2009. Since 2010, the amount of subsidies to NGOs in the agriculture, forestry, and fishing sectors has returned to its growing trend, and in 2012 the sum of subsidies oscillated around CZK 127 million, which is one half of the sum provided to NGOs from 2006 through 2008. The prevailing source of subsidies for agricultural NGOs from 2006 through 2012 is the state budget (nearly three-quarters of all the subsidies). It is exclusively the share of the state budget within the authority of the Ministry of Agriculture.

The economic literature [7], [9], [11], [14], frequently focuses on following important aspects of rural third sector: public funding of agricultural NGOs and significant benefits of agricultural NGOs to sustainable agriculture and rural development.

This paper investigates both aspects in the conditions of the Czech Republic. Hence, we put impact on research methods used (detailed described in methodology section).

Our research questions were:

1. How the agricultural NGOs were affected by public subsidies cut off in times of financial and economic crisis?
2. Have the agricultural NGOs with significant benefit to sustainable agriculture and rural development been affected by the decreasing public funding as well?

Hence the aim of the paper is to determine which groups of agricultural NGOs were negatively influenced by decreasing of public subsidies related to financial and economic crisis.

The main argument supporting the need for public funding of rural NGOs is that the intensifying relations between the government and NGOs bring significant benefits to sustainable agriculture and rural development. 'NGOs can induce innovation in rural development in a variety of ways including advocacy, awareness raising, contracting, and direct delivery of public goods' [11]. The authors claim that the 'availability of public funding provides major fundraising stability' to agricultural NGOs.

We assume that agricultural NGOs with significant benefit to sustainable agriculture and rural development shall suffer less by the public subsidies cut off.

The paper is structured so as to present the answers to our research question. The first part of the paper provides data about agricultural NGOs and their funding. The second part presents the results of the research. The final part discusses the results and formulates conclusions.

Relevance of the paper can be proved from theoretical as well as empirical point of view. Literature review [10-11], [17-20] shows that agricultural NGOs play an important role in the rural development and sustainable agriculture of every country. Even if the widely recognized

importance of the rural third sector is high on international research agendas, research in the Czech Republic remains scarce. Based on sector-specific rationales for rural NGOs, including government/third-sector relations, we focus on the most important expression of public policy towards nonprofit organisations: the system of their public funding. Evidence from the Czech reality can be proved by the outcomes of the meeting of the GCNGO held on April 1st 2014. All ministries recording a decline in NGOs public funding (including the Ministry of Agriculture) should have given a statement to the year on year development of NGOs public funding from the state budget. The representative of the Ministry of Agriculture (as the only one) refused to do so. Even though, unlike other sectors, where changes were ongoing, there was a steep decline in 2008 by about 80%, which has remained unchanged [6].

## 2 Materials and Methods

The research was performed with respect to data collected for the five-year period from 2006 to 2012 with all 1831 subsidies allocated NGOs from Ministry of Agriculture. The analysis was based on a sample of all 910 agricultural NGOs which obtained these 1831 state budget subsidies, reflecting the general structure of agricultural NGOs in the Czech Republic.

The source of data for the state budget subsidies was the unique unpublished database of subsidies granted to NGOs as maintained for individual chapters of the state budget of the Czech Republic. The database was also the main source of data for all the Analyses of the Financing of NGOs from Public Budgets, focusing on the state and regional budgets, prepared by the author for the GCNGO over a long period of time.

The amount of subsidies flowing to agricultural NGOs from the state budget was not the only data source we used to characterize and quantify agricultural NGOs in the Czech Republic; in addition, we also used the Nonprofit Institutions Satellite Account (hereinafter referred to as NPISA), the most comprehensive and reliable macroeconomic data source mapping the Czech nonprofit sector.

The methodology tools used for the analysis were the theory of sets and cluster analysis that we applied to classify the agricultural NGOs into groups (sets) by main agricultural scope. Afterwards we divided the agricultural NGOs in two main groups according to benefit in sustainable agriculture and rural development (SARD): the agricultural NGOs with benefit in sustainable agriculture and rural development (the main criterion was impact on sustainable development and environmental impact), the agricultural NGOs with benefit in agricultural and rural development. The beekeepers (many articles on ecosystem services cite as a representative example the work of bees and function of beekeepers [5], [10], among others) and ecological farmers (Classification of ecological farmers on the basis of Act No. 242/2000 Coll., on organic farming) have been classified to the group of agricultural NGOs with benefits in sustainable agriculture and rural development.

We used a descriptive and comparative analysis of primary and secondary data to quantify the financial flows from public budgets to agricultural NGOs and to evaluate the development of the flows from 2006 through 2012. Furthermore, we have used the method of logical induction, that allows the formation of conclusions based on logical conclusions from individual cases.

## 3 Results and Discussion

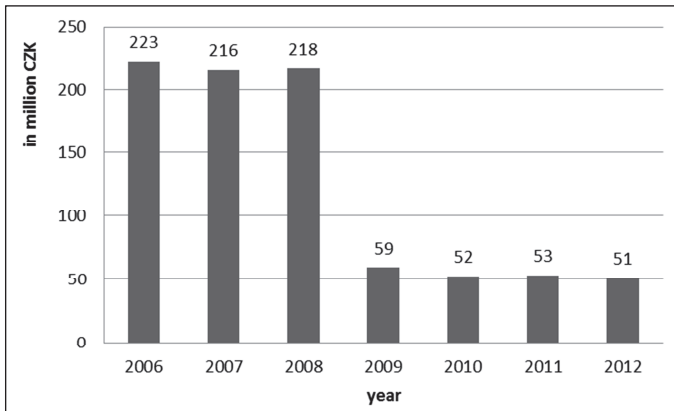
The results of the analysis of the development of the agricultural NGOs funding from the state budget in the Czech Republic are shown in Figure 1 and Table 1.

The prevailing source of subsidies for agricultural NGOs from 2006 through 2012 is the state budget (nearly three-quarters of all the subsidies). It is exclusively the share of the state budget within the authority of the Ministry of Agriculture. From 2006 through 2012, subsidies amounting to nearly CZK 0.7 billion were provided to NGOs from state budget in the agriculture, forestry, and fishing sectors, see Figure 1.



The results of the detailed analysis of the development of the agricultural NGOs funding with focus on the agricultural NGOs with SARD benefit are shown in Table 1.

**Figure 1. Development of subsidies provided to NGOs in the agriculture, forestry, and fishing sectors from 2006 to 2012 from state budget (in mil. CZK)**



Source: Authors

The outcomes of the detailed analysis are very interesting. The slump in the state budget subsidies in times of the financial and economic crisis resulted in a complete discontinuation of public subsidies for wine growers, forestry cooperatives, hunting associations, and clubs of flower growers and florists. This is consistent with the assumption that agricultural NGOs with significant benefit to sustainable agriculture and rural development shall suffer less by the public subsidies cut off.

Other agricultural NGOs, which suffered greatly under reducing state budget subsidies, were breeders and beekeepers. This is very interesting also in point of view, that from 2006 through 2008, breeders' and beekeepers' associations were provided more than 90 percent of all subsidies from the state budget for the agriculture, forestry, and fishing sectors, see table 1.

After 2008 the aid to breeders' associations was nearly discontinued. It currently oscillates around CZK 2.5 million and is on 3 percent of the aid provided in previous years. Beekeepers currently obtain one third of the subsidies provided to them from 2006 through 2008 (see table 1.). This is in contradiction with our assumption that the agricultural NGOs with significant benefit to sustainable agriculture and rural development shall suffer less by the public subsidies cut off. On the other hand, currently, the aid to beekeepers accounts for more than 40 percent of subsidies from the state budget in this area.

For farmers and gardeners, the decrease can be characterized as relatively moderate (20-30%), and as regards forest-owner associations, the aid from the state budget has been growing despite the financial crisis. Since 2009, aid is newly provided also to fishermen, scientific research, educational organisations in agriculture, and ecological farmers.

It is interesting that the hunters and fishermen obtained more public subsidies in times of financial and economic crisis. It could be explained by research paper of Brinkerhoff and Brinkerhoff [1]. They [1] argued that the relationship between government and the nonprofit sector is influenced by the character of their mutual interactions.

As the results show, the assumption about the agricultural NGOs with significant benefit to sustainable agriculture and rural development suffering less by the public subsidies cut off was not proved nor refuted. The beekeepers have gained fewer public subsidies, but their share of total state budget subsidies account for more than 40%. Furthermore, from point of view benefit

in sustainable agriculture and rural development, the new group of agricultural NGOs - Ecological farming has arisen.

**Table 1. Development of subsidies from the state budget in the agriculture, forestry, and fishing sectors from 2006 through 2012 in a breakdown by the type of agricultural NGOs and annual change [in thousands CZK]**

Groups of agricultural NGO	2006	2007	2008	2009	2010	2011	2012
<b>with benefits in sustainable agriculture and rural development</b>							
beekeepers	79 831	79 581	94 945	26 360	20 850	30 011	21 853
		<i>-0.003</i>	<i>0.193</i>	<i>** -0.722</i>	<i>* -0.209</i>	<i>* 0.439</i>	<i>* -0.272</i>
ecological farming				1 250	1 250	1 070	1 065
					<i>0.000</i>	<i>-0.144</i>	<i>-0.005</i>
<b>with benefits in agricultural and rural development</b>							
farmers <sup>a</sup>	6 296	6 037	6 612	5 614	7 898	5 587	4 550
		<i>-0.041</i>	<i>0.095</i>	<i>-0.151</i>	<i>* 0.407</i>	<i>* -0.293</i>	<i>-0.186</i>
breeders <sup>a</sup>	129 974	115 781	101 776	2 650	2 240	2 040	2 370
		<i>-0.109</i>	<i>-0.121</i>	<i>** -0.974</i>	<i>-0.155</i>	<i>-0.089</i>	<i>0.162</i>
research, development, education				2 800	2 550	2 350	2 450
					<i>-0.089</i>	<i>-0.078</i>	<i>0.043</i>
hunters	2 950	10 511	9 411	12 340	8 660	5 100	9 360
		<i>***2.563</i>	<i>-0.105</i>	<i>* 0.311</i>	<i>* -0.298</i>	<i>* -0.411</i>	<i>** 0.835</i>
fishermen <sup>a</sup>			213	5 500	6 300	4 560	5 850
				<i>***24.822</i>	<i>0.145</i>	<i>* -0.276</i>	<i>* 0.283</i>
gardeners	3 160	2 995	3 452	2 400	2 200	2 100	2 550
		<i>-0.052</i>	<i>0.153</i>	<i>* -0.305</i>	<i>-0.083</i>	<i>-0.045</i>	<i>0.214</i>
forest-owner associations	121	562	184	500	500	500	1 150
		<i>***3.645</i>	<i>** -0.673</i>	<i>***1.717</i>	<i>0.000</i>	<i>0.000</i>	<i>***1.300</i>
florists associations	399	300	666				
		<i>-0.248</i>	<i>***1.220</i>				
wine growers	180	330	339				
		<i>** 0.833</i>	<i>0.027</i>				
forestry cooperatives	10	240					
		<i>***23.000</i>					
hunting associations	5	16	20				
		<i>***2.200</i>	<i>0.250</i>				
other		51				50	50
							<i>0.000</i>

Source: Authors

Note: Annual changes are in italics

\*\* positive or negative annual change more than 25%,

\*\* positive or negative annual change more than 50%,

\*\*\* positive or negative annual change more than 100%.

## 4 Conclusion

The objective of the paper was to determine, which groups of agricultural NGOs were negatively influenced by decreasing of public subsidies related to financial and economic crisis. To address this issue puzzling rural third sector scholars, practitioners, and policy makers in the Czech Republic we used a unique dataset from Ministry of Agriculture.

To briefly summarize the paper outcomes, we characterized and quantified agricultural NGOs in the Czech Republic; analyzed financial flows to these organizations from public sources and evaluated the development (2006–2012) of Czech agricultural NGOs. Resulting from a

comprehensive analysis of primary and secondary data, the paper provides a deeper insight into the public funding of these organizations. The question is whether public sources can be seen as stable and predictable funding sources (not only) in the times of financial and economic crisis. The main argument supporting the need for public funding of agricultural NGOs is that the intensifying relations between the government and NGOs bring significant benefits to rural development.

Hence, we based on an assumption that agricultural NGOs with significant benefit to sustainable agriculture and rural development shall have suffered less by the public subsidies cut off caused by financial and economic crisis. Thus we focused on the extent to which the agricultural NGOs were affected by public subsidies cut off. Furthermore, we tried to find out, whether the agricultural NGOs with significant benefit to sustainable agriculture and rural development have been affected by the decreasing public funding as well.

The analysis outcomes brought up an interesting question. Is a key factor influencing agricultural public funding of NGOs the benefit into sustainable agriculture and rural development? As the paper shows, the results are ambiguous and the assumptions could not be proved nor refuted. Nevertheless, the limitations of the results – that we are fully aware of – suggest that this is an area with interesting potential for further research. It opens a space for discussion resulting in further research implications.

We suggest e.g. to prove whether the development of rural areas is actively supported by agricultural NGOs; to determine whether the institutional merging between NGOs and the state may significantly limit the scope for innovation in rural development; to define the determinants influencing the scope of state funding of agricultural NGOs; to determine the influence of the public funding on the scope of agricultural NGOs; to evaluate the effectiveness of public funding programs aimed at rural development; to empirically prove whether the incentives to secure public sources shift NGOs from their original mission; and to discuss policy implications for public funding of agricultural NGOs. We argue that further research bringing other pieces of relevant information is needed in order to deal efficiently with this issue in the economic theory and praxis and to understand it in a complex manner.

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# Publicly Funded Social Innovations

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## Abstract

This paper critically focuses on the latest theory which considers the non-governmental non-profit sector to be the major and always civic-minded social innovator, nearly unbeatable by its private for-profit and public non-profit “competitors” as regards generated innovations. The idea that the non-governmental non-profit sector is somehow superior in terms of generated social innovations is also frequently mentioned in the current scientific and research projects dealing with this phenomenon, for example “The Theoretical, Empirical and Policy Foundations for Social Innovation in Europe (TEPSIE)”, “Impact of the TS and Social Innovation (ITSSOIN)” and a number of other projects that are smaller in their scale (but not less important), to name but a few. The present contribution (that takes into account the selected theories of the non-governmental non-profit sector) answers the question of whether it is actually possible to consider the non-governmental non-profit sector to be a self-reliant innovator independent of the public support. On the basis of a detailed study of a group of projects that can be considered to be examples of good practice in the field of social innovations, the paper outlines the real role played by the non-governmental non-profit sector in their development. Hence, it also provides answers with respect to the necessity and importance of engagement of the remaining sectors in the socially-innovative activities.

*Keywords:* non-profit sector; social innovation; public sector; interdependence theory; financing

*JEL Classification:* L31, A13

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## 1 Introduction

According to the established academic culture, the non-governmental non-profit sector (also called the Third Sector, hereinafter referred to as “TS”) is defined by means of an extensive descriptive theory. The theory defines TS in relation to the other sectors, particularly the public sector, comprising organizations controlled by the state and executing its policy, and the private (or commercial) sector representing common business entities that operate on the market with the aim to make a profit. The theory perceives TS, or more precisely the non-governmental non-profit organisations (sometimes referred to as “NGOs-NPOs”, hereinafter referred to as TSO, for shortening, from Third sector organisation) comprising it, as something unique. Accordingly, many researchers in the area of social innovations have adopted a similar approach, arguing that the specific characteristics of TSOs predetermine the sector to be more socially innovative than the public sector (which is too rigid and bureaucratic) and the private for-profit sector (which is too profit-oriented).

Some of these specific characteristics are mentioned in the economic and non-economic theories that explain the existence of TS, hence the theories back up the idea of the sector importance for social innovations. One of the basic theories that are commonly referred to is the “Interdependence Theory”. Although it partially follows from the Theory of Government and Market Failures, perceiving TSOs as solvers of the problem that neither the state nor the market are able to solve, it adds an important factor to it: according to the theory, the market and the state are not the only failing entities. Indeed, TSOs may also fail and so they cannot play the role of the only saviour rectifying anything that the remaining sectors have failed to rectify [5], [2]. Furthermore, the Interdependence Theory names the shortcomings of TSOs that considerably limit TSOs’ ability to solve problems. These include philanthropic insufficiency, philanthropic particularism, philanthropic amateurism, and philanthropic paternalism [4], [5], [2]. The above mentioned shortcomings can result in lack of resources, among other things, which may force an organisation to reduce the scope of services offered by it, or its activities

in general. Problems can be caused by the existence of the “free-riding” phenomenon, or simply by the character of the service that is provided free of charge or only in return for a minor consideration. TSOs then get into financial problems that they subsequently try to address through raising additional funds strenuously or by performing side-line profitable activities. The lack of resources is also caused by amateurism, which is an issue related to the staffing of TSOs by interested and enthusiastic, yet unqualified workers and concurrent understaffing by experienced and skilled professionals. The predominance of unqualified staff over specialists may simply stem from lack of funds or “contradictory” activities of an organisation. The final deficiency mentioned in the theories is philanthropic paternalism, which is not related to resources but the legitimacy of an organization. The problem of philanthropic paternalism occurs when an organization misses its aim, loses contact with persons actively seeking its services, and gives precedence to its interests over the interest of the community or society, believing it best knows the needs of people. Such an organisation then provides services regardless of the actual interests of the society (this is a problem that is also peculiar to the state bureaucracy) [4].

The authors consider the interdependence theory to be particularly important for the analysis of the relation between TSOs and social innovations. It specifies some of the basic problems of TSOs associated with the implementation of innovations and indicates appropriate solutions for them. Moreover, it also explains one important relation that is the relation between the state and TSOs. In many countries, the share of government funding in the TSOs funding is very important. It even states for example results of The Johns Hopkins Comparative Non-profit Sector Project [6]. Thanks to the taxing institutes, the state has a unique opportunity to address market issues, while being able to finance publicly beneficial activities (that would otherwise be hard to be funded in a “common” manner), such as social innovations. In the outcome, the theory thus defends the relation between TSOs and the public sector [5].

The state and its bureaucratic authorities may have a number of limitations hindering their ability to develop social innovations (e.g. the drawbacks typical for any bureaucracies: strict rules limiting proactive approach, low willingness to accept risks); however they also have the opportunity to provide financial assistance. This makes them (i.e. the whole public sector) an excellent partner for the constantly underfunded TS. This interdependence relation has a number of advantages for both parties and it especially favours development of innovations [8]. We can provide actual data illustrating there are strong links between TS and the public sector in practice.

The Johns Hopkins Comparative Non-profit Sector Project [6], under which non-profit sectors were studied in 22 countries worldwide in its initial phase (and up to 45 countries in its later phase) and its published outcomes are still applicable to the whole, more or less, world, is a proper document to illustrate the financial relations between the state and TS. In addition to the descriptions of the scope, structure, and roles of TSOs in individual countries, the project also focuses on their financing. Despite slight differences among individual studied countries, the project outcomes as regards financing suggest that philanthropy plays rather a minor role (on the average of the studies countries it generates 11% of TSOs’ funds). The main sources of TSOs’ financing are the fees they collect for their individual performances (on average 49% of their funding worldwide) and subsidies received from public funds (on average 40% of their funding).

The American project revealed that the most significant interstate differences included the ratio of the different sources of funds (in 13 countries the dominant source of funding is own activities of TSOs, in 9 of the participating countries the dominant source is the public sector), and particularly the range of areas and activities of the non-profit sector which are funded from individual resources. According to the project, public finances go to health and social services and educational activities rendered by TSOs in particular.

Besides the above specified general conclusions applicable to the sample of the countries studied under the project, individual participating countries can be of course used as illustrative examples of similar cross-sector relations. As regards the information about public financing of TSOs in the Czech Republic, the Analysis of the Financing of NGOs from Selected Public

Budgets (hereinafter referred to as the "Analysis") that is annually drawn up by Zuzana Prouzová from the Centre for Non-profit Sector Research for The Government Council for the Non-government Non-profit Organizations in the Czech Republic can be considered to be a relevant resource. The Analysis provides information about the total amounts of aid, supported areas, and entities participating in the grant application procedure (the grant provider and recipient). Based on the current data (the most recent data are available for 2012), we can say that the amount of the public funds allocated to support TSOs' increases year by year. According to the Analysis, about CZK 11,770 million, accounting for about 0.74% of the total public budget (CZK 1,591,179 million), were distributed among TSOs in 2012. These funds went primarily to the areas of physical education and sports (37.3%), social affairs and employment policies (29.9%), and culture and preservation of monuments (10.1%). The areas of special interest activities and recreation (4.1%) and housing, municipal services and local development (3.9%) were among the less supported. This allocation scheme is more or less the same every year [3].

Given the extent of support in both absolute and relative amounts (in proportion to the other sources of TS), we can consider the activities of TSOs to be heavily dependent on public funding. Moreover, public funding of the non-profit sector is an established practice in many countries and represents a significant and particularly traditional part of its incomes. The intensity of inter-sectoral dependence is expressed by the share of public funding in the incomes of TSOs that was also studied under The Johns Hopkins Comparative Non-profit Sector Project [6]. Whether the theory of interdependence is valid or not, the current practice of many countries is to finance TSOs and support their activities, which actually leads to the fulfilling of publicly beneficial objectives.

If we consider TS to be the "main" social innovator, we must conclude from the information presented in the above mentioned theories that an important share in these innovative activities will be influenced by state contributions. It can hence be assumed that the government contributes to the development of social innovations precisely by supporting TSOs through direct funding (i.e. aid schemes) and indirect funding (i.e. tax reliefs).

## **2 Material and Methods**

The goal that we have set for this paper is to verify whether the above outlined assumption about the support provided to TS (as a social innovator) by the public sector holds true in the Czech environment and for Czech non-profit social innovators. We intend to illustrate this by analysing a sample of TSOs' projects that we can identify as "social innovations" with "reasonable certainty".

However, the selection of the sample is contentious in itself, not only in the Czech Republic. The biggest stumbling block is non-existence of a generally accepted uniform definition of "social innovations". Although the definition created by TEPSIE (see herein under) [8] can be used to define the term, there is no simple method that can be applied to search innovations within an economy. For the purposes of the present paper, we used the Czech winners of the SozialMarie Awards, a competition annually announced by Austrian Unruhe Privatstiftung [9] in Central Europe. The competition has been designed to recognize the best social innovations and thus to highlight examples of best-practice. Among the competition winners acknowledged in the past ten years when the award has been granted, we found fourteen award-winning innovation projects implemented in the territory of the Czech Republic (see Table No. 1). Projects are nominated both by members of the foundation and the professional public engaged in social innovations, social services and the non-profit sector who are in contact with the Unruhe Privatstiftung or one of its partners. For us is important that the nominated projects are evaluated by the Commission of experts in the area of social innovation. In addition, only the best innovations from the region of the former Austria-Hungary, which is the territory targeted by the Austrian fund, are selected.

Therefore, we have worked with an elite but also very small sample of innovations selected on the basis of a broader consensus.

*"Social innovations are new solutions (products, services, models, markets, processes, etc.) that simultaneously meet a social need (more effectively than existing solutions) and lead to new or improved capabilities and relationships and better use of assets and resources. In other words, social innovations are both good for the society and enhance society's capacity to act."*

TEPSIE definition of social innovation [1]

In this paper, focusing on the simplest evaluation of the share of public funding in social innovations, we work with electronically available information (project applications, documentation of the SozialMarie Award, and annual reports) about the award-winning TSOs. On the basis of these data, we then determine the structure of their financing and, above all, the share of public finance in this structure.

Taking into account the available underlying data, the research we present here is only indicative, with limited possibilities of generalization. We are aware of this limits associated with the method of our work. In addition to the superficiality of the information about the funding of the award-winning projects, we consider the scope of the studied sample of organisations, in terms of both their number and the structure, which is limited as regards the selection of innovations through the networks of the contacts and supporters of the Sozial Marie Award and Privatstiftung Unruhe, to be the major limitations. These and other limits will be briefly discussed in the following section of this paper.

However, we would like to mention already here that this area of TS suggests itself for further analysis that would study it in more detailed way (ideally, including a supplemental qualitative aspect), searching for the dependence of social innovations in TS on public funding.

**Table 1. The Sozial Marie Award-winning social innovations**

<b>Title of the innovation project</b>	<b>Organizer</b>	<b>Share of public funding</b>
Patron	League of Open Men	100%
In Justice	In IUSTITIA, o.p.s.	90%
Night Out	Faculty of Social Studies, University of Ostrava	20%
Construction of activation centres for young people with Schizophrenia	EC-Employment Consulting	100%
Discover Prague in a Different Way	PRAGULIC - Poznej Prahu jinak! o.s.	0%
Memory of Nations	Post Bellum	30%
Children of Imprisoned Parents	The Czech Helsinki Committee	60%
Socialisation of families through FamilyPoint	Centrum pro rodinu a sociální péči	100%
Next Door Family	Word 21	100%
Patients Trustees and Advocates	Civic Association KOLUMBUS	25%
We're in it Together	Asistence, o.s.	55%
The multicultural rural community centre for migrants in Rakovice	Berkat, o.s.	65%
Magdala	Oblastní charita Blansko	40%
Roma Police Assistants Programme	Mutual coexistence	80%

Source: Authors



**Table 2. Summary statistics (n=14)**

Indicator	Value
Mean	0.61786
Median	0.62500
Minimum	0.00000
Maximum	1.0000
Standard deviation	0.34452

Source: Authors

**Table 3. Frequency distribution (n=14)**

Interval	Midpoint	Frequency	Relative	Cumulative	
< 0.20000	0.10000	1	7.14%	7.14%	**
0.20000 - 4.20000	0.30000	3	21.43%	28.57%	*****
0.40000 - 6.20000	0.50000	3	21.43%	50.00%	*****
0.60000 - 8.20000	0.70000	1	7.14%	57.14%	**
>= 0.80000	0.90000	6	42.86%	100.00%	*****

Source: Authors

### 3 Results and Discussion

On the basis of the selected (and also limited) sample of fourteen organisations, we can conclude that thirteen of the winning projects were supported from public funds. Only in one case, the social innovation project was funded solely from the innovator's own sources. It was one TSO, claiming its commitment to the social innovation concept that financed its innovation only from the revenues generated by the social innovation.

As regards all the other award-winning projects and organisations implementing them, an important role was played by financial contributions from the subsidy programmes of the government, individual ministries and municipalities. A significant share of public funds, many times fully financing the respective project, was revealed. The most often stated providers of public support are ministries (the Ministry of Labour and Social Affairs and the Ministry of the Interior), and the operational funds of the EU (often in combination). Other notable supporters included the capital city of Prague and the statutory city of Brno (mainly because the supported organisations fell within their territorial authority).

Taking into account the facts presented herein above, we can conclude that the share of the government subsidies or the public funding in innovation performance (at least in the sample of TSOs selected by us) is not negligible. On the contrary, it is very high. Its average value is 62%, which exceeds the national average of the public funding for TSOs (national average for Czech Republic is about 39% [6]).

However, we cannot claim that there would be no innovations without the public funding, let alone being able to determine how much it depends on public resources. Due to the limited data set available to us, we are neither able to identify in what stage of an innovation project life cycle the public funding is received (whether at the beginning or in the course of its implementation). From the perspective of the authors, it would be really useful to have a wider survey available that would answer the following questions: what is the share of the innovations developed with financial assistance or on the initiative of the about innovation that arise for support or on the initiative of the state authority providing the subsidies (i.e. to carry out a research on a much broader sample) and what is the dependence of innovations on public funds (i.e. to perform a research of dependence of TSOs on public funds as regards this type of innovative activities, i.e. activities focused on supplementary social services, not including innovations from the area of participation and administration).

Based on the results of our small-scale survey, we take the liberty to express the assumption that a number of the current innovations would be at risk if they were not supported from public funds. Be that because TSOs would not have finances from other sources to implement their activities or their initiator would be totally inactive without the public funding.

Finally, it is important to say that our opinions on the relation between the generation of social innovations and public funding as expressed herein above applies to the researched group of social innovations that won the SozialMarie Award. To be as correct as possible, we need to look at the specifics that this group may have and to what extent it can be perceived as a representative sample of social innovations in general. The general definition of social innovations (e.g. the one proposed under TEPSIE) implies that the range of such specifics may be broad. Therefore, social innovations may include solutions of a number of problems not only in the area of social services but also in other fields of the society. [8] "Novelties" in the area of civic participation or governance are an example of the type of social innovations that are not explicitly represented in our sample. The sample of award-winning innovations consists exclusively of projects dealing with social services and additional services provided by TSOs as a supplement to state services. Therefore, we cannot rule out the assumption that the strong correlation outlined in dependence theory, which leads us to the conclusion on the significant role played by public funding as regards social innovations, may be present in the "social services" group but not in others. Hence, our conclusion does not necessarily have to be in conflict with opposite findings claiming that social innovations are "not supported" by state in other areas of activities, or within other geographic regions.

#### **4 Conclusion**

The Interdependence Theory belongs among the basic theories defining the size and structure of TS. It informs about the shortcomings existing on the side of both the public and non-governmental non-profit sector and encourages cooperation among the aforementioned. Cooperation is mutually beneficial and ultimately helps to bridge the above-mentioned imperfections. Failures on the part of TS primarily result from the financial and material deficiencies and the State, as the holder of the "absolute" tax power, can help TS to overcome the financial problems. This cross-sectoral financial partnership can be detected on the basis of real data obtained from the practice of the TS funding. The government participates in the activities of TS, thus supporting its socially innovative potential.

This is what the authors of the paper illustrate using the sample of the social innovations that won the SozialMarie Award (the best-practice). Despite the specifics and limitations of the sample which may show some inclination towards one type of social innovations, it is possible to conclude that the award-winning projects in the framework of the competition have been substantially supported by public funds (60% on average, which exceeds the average of the public financial support to TSOs by 20 percentage points).

The authors are absolutely aware of the restrictions connected with the applied sample of the studied organisations and the given area, encouraging further research of inter-sectoral links and their influence on the potential of TSOs to generate social innovations. The authors also warn against jumping to conclusions about the performance of the TS, without taking into account the role of the State in the area of legal and financial support.

On the basis of the survey and discussion, the authors set a goal for the future - to carry out a more extensive research that will work with a wider sample of social innovators from TS (of the Czech republic and also of others European countries) and that will be based "only" on the research of available information about the share of public funding (and categories of public funding) in an innovation project. The subsequent research should already work with a detailed structure of the funding provided to social innovations in the non-profit sector and the real dependence on public resources. Also, the future research should be better defined in relation to the types of social innovation, and possible relation between public funding

and the type of social innovation. Such a research should generate unambiguous conclusions on whether social innovators from TS are or are not dependent, while the current research only points out to the possibility of dependence of TS on public funds.

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**Appendix 1. List of the organisations implementing the projects, including websites**

<b>Name of the organisations</b>	<b>Websites</b>
Liga otevřených mužů o.s.	<a href="http://ipatron.cz/">http://ipatron.cz/</a>
In IUSTITIA, o.p.s.	<a href="http://www.in-ius.cz/">http://www.in-ius.cz/</a>
FSS of the University of Ostrava	<a href="http://nocvenku.cz/">http://nocvenku.cz/</a>
EC-Employment Consulting s.r.o.	<a href="http://www.empl-cons.cz/">http://www.empl-cons.cz/</a>
PRAGULIC - Poznej Prahu jinak! o.s.	<a href="http://pragulic.cz/">http://pragulic.cz/</a>
Post Bellum o.p.s.	<a href="http://www.postbellum.cz/">http://www.postbellum.cz/</a>
The Czech Helsinki Committee	<a href="http://helcom.cz/">http://helcom.cz/</a>
Centrum pro rodinu a sociální péči z.s.	<a href="http://www.crsp.cz/projekty/13-family-point">http://www.crsp.cz/projekty/13-family-point</a>
Slovo 21 z.s.	<a href="http://www.slovo21.cz/">http://www.slovo21.cz/</a>
Občanské sdružení Kolumbus	<a href="http://www.os-kolumbus.org">http://www.os-kolumbus.org</a>
Asistence, o.s.	<a href="http://www.asistence.org/">http://www.asistence.org/</a>
Berkat, o.s.	<a href="http://www.berkat.cz/">http://www.berkat.cz/</a>
Oblastní charita Blansko	<a href="http://blansko.charita.cz/ohrozene/magdala/">http://blansko.charita.cz/ohrozene/magdala/</a>
Vzájemné soužití o.p.s.	<a href="http://www.vzajemnesouziti.estranky.cz/">http://www.vzajemnesouziti.estranky.cz/</a>

Source: Authors

Editorial supplement (p.203)

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