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Current Trends in Public Sector Research

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Prologue

The theoretical seminar in Šlapanice hosted by the Department of Public Economics of the Faculty of Economics and Administration at Masaryk University is now in its eighteenth year. This can be seen as a good time for a small review.

The seminar was founded by a key figure in public sector research in Czech academic society in the 1990s: Professor Yvonne Strecková. Her initial idea for annual meetings in Šlapanice was to gather researchers and academics from the Czech and Slovak Republics and discuss selected theoretical topics connected with public sector research. As the community of Czech (and Slovak) researchers in the field was rather small in the early 90s, the very first seminars assumed the nature of discussions or workshops, and usually focused on one research question or topic (effectiveness in the public sector, externalities, public interest).

As the community of public sector researchers expanded, the seminars increasingly took on the nature of typical scientific conferences. We are delighted that one of the key elements of the original design has remained: every year, one significant current trend in public sector research is selected for closer attention. This topic is usually presented by the keynote speaker of the seminar.

We are happy that this year's seminar will be attended by our colleague Dr. Antti Moisio, research director of the Government Institute for Economic Research (VATT) in Helsinki. VATT analyzes public finances in Finland and evaluates economic reforms. The purpose of VATT's research is to support informed decision making, and its focus is on policy-relevant topics. VATT has complete independence in conducting its research, which meets high standards of scientific quality.[1] VATT's mission represents a positive example of the cooperation between policy makers and public sector researchers. Such cooperation is still more of a vision than a reality in the Czech context. Although there are government research institutes in the Czech Republic (usually departmental ones), long-term research accepted and discussed with the government bodies is still missing.

The papers selected for this year's conference prove that academics are capable of providing analyses touching on a variety of public policy issues.

Two contrasting approaches toward pension reform, one of the most controversial topics in the Czech Republic, are presented in the contributions from Vostatek and Řezáč. Vítek, Bayer, and Kostohryz, as well as Soukopová and Šinkyříková, deal with selected tax issues. Meričková and Nemec, Sedmihradská, Provazníková, and Pavel, Plaček et al, and Jacko focus their attention on local and municipal levels of government.

The seminar has a long tradition of dedicating some time to selected healthcare policy issues. Darmopilová presents an interesting review of the healthcare reform in the Czech Republic, and Lacko et al show the Slovak experience. Vrabková and Vaňková discuss the efficiency of hospital health care.

Another traditional topic for the Šlapanice seminar is the research of non-profit organizations. Prouzová and Hyánek as well as Vaceková and Svidroňová look at the efficiency and sustainability of NGOs in the Czech and Slovak contexts.

Public administration and public official performance issues are discussed by Špalková and Špaček and by Staňová and Staroňová. Lněnička, Hub, and Sedlák pay attention to public sector information systems and IT indicators in public administration.

The more theoretical nature of the early seminars is still present. This is well documented in the proceedings. Examples of this include Wawrosz and Valenčík, who enlarge their long-term research on redistribution systems, and Fišar and Kubák, who present the possibilities for measuring corruption via an economic experiment.

It is not possible to mention here all of the papers selected for the Current Trends in Public Sector Research 2014, but each one represents a piece of interesting and notable work. The

[1] For more information, see the institute's web site at < http://www.vatt.fi/en/>

papers went through a double-blind review process and were discussed by the Program Committee. Only 45 out of 66 papers were accepted for publication in the Proceedings.

I would like to thank all the reviewers and members of the Program Committee for their effort and comments. We consider feedback from colleagues, whether via review or during discussions at the conference sessions, to be the most important argument for organizing the conference. I am proud that so many of you share this perspective with us.

Jiří Špalek

SESSION I:
PUBLIC FINANCE

Corporate Income Tax as an Anti-crisis Tool

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Abstract

Corporate income tax (CIT) is very important tax in tax systems. The revenues of CIT are related to the economic situation more than revenues of other taxes.
The paper introduces CIT in context of other taxes. It focuses on corporate income tax rate as one of the most important factors that determine CIT revenues in period 2002 – 2012. The analysis shows the influence of tax rate changes on total CIT revenues. The influence of GDP on tax revenues is very important in this period and therefore GDP has been also taken into account. In the conclusion of this paper are summarized the effects of tax policy to support economic growth by the change of CIT tax rate. At the end of the paper there is briefly summarized why the CIT statutory rate isn´t a suitable anti-crisis tool.

Keywords: Corporate income tax; tax revenue; crisis; regression analysis

JEL Classification: H20; H25

1. Introduction

The influence of the financial, economic and debt crisis on public finance is clear. Taxation is one of the most important tools in the fiscal policy area. More functions of taxes are described in tax theory. The most important function is the fiscal function. It means that taxes serve as a tool to get money for public budgets. Other functions of taxes are for example allocation, redistribution, stabilization or stimulatory function. We will focus on fiscal and stimulatory function in this paper. The fiscal policy could influence behavior of taxpayers using the setting of tax system. Interesting is the fact that the fiscal and stimulatory function stand very often against each other. We can observe the emphasis on stimulatory function in the first years of the crisis in the Czech Republic. The emphasis on fiscal function prevails currently.

This paper focuses on the development of the corporate income tax (CIT) in the Czech Republic in last 10 years (especially in crisis time). Tax measures (especially in corporate income tax) taken to fight the crisis are mentioned. There are also mentioned some other important changes in the main tax areas (ie. personal income tax, VAT, excise duties, social security contributions) in this paper. Each tax change has some expected consequences (budgetary, stimulatory, etc.). The expected results aren´t sometimes achieved. The difference between expected and real impact of tax changes causes logically problems.

The dependency of CIT revenues on CIT rate and GDP growth is described in the second part of this paper. The main goal of this paper is to find if the CIT rate is suitable anti-crisis tool.

This or similar topics are analyzed by many authors. [8] deal with the possibility of eliminating errors in tax forecasts in New Zealand. [7]describe the basic methods of construction tax estimate of macroeconomic and microeconomic perspective.

[10] discuss factors that affects CIT revenues. Lot of variables were analyzed. The conclusions of this paper confirms that CIT rate and GDP (GDP growth) are very important variables that affect CIT revenues in OECD countries. [2] also confirms the influence of GDP (GDP growth) on CIT revenues.

Interesting are also the conclusions of [9]. Authors had analyzed the volatility of GDP. They found that higher volatility level leads to lower CIT revenues. That´s very interesting founding and it means that in these countries the governments don´t rely so much on CIT revenues in the tax system. The reason is the sensitivity on GDP and the resulting instability of tax revenues. It is also useful to keep this finding in mind during the interpretation of this paper results.

The evidence of the impact of taxes on behavior of companies provide [3]. The corporate tax rates (especially effective tax rates) have large impact on aggregate investment, FDI, entrepreneurial activity ie. also the influence on CIT revenues.

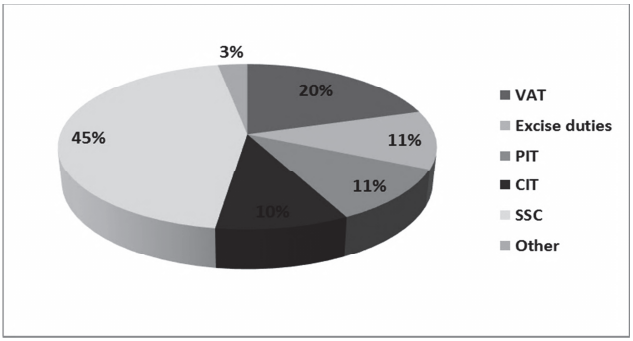
2. Material and Methods

This chapter deals with the typical properties and with the position of corporate income tax in the whole tax system. The elasticity of CIT revenues in relationship to GDP and CIT rate will be used to find if tax policy is an effective anti-crisis tool.

2.1 CIT in comparison to other taxes

The importance of corporate income tax (the share of CIT revenue in comparison to other tax revenues) shows Figure 1. [6] shows that the total Tax-to-GDP ratio (including social security contributions) was in the Czech Republic 34,4 % in 2011. The weighted average was in the EU 38,8 % in 2011. The share of CIT is 10%. It isn´t too much but this tax is very interesting object of research especially because of the crisis. CIT revenues are often related to the GDP.

Figure 1. Structure of tax revenues in the Czech Republic



Source: Authors, Eurostat [5]

2.2 Overview over the Czech anti-crisis measures

We can observe the emphasis on stimulatory function of taxes in the early years of the crisis in the Czech Republic. The emphasis on fiscal function prevails currently. Therefore we can divide tax anti-crisis changes into two groups: first group are changes taken in years 2008 – 2010, second group is represented by the changes taken since 2011.

Among the most important measures taken in 2008 – 2010 include following:

- accelerated depreciation (new vehicles, machinery)
- CIT rate lowering 21% → 20% → 19%
- increased tax credits for individuals
- increased percentage rates of fixed costs for individuals
- SSC changes (low wage employees, small employers)
- VAT deduction on purchase of passenger cars
- faster VAT refund.

Lot of measures taken in the first years of the crisis were taken for a limited period. It means that lot of them aren´t valid yet. That is also the evidence that there was an effort to support the economy but just for limited period because of the state budget revenues shortfall.

Among the most important measures taken since 2011 include following:

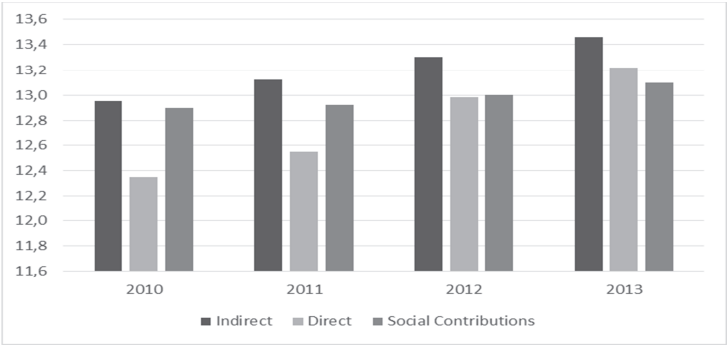
- higher taxation of consumption (VAT, excise duties)

- emphasis on tax control (new institution „Specialized financial authority")
- new VAT rules (domestic reverse-charge, unreliable taxpayer, publishing of bank account number)
- focus on parametric changes (cancelation of some exceptions).

Figure 2 shows the development of revenues of direct taxes, indirect taxes and social security contributions. An interesting fact is that tax revenues from selected types of taxes increased in period 2010 – 2013 (for 2013 it is a European Commission forecast). Many EU member states have increased their overall tax burden (comprising direct and indirect taxes and social contributions). We can observe in the last years in the European Union an increasing share of indirect taxes to GDP.

Another angle of view on Figure 2 could be that it confirms the theory that CIT revenues are very sensitive to GDP and therefore also sensitive to the crisis. It is important to point that direct taxes revenues (especially corporate income tax) are strong related to GDP.

Figure 2. Evolution of tax revenues



Source: European Commission [4]

2.3 Regression analysis

The method of regression analysis was used to determine the elasticity of corporate income tax revenues in relation to GDP and in relation to corporate income tax rates. The actual calculated elasticity was used to ex-post projections to determine if tax policy is an effective anti-crisis tool. Limitation of this method is the relative unavailability of detailed data sources (ADIS database operated by Czech Ministry of Finance is not public), so this method was used for the "raw" data obtained from the ARAD database (operated by Czech National Bank).

To meet the objective of this paper the multiple regression method was used where the dependent variable is corporate income tax revenue and explanatory variables are real GDP and statutory tax rate. The explanatory variables were selected because there is clear evidence that income taxes depend on these parameters. This fact is obvious from the tax structure/ tax construction. These two independent variables are the best explanatory variables by [10] or [7]. Using other explanatory variables could be problematic because these new variables could cause the occurrence of multicollinearity and in some cases these new variables (like inflation) could be statistically insignificant. That is the reason why authors decided use the only two explanatory variables..

Due to the very high volatility of the tax system only 10 annual observations (years 2002-2012) were used to identify the main trends in the development of tax revenues. Ten observations should be enough for statistical testing, but longer time series have better information value. On the other hand longer time series have higher risk of distortion caused by many discretional tax changes.

In the regression analysis was used so-called log-log relationship according to [7], where:

$$\ln AT_j = \gamma + \delta * \ln Y_j \qquad (1)$$

where AT_j = adjusted tax revenue,
γ = regression constant,
δ = regression parameter,

δ is actually tax elasticity:

$$\delta = \left(\Delta AT_j / AT_j\right) / \left(\Delta Y_j / Y_j\right) = \left(\% AT_j / \% Y_j\right) \qquad (2)$$

where T_j = adjusted tax revenue,
Y = product

The obtained regression parameters (elasticity) were used to ex-post forecast. Ex post prediction means to use the predictive power of the regression equation to the data already known. This method is used to measure the quality of models. In case of this paper it serves as the main indicator of the effectiveness or ineffectiveness of tax policy where deviations of estimated model (long-term trend) will be discussed with reality.

A typical problem for the regression equation describing the relationship of tax revenue to GDP in a relatively short period is the presence of autocorrelation. The autocorrelation distorts the entire model (specifically the significance of statistical tests and coefficient of determination). Therefore the autoregressive estimation method was used instead of a conventional least squares method.

Heteroskedasticity issue has not been solved, because this phenomenon occurs more in multidimensional time series.

2.4 Ex-post prediction

The "ideal" development of CIT receipts is made by transformation of the estimated regression coefficients according to the elasticity equations 1 and 2. Followed by comparing the known facts and the estimated value of dependent variable it is possible to measure deviations of model scenarios from reality. Higher values of deviations mean influence of other endogenous factors and the relative ineffectiveness of tax policy by changing the rate.

3. Results and Discussion

Table 1 describes the evolution of the percentage change in tax income and GDP growth together with a change in tax rates on corporate income in the Czech Republic.

Table 1. Development of followed economic variables

Year	CIT in billions CZK	CIT growth in %	GDP c.p. in billions CZK	GDP growth in %	CIT tax rate
31.12.2002	86.7		2567.53		31%
31.12.2003	100.8	16.26%	2688.11	4.70%	31%
31.12.2004	110.4	9.52%	2929.17	8.97%	28%
31.12.2005	112.04	1.49%	3116.06	6.38%	26%
31.12.2006	142.25	26.96%	3352.60	7.59%	24%
31.12.2007	135.44	-4.79%	3662.57	9.25%	24%
31.12.2008	182.51	34.75%	3848.41	5.07%	21%
31.12.2009	119.6	-34.47%	3758.98	-2.32%	20%
31.12.2010	123.86	3.56%	3790.88	0.85%	19%
31.12.2011	118.11	-4.64%	3823.40	0.86%	19%
31.12.2012	128	8.37%	3845.93	0.59%	19%

Source: Authors, data ARAD [1]

From the observation of the development of monitored variables, it is clear that the decline in tax revenue is very remarkable in 2007 and especially in 2009. One of reason could be that the decline in revenues in 2007 could be caused by the changes in tax law that is related to the deductibility of different costs related with employees. These rules were much stricter till 2007. It means that there is wider possibility to use more types of costs as tax deductible costs (especially costs related to employees).

The deviation in 2009 was clearly caused by the economic crisis. An interesting fact is that the decline in tax revenue collection compared with a fall in GDP is very significant. A possible explanation for this fact is the possibility of utilization of tax losses; the companies took advantage of the opportunities to reduce their tax liability.

CIT revenues in 2010 show an interesting phenomenon, when (despite the marginal growth in GDP) tax revenue grew. There is clearly evident influence of tax rate reduction, which caused the increase tax revenue collection. Another possible factor is the positive expectation, the companies assumed a possible end of the crisis. Alternatively, other companies have used tax optimization opportunities.

The year 2011 shows again decline of CIT collection. It is clear that consequences of ending the economic crisis are reflected; companies probably used the opportunity to apply losses from previous periods to reduce their tax bases.

The year 2012 is already showing positive trend in the case of corporate income tax revenues and GDP.

For the purpose of estimating the elasticity of tax revenue has been designed following model:

$$lnCIT = -17.83 + 3.113 * lnGDP + 1.83 * lnCITrate - 0.8468 * Uhat\_1, \qquad (3)$$

where CIT = tax revenue from CIT,
GDP = real gross domestic product,
$CITrate$ = CIT rate
$Uhat\_1$ = special variable based on auto-regression method, which describes power of autocorrelation.

It is clear that the regression parameter related to GDP is very high and it means that the elasticity between GDP and CIT revenues id high.

Evaluation of the estimated model equations using ex-post verification is summarized in Table 2. This table is used as quality test of the model. Autoregressive models don´t have coefficient of determination. The actual conclusions of the effectiveness of tax rate changes are estimated using deviations from the model, which assumes a stable development of CIT

revenues depending on the explanatory variables. The model itself may be distorted by relatively small scale of observation or high volatility of the tax system.

Table 2. Ex-post verification

Year	Real CIT in billions CZK	Predicted CIT in billions CZK	Deviation	Deviation in %
31.12.2002	86.7	87.00	-0.30	-0.35%
31.12.2003	100.8	100.37	0.43	0.43%
31.12.2004	110.4	108.84	1.56	1.41%
31.12.2005	112.04	115.22	-3.18	-2.84%
31.12.2006	142.25	124.98	17.27	12.14%
31.12.2007	135.44	164.58	-29.14	-21.52%
31.12.2008	182.51	150.37	32.14	17.61%
31.12.2009	119.6	127.82	-8.22	-6.87%
31.12.2010	123.86	119.47	4.39	3.54%
31.12.2011	118.11	122.69	-4.58	-3.88%
31.12.2012	128	124.96	3.04	2.38%

Source: Authors, data ARAD [1]

It is clear from Table 2 that reducing the tax rate is a good tool of tax policy in case of a relatively stable economic development (for example in 2004).

In case of significant deviations from trend (more than 5%), it is clear that the tax rate alone is not a sufficient stimulation factor. Here can be assumed some adaptive relationship between GDP growth and tax revenues because of the positive expectations companies achieve higher taxable income (year 2008).

This adaptive expectation, of course, also works in the opposite direction. There was very significant decline in corporate income tax collection in 2009.

Another interesting fact is that the very high influence of discrete tax changes increase the volatility of tax revenues, for example in 2007, when possibilities of tax-deductible expenses were extended, which reduced the corporate income tax collection (discretional change that can´t be described using this model).

In 2009 - 2011 there is a high volatility of tax revenues. This phenomenon is caused by the influence of adaptive expectations of GDP together with the fast implementation of changes imposed by supporting the reduction of the tax bases of companies.

4. Conclusion

The first part of this paper focused on tax measures taken to fight the crisis with emphasis on the Czech Republic. The examples show that countries try to fight with the crisis and its´ impact on public finance in the area of all taxes. Czech Republic is not an exception.

Corporate income tax is special tax type that is more sensitive on crises than other tax types. It shows for example [11]. It is because of the characteristics of CIT. Therefore this article was focused on CIT and it shows the important characteristics of CIT revenues and the behavior of the revenues in relationship with GDP and statutory corporate income tax rate.

We can say that the conclusions of this paper complement with [10] and [11].

Under authors opinion the reduction of the tax rate is in terms of examined problems best to apply in the case of "fading" of the crisis, when the expectations of economic entities about future growth are positive. Reducing rates are acting as a multiplier of these positive expectations. Authors assume that in the case of ad-hoc solution would be much better to use direct discretionary intervention in the possibility of reducing the tax base.

Acknowledgements

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Territory Unit Evaluation – a Case Study in Districts in the Czech Republic

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Abstract

Territorial performance assessment poses a contemporary challenge. A standard indicator used for defining territorial or regional performance is gross domestic product (GDP). This indicator reflects the performance of a specific territorial unit quite reliably, but it has inherent limitations. For example, the performances of smaller units are difficult to compare when it is technically complicated to determine their GDP value. GDP also does not indicate all of the socio-economic characteristics of a territory, and it does not take possible future development into consideration. This is one reason that other sets of indicators have been developed to enable a more comprehensive assessment and comparison of the performances of territorial units. The purpose of the paper is to present a comprehensive indicator with an algorithm that reflects the economic performance and future potential of a specific territorial unit. The paper presents how this indicator can be used by including a case study of a district unit for which the indicator was tested. The results show that the indicator can be used to compare territorial units, to make decisions about allocating resources, and to balance regional disparities. It is possible to change individual variables for determining the indicator and thus focus on various priorities of decision-making in terms of investments.

Keywords: Complex indicator; evaluation; territory units, resources

JEL Classification: E61, H71, R11

1. Introduction

Due to the fragmentation of public administration in the Czech Republic and the large number of territorial units, the municipalities and their roles in relation to people have become objects of examination. Standardized indicators such as gross domestic product (GDP) are used in order to compare the performances of the smaller governmental units (states, counties, and municipalities). Economic aspects are compared, as are general social and environmental aspects, and there are specific analyses of individual sectors such as energy, education, health care, etc. A set of indicators was developed to describe the dynamic evolution of particular regions in these sectors, taking changes over time into account.

The sustainability of regions and municipalities is often mentioned in the context of discussions about structure of indicators. Sustainability is measured using sustainable development indicators. Particular indicators at the municipal level have been researched by several authors [1-4]. Mascarenhas et al. [1] analysed indicators such as unemployment, energy, health care, business structure, etc. and developed a conceptual framework for these indicators. Holman [2] described differing approaches to the study of these sustainability indicators into two groups: the 'technical' or 'expert oriented' approach and the 'participative' or 'citizen-oriented' approach and identified the third approach to 'governance'. Pires et al. [3] examined differing approaches to the study of these sustainability indicators and noted that the convergence between these two approaches is often perceived as a third approach to 'governance', which was presented by Holman [2]. Tanguay et al. [4] summarized various studies of sustainability indicators, observing no general consensus on the conceptual framework of indicators or in the selection and optimal number of sustainable indicators.

The different indicators thus represent a wide field for research. The most interesting area in terms of economic research is the economic strength of individual regions or agglomerations or even individual communities and the accompanying search for the causes and factors that

support existing development. Studies in this area include, in particular, Porter [5], who used economic indicators such as unemployment, wages, urban growth, and the number of patents to examine the performance of individual regions in the US. The most frequently appearing economic indicator in relation to the examination of performance is obviously GDP. We consider GDP to be a relevant factor for investigating the performance of countries. GDP can also be used to study regional disparities if there are available data. Disparities in Greece were thus examined [6]. However, problems arise when exploring lower level units, such as counties or municipalities, where data are difficult to collect or unavailable due to the considerable difference in size compared to international units. Therefore, economic indicators such as unemployment, the number of entrepreneurs, investments, average wages, tax rates, etc., are sometimes used.

The following table shows selected authors and their explored indicators.

Table 1. Selected Authors and Economic Indicators

Reference	Economic Indicator	Unit
Armstrong et al. [7]	GNP per capita	micro-state, sub-national region
	natural persons – registered business for VAT	
	productivity: earnings	
Agarwal et al. [8]	employment: participation rate, type of employment, enterprise business entry and exists (VAT registered start-ups and VAT de-registrations, investment, existence of transport infrastructure, distance of firms to main markets	rural area
Kostelecký et al. [9]	GDP per capita, GDP per employee, net income per household per capita, registered unemployment rate,	region
Porter [5]	wage, wage growth, employment, patenting rate	region
Mascarenhas et al. [1]	unemployment*	region
Golitsis, Chletsos [6]	GDP per capita, Gross fixed capital formation per capita, Savings per capita, Employment (% of total workforce)**	region
Tunkrová [10]	GDP per capita in PPP	region (NUTS II)
Rydvalová, Žižka [11]	unemployment***	municipality
Žižka [12]	population density, unemployment, tax yields, etc.	municipality

Source: Authors

Note:

* They used other indicators such as population, age structure etc.

** They used others indicators such as number of new houses per 100 inhabitants, number of private cars per 100 inhabitants, number of pupils (primary e secondary education) per 1000 inhabitants, number of schools 1000 inhabitants, number of doctors per 1000 inhabitants, number of hospital beds per 1000 inhabitants, number of hotel beds per 1000 inhabitants

*** They used others sustainable indicators such as access to healthcare, public green space etc.

The evaluation of regional performance in the Czech Republic was examined by [9] and [13]. The economic potential of municipalities was evaluated by [11] and [12], based on the following factors: unemployment, the attractiveness of the place of residence, population density, age structure, available amenities, economic structure, sustainable development, the environment, and economic activity.

In order to reduce regional disparities over the long term, the most accurate model, with as many indicators as possible, is the best. These indicators show the causes and factors that support development in the region, district, or municipality. We propose a complex indicator that takes into account the key aspects of economic development in smaller units such as districts, while providing a quick and simple basis for decision making.

The aim of our paper is to present a complex indicator for evaluating territory units and to show its use in terms of increasing resource spending efficiency. This complex indicator is formulated as a combination of simple indicators affecting a territory and its economic potential.

2. Material and Methods

The complex territory unit indicator is a real-value function defined through a set of variables concerning the territory and its economic potential:

$$Ep_j = f(x_1,\ldots,x_n) \qquad (1)$$

where Ep_j is the value of the economic potential of j-territory unit, j=1,…,n
x_i are variables affecting the value of the economic potential, i = 1,…,n.

To develop the complex indicator we examined the models available in literature and defined a set of variables affecting the value of economic potential:

- *basic indicators* defining the territory (population density);
- *economic indicators* considering the riches of the region in terms of tangible assets (property values and structures), investments (foreign direct investments) and businesses (number of business entities);
- *income indicators* (performance of economy, average wages and employment).

To construct the economic potential, we used a multi-criteria weighted point evaluation method, converting variables into comparable indicators (coefficients). Thus

$$Ep_j = \sum_{i=1}^{n} ep_{ij} w_i \qquad (2)$$

where Ep_j is the value of economic potential of j-territory unit, j=1,…,n
ep_{ij} is the coefficient of i-variable (indicator) and j-territory unit, i=1,…,m, j=1,…,n, $ep_{ij} \in [0,1]$
w_i are weights for individual coefficients

Coefficients are constructed subsequently

$$ep_{ij} = f(x_{ij}) \qquad (3)$$

Wherein in case that:

$$X \to \max, \text{ then } ep_{ij} = \frac{x_{ij}}{RV_i} \quad \text{and} \quad X \to \min, \text{ then } ep_{ij} = \frac{RV_i}{x_{ij}}$$

where x_{ij} is the value of the of i-variable and j-territory unit, $X = (x_{ij})_{m,n}$
RV_i is the reference value of variable determined on the basis of mathematical and statistical methods and distribution as 95th percentile of the distribution ($Q_{0,95}$ for $x_{ij} \to \max$ and $Q_{0,05}$ for $x_{ij} \to \min$).

This is a general methodology that we developed to assess territorial units. Individual variables can be selected depending on the character of the territorial unit. The number of variables is not random.

We used districts as the basic territory unit. We wanted to evaluate territorial units smaller than regions because regional comparisons are already conducted by the Czech Statistical Unit.

2.1 Methodology for Assessment of District Territorial Units

As was mentioned, when setting the complex indicator, it must include basic economic and income indicators. We supposed that the economic potential of a district is dependent mostly on the following variables (indicators):

- x_{1j} population density (inhabitants per hectare);
- x_{2j} property – the proportion of built-up areas and courtyards (%);
- x_{3j} tax revenue per capita (in thousands CZK);
- x_{4j} average wage (in thousands CZK);
- x_{5j} unemployment rate (%);
- x_{6j} foreign direct investment per capita (CZK);
- x_{7j} number of business entities per capita.

then the $X = \left(x_{ij}\right)_{7,77}$ $m = 1,...,7$ a $n = 1,..,77$.

The weights for individual coefficients constructed by Formula (3) were set expertly[1], where:

$$w_1 = 0.10,\ w_2 = 0.10,\ w_3 = 0.10,\ w_4 = 0.40,\ w_5 = 0.10,\ w_6 = 0.10,\ w_7 = 0.10.$$

We used the *tax revenue per capita* variable as an alternative to the *GDP per capita* variable, which we consider more relevant but which is only available for larger territorial units (regions). The tax revenue indicator provides information about how much money is actually collected in the form of taxes and how important the territory is from the point of view of the public administration.

There are not always sufficient sources of data expressing the economic potential of a region. This is probably one reason that experts in this research area design different patterns and indicators, usually based on the available information. In this sense, there is no uniform methodology for evaluating the territorial or administrative units of a country, so this approach has a purposeful nature. If the data exist (e.g., GDP), then they could be applied generally to the mid-level territorial units or public administration of the country. For lower levels, synthetic economic characteristics are not usually stated, and only partial indicators such as the number of inhabitants, unemployment rate, etc., are published.

We recommend using the appropriate indicators and their coefficients to assess regional development for lower levels of territorial units (following the example of districts in the Czech Republic). The number of indicators is not random. It is based on their traceability and on the opinion of an expert panel. Using only one or two indicators could lead to distortions in the description of the real economic power of examined territorial units. Distortion is to a certain extent reduced by using multi-criteria evaluation. It is obvious that other possible indicators could be taken into account. The complexity of the calculation is increased with the rise in number of indicators, but the marginal value of each indicator decreases, as many indicators correlate or have some substitutes. It is therefore necessary to have a selection of indicators that are available, simple and easy to use.

All of the variables used in the assessment are tracked and available. We used available data from the database of the Czech Statistical Office [13]. The average wage was calculated based on company data and the server Profesia City for business [14]. Data from the Ministry of Finance was used to calculate tax revenues per capita.

The case study used data from 2010 with regard to the data we obtained from the Ministry of Finance.

[1] We used Delphi method, panel of 5 experts and 3 rounds. The third round was after sensitive analysis. Thus, experts were encouraged to revise their earlier answers in light of the replies of other members of their panel and results of the sensitive analysis.

3. Results and Discussion

The developed complex indicator was constructed for the Czech Republic and 2010 for all 77 districts of the Czech Republic. The complex indicator of the territory unit evaluation of the districts of the Czech Republic according to Formula (2) is shown in next table.

Table 2. Complex indicators and ranks of the districts in the Czech Republic in 2010

District	Ep	Rank	District	Ep	Rank
Praha	1,000	1	Liberec	0,638	11
Benešov	0,547	27	Semily	0,506	57
Beroun	0,668	9	Hradec Králové	0,635	12
Kladno	0,594	16	Jičín	0,560	24
Kolín	0,580	21	Náchod	0,510	53
Kutná Hora	0,527	35	Rychnov n Kněžnou	0,525	39
Mělník	0,586	17	Trutnov	0,525	38
Mladá Boleslav	0,802	5	Chrudim	0,508	55
Nymburk	0,519	46	Pardubice	0,645	10
Praha-východ	0,780	6	Svitavy	0,478	70
Praha-západ	0,694	8	Ústí nad Orlicí	0,521	45
Příbram	0,521	43	Havlíčkův Brod	0,499	62
Rakovník	0,525	37	Jihlava	0,605	15
České Budějovice	0,717	7	Pelhřimov	0,582	20
Český Krumlov	0,516	48	Třebíč	0,475	71
Jindřichův Hradec	0,482	67	Žďár nad Sázavou	0,482	68
Písek	0,516	49	Blansko	0,516	51
Prachatice	0,493	64	Brno-město	0,905	3
Strakonice	0,505	59	Brno-venkov	0,573	22
Tábor	0,538	30	Břeclav	0,538	29
Domažlice	0,481	69	Hodonín	0,493	63
Klatovy	0,545	28	Vyškov	0,569	23
Plzeň-město	**0,934**	**2**	Znojmo	0,504	61
Plzeň-jih	0,523	41	Jeseník	0,451	76
Plzeň-sever	0,523	42	Olomouc	0,535	32
Rokycany	0,527	36	Prostějov	0,473	73
Tachov	0,507	56	Přerov	0,509	54
Cheb	0,530	33	Šumperk	0,483	66
Karlovy Vary	0,517	47	Kroměříž	0,466	74
Sokolov	0,453	75	Uherské Hradiště	0,487	65
Děčín	0,506	58	Vsetín	0,524	40
Chomutov	0,536	31	Zlín	0,622	14
Litoměřice	0,516	50	Bruntál	0,427	77
Louny	0,473	72	Frýdek-Místek	0,511	52
Most	0,628	13	Karviná	0,528	34
Teplice	0,521	44	Nový Jičín	0,504	60
Ústí nad Labem	0,584	18	Opava	0,554	25
Česká Lípa	0,548	26	Ostrava-město	0,891	4
Jablonec nad Nisou	0,582	19			

Source: Authors

The outcomes of the study of individual districts generally correspond to the outcomes of the region-related statistics. The outcomes for the Plzeň-město district are interesting. The values in this district were mostly influenced by the outcomes of average wages. The outcomes of the comprehensive indicator depend on the values of individual variables but particularly on how they are weighted. The weights were set with a view to the importance of the variables and subsequently reviewed with respect to the distribution of the values of the variables when the outcomes were tested by means of a sensitivity analysis. The statistics of the distribution of variables and the reference values for the variables are shown in next table.

Table 3. Variables/indicators. Reference values and descriptive analysis

Variable/Indicator	Reference value$_{0,95}$	Mean	Standard deviation	Minimum	Maximum
population density	13.80	2.11	3.89	0.37	25.34
property	9.17	2.11	1.95	0.52	11.06
tax revenue	47.00	18.70	14.42	6.04	109.70
average wage	26.60	22.02	2.24	18.62	30.55
unemployment	4.80	9.72	2.75	3.84	16.17
foreign investment	338.50	113.59	146.66	8.99	926.43
business entities	0.30	0.23	0.04	0.16	0.40

Source: Authors

To determine the volatility of individual indicators and benchmarks, a sensitivity analysis was performed. A sensitivity analysis was performed only for the reference values, because those individual variables are converted to factors, for which their key reference value is set as the 95th percentile, and then changes of the variables in turn change the reference value, and there is no change of coefficients. The following table shows the results of the sensitivity analysis to changes in the reference value of variables / indicators. For the sensitivity analysis, we selected changes to the 90th percentile, 80th percentile, and 70th percentile (for RV_5 - Unemployment rate, we selected the 10th percentile, 20th percentile, and 30th percentile, because $x_{5j} \rightarrow \min$).

Table 4. Sensitive analysis for changes of reference value as percentile of the distribution

Variable/Indicator	w	$Q_{0,90}$	$Q_{0,80}$	$Q_{0,70}$	$Q_{0,60}$
population density	0.10	-5.878	-8.054	-8.729	-9.469
property	0.10	-6.874	-8.609	-9.345	-9.539
tax revenues (yields)	0.10	-2.602	-5.471	-6.973	-8.277
average wage	0.40	-4.140	-6.199	-7.587	-8.987
unemployment	0.10	-2.830	-3.955	-5.690	-5.986
foreign investment	0.10	-1.159	-4.707	-6.422	-7.399
business entities	0.10	-0.994	-2.053	-2.839	-3.231

Source: Authors

The outcomes of the sensitivity analysis show increased sensitivity for the variables of population density, property, tax revenues and average wages. The sensitivity increases the fastest for the tax revenue variable. This was one reason that the weight of this variable was decreased from 20% to 10% in the expert weight setting. This may seem like a problem with the issue of choosing this indicator. This indicator, however, was chosen with regard to the overall concept of a complex indicator for evaluating territory units and increasing the efficiency of resource spending. Because the complex indicator was developed as an instrument for the efficient allocation of public expenditure from the state administration, the tax revenue variable was chosen with regard to the performance of the region related to the size of public budgets for which tax revenues are used as a tool for their implementation. The influence of tax revenue on a

region's economic performance has been shown (e.g. [16] or [17]) Becker and Fuest [18] analysed the interaction between tax competition and regional policies, i.e. public investment in regional infrastructure.

4. Conclusion

The paper presented a methodology used to determine a comprehensive economic indicator for evaluating the economic potential of territorial units. We chose the district as the basic unit for evaluation in the case study. We realize that the district, as an administration unit, has no legal basis for decision-making processes in local self-governments in the Czech Republic; nevertheless, it provided us more space than the municipalities with extended powers for the analysis carried out as a part of our case study. Some variables, such as average wages, foreign investments, etc., are monitored for the lowest territorial unit – the district – and are no longer monitored for other territorial levels (municipalities with extended powers and municipalities). The research outcomes showed that the choice was not optimal. Therefore, our follow-up research and testing of the suitability of this comprehensive indicator of economic potential will focus on the smaller units (of municipalities with extended powers) and larger units (of regions) where we can compare the results of this methodology with the results of the comparison of regions that has been elaborated by ČSÚ. We wanted to show in the case study that the proposed complex indicator may have a wide application, e.g. in developing strategic, conceptual, and program documents of public administration at the state or regional level, especially in regional politics, when deciding how to allocate resources in the area and establish the priorities for disparate regions. This indicator may serve both for comparing the given units and for decision-making by municipal representatives about allocation of resources for balancing regional disparities and for making investments, e.g. to protect a territory.

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Tool for Detection of Value Added Tax Evasion on Fuel Market

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Abstract

The paper focuses on the problem of tax evasion on value added tax on fuel in the Czech Republic. The authors search for a simple, administratively undemanding instrument for reduction of tax evasion which does not distort the fuel market. General methods of tax evasion suppression are not in this specific area effective and applicable. We therefore provide a tool to identify risky selling prices of fuel using usual price of fuel at a specific time period. To determine the usual price it is essential to quantify all its components, which may be problematic especially in the case of margin and transportation cost. Despite its limitations, usual price is both theoretically convenient and empirically applicable instrument for detection of risky selling prices from the perspective of tax evasion. At the moment, when the tax burden of fuels appears to be collection boundary, it is only possible to increase public revenues through decreasing the propensity to tax evasion, and specifically by enhancing the probability of tax evasion disclosure.

Keywords: Fuel; tax evasion; usual price; value added tax

JEL Classification: H20, H26

1. Introduction

The problem of tax evasion is a multidisciplinary topic having roots in areas such as law, ethics, corporate structures or labour market. From the perspective of public finance it includes terms justice, effectiveness and incidence [1]. Tax practice and tax evasion occurrence significantly deteriorate original intentions and formulation of tax law.

The implication of tax evasion is in the case of value added tax (VAT) on fuel entirely clear. Justice is disrupted as several entities pay the tax and to function efficiently in the long run they set a reasonable price policy. Contrary to them, other entities evade the tax. This implies lower selling prices of products and higher profit. Consequently, they may increase the market share which would not happen if they did not evade the tax and set a reasonable price. Following this practice, the effectiveness of market on one side and the effectiveness of value added tax collection on the other, are disrupted. The resulting incidence has the impact on fair subjects, the buyers of fuel and the government budget. The only theoretically profiting side are the buyers of fuel. Tax evasion may put the prices of fuel under pressure, but doubts on the quality of fuel may emerge. The impact on fair sellers having the form of loss in turnover is clear, as well as the shrinkage of government revenues. It is necessary to mention, according to the classification [2], our paper deals with tax evasions, which means intentionally committed criminal acts.

The aim of this paper is to propose an instrument for reduction of tax evasion on value added tax on fuels. The instrument must reflect theoretical and practical requirements, be of low cost, simple, applicable and have minimum distortive impact on the performance of subjects on the fuel market.

2. Material and Methods

The authors in this paper employ several specific methods of data collection and data processing. Combination of positive and normative approaches permits to objectively evaluate the problem in theoretical and empirical level, and to formulate conclusions on the effectiveness

of real applicability of instruments for tax evasion detection, including the proposal of a model instrument for reduction of tax evasion on value added tax on fuel.

To identify the tax burden of fuel as the important factor of tax evasion, the following equation is used:

$$TB = VATcoef \times P + ExD, \qquad (1)$$

where TB is the rate of tax burden,
$VATcoef$ is coefficient for calculation of value added tax from a price, including the VAT
P selling price,
ExD excise duties on mineral oils.

$$VATcoef = \frac{VATr}{100} + VATr, \qquad (2)$$

where $VATr$ is nominal value added tax rate.

To specify a convenient instrument for reduction of tax evasion on value added tax on fuels, we use the decomposition of selling price:

$$P = Ppp + ExD + M + Ctr + VAT, \quad (3)$$

where P selling price,
Ppp purchase price in refinery,
ExD excise duties on mineral oils,
M margin for fuel traders,
Ctr transportation cost,
VAT value added tax.

Selling price is calculated from individual components which are known or which it at least contains. Purchase price in refinery is a price for which the goods were delivered. Price at commodity exchange may serve as an example. To calculate the selling price we further need to include excise duties on mineral oils and value added tax depending on the rates in individual countries. Because the fuel has to be transported and sold with profit, margin for fuel traders and transportation costs are also included. These two components cannot be precisely quantified. However, they can be an important factor in determination of final selling price.

Important sources of data are regularly held PETROL summits and seminars organised by Budgetary and Agricultural Committee of Chamber of Deputies of Parliament of the Czech Republic. Obvious sources of data are the directives of the Council of the European Union on value added tax and the information of the European Commission on planned law amendments. The authors also use the legislation of the Czech Republic. Data on prices of fuel were obtained from ČEPRO, a.s. where the only shareholder is the Ministry of Finance of the Czech Republic. We can therefore assume that the prices are not deformed by tax evasion. Basic weakly prices are available upon request at the company (further referred to as „ČEPRO, 2013“)

In terms of wholesale sales, approximately 15% of market share belongs to ČEPRO, a.s. in the long run [3], [4]. A problem to solve was whether the data of a company with higher markets share, such as ČESKÁ RAFINERSKÁ, a.s, are not more convenient for analysis. An important criterion in selection of the subject was the distribution of fuel warehouses. ČESKÁ RAFINERSKÁ, a.s. has placed its refineries in Kralupy nad Vltavou and in Litvínov which means that the prices are determined by long distance for transportation. On the contrary ČEPRO, a.s. has built the warehouses regularly around the Czech Republic and also uses the services of ČESKÁ RAFINERSKÁ, a.s. Additional impact of transportation on the prices of fuel is therefore minimised. To make the final proposals, the authors also used the monthly reports of General Financial Directorate which also provided a more detailed explanation of methods and the requirements for the distributors of fuel.

3. Results and Discussion

Because of the fact that very different methods of determination of tax evasion which were applied on different taxes, group of taxes or tax regimes, in different regions, countries and group of countries, exist, it is not surprising that the results are very heterogeneous. Underground economy and tax avoidance also play a role. Christian [5], using different research methods identified that only 26 % of taxpayers provide input data correctly, but 97 % of the amounts are reported according to the law. The exact amount of evaded tax is not therefore as important to know as the fact that it makes a significant loss in tax revenues. New figures related to the evasion on value added tax on fuel have recently been published. The estimates for the Czech Republic amount to 4-6 billion CZK per year as the loss in tax revenues [6] a [7]. In the case of the European Union countries, the amount is estimated to be approx. 100 billion EUR per year [8]. During the recent decades a boom of systematic tax fraud on VAT is reported [9]. According to a recent study the estimated evaded tax for 2011 amounts to 193 billion EUR, i.e. 1.5% of GDP [10].

The global significance of the problem is captured in study [11] which identifies methods of tax evasion in China, despite the fact that the sentences after disclosure are in this country inappropriately high. How important is tax evasion on VAT in the European Union is documented in [12], including the lessons to avoid in the case of VAT introduction in the USA.

Now, let's focus on facts that make oil and fuels specific commodities. From the parameters of demand characteristic by its low elasticity, we will get to its form and the rate of taxation, and consequently to supply which is represented by the global production of oil.

Places where crude oil is mined are randomly distributed around the globe. Most of the countries therefore have to import oil to meet domestic demand. Trades are settled at commodity exchanges and despite the variety of kinds of oil, mot contracts are settled on BRENT oil form the North Sea and WTI oil traded in Northern America. Oil crises in 1970s revealed irreplaceable importance of oil for the global economy. Commodity exchange indexes do not only reflect socio-economic aspects, but also the environmental factors. Hurricane Katrina in 2005, which resulted in a break in mining of crude oil in the United States, may serve as an example. Consequently, oil had to imported, which affected the retail prices of fuel.

The price of oil does not only reflect the costs of purchase, but it is also important to take into account transportation costs from mining towers to refineries. Other costs include insurance, local fees and taxes. Oil is transported through the pipes, tankers and trains. For local transportation and for the delivery of oil from refineries and warehouses to petrol stations, tank trucks are frequently used.

Indirect taxes, specifically the VAT and excise duties, form an important part of the selling price of fuels. Average basic VAT rate in the European Union currently (in 2013) exceeds 21 % (21.21% [13]). In the case of excise duties on mineral oils the European Commission only sets the minimum rates. Regarding the fuels, specifically the unleaded car petrol and diesel oil, the minima are €359/1000 l for car petrol and €330/1000 l for diesel. In the case of the Czech Republic the excise duty on diesel is 10.95 CZK/litre and 12.84 CZK/litre for car petrol.

Table 1. Wholesale percentage composition of the price of diesel and petrol

Item	Percentage share [%]	Percentage share [%]
Purchase price in refinery	50.24	44.01
Margin of fuel traders	0.00	0.00
Excise duty	32.42	38.63
Value added tax	17.35	17.36
Total	100	100

Source: Authors, [3]

Basic weekly prices of ČEPRO, a.s. for the week 24th – 30th September 2013, 27.92 CZK/litre for diesel and 27.47 CZK/litre for petrol, were used. The calculation in Table 1 using equations *(1)* and *(2)* shows that the overall taxation of diesel is 49.77% and 55.99 % for petrol.

Such high taxes may easily motivate some entrepreneurs to evade taxes. In this paper the centre of our attention is the VAT because, contrary to tax evasion on excise duty, there is no need to possess any other minerals to add into the fuel to evade paying the tax.

The connection of the VAT rate and the rate of tax evasion on VAT was studied by Chiarini [14], who employ official statistics on tax evasion in Italy and compare them with the tax burden.

It is therefore not a direct measurement of tax evasion. The authors nevertheless found a permanent gap on VAT irrespective of the tax rate, which relates to the approach to risk. It is rather interesting that the rate of tax evasion grows faster in the short and long run than the tax rate itself. Raising the VAT rate therefore appears to be ineffective with the regard to tax collection.

Tax evasion has to be reduced. Decreasing the rate of tax evasion currently appears to be the only effective solution to raise the public revenues. The VAT rates are currently approaching the maximum collection limit, which was empirically confirmed by Matthews and Lloyd-Williams [15]. Moreover, the VAT has become a politically sensitive tax with all its consequences. Instead of reflecting the phases of business cycle, it is strongly determined by the political cycle, and especially the tax rates and the goods composition have become important policy topics.

In strongly competitive environment of fuel market it is not possible to omit the effect of tax rate on decrease of sales of fuel in countries with high tax burden. Tax competition between countries may then cause tough fight for customers with increasing percentage of fuelling tourism. Price sensitivity is common especially in the case of professional carriers. Frustration from the changing behaviour of customers may then stimulate tendencies to tax evasion. Another factor to take into consideration is the effect of modernization of vehicle fleet, when new cars usually consume less fuel than the old ones.

Broader consequences of reduction of VAT evasion provide Gomez-Plana a Arzoz [16]. The authors calculate positive impact of reduction of tax evasion on GDP, unemployment, wages and pensions.

The only effective tool for disclosure of tax evasion is controlling. Traditional tools for tax evasion disclosure are time-consuming, tiring and expensive. It is therefore important to search for new instruments to overcome the shortcomings of the traditional tools. Nigrini [17] provides instruments for detection of frauds and mistakes in accountancy. The author uses standard programmes and statistics for identification of incorrect figures, deviations, uncommon values and the risk of fraud. Data mining appears to be a useful tool to detect cases with high probability of tax evasion [18]. What are the indicators to be evaluated using these methods? For VAT tax evasion on fuels we propose the indicator to be usual price. If the selling price of fuel is lower than the calculated figure of usual price, then the seller is considered to be tax risky and it is recommended to undertake a control to identify possible tax evasion.

Tax evasion occurrence is determined by factors such as tax rate, the duration of sentence and the probability of tax evasion disclosure. A less known factor is the method of determination of the basis of sentence once tax evasion is disclosed. If the basis is the amount of distortion of tax basis, then with increasing tax rate tendencies to tax evasion increase as well. On the contrary, if the basis is uncollected tax, then the sentence increases with the tax rate and the tendencies to evade tax are therefore reduced. To reduce tax evasion, it is important either to increase the probability of disclosure in the case of low sentences, or to have high sentences with low disclosure probability. From the perspective of the cost of tax administration, the second option is more convenient.

Is the existence of tax evasion an argument for application of low marginal rates? Despite the non-existence of analyses, Sandmo [19] supports this thesis. He nevertheless admits that parameters of controlling and the duration of sentences are more substantial in reduction of tax evasion than the tax rate. When evaluating the effectiveness of VAT collection he employs a lag in the introduction of measurements for tax evasion reduction [20]. Besides the factors of the probability of a control and the size of sentence, it is important to take into consideration the fact that the effect of introduced measurements will not prove immediately, but with a delay. In this paper we therefore set the basis period to be able to detect the effect of measures in the

following periods after their introduction. A rather underestimated determinant of tax evasion is the current condition and development of business environment**.** Informal institutional environment including traditions, habits, morality, tolerance of tax evasion; and formal institutional system in terms of its complexity, quality, variability and the strictness of communication of the taxing authority, play important roles.

Detailed evaluation of models of VAT evasion reduction, specifically carousel frauds in EU countries with focus on Germany, is provided by Gebauer et al. [21]. The authors stress high administrative costs of proposed measurements and their limited effectiveness in terms of the tendency to further evade tax. The employed methods are Mittler-model, reverse charge model with input tax settlement and reverse charge model with joint and several liability of debtors. Despite the above-mentioned limitations, the authors quantify important benefits from reduction of tax evasion.

Keen and Smith [12] argue that CVAT and VIVAT systems help reduce carousel fraud. Within the CVAT system exports would be formally zero-rated in the exporting country but then immediately subjected to a special "compensating" VAT that would be fully creditable in the importing country. The VIVAT system instead charges a single rate, common to all participating countries (or states), on all B2B sales, whether domestic or across borders, while leaving the rate applied to final sales to the discretion of each. Authors do not suggest to evaluate the VAT evasion separately, but to compare the results with other countries. We may finally come to a conclusion that VAT is still a convenient tax in terms of tax evasion reduction. Due to the administrative costs, the European authors Gordon and Nielsen [22] prefer VAT to income tax with respect to tax evasion reduction.

Value added tax evasion on fuel may be reduced. General principles**,** however, are not sufficient to effectively suppress tax evasion. It is essential to formulate appropriate measures and instruments for tax evasion detection. General principles of tax evasion reduction should then be considered as the criteria of suitability for a selected method of market regulation.

The European Union directives and legislation of EU member states are therefore developed to effectively tackle the problem of tax evasion. For a long time the frauds were overlooked and the solution of problems was postponed passing the responsibility to individual EU member states. Value added tax administration was regulated by the Council Directive [23]. It's interpretation implied that if a member state wanted to diverge, it could only be done with permission of other states. Since 2011, the situation has changed and new measures have been developed. The approval of the mechanism of quick reaction (further referred to as "QRM"), [24] is regarded as a very positive factor. In the area where the loss in tax evasion amounted to billions of EUR per year, cutting time for approval of an exception for determination of taxable person enables to pay the tax. This approach was already incorporated in directive from 2006, but a problem with divergence may have emerged. The rejection of the request of the Czech Republic [6] on introduction of reverse charge mechanism on selling fuels may serve as example. Member states therefore had to use other options which often could not be applied effectively.

The estimated rate of tax evasion and their absolute volume make a strong pressure on politicians who are expected to propose measurements to minimise these criminal acts. Since April 2011, the act on VAT has been amended [25] with changes in taxation period, introduction of the institute of unreliable taxpayer, liability of eligible receiver, liability of receiver of taxable supply, special means of tax securing, etc.

Most of the amendments were approved mainly because of the need to reduce tax evasion on fuels. Art 109 para 4 [25] directly focuses on the distributors of fuel who are considered to be the riskiest group of taxpayers. A distributor is a person eligible to sell fuels in the Czech Republic, with the exception of selling the fuel at petrol station [26]. The centre of our attention is a universal method of securing the tax in the form of liability. Art 109 para 2 a) defines that a receiver of taxable supply also guarantees for unpaid tax from the taxable supply, if only the payment for the taxable supply deviates from the usual price without any reasonable explanation.

Apart from the amendments of VAT act the law on fuels has also been amended. Every distributor has duty to deposit 20 million CZK as security or assure a bank guarantee. Without the compliance with this duty, no subject can be registered as the distributor of fuels.

In the introduction of the paper we mentioned that a seller of fuels contributing or profiting from tax evasion may set lower selling prices which implies higher profit and margin, compared to his competitors. To theoretically support these arguments we use Table 1. If the whole margin was created by VAT, than the profit from 1 litre of fuel would be 5 CZK. Usual margin of distributor is approx. 0.20 CZK/litre.

General Financial Directorate of the Czech Republic collects selling prices from all distributors, who every month send the overview on sales and purchases to the tax administrator. Despite the fact that the prices are known, they are not publicly announced. Distributor therefore cannot identify what is usual price and what is not. Usual price is a price of the same goods or of comparable or substitutable goods agreed between a buyer and a seller, who are mutually economically or personally independent, on a given market which is not harmed by competition restriction [27].

Despite the fact that no perfect and exact method of detection of tax evasion exists, new mechanisms of identification of a possible tax fraud can be created. Apart from random controls, knowledge of the market and examination of provided figures are essential. Currently (October 2013) 1949 distributors run the business in the Czech Republic [28]. It is reasonable to assume that, after the introduction of refundable deposits, this number will decrease by 30-50% [29] a [30]. This represents a suitable database, as monthly reports of General Financial Directorate are regularly updated. It would be possible to compare and evaluate risky prices which deviated from the usual price. The gap between the usual price and a low risky price would then indicate tax evasion.

Table 2. Wholesale price composition of petrol and diesel

Item	Price per litre [diesel]	Price per litre [natural 95]
Purchase price in refinery	16.97	14.63
Margin of fuel traders	0	0
Excise duty	10.95	12.84
Value added tax	5.86	5.77
Total	33.78	33.24

Source: Authors, [3]

Identified individual parts of the selling price of fuel make suitable input values for determination a borderline between usual prices determined according to equation *(3)* and unusually low price. On a competitive market it is unlikely to identify big differences between prices of individual sellers. We see the biggest problem is in intra-community trades. The first subject which possesses fuel on the ground of the Czech Republic and which goes bankrupt according to the predefined schedule causes the biggest market distortion with highest tax evasion. As it is clear that the tax is evaded or there is at least an attempt to evade, the selling price is lower than the one of other distributors. With lower price the sales increase. The question is whether the refundable deposits are an effective solution, whether they suppress tax evasion or whether the effect is not even contradictory resulting in even more aggressive tendencies to evade the tax.

4. Conclusion

The paper focuses on criminality on the fuel market in the Czech Republic. It is difficult or nearly impossible to clearly identify the scale of tax evasion, and despite the fact that several direct and indirect methods of tax evasion measurement exist, the reality may be different. The application of commonly used methods by various authors indicates the imbalance between theoretical and practical perspective [5]. Attempts for finding tools, which detect tax evasion and

accounting errors on the basis of indicators [16, 17, and 18] and under specific conditions in certain markets, cannot be underestimated.

The proposed system of monitoring of selling prices of fuel may help indicate tax evasion when prices, which are available to the General Financial Directory from the sellers themselves, are compared. When the price deviates from a long-term balanced average, a suspicion of tax fraud may be raised. Attention should be paid to individual parts of the selling price, and adequate costs such as margin of distributor and transportation cost are supposed to be calculated as well. The proposed solution only brings minimum administrative costs in the form of necessary supervision. The prices are already available to General Financial Directory and can therefore be used for detection. The burden of taxpayers stemming from the application of the proposed tool is negligible and the fuel market in the Czech Republic would not be deformed. It therefore seems that if the proposed tool was applied on real cases, it would become effective after revealing the first criminal act.

It is, however, likely that some taxpayers may hide their illegal activities. To prevent disclosure, they could adjust the price policy in favour of usual prices, and within grey economy they could provide various benefits to the receivers of taxable supply. No method is resistant to such practices of tax evasion. The proposed instrument nevertheless may become another tool for reduction of value added tax evasion on fuels.

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Microsimulation Models in the EU and the Czech Case

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Abstract

Microsimulation model (hereafter, MSM) is tool increasingly used not only within the scientific community, but also by public administration institutions. MSMs are tools that can answer such questions as: What impact will option A and option B have on a reform's monitored entities (e.g. public finance)? What impact will the implementation of certain measures have on specific groups (e.g. high-risk groups such as pensioners, families with children, low-income households, etc.)? What is the degree of redistribution in the system?

MSMs have the ability to assess both ex ante and ex post impacts. In this study, we briefly describe this tool, and discuss the advantages and limits of using them for evaluations. In doing so, we focus on various MSMs used in the European Union. Using a multi-level search, we identified 169 models used in the EU, and ascertained that Germany and the United Kingdom are the countries which most frequently use them (20 and 15 MSMs, respectively). A more elaborate specification of MSMs will be made for the Czech Republic.

Keywords: Microsimulation model; European Union; Czech Republic

JEL Classification: C80, C81, D10, D30, D31, H20, J20

1. Introduction

Public administration is often faced with questions related to public policy evaluation, i.e. their efficiency, economy and effectiveness. These questions also include assessments of the impact of considered or undertaken measures. Many countries' default health systems, pensions system, etc. are a result of their aging populations, but these are unsustainable and need to be reformed. As such, microsimulation model (hereafter, MSM) appears to be a very suitable tool for this type of work.

MSMs are tools which can carry out ex ante and ex post analyses. They can also answer questions regarding redistribution within a set of systems, and can be used to evaluate variant solutions to problems and the impacts on stakeholders (who can also be specified). When assessing changes in the settings of social benefits, the stakeholders may include high-risk groups such as pensioners, households with children and low-income households.

The main goal of this paper is the identification of used MSMs in the EU, more specifically in the Czech Republic. The article is divided into five parts. After the introduction, a chapter is devoted to different types of MSM, as well as the advantages and limitations of their usage. The third chapter is a list of MSMs used throughout the European Union (hereafter, EU), which is followed by a chapter with a more detailed overview of Czech MSMs. The paper concludes with a summary of the findings and possible future usage of MSMs.

1.1 Microsimulation modelling

Many EU countries rank among the world's most developed countries; as a result, they contribute a significant amount of research to the development of new MSMs, which are not only implemented in scientists´ workplaces, but also in the institutions of public administrations. With the development of information technology, MSMs are now capable of being more complex, are more adept at handling large amounts of data and have reduced computing times.

The use of simulation methods began with the development of information technology. In Europe, this dates back to the turn of 1970s, but the first MSM arrived in the US around the 1950s [1, 2]. With improvements to computer equipment and their performance, we are now

able to process more complicated and complex tasks [1]. Nowadays, MSMs are used in many countries and to a greater extent; almost every university, research institute or ministerial department has its own MSM. An alternative to this approach is based on an analysis of typical households that only simulates the impacts on selected households [3].

Štěpánková [1] generally describes a microsimulation method as one that examines the input and dependent outputs (Y) which enter a model (T). Among the input variables is a setting for public systems, as well as a setting for public policy (P) and environmental characteristics, but particularly the characteristics of the population (Z). We define the relationship between the variables as:

$$Y = T(P, Z) \qquad (1)$$

There is much consensus about the advantages and limitations of MSMs (see e. g. [3, 4, 5, 6, and 7]). The main advantage is the comprehensive view it offers of the entire system (or systems), which can be achieved by using the tool alongside assessments regarding impacts on specific groups (such as income distribution), and the level of solidarity and redistribution within the system. However, the complexity is often offset by higher demands on the input data. Furthermore, there is always a time lag between the data collection and the moment it is analysed. Also, certain simplifications of reality and limiting conditions are connected with their usage. One of the limitations of the simulation tax and benefit system is the unknown level of tax evasion and the phenomenon of so-called "non-take-up", which describes a situation whereby claimed benefits are not withdrawn. There are also high demands on the scientists involved.

Štěpánková [1] further divides MSMs into static and dynamic models. Static models fix the demographic characteristics of the population, and thus leads to an extrapolation of data from time *t* to time *t + i.* Dynamic MSMs bring greater realism to the microsimulation approach by modelling population demographics. They take place either longitudinally or are cross-sectional: longitudinal modelling examines the entire life cycle of the population; whereas the cross-sectional approach models the individual states/steps (t +1, t +2 , ..., t + i) of the monitored population.

2. Material and Methods

There is no public list of MSMs which are being developed around the world, so in this paper we have focused on MSMs which have been created and implemented in the EU.

As suggested by Salanauskaite [8], we have employed a multi-level search technique for identifying region-specific MSM resources. This required us to conduct a systematic search of publications via the meta-databases MetaLib and EBSCOhost – which consist of more than 2,600 journals – for the keywords "microsimulation & European Union"; and a subsequent search of the resulting publications for the keywords "microsimulation & X country", where "X country" refers to each EU country. Relevant sources were selected according to their titles and abstracts.

We also manually searched the World Wide Web (e.g. Google Scholar) and found publications on MSM development in transition Salanauskaité [8] and Eastern European countries Lelkes [9], as well as for pension systems MSMs Gál et. al. [6], Jinjing and O'Donoghue [10] and Merz [11, 12], Zhou et. al. [13], Bijwaard [14].

The description of the each model was different, so we have collected information about the name, MSM type, the area of focus, the source of the data and data sample, the model´s developer and its date. We identified 169 MSMs in total (see Figure 1). Three MSMs were used in more than one country: EUROMOD (in 28 countries), MIDAS (in Belgium, Germany, Italy and Luxembourg) and MIMOSIS (in Belgium, Denmark and Sweden).

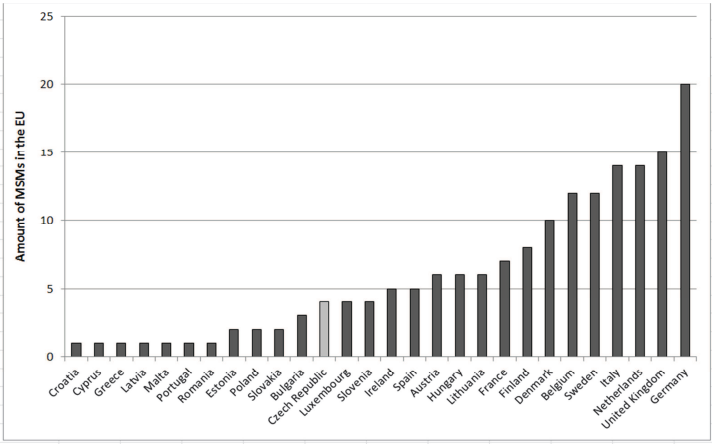
EUROMOD is an MSM which was developed at the University of Essex, UK, as part of a Europe-wide project. It is a static MSM which includes the tax-benefit systems of all European countries (as well as candidates for entry into the European Union). EUROMOD uses data from a European survey called "European Union Statistics on Income and Living Conditions (EU-

SILC)". An indisputable advantage is that EUROMOD uniquely allows us to compare outputs across EU member states, and offers the possibility of comparing one country's system against the demographic features of another [15].

MIDAS is a dynamic population model with dynamic cross-sectional aging. This means that it starts from a cross-sectional data set representing the population of all ages at a certain point in time. The model then simulates the lifespans of individuals in the data set, including their interactions [16].

MIMOSIS captures the heterogeneity of the population by looking at representative micro-data. The model is able to observe gross earnings directly from the administrative data [17]

Figure 1. MSMs in the EU



Source: Authors based on [6, 8, 10-14, 16, 17, 23-52]

MSMs are most frequently used in Germany (20 MSMs) and the United Kingdom (15 MSMs). On the other hand, six countries solely use EUROMOD (see Table 1). The MSMs most frequently focus on personal income/wage tax; pension reform; the labour market; and complex MSM tax-benefit models.

Table 1. MSMs used in the EU

Country	Amount of MSMs	International			National
		EUROMOD	*MIDAS*	*MIMOSIS*	
Austria	6	X			XXXXX[1]
Belgium	12	X	X	X	XXXXXXXXX[2]
Bulgaria	3	X			XX[3]
Croatia	1	X			
Cyprus	1	X			
Czech Republic	4	X			XXX[4]
Denmark	11	X		X	XXXXXXXXX[5]
Estonia	2	X			X[6]
Finland	8	X			XXXXXXX[7]
France	7	X			XXXXXX[8]
Germany	20	X	X		XXXXXXXXXXXXXXXXXX[9]
Greece	1	X			
Hungary	6	X			XXXXX[10]
Ireland	5	X			XXXX[11]
Italy	14	X	X		XXXXXXXXXXX[12]
Latvia	1	X			
Lithuania	6	X			XXXXX[13]
Luxembourg	4	X	X		XX[14]
Malta	1	X			
Netherlands	14	X			XXXXXXXXXXXX[15]
Poland	2	X			X[16]
Portugal	1	X			
Romania	1	X			
Slovakia	2	X			X[17]
Slovenia	4	X			XX[1X8]
Spain	5	X			XXXX[19]
Sweden	12	X		X	XXXXXXXXX[20]
United Kingdom	15	X			XXXXXXXXXXXXX[21]

Source: Authors based on [6, 8, 10-14, 16, 17, 24-52]

3. Results and Discussion

3.1 MSMs in the Czech Republic

The Czech Republic became an EU member state in 2004, and has since worked on the development of its economy and the transformation of its public systems; for instance, its latest reform, on January 1st 2013, related to its pension system. MSM has the potential to be a useful tool for evaluating the alternative scenarios in both ex ante and ex post analyses.

We produced a detailed overview of MSMs used in the Czech Republic. Similar to other countries in the EU, the Czech Republic uses *EUROMOD* as a tool for evaluating the effects of policies and policy reforms on income, poverty, inequality, social inclusion and work incentives. EUROMOD combines information on relevant policy rules with detailed and representative micro-data on individual and household circumstances drawn from national household income surveys and other data sources. The results of EUROMOD calculations are stored at the micro

level, and can be easily analysed with any statistical software. Moreover, EUROMOD can also be used to calculate a set of work incentive indicators (e.g. effective marginal tax rates, replacement rates and participation tax rates), which gives an initial indication of the likely impact of policy reforms on individual work behaviour [18]. In the Czech Republic, EUROMOD uses Czech data from the European survey EU-SILC. A project called "Improving the Capacity and Usability of EUROMOD (I-CUE)" has prepared new members of the EU in use of this model; meanwhile, Kamil Galuscak and Jozef Zubricky processed a feasibility study for the Czech Republic [19].

The second MSM used in the Czech Republic, *MIMOD*, was established on the recommendation of the OECD. The model intended to verify a hypothesis about a correlation between social benefits and rates of unemployment. The MSM matches tax-benefit equations with the individual level income survey "Mikrocenzus 2002". It analyses the incidence of high net replacement rates and the extent of unemployment and inactivity traps for the year 2006; this phenomenon stems from the combined effect of taxes and benefits [20].

"Who gains and who loses?" answered another national MSM enquiry. It was funded by the Czech National Bank, and analysed the redistributive effects of taxes and benefits. It is used to analyse the effects of incentives, for example, by calculating the net replacement rates. This model uses data from Mikrocenzus, and is also used by the Ministry of Finance [9].

The latest MSM is being developed by Deloitte Advisory and is funded by the Program of the European Commission on behalf of the Ministry of Labour and Social Affairs of the Czech Republic. The objectives of this project include:

- to supplement the ministry's existing modelling system;
- to develop a model which will can use the available individual data;
- to develop a model which will be able to assess adjustments to and reforms of a pension system;
- to develop a model which will be able to expand subsequent benefits systems (e.g. unemployment benefits, maternity leave benefits, social benefits, etc.) [21].

The model is implemented in Prophet, a piece of software developed by Sungard which is often used at life insurance companies. It is based on data from the Czech Social Security administration and the Czech Statistical Office [22]. This topic, setting of pension system, is very important and long-debated topic for the Czech Republic [e.g. 23].

Table 2. Czech MSMs

Model name	Model type	Policy coverage	Input data	Developing institution
EUROMOD	Static	Taxes & benefits	EU-SILC	EUROMOD Update project*
MIMOD	Static	Social benefits & labour market	Mikrocenzus	Czech National Bank
[No name]	Static	Taxes & benefits	Mikrocenzus	Czech National Bank
[No name]	Dynamic	Pensions	Data from the Czech Social Security administration and the Czech Statistical Office	Ministry of Labour and Social Affairs

Source: Authors based on [9 ,5,18-19,21-22]

**The EUROMOD Update project is being carried out by the Institute for Social & Economic Research, University of Essex*

4. Conclusion

Microsimulation modelling is fast becoming a widespread tool for evaluating ex ante, ex post and hypothetical social policy impacts. In this article we identified 169 MSMs used within EU countries by using a multi-level search. We can observe that countries which acceded to the EU after 2004 lag behind in their use of MSMs; only 34 MSMs were identified in these countries, in comparison to 135 within the EU-15. The cause for this lag may be that they are mostly

transition economies who suffered from the low interest and knowledge of distributional analyses and MSM techniques during the Soviet era. Their current MSMs are most frequently used for analysing and evaluating the impact of personal income/wage taxation, pension reform and changes in the labour market. The highest step is conducting of complex tax – benefit MSM.

There are currently four MSMs in use in the Czech Republic. The best-known model used under the EU is EUROMOD. EUROMOD is technically the best MSM model: it is the most accessible and the most user-friendly model with which to analyse diverse national and cross-national policy questions. The other presented MSM is MIMOD, which examines correlations between social benefits and rates of unemployment. The third MSM, which is funded by the Czech National Bank, focuses on the effects of tax and benefit redistribution. The last newly established model is an MSM funded by the Ministry of Labour and Social Affairs, and evaluates the impacts of pension reforms. It is expected to spread to other areas of the benefit system in the future.

In spite of fact that MSMs are fast becoming an indispensable tool for evaluating changes and reforms in public policies, the Czech Republic – as with other transition countries – lags behind developed countries from the EU-15 in its utilisation of MSMs. Microsimulation modelling is not only an opportunity but also a challenge – one that offers new possibilities for the future efficiency, economy and effectiveness of the public sector.

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(In)efficiency of the Stability and Growth Pact – What Next?

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Abstract

Once the member states of EU entered the European Monetary Union they lost the possibility to use the monetary policy as a tool of macroeconomic stabilisation. This competence is transferred to European Central Bank who is therefore responsible for the monetary policy in EU. The only instrument left for the member countries is the fiscal policy. Since there is 27 fiscal policies held by national governments the strong fiscal coordination is needed to ensure the stability of the common currency. The Stability and Growth Pact was signed in 1997 as an instrument to enforce the fiscal responsibility in EU. States of the EMU have agreed to satisfy the 3% of GDP for the maximum annual public budgets deficit and 60% of GDP for the maximum annual public debt. Lot of hopes were put in this instrument but after more than 15 years of its application we can say that the SGP failed so did the insurance of the fiscal discipline in European level. This fact is fully reflected during the financial crisis, which subsequently became debt crisis. In this paper we will provide an overview of the literature treating the problematic of the SGP starting with the circumstances of its conception, continuing with its implementations since 1997 and impact of the debt crisis. The author will also outline the possible prospects for this instrument and the fiscal coordination in EU.

Keywords: Stability and Growth Pact; European Union; public deficit; public debt; fiscal disciplin

JEL Classification: E62, H62, H63

1. Introduction

The European Union is a specific organisation laying somewhere between a simple international organisation and a federation. The peak of integration efforts was probably reached by creation of European Monetary Union (EMU) and by introducing a common currency Euro. By joining the monetary union the member states lost one of the tools of macroeconomic stabilisation-the monetary policy. The responsibility for the monetary policy is transferred to the European Central Bank (ECB). The independence of the ECB is an essential condition so it could pursue its main objective i.e. the price stability. This goal is to the ECB assigned by articles 127 and 130 of the Treaty on the Functioning of the European Union. Since the member states gave up the competences in the field of the monetary policy so the only toll left to correct the asymmetric shocks is the fiscal policy, in case of EMU the 17 fiscal policies. Since the responsibility for fiscal policies lies on the shoulders of national governments the coordination is necessary for the correct functioning of the common currency.

The need for fiscal discipline was underlined especially by Germany. And it was also Germany which acted as an initiator of the Stability and Growth Pact. The Stability and Growth pact (SGP) was agreed as an instrument of fiscal discipline by member states of European Union and great hopes was put in it. Unfortunately, these hopes were not fulfilled. The aim of this paper is to provide an overview of the literature treating the problematic of the SGP and emphasize that the fiscal discipline coordination is not sufficient on the European level. Therefore the author will also outline the possible prospects for the instrument and for the fiscal coordination in the EU.

1.1 Circumstances of the Conception

The Stability and Growth Pact is an essential tool established in order to sustain sound public finances within the EU. The principal document for the SGP's constitution is the Maastricht Treaty of 1993. It provides that – as part of the economic and monetary integration – the EU Member States would form the European economic and monetary union and would adopt euro as a single currency. Furthermore, a necessary prerequisite here would be the fulfilment of the Maastricht criteria.

As stated by Baldwin and Wyplosz [1] especially Germany was deeply concerned about this criteria being insufficient and feared that a failure to follow the criteria of budgetary equilibrium would cause the inflation to rise, as it was the case in the inter-war period. A stability of common currency would thus be threatened. Furthermore, this brought about the conflict of monetary policy, assigned to the newly born European Central Bank, and fiscal policy, which remained the competence of individual nation states. While the Maastricht criteria served as an indicator for EMU accession, what was missing was any tool to enforce observing the rules by the states already within the union. This is why Germany initiated the birth of Stability and Growth Pact. The pact was adopted at the Amsterdam European Council meeting in 1997.

1.2 A Word about the Pact

The Stability and Growth Pact represents an instrument for coordinating the fiscal policies of EU nation states. It consists of three documents:

- Resolution of the European Council on the Stability and Growth Pact Amsterdam, 17 June 1997 (1997).
- Council Regulation (EC) No 1466/97 (1997).
- Council Regulation (EC) No 1467/97 (1997).

The aim of the pact is to maintain the public finances deficit within 3% GDP and the public debt under 60% GDP. To achieve these objectives, the SGP consists of two mechanisms: preventive arm and corrective arm.

As its name implies, preventive mechanism aims to ensure the absence of excessive deficits. Therefore, the EU member states submit their stability (for participating states) and convergence (for non-participating states) programmes. These programmes are then evaluated by the European Commission, which subsequently makes recommendations to the Council of the European Union. The Council then adopts the opinion. Preventive mechanism is based on two measures. Based on the recommendation by the Commission, the Council is authorized to give an early warning when preventing the excessive deficit. Using these early political recommendations, the Commission can urge a state to comply with the reference values laid down by the pact. Still, if the limit gets exceeded, that is when the sanction mechanism or more precisely Excessive Deficit Procedure (EDP) comes. Pact commenced use only after finishing the third stage of economic and monetary integration in 1999, a year when euro was adopted. The real problem occurred when the values had been exceeded by two founding EU countries, Germany and France.

2. Material and Methods

The main strategic approach for the preparation of this paper was a secondary analysis of the literature. The most important part of the research is based on the content analysis of foreign and domestic relevant sources with recent and historical knowledge from the problematic of the Stability and Growth Pact. The author's outcome relies mainly on basis of normative approach. The author uses also the method of deduction and synthesis to create an overview of the efficiency of the SGP as a tool of fiscal discipline at the EU level. These methods are also used to generate the possible prospects of the Stability and Growth Pact and coordination of fiscal discipline in EU. All data we refer to in the text are collected from the

Eurostat database. The concern period for the stability and growth pact are years since 1997 – the year of adoption of the SGP.

3. Results and Discussion

Lot of hopes were put in to the SGP, but some of the members (Belgium, Italy, Germany and Netherlands) did not meet the debt criterion even at the time of introduction of common currency. Bednářová [2] says that the states distorted the values of indicators using the methods of "creative accounting." Introduction of the euro was perceived as something prestigious and all the states wished to find themselves in the "club". The Belgian government carried out transactions between budget and pension funds, French government took over surplus pension funds, Italy introduced special 'pro-European' tax, Greeks admitted that they expediently met the criteria by taking "one-off and unrepeatable steps." So even the reported values for the deficit did not exceed the 3% of GDP, it is quite possible that it is due to the exceptional measures. This fact is supported by von Hagen [3] who argues that EMU was not launched under favourable circumstances of long-term balanced public finances. Ones can conclude that even at the beginning of the project of the single currency countries were not able to satisfy the reference values, it is very likely that this goal will be even more difficult to achieve in the future. The debate among economists and politicians about the suitability of this instrument and set rules were still present an even if during the first years of its existence its functioning was rather smooth, it was subject to many critiques and studies and its credibility was questioned.

3.1 Critical responses

As stated above, the suitability of the SGP was questioned since the beginning of its implementation. Wenzel, Lackenbauer and Brösamle [4] claim that the SGP does not allow for an appropriately flexible reaction to economic fluctuation, even if fiscal policy remains the only instrument appropriate for their mitigation. This fact surfaced, in particular, with the accession of ten new Member States in 2004. EDP was initiated with six out of ten. There was a need of public spending increase due to the EU entrance, which would burden their national budgets. The outcome is that it is not fair to establish uniform rules for heterogeneous economies. Shortly, the rule "one size fits all" cannot be applied on the SGP. For countries such as Romania or Bulgaria or even the newest member Croatia would be very difficult to show the same public discipline like for example Germany, the founding member and large strong economy. On the other hand, if the rules become too complex, with a large number of exceptions and parameters, it would be less clear and transparent. Every member state of the EU had to pass the pre-accession phase hence had some time to adapt its economy to required level thus it is entitled to expect that the countires comply with agreed rules.

Alesina and Giavazzi [5] object to the fact that states with low (Portugal) and high debt level (Greece or Italy) are treated equally. An example could be early warning for Ireland in 2001 because a lower than predicted growth. The Portugal was punished because the predicted growth was higher than the real one. The EDP was launched despite nonexistence of the excessive deficit. The authors take the view that mechanisms of SGP should primarily target the states with high debt ratios, make them reduce their public debt and strive for restoring stability of public budgets. They also point out that SGP concentrates mainly on public finances deficit and does not take the structure of taxes and government expenditure into consideration. They also suggest that the problem arises when governments resort to increasing the tax burden. Doing so, they affect the individuals' willingness to work, invest and also their apprehension of business risk. Such a situation occurred in Ireland in 2001 when a deceleration in predicted growth was due to transferring 1% of GNP to national pension fund [6].

Brunila [7] draws attention to the following problem. SGP endeavours to ensure that, under the threat of sanctions, even during the recession period the countries keep their deficit and debt below the reference value. On the contrary however, it fails to motivate the countries

and to reward them for generating surpluses. The mechanisms of the SGP stay exclusively focused on the public deficit and debt.

Alesina and Giavazzi [5] also criticise the SGP for an undue collegiality. They point out that it was only made use of with minor states, whereas for the larger states like German, France or Great Britain it remained a mere formal admonition since all procedures were blocked by qualified majority within the Council which was reflected afterwards and is analysed in the following section of the paper.

But the most significant problem is employing a "creative accounting". Governments deliberately distort the statistical data to avoid the EDP [5]. That is what Portugal or Greece resorted to. It is fair to say that the SGP is not to blame here. The alteration of data was, after all, the states' voluntary decision. Even if the conception of the SGP would be flawless without a respect of the signatory countries it is meaningless. States have voluntarily decided to lead unhealthy fiscal policies, which have subsequently breach of the rules.

3.2 Lost credibility and reform

From the previous, one can conclude that the SGP was not from some point of view a perfect tool and was subjected to many criticisms. But due to the event of 2002 it lost its credibility and the criticisms became even stronger. The real problem occurred when the values had been exceeded by two founding EU countries, Germany and France. Neither of them was able to meet the deficit criterion for 2002. That is why the Commission suggested that the EDP be initiated, which was, however, rejected by the Council in both cases. It may be assumed that the Council decision was driven by political reasons. Germany and France remain so influential that the other members did not dare to vote for EDP initiation in the Council. The most radical voices demanded the SGP revocation, the moderate ones called for reform.

In 2004, the Commission came forward with proposal for a revision, which was rejected by the Council. In 2005, the Council prepared its own proposal, which was approved. It took account of the fact that SGP must function for all the 25 heterogeneous economies. The reform introduced some new elements, but none of them represented a fundamental systemic change. Schuknecht, Moutot,Rother and Stark [8] argue that it brought "greater discretion, leniency and political control into procedures. The strictness of the 3% limit and the time frame for correcting excessive deficits were relaxed, while procedural deadlines were extended. The greater complexity of the rules made monitoring by markets and the public more difficult."

The biggest deficiency of the SGP – disrespect of agreed rules, lack of consistency in application of sanctions and weak enforcement provisions were not introduced even with the reform. In 2005 ECB expressed its uneasiness towards the frail institutional framework and the results of the reform. [9]

Considering the above it is no surprise that Schuknecht, Moutot, Rother [8] indicate the period 1999-2007 as "wasted good times". Especially since 2005 the real GDP growth around 3% is witnessed when the average deficit in Eurozone dropped to 1% of GDP. The member countries should take advantage of the favourable development and reduce their deficits or creating the surpluses. But none of this happened. Hauptmeier et al. [10] describe the on-going fiscal policy as "broadly relaxed". The low interest rates as a result of EMU entrance were used to for increases in primary spending and tax cuts. [11]

3.3 Hit of the crisis

In summer 2007 the financial crisis began to show in USA and spread to the European continent as well. The countries hit the hardest by the crisis in European Union were given the unflattering designation PIIGS. As the recession came in 2008, the situation further deteriorated and in 2009-2010 neither of the euro area countries was capable of drawing up a balanced budget. Fourteen out of sixteen countries could not even comply with the set reference values. A similar trend could be observed with the public debt. European trend in 2005-2007 was decreasing; since then, however, it rises very sharply. In 2006, the reference values was exceeded by ten countries, in 2010 the number went up to 12. 2010 was a year when all EU

countries, whether euro area members or not, faced fully the consequences of crisis. The state of EU public finances was unfavourable and SGP was just an empty instrument to measure the deficit and the debt. No more than five Member States met both of the criteria observed. Eight countries met the debt criterion, while breaching the condition of the budgetary equilibrium. The remaining fourteen met neither of the criteria, even though – with the exception of Hungary and United Kingdom, they are all euro zone members. If the data for 2010 are summarized, the balance left is more than unfavourable. The average EU-territory deficit amounts to -6.6% GDP and the reference value was exceeded by 22 out of 27 countries. The average debt accounted for 80% GDP. Fourteen states met none of the criteria followed. On the other hand, only two were able to comply with both of them. The year 2010 was therefore perhaps the peak of the financial crisis in the European Union.

3.4 The remedy

As a response to a crisis, the national governments adopted several measures to mitigate the impact of the crisis and starting the economy. But it was necessary to take action in the European level and restore the credibility of the financial framework in European Union. The efficiency of the SGP was underestimated and the coordination of the fiscal discipline had to be strengthened.

In Autumn 2010 the Council signed a project of the so called European Semester. As the European Parliament website states, European Semester aims at providing a structural framework within which the Member States will coordinate their budgetary and economic policies in accordance with the Stability and Growth Pact and Europe 2020 strategy. An annual six-month cycle begins in January when the Council and Parliament have annual growth analysis at their disposal. They subject this analysis to evaluation before the Spring European Council in March. Consequently, the Commission receives stability and convergence programmes and medium-term budgetary strategy and evaluates them. Within June or July, the Council delivers its opinion on the documents. In July, right before the approval of national budgets, both Council and European Council aim their policy recommendations at the states to coordinate their fiscal policies. The states are thus provided with some more space for implementing recommendations by the Council. [12]

Another agreement strengthening the fiscal discipline is Euro Plus Pact. [13] It commits euro area countries, plus Romania, Poland, Lithuania, Latvia, Denmark and Bulgaria. It aims to foster the economic pillar of monetary union, improve quality of the coordination of economic policies and boost competitiveness, which will result in greater convergence. The Pact in particular targets areas falling within the competence of national states. States who adopted the Pact will submit measures in order to meet the required objectives. The implementation of policies remains in the hands of Member States, though the framework of objectives will be determined by the European Council. Annual measures will be implemented into stability and convergence programmes so as to establish connection between the Euro Plus Pact, SGP and European Semester. The major contribution of Euro Plus Pact is providing an obligation to introduce SGP fiscal rules in the Member State's legislation, which, in fact, gives rise to budgetary responsibility.

So far the latest strengthening of SGP is represented by signing the Treaty on stability, coordination and governance in the economic and monetary union in late January 2012 [14] . The signature commits euro area members as well as all the remaining countries, with the exception of Czech Republic and United Kingdom. The treaty aims to implement budgetary discipline at a national level and with all countries taking part. The maximum medium-term structural deficit is set to 0,5% GDP (or 1 % GDP under specified conditions). The treaty also provides that European Court of Justice will act as an arbitrator. In case of rules infringement, the court will have the right to impose fine totalling not more than 0.1% GDP of the respective state. Provided the penalised state is a euro area member, such sanction will flow to the European Stability Mechanism fund. If non-member, it will accrue to the EU budget.

3.5 What next?

According to Schuknecht, Moutot, Rother and Stark [8] the serious doubts and concerns remain over the new European financial framework and they propose several specific measures that must be implemented. First of all, the deficits exceeding the 3% reference value have to be approved unanimously on European level. The authors suggest this approving role to be provided by ECOFIN Council. In our opinion such a choice would not be appropriate. The coercive weakness of the SGP was caused mainly by ECOFIN unwillingness to apply rigorously its dispositions. States show mutual solidarity and they do not want to punish each other. There is no reason that ECOFIN would behave differently in this case.

The authors also point out a need that sanctions provided by the SGP are automatic, fully respected and implemented. Of course, the punishing element of fines is understandable but since the fine is given to a country which already is in problematic financial situation and has to face the deficit to cover its expenditure needs the author argues that is not an optimal solution.

It was proposed to create an independent office in national level to forecast the midterm objectives. The author argues that this competence could be confided to the national statistical offices. The creation of a new bureau does not mean necessarily greater level of independence and objectiveness. Such a step could turn out to be an additional administrative burden which would be subjected to a political pressure. In euro area level they suggest a creation of an independent office called European Budget Office to assess national policies and the proper implementation of governance procedures. As in the previous case this step would represent another administrative burden and the escape from political pressure is uncertain.

The lost credibility cannot be regained without deepening of fiscal policy surveillance and coordination. But such a step is improbable. The deepening of fiscal coordination would require the transfer of national competencies towards European institutions. The states have to accept the fact that in for the benefits stemming from the entry to the euro zone will have to give up part of their national sovereignty. But neither the existing framework was supported by every member country. Even if they could build independent institutions to strengthen fiscal discipline at the European level the member states assistance is essential. Any strong institutional framework is worthless if states do not take these commitments seriously and do not respect the rules. The case of Greece or even of Portugal which reported the altered statics to the European Commission clearly shows that the crucial aspect of sound public finances in European Union lies on the shoulder of national governments and their willingness to obey the rules.

4. Conclusion

The aim of the paper is to provide an overview of the literature treating the problematic of the SGP starting with the circumstances of its conception, continuing with its implementation since 1997 and impact of the debt crisis. The author also outlined the possible prospects for this instrument and the fiscal coordination in EU. Once the member states of EU entered the European Monetary Union they lost the possibility to use the monetary policy as a tool of macroeconomic stabilisation. This competence is transferred to European Central Bank who is therefore responsible for the monetary policy in EU. The only instrument left for the member countries is the fiscal policy. Since there is 27 fiscal policies held by national governments the strong fiscal coordination is needed to ensure the stability of the common currency.

The Stability and Growth Pact was signed in 1997 as an instrument to enforce the fiscal responsibility in EU. The project of European single currency had to be accompanied by adequate measure to ensure its stability. Since strong fiscal coordination among countries is required the Stability and Growth Pact was designed to maintain the countries' deficit below 3% of GDP and debt below 60% GDP. Lot of hopes were put in this instrument but after more than 15 years of its application we can say that the SGP failed. According to some authors even the core of the project of common currency was not built under favourable circumstances of long-term balanced public finances. Since the creation of this tool its suitability was always questioned but since 2002 even its credibility was lost when it showed its enforcement

possibilities were low and its dispositions were not rigorously applied. European politicians tried to rebuild the trust by launching the necessary reform in 2005. Even after this step the SGP's power remained modest. The member countries did not profit from the economic growth during 2005-2007 and they did not balance their budgets neither created surpluses. One of the positive effects of the introduction of the common currency was the convergence of interest rates and their reduction to below 4%. The situation of lower interest cost and primary surpluses in the countries could be used to sharp reduction of fiscal imbalances. If we take into account that the deficit consists of two components (the primary balance and interest on public debt) it turned out that one component of the deficit (interest costs) was continuously substituted by another component of the deficit (primary deficit).

Considering the wasted "good times" it is a logical consequence that after 2007 the fiscal position of member countries worsened when the recession came. The bottom was achieved in 2010 with the average deficit of 6,6% of GDP and 80% of GDP for the debt. 22 out of 27 members breached the deficit criterion and the stability of the whole Euro project was threatened. Many scenarios appeared claiming that Germany will go back to deutsh Mark, Greece will leave the Eurozone etc. Especially Germany and France were convinced that the project of single currency cannot be abandoned and necessary measures have to be taken at the European level to strengthen the framework for the fiscal discipline. It could seem that it is only a political response to defuse the situation and satisfy voters who expect a strong actions from their leaders. Nevertheless, it is too soon to assess the effectiveness of new measures. But theirs credibility could be questioned right from the beginning since not all of the member countries agreed their ratification. Some authors argue that the only cure for the EU is further transfer of national competencies regarding the fiscal discipline towards the European institutions. Such a step seems to be difficult and politically impassable. The European Union still did not choose whether to become a federation or remain something between federation and international organization. The recent crisis did not strengthen the European spirit, on the contrary. Even if the member countries find consensus and agree to transfer more of their national competencies in the field of fiscal policy to the European institutions, without their responsible approach any strong institutional framework is worthless. We cannot blame the week European framework. The rules were set clearly and the states decided deliberately to breach them. Some countries went even further with falsifying the data. Any tool would fail if the countries do not take these commitments seriously and do not respect them.

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Liberalization of the Social Care Services Financing

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Abstract

The adoption of the new Social Services Act resulted in the implementation of all modern elements, which are currently applied within the systems of social services in developed European countries, in the system of social services in the Czech Republic. At the same time; however, the role of the government in the given area has increased dramatically; the entire system is built on central, administrative/directive elements that significantly prevent the development of the social services system as a whole, which is very alarming, particularly in connection with the consequences of population aging. From this perspective, the area of social services is thus at an imaginary crossroad and it is necessary to seek new stimuli for ensuring their further development. The key factor in this regard is the change of the social services financing system, consisting in the elimination of directive approaches of the state and the replacement thereof with liberal elements. Therefore, the objective of this paper is to characterize possible approaches aimed at the liberalization of the social services financing system.

Keywords: Social care; financing of social care; subsidies from public funds; aging population

JEL Classification: I38, H71

1. Introduction

The adoption of Act no. 108/2006 Coll., on Social services, resulted in significant changes in the system of the long-term social care financing. A new social benefit came into existence – "attendance allowance" – the objective of which was, among others, to promote effective demand, and thereby contribute to creating market attributes within the system of public. It was assumed that new social services, particularly field and out-patient forms, would develop dramatically and the quality of the provided social services would significantly increase.

The existing findings suggest [1] that the goal has not been successfully achieved so far and that the expended financial funds are not being used in line with the legislators' vision. The role of the government has increased dramatically; the entire system is built on central, administrative/directive elements, which is very alarming, particularly in connection with the consequences of aging. From this perspective, the area of the long-term social care services is thus at an imaginary crossroad and it is necessary to seek new stimuli for ensuring their further development. The key factor in this regard is the change of the social services financing system, consisting in the elimination of directive approaches of the state and the replacement thereof with liberal elements. Therefore, the objective of this paper is to characterize possible approaches aimed at the liberalization of the financing system of the social care services.

2. Material and Methods

To achieve this goal, the authors made secondary analysis of available literature that deals with this issue, and based on its own analysis of available statistical sources conceived own proposals on the basis of which it would be possible to liberalize the system of financing social services in the country.

3. Results and Discussion

In performing the analysis of the financing structure of individual types of the social care services, the information from various social services providers on the facility financing structure from 2011 grant applications served as a guide.

3.1 Contribution of individuals to the coverage of costs of the provided social services

The contribution of individuals and their families to the coverage of costs of the services provided represents an important component in the financing of costs of individual social care services. The maximum payment for room and board is limited by Decree no. 505/2006 Coll., which implements some provisions of the Social Care Act, as amended. The specific payment of individual clients is set down in an agreement entered into by and between each client and a service provider. At the same time, Act no. 108/2006 Coll., on Social services, as amended, specifies that clients of residential services in weekly care centers must retain at least 25% of their income, whereas clients of other residential services facilities must retain at least 15% of their income.

The payments of individual clients for care in residential services facilities are determined in line with Act no. 108/2006 Coll., on Social services, as amended, in the amount of an awarded allowance, with the exception of weekly care centers, where the payment is set down at the maximum amount of 75% of an awarded allowance. With regard to the provision of personal assistance, attendance care, emergency care, guide and reading services, support of independent housing, respite care, daycare center services, services in daily social welfare institutions, residential services in the centers of social-rehabilitation services and protected housing services, individuals pay a charge for the basic services, to the extent set down by an agreement, whereas the maximum payment is set down by Decree no. 505/2006 Coll., which implements some provisions of the Social Care Act, as amended.

The average payment per client for individual types of social services in 2009 is shown in Table 1.

Table 1. Average payment per client for individual types of social services in 2009

	CZK per month	Share of total costs (%)
Daycare service centers	1,304	19.36
Daily social welfare institutions	2,061	16.13
Homes for handicapped people	13,911	46.88
Senior homes	12,712	55.87
Homes with special regime	14,580	52.68
Protected housing	6,363	40.61
Respite care	3,620	28.43
Personal assistance	2,927	27.20
Attendance care	708	26.58
Support of independent housing	765	8.57
Guide and reading services	708	13.99
Social services provided in medical facilities	12,757	43.91
Emergency care	146	24.11
Weekly social welfare institutions	7,120	29.55

Source:[2]

It is clear from the analysis of the aforementioned data that clients pay the highest share of costs of the provided social services in residential facilities, both in absolute and relative numbers, while the absolute contribution of clients is the lowest for field social services; in relative numbers, it is at a level comparable to out-patient facilities of daily nature (daycare service centers, daily social welfare institutions). These are absolutely logical conclusions, which result from the very principles of construction of the clients' payments for the provided services, in line with applicable legal regulations.

3.2 Share of awarded public funds subsidies in the financing of the provided social care services

According to Section 101 of Act no. 108/2006 Coll., on Social services, as amended, subsidies from the state budget are provided for ensuring the provision of social services to the social services providers, who are registered in a specific register. The subsidies are provided for the funding of standard expenditure associated with the provision of social services, in line with a prepared medium-term plan of the social services development. The subsidies are provided via budgets of individual regions.

The implementing legal regulation should set down more detail terms and conditions for determining the subsidy amount, purpose of such subsidy, subsidy classification, and the method of providing the subsidy. However, the legal regulation in question has not been prepared so far and the amount of subsidies for individual social services providers is determined on the basis of an annually declared order of the Minister of Labor and Social Affairs.

It is clear from grant applications for the year of 2011 submitted by the social services providers that, in 2009, the highest subsidies – in absolute numbers per client and month – were provided to facilities providing services in weekly social welfare institutions (CZK 9,885) and in homes for handicapped people (CZK 9,217); on the other hand, the lowest contributions were provided to emergency care services (CZK 234) and day care service centers (CZK 584). In relative numbers (relatively to the amount of the total operating costs), the relatively highest support was given to the supported housing services (56.6%) and guide and reading services (51.6%); on the other hand, the lowest support was provided to facilities providing attendance care services (21.9 %) and respite care (23.1%). It is clear from the aforementioned data that the system of subsidies/grants provided by the Ministry of Labor and Social Affairs has not predominantly been used in support of the declared transition from the services provided in residential facilities to the services provided within the natural environment of individual clients of social services.

In addition to subsidies to the social services providers paid from the state budget, the given entities receive additional funds from the budgets of individual municipalities, towns, and regions. The analysis of the data suggests that the highest absolute support was provided to weekly (CZK 5,605 per client and month) and daily (CZK 4,226) social welfare institutions, while the facilities providing the emergency care services received the lowest support (CZK 173 per client and month). In relative numbers (relatively to the amount of the total operating costs), the highest level of support was provided to the facilities providing attendance care services (47.2%) and to daily social welfare institutions (33.1%). The lowest relative support was provided to medical facilities providing social services (6.7%) and to senior homes (11.0%). It is safe to say that, in this case, contributions to the social services providers are predominantly not provided as a result of the support for the implementation of local and/or regional plans for the social services development either, but they represent a "supplement" to the subsidies granted by the Ministry of Labor and Social Affairs from the state budget, so as to ensure the basic operation of individual providers. It is very complicated to evaluate these relations in respect to the reflection of priorities of the social services development in individual regions based on medium-term development plans, because a number of them does not contain any financial quantifications of individual development plans [3].

Combined for both sources of funds provided from the public funds, the highest absolute support in 2009 was given to weekly social welfare institutions (CZK 15,270 per client and month) and to homes for handicapped people (CZK 13,356); on the other hand, the lowest support was awarded to facilities providing emergency care services (CZK 407 per client and month) and attendance care services (CZK 1,842). In relative numbers (relatively to the amount of the total operating costs), the highest level of support was provided to the daily social welfare institutions (74.3%) and daycare service centers (72.8%). On the other hand, the lowest relative support was provided to medical facilities providing social services (34.4%) and to senior homes (34.8%).

More detailed information is shown in Table 2.

Table 2. Amount of subsidies from public funds to the social services providers, relatively per 1 client a month in 2009

	CZK per month	Share of total costs (%)
Daycare service centers	4,902	72.79
Daily social welfare institutions	9,498	74.34
Homes for handicapped people	13,356	45.01
Senior homes	7,909	34.76
Homes with special regime	10,395	37.56
Protected housing	8,497	54.23
Respite care	5,962	46.82
Personal assistance	6,572	61.08
Attendance care	1,842	69.12
Support of independent housing	6,278	70.31
Guide and reading services	3,627	71.68
Social services provided in medical facilities	9,985	34.37
Emergency care	407	67.24
Weekly social welfare institutions	15,270	63.37

Source:[2]

3.3 Share of payments from the public health insurance system

According to Section 17a of Act no. 109/2006 Coll., which amends certain acts in connection with the adoption of the Social Services Act, as amended, the General Health Insurance Company (VZP) and other health insurance companies should enter into the so-called special agreements with residential social services facilities in order to ensure material performance in the provision of attendance and rehabilitation healthcare to insured persons placed in such facilities. Even though the aforementioned obligation was formally fulfilled by all insurance companies, the factual fulfillment thereof has been subject to longstanding criticism by individual social services providers, as a result of the discriminatory terms and conditions of such agreements and discriminatory approach, particularly on the part of VZP. While insurance companies finance comparable care provided in, for example, medical institutions for long-term patients in the form of a flat payment per client, the same care in residential social services facilities is financed on the basis of the so-called performance assessment, which also provides insurance companies with the opportunity to significantly curtail any attendance tasks factually indicated by physicians and carried out by nurses.

In 2008, VÚPSV, v.v.i. (Research Institute for Labor and Social Affairs) performed an investigation in respect of the attendance care delivered in residential social services facilities using a sample of approximately 1,450 clients of such facilities [4]. The following resulted from the investigation:

- Costs of attendance care per client amount to CZK 5,086 – 5,719 in senior homes, CZK 11,170 – 12,028 in homes for handicapped people, and CZK 8,672 – 9,417 in homes with special regime;
- Costs of such care are greatly differentiated according to the level of dependence of individual clients;
- Total costs of attendance care in residential social services facilities amount to approximately CZK 5.2 billion.

In fact; however, VZP only paid CZK 749 million for this type of care to the residential social services facilities in 2010. This fact is one of the causes for ineffective provision of care to clients drawing on an attendance allowance, because:

- Social services providers are forced to cover the attendance care costs from other financial funds;
- Social services providers are dependent on the subsidies/grants provided from the state budget.

More detailed information is shown in Table 3.

Table 3. Amount of covered costs of the provided attendance care from the public health insurance system to the providers of individual types of social care services, relatively per 1 client a month in 2009

	CZK per month	Share of total costs (%)
Daily social welfare institutions	218	1.71
Homes for handicapped people	1,582	5.33
Senior homes	1,265	5.56
Homes with special regime	1,973	7.13
Protected housing	55	0.35
Respite care	2,070	16.26
Personal assistance	114	1.06
Attendance care	11	0.43
Social services provided in medical facilities	4,401	15.15
Weekly social welfare institutions	552	2.29

Source: [4]

The aforementioned data clearly document the discriminatory position of health insurance companies towards the residential social services facilities compared to medical facilities; the payments per client for the provided attendance and rehabilitation care received by medical facilities providing social services were 3.5 times higher than senior homes, although the age structure, basic diagnoses, and level of self-support for patients of medical institutions for long-term patients and of senior homes placed in attendance beds are basically identical [5].

3.4 Summary relating to the financing

Based on the analysis performed above, it is safe to say that the financing of all types of the social care services must be rated as ineffective. The key reasons for such conclusion are as follows:

- Dependence of all providers on awarded subsidies from public funds;
- Insufficient amount of reimbursements for attendance care indicated by physicians and provided by medical staff from the health insurance system;
- Government regulation of clients' payments for the social services provided at a level that assumes subsidies from public funds awarded to the social services providers (however, there is no legal right to claim such subsidies).

3.5 How to liberalize the financing system of the long-term social care services?

Considering the aforementioned premise that a form of ensuring care for the attendance allowance recipient is effective, from the perspective of the state and from the perspective of the founder, in case the amount of the clients' payments for the provided type of service - together with the attendance allowance and reimbursement of healthcare by a health insurance company – covers the average nationwide costs of the given type of service [6], and considering the fact that – according to the plans of the Ministry of Labor and Social Affairs – the government will cease to interfere with the social care services system as part of individual reformatory measures and the network of such services will come into existence, at a regional level, on the basis of mutual relations of supply and demand [7], the solution of this issue must predominantly be seen in:

- Eliminating the dependence of the social services providers on awarded subsidies from the state budget;
- Making the payment of the attendance allowance subject to such care being ensured – preferably – by a registered social services provider.

The key factor, which may be seen in this regard, is the differentiation of the attendance allowance amount based on whether the care for an attendance allowance recipient is provided in a residential or out-patient facility or whether it is provided within the recipient's natural

environment via a registered social services provider or via family members/relatives. For the purpose of such differentiation, it is possible to use financial funds, which have been provided to the providers of the social care services in the form of the state budget subsidies. At the same, it is possible to propose that the allowance be set at CZK 0 – i.e. no allowance paid out – in case the attendance allowance recipients falling in dependence level I receive the necessary form of care within their natural home environment by family members or relatives, without the participation of a registered social services provider. The solution may be justified as follows: the scope of the necessary care, which is provided to an attendance allowance recipient in this case, does not exceed the scope of support, which should be provided as part of intergeneration solidarity and not for a consideration.

In drafting a specific proposal of the above mentioned modifications, many alternatives of the attendance allowance amount were analyzed using mathematical modeling. The alternative specified in Table 4 appears to be optimal. This alternative respects the above mentioned approach to assessing the social services effectiveness – i.e. it is drawn up so that the amount of the clients' payments for the provided type of service, together with the attendance allowance and reimbursement of attendance care by a health insurance company, covers the average nationwide costs of the given type of service.

Table 4. Proposed amount of the attendance allowance depending on the form of the provided care

Attendance allowance	Form of care			No regional provider
	Residential facilities	Out-patient facilities	Field facilities	
I.	800	2 000	2 000	0
II.	5 000	5 000	8 000	4 000
III.	10 000	10 000	14 000	8 000
IV.	15 000	15 000	20 000	12 000

Source: [2]

The performed calculations show that if the structure of the attendance allowance recipients of December 2010 remained unchanged, the volume of financial funds would have increased by approximately CZK 122 million per month or CZK 1,460 million per year, as appropriate. It is safe to assume that this increase would in reality be higher, because – as a result of a significant increase of the attendance allowance amount for those recipients of the allowance, to whom care would be provided within their natural home environment via registered social services providers – the supply of such services will increase considerably, and this will be utilized by many recipients of the attendance allowance, who currently receive care from family members or relatives, e.g. due to inaccessibility of such services – particularly on the periphery of individual regions. Nevertheless, it is safe to assume that there would be major savings of public funds in comparison to the amount of subsidies provided to registered social care services providers (the subsidies amounted to CZK 5,652 million in 2009).

At the same time, liberal environment in the provision of long-term social care services will be created, the supply of the social care services will increase as a result of the demand after such services (particularly in rural regions, where the supply of such services is currently usually very limited); it is safe to assume that new entities, including foreign entities, will also take part in the system of the social services delivery. This will result in the necessary network of the social care services within individual regions, preconditions will be created for early response to expected demographic trends, as the Czech Republic is currently not prepared to resolve their potential consequences in the area of social services. The key limit for the implementation of this solution is a political consensus at all public administration level as well as on the tripartite level.

4. Conclusion

The performed analysis of the social services financing system has repeatedly shown that the existing system of the social case services financing is ineffective, particularly as a result of:

- Dependence of social services providers on awarded subsidies from public funds;
- The so-called "price regulation of reimbursements for room and board within residential and out-patient facilities and for individual activities in the area of field social services on the part of the government;
- Long-term frauds within (transfer of assets from) the social services system by insurance companies, which only cover about 20% of the costs of providing attendance and rehabilitation care in residential facilities.

The performed analysis of the contributions of individuals and their families to the coverage of costs of the provided social services has revealed that the highest payments of clients for the coverage of costs of the provided social services prevail in residential facilities, both in absolute and relative numbers, while the absolute contribution of clients is the lowest for field social services; in relative numbers, it is at a level comparable to out-patient facilities of daily nature (daycare service centers, daily social welfare institutions). These are absolutely logical conclusions, which result from the very principles of construction of the clients' payments for the provided services, in line with applicable legal regulations.

The analysis of the awarded subsidies from public funds has shown that, in 2009, the highest support – in absolute numbers – was provided to weekly social welfare institutions homes for handicapped people; on the other hand, the lowest support was provided to emergency care services and attendance care services. In relative numbers (relatively to the amount of the total operating costs), the highest level of support was provided to the daily social welfare institutions and daycare service centers. On the other hand, the lowest relative support was provided to medical facilities providing social services and to senior homes.

The approach of health insurance companies to the financing of attendance and rehabilitation care in residential social services facilities dramatically affects the effectiveness of care for the attendance allowance recipients. The performance assessment of costs of such care – in comparison to flat payments for comparable type of care within inpatient medical facilities – and only 20% reimbursement of the actual costs of such care document the discriminatory approach of health insurance companies to residential social services facilities, which – in a significant manner - adversely affects the effectiveness of the care provided to attendance allowance recipients.

Two basic premises were expressed on the basis of the above mentioned characteristics, which would lead to higher effectiveness of financing of this type of care. This concerns the elimination of the dependence of the social services providers on awarded subsidies from public funds and the need to make the payment of the attendance allowance subject to such care being ensured – preferably – by a registered social services provider. The key factor, which may be seen in this regard, is the differentiation of the attendance allowance amount based on whether social services are provided to attendance allowance recipients in a residential or out-patient facility or whether they are provided within the recipient's natural environment via a registered social services provider or via family members/relatives. For the purpose of such differentiation, it is possible to use financial funds, which have been provided to the providers of the social care services in the form of subsidies from public funds. This would also result in the creation of liberal environment in the provision of social services and it is safe to assume that new entities, including foreign entities, would also take part in the system of the social services delivery. This measure will also result in the emergence of the necessary network of the social care services within individual regions, basic preconditions will be created for early response to expected demographic trends, as the Czech Republic is currently not prepared to resolve their potential consequences in the area of social services.

The solutions provided will contribute to the elimination of existing problems and to the necessary development of this public services segment. These solutions are commonly applied

in practice in a number of European countries [8] and it is thus possible to utilize the experience of such countries in the Czech Republic as well.

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Approaches Towards Subsidies Efficiency Analysis

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Abstract

The aim of this paper is to introduce and propose suitable approach towards efficiency analysis of public expenditures – namely subsidies from the European Union. Public expenses must be reasonably – i. e. efficiently spent. Since the beginning of 20th century, when the efficiency analysis originated, many methods were introduced and developed by scholars. For selection between alternative projects, cost-benefit analysis (CBA) is obligatory set by European Commission. Approaches towards the efficiency analysis of the whole subsidy programme include parametric and non-parametric methods. Parametric approach originates from production theory and is more suitable for firms' analysis. On the other hand, non-parametric approach (especially Data Envelopment Analysis – DEA) is more general. The inputs and outputs do not have to be production factors and production. It can be applied also on subsidies, where beneficiaries are municipalities or non-profit companies. Therefore, we propose methodology for subsidies efficiency analysis based on a combination of CBA and DEA. The outcomes of CBA analysis are further used in DEA as outputs.

Keywords: Efficiency analysis; cost-benefit analysis; profitability index; data envelopment analysis

JEL Classification: D61, H71, C54

1. Introduction

After the entrance of the Czech Republic in the EU, the economic subjects gained the access to the EU funds. For the programming period 2007–2013 the budget for Structural and Cohesion funds is 26.69 bil. EUR (752.70 bil. CZK). There are 26 operational programmes divided among three objectives: cohesion, regional competitiveness and employment and European territorial cooperation. Seven programmes are regionally based, eight are aimed at specific areas, two are realized in Prague and finally the rest of programmes are cross-border.

According to Midmore et al. [10] "...spending must be directed to the most effective and appropriate means of fulfilling objectives". Similarly Offutt [11] states that "responsible usage of public funds requires accountability and transparency." Hence, the justification of the efficiency of public spending is obvious. On the other hand, the way how to assess the efficiency is not that straightforward. It is difficult to set suitable criteria to assess the efficiency of subsidies programs and measures. The question is whether only economical and financial points of view should be taken into account or if also other non-tangible benefits are relevant.

Since the beginning of 20th century, from which originates the efficiency analysis of public expenditure, several analytical methods were created. The efficiency approaches were developed at four lines [8]. First group of studies concentrated on practical applications, aiming at specific type of government addressed in a specific country. Second group of surveys evaluated the public spending efficiency in quantitative terms, but taking into account only inputs (financial expenditures). In contrast, third type of researches considered only outputs but not inputs. Finally the most complex studies compared inputs and outputs at once.

Antoušková et al. [2] introduced four methods, which enable to choose between alternative ways of public support: cost minimizing analysis (CMA), cost-benefit analysis (CBA), cost efficiency analysis (CEA) and cost utilization analysis (CUA). Those methods (called as input-output) are based on one-criterion decision making. CBA became official method to evaluate the outcomes of structural and cohesion policy of the EU in 2000.

The efficiency of production has been attracting the attention of researchers since the middle of 20th century, beginning with Farrell's work in 1957. The scope of application of his non-parametric method was enlarged from companies on non-profit organizations and to the

public sector. Contrary to that, the application of another efficiency analysis – parametric frontier is focused mainly on firms and its usage in public sector is limited. Above stated methods had their application in the wide range of areas. This methodologically aimed article describes the approaches and applies them on the subsidies efficiency analysis.

This paper is structured as follows. Introduction provides an overview of the literature on the efficiency analysis of public expenditures, namely subsidies. Second section is describing the article's methodology. In the results section, there are suggested suitable methods of subsidies efficiency analysis and discussed pros and cons of their application. Last section summarizes the results and the policy implications.

1.1 Cost-benefit analysis

„Cost–benefit analysis is a technique based on the theory of welfare economics, which is used by governments worldwide to appraise both policies and projects." [8] CBA "is generally used to determine the changes in net social benefit due to a government measure [4]. Various alternatives of a policy or programmes are compared in terms of their benefits and costs. The alternative with the highest net benefit is the one preferred to be realized. The ideal aim is to achieve Pareto optimum. "If Pareto optimum is reached, the public policy has been perfectly efficient". [15]

CBA "has very well established also as methods and also as the theoretical framework during socioeconomic evaluation of projects." [9] It can be used particularly when one subsidy project is a subject of evaluation and especially when there are several alternatives to be compared. For projects financed from EU funds, European Commission issued and continues to update obligatory Guide to cost-benefit analysis. On the other hand, the Czech guide Analysis of costs and benefits created in 2006 [16] has not been updated yet.

CBA measures „relationship between value of resources used by a programme, and value of resources produced by programme. Value is measured in same, usually monetary, units for both costs and benefits." [14] On the other hand, as Rogers et al. [13] object "while it may be possible to undertake cost-benefit evaluation of an individual project, by developing an evaluation as the project takes shape, this does not address the challenges of how to do cost-benefit evaluation of the funding program itself." This might be overcome by DEA method introduced later in the text.

CBA measures inputs and outputs in monetary units which is its strength and weakness. On one hand, it understands the benefits as every increase of the utility and costs as every decrease of the utility. On the other hand, those benefits must be explained in financial terms.

Rogers et al. [13] suggests that the benefits should be disaggregated into positive outcomes achieved and negative outcomes avoided. Suster et al. [17] define the term benefit as "an effect or result of desirable and measurable actions, investments, projects, resources or technologies, containing inclusively additional revenues, reduced costs and also social, positive and environmental externalities." Therefore, to make the analysis more complex, not only explicit, but also implicit costs should be included. They can be for example estimated as opportunity costs – loss from the alternative projects or the revenues which could have been achieved if the alternative project had been implemented. It is also possible to discount the monetary values of costs and benefits.

Public support effect of subsidies was analysed by CBA for example by Yrjölä and Kola [15]. They assessed the effects of the decline in agricultural support on multifunctional features of agriculture in Finland. However, due to the lack of data on the economic value of many elements of this type of agriculture, they were not able to assess the efficiency fully.

1.2 Data Envelopment Analysis

First approaches towards the estimation of the production function's frontier in the efficiency analysis were based on linear and quadratic programming techniques (e.g. Aigner, Lovell and Schmidt [1]). "When dealing with multiple inputs yielding multiple outputs, efficiency literature usually makes use of Data Envelopment Analysis (DEA) frontier methods." [3] This

was particularly developed to analyse firms' efficiency, although it has been applied to evaluate the efficiency of non-profit entities already since 1978. According to Pina and Torres [12] it is especially due to that traditional measures – income and profitability – are not satisfactory because these entities are not focused on obtaining profits and the main source of finances does not come from the sale of goods and services. There are many references on applications of the DEA technique. For example Gupta and Verhoeven [7] assessed the efficiency of government spending on education and health in 37 countries in Africa. They ranked the countries according to their efficiency and observed the changes in efficiency in three African regions.

DEA can be applied also on subsidies, where beneficiaries are not firms. Public body is considered as a producer using production factors such as capital (investments, subsidies or grants) and producing different kinds of outputs. Those can be measured in monetary form or by indicators related to the topic. Public bodies which spend less on inputs are viewed as more efficient than governments that produce the same output, but with higher spending on inputs.

2. Material and Methods

The aim of this methodologically focused paper is to introduce theoretical approach towards efficiency analysis of public expenditures – namely subsidies provided by the European Union. Therefore, the main method used is review of scientific articles and methodical brochures. The proposed methodology consists of the combination of CBA (obligatory set for subsidized investment projects' assessment) and DEA. This enables to include into efficiency analysis also non-financial outcomes quantified by CBA.

Firstly, each project is evaluated by CBA. The approach towards the analysis is outlined in guideline elaborated by Sieber [16]. CBA starts with the definition of the project nature. Then all potential beneficiaries such as households, firms, municipalities, states or other stakeholders are determined and listed. It must be kept in mind that benefit for one subject might mean a loss for the other. Next step is to describe the difference between investment and null (when the investment is not realized) variant. The costs and benefits must be assessed and quantified for all life phases of the project. Quantifiable outcomes are then transformed on cash flow, while non-quantifiable are described verbally. An incremental method to set costs and benefits of the investment can be applied. The principle is in calculating only the final balance of the costs and benefits. The table of incremental benefits and incremental costs is created. Only those costs and benefits which would not have been realized if the null variant had been applied can be considered. When it is difficult to transform the non-financial benefits to financial, suggested approach is to use shadow prices. To evaluate the prices of the estates or services which are not sold at the market we can use analogical price from ersatz market.

An important part of CBA analysis is setting the discount rate, which serves to the conversion of future value of cash flow (CF) on the current value. It should reflect the best possible yield of the alternative investment to the evaluated one. It has to be decided whether to discount real CF by real discount rate or nominal CF by nominal discount rate. To convert the real values to the nominal, it must be multiplied by inflation coefficient. Usually present value (PV) (the sum of all future CF from the investment discounted on the current value), net PV (NPV = PV minus investment costs), internal rate of return (IRR) (the value of discount rate when the NPV from the investment is equal to zero) or payback period (PBP) are calculated and compared. Net present value represents "future costs and benefit, depreciated using one of several discount rates to reflect delayed value". [14] The projects with NPV lower than zero are considered to be eligible for support. "Profitability refers to the profit received related to the amount invested. The simplest way to assess the profitability is to measure the internal rate of return of the investment..." [5] In other words, IRR is the rate when the NPV equals to zero. There are also other indicators. Return on investment (ROI) sees the projects as "means of saving money or generating income" [14]. Time to return on investment (TROI) is defined as a "typical time elapsed between program operation and occurrence of program benefits" [14]. The

final decision about the investment acceptability is based on the value of criteria indicators, results of sensitivity analysis and also on inestimable effects.

The criteria indicators can serve as the measures of the projects' outputs. In DEA it is possible to express the output in non-financial terms. It is commonly used approach; e. g. the output of the education is usually measured by test scores. Therefore, in our article, the inputs are subsidies and the outcome is the NPV in relation to the investments – i.e. profitability index.

The DEA is performed afterwards. It helps to identify the best practices, i. e. how efficiently beneficiaries use the subsidies. A beneficiary is relatively efficient if there is no other beneficiary that uses less or an equal amount of input (subsidies) to generate the same or more output (profitability index). DEA is a non-parametric method based on linear programming. It approximates the true but unknown technology without taking any prior assumptions about the sample distribution. The technological assumption of models is that any production unit – i.e. subsidies beneficiary (i) uses inputs $x = (x_1, \ldots, x_I) \in R+J$, which are represented by subsidies in our case, to produce $y = (y_1, \ldots, y_M) \in R + M$ outputs, measured by profitability index. These sets form the industry technology (T): $T = \{(x, y): x \text{ can produce } y\}$.

Firstly, the assumptions regarding the return to scale must be set: decreasing (DRS), increasing (IRS), constant (CRS), non-increasing or non-decreasing returns to scale (DRS) can be distinguished. There are also two special types of models: Free disposability hull (FDH) and Free replicability hull (FRH). "Although defining a constant returns to scale (CRS) technology has attractive properties, in most sectors the true technology experiences variable returns to scale (VRS) in the short term" [3].

A second assumption deals with the choice of the measurement orientation (input minimization or output maximization). Our DEA model has an output orientation as suggested by Berbegal-Mirabent et al. [3]: "... in the public sector the workforce and the budget tend to be fixed and these organizations will likely produce the maximal possible output given the resources available." The subsidies are given and the aim is to maximize the outcome.

3. Results and Discussion

3.1 Cost-benefit analysis of a particular project

We will present suggested approach on the example of an investment project which aim is to re-build and expand the older sport centre in the municipality. The tennis court will be added and existing football pitch and the facilities will be renovated. Therefore, the subject of the investment is a tangible asset. We suppose that it will be realized during two years. Its potential impact is mainly on the local inhabitants and entrepreneurs, although, people from surrounding municipalities and tourists are also relevant beneficiaries.

The costs and benefits are displayed in following tables. Firstly they are listed form the point of view of the municipality and in financial terms (Table 1 and Table 2). Then non-financial benefits for the local households are displayed in Table 3. Only the difference between the null and investment variant is relevant for future analysis.

Table 1. An example of incremental method usage to identify financial benefits of the municipality

Benefits	Year 2012 (in CZK)	Year 2013 (in CZK)
Expected municipality's incomes from the operation of the sport centre when the investment is not realized	50 000	50 000
Expected municipality's incomes from the operation of the sport centre when the investment is realized	125 000	135 000
Cash flow (income) from the investment	75 000	85 000

Source: Author

Table 2. An example of incremental method usage to identify financial costs of the municipality

Costs	Year 2012 (in CZK)	Year 2013 (in CZK)
Expected municipality's costs from the operation of the sport centre when the investment is not realized	45 000	50 000
Expected municipality's costs from the operation of the sport centre when the investment is realized	65 000	70 000
Cash flow (costs) from the investment	20 000	20 000

Source: Author

When the null variant is applied, the municipality will get the stable income from the football pitch rent, but the maintenance costs will be higher each year as the facilities get older. The widening of the centre will bring higher maintenance costs, but the rent of the tennis courts will raise the income. When the sport centre is promoted, the incomes will increase next year.

The costs and benefits can be expressed also in non-financial form. For example when the tennis court is local, the travelling time to the nearest tennis court will decrease.

Table 3. An example of incremental method usage to identify non-financial benefits of the inhabitants

Costs and benefits	Year 2012 and 2013 (in hours)
Time to commuting to the nearest sport centre in case of null variant	1.50
Time to commuting to the nearest sport centre in case of investment variant	0.25
Benefit from the investment	1.25

Source: Author

Time savings of the local inhabitants are a benefit. However, the fact that they will not commute to the sport centre in nearby small town means significant financial loss of the private company which runs the sport centre there. On the other hand, probably more people will come to the municipality and the business environment here improves. We can determine the benefits of the local firms in terms of the net profit increase, the benefits of the households in the net wage increase, the benefit for the state in increased tax yield and municipality benefit from the part of tax which belongs to them. All costs and benefits have to be expressed in financial form so the criteria indicators can be calculated. In our example the benefit of shorter commuting can be expressed also as saved costs for ticket or petrol per one visit of the nearest sport centre multiplied by the average number of visits per year.

The investment projects are usually influenced by the inflation. Therefore, the real values must be calculated by discounting the nominal ones by discount rate set by the subsidy provider. EU declared financial discount rate at 5 % and social discount rate for competitive countries 3.5 % and for cohesion countries 5.5 %. For Czech Republic, a special rate 5.7 % is set. [6] However, for example in Joint Regional Operational Programme was long-term real social discount rate to discount costs and benefits set at 5 % p. a.

Then decision criteria are calculated. PV indicator is calculated as in *(1)*.

$$PV = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} \qquad (1)$$

where *PV* is present value of all cash flows (CF_t) from the investment from year 1 till year *n*, *r* represents the discount rate, *t* is a year and *n* is the last year. When PV is higher or equal to the CF in year zero, or when it is higher or equal to the investments in year zero, than the project is acceptable. Similar criterion is NPV. We can calculate it as that we subtract from PV the investment costs spent in a year zero – see equation *(2)*.

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+r)^t} - I \qquad (2)$$

where *NPV* is net present value of the investment, and *I* are the investments in year zero. When NPV is higher or equal to zero, project is acceptable. Its advantage is that it takes into account value of money in time and enables to compare projects to each other.

Another criterion is IRR, which is the discount rate when NPV is equal to zero *(3)*.

$$0 = \sum_{t=0}^{n} \frac{CF_t}{(1+IRR)^t} \qquad (3)$$

IRR is afterwards calculated by iterative or approximation method. When IRR is higher or equal to assumed discount rate, the project is acceptable. A project with higher IRR is the one to be preferred. However, there are some problems associated with IRR calculation. Sometimes it cannot be even calculated at all. Besides, it does not take into account the CF development. Hence, the indicator payback period (PBP) is calculated as *(4)*.

$$PBP = \frac{I}{CF_t} \qquad (4)$$

When the PBP is lower or equal to the lifetime of the project, the project is acceptable. The disadvantage of this method is that it does not consider time value of CF. On the other hand profitability index calculated as the ratio of NPV and I enables this. When NPV/I is higher or equal than 0, the project can be accepted.

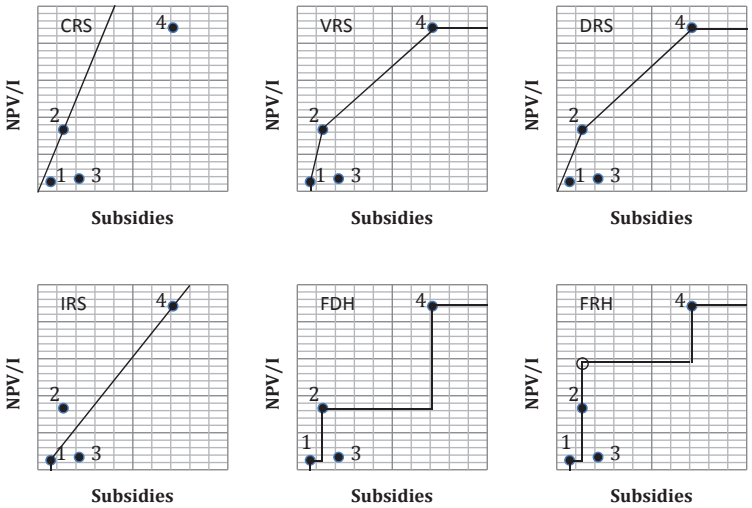
Finally the sensitivity analysis can be done. The impacts of changes of CF values on the criteria indicators are simulated. Assumptions about the CF for all years are changed by 1 % and the criteria indicators are recalculated and the difference is expressed in percentage.

3.2 Data envelopment analysis of the whole programme

For global efficiency analysis are important criteria indicators as they directly rank the projects. Especially profitability index, which enables comparison of differently financially demanding projects, is useful. From a point of view of the programme, it is desirable that projects generate the highest possible NPV in relation to the investments. The relation between subsidies and profitability index is the relation between inputs and outputs in DEA model.

The differences in the assumptions of return to scale are visible in the shape of production frontier (Figure 1). Those beneficiaries lying at the frontier of the production function are 100 % efficient.

Figure 1. Frontier shape according to the return to scale assumptions



Source: Author

We can derive a linear programme to each type return to scale assumptions. DEA finds the maximum value of the relationship between the output (NPV/I) and the inputs used in the production of this output (subsidies) for each beneficiary. Then a particular value for beneficiary is compared to those obtained by the other beneficiaries. The advantage of DEA is that when homogeneity is maintained, the outputs and inputs can be expressed in any measurement unit and that the measurement is relative. The linear programme is written as in equation *(5)* [12].

$$\min f_0 = O_0 - e\left(\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{S} S_r^+\right)$$

$$s.t.: O_0 x_{i0} - \sum_{j=1}^{n} x_{ij} a_j - s_i^- = 0, \qquad (5)$$

$$\sum_{j=1}^{n} a_j y_{rj} - s_r^+ = y_{r0},$$

for all a_j, u_j, $v_i > 0$; $r = 1,...$ s; i = 1, ..., m; j = 1, ..., n; where e is a small number which assures that no output or input are excluded from the final solution. S_i^- and S_i^+ represent the slack variables. The input and output of each beneficiary are in the restrictions: x_{ij} = value of the input i for the beneficiary j and y_{rj} = value of the output r for the beneficiary j.

Overall efficiency can be further divided into two components – technical which is determined by the situation of the beneficiary on the frontier of efficient production, and efficiency of scale which is given by the size of the beneficiary.

Suggested analysis ranks the beneficiaries according to their subsidy usage ability and enables to identify the types of projects where NPV/I is the highest. High profitability index does not mean that the beneficiary is 100 % efficient. However, it is very likely.

4. Conclusion

The aim of the paper was to propose suitable approach towards efficiency analysis of subsidies from the EU. The method started with evaluation of the individual project using CBA. Particularly profitability index calculated as NPV of the CF divided by investment costs is utilized. The index is included into DEA as an output of a project. The inputs are subsidies.

The efficiency study using DEA approach provides a benchmark for each beneficiary to improve its management and to better use the subsidies. Information about which types of the projects have the highest profitability index and which beneficiaries are able to use the subsidies the most efficiently are important for the steering bodies of programmes financed from the EU's funds. Our method can tell if projects aimed at infrastructure or on the improvement of the environment are more profitable than the others and if smaller or bigger beneficiaries use the subsidies more efficiently. The advantage is that it does not depend on the type of beneficiary and can be applied universally on any type of subsidized project. The drawbacks are difficulties with setting of the discount rate and with assessing of the non-financial benefits of the projects. Besides only the projects with negative NPV are eligible for support and therefore the subsidies must be added as a benefit to make profitability index positive.

The challenge for future research is to apply proposed methodology on the real data of investment projects financed from the European Union. The projects efficiency can be further put in the context of disposable of financial means.

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The Aspects of Financing of Municipalities with Extended Power

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Abstract

In connection with the third phase of public administration reform in the Czech Republic, there's an ongoing discussion about delegating execution of state administration to municipalities. The basic elements, from the point of provision of delegated state administration, are "designated" municipalities with delegated state competencies ("municipalities with extended competencies"). These municipalities were founded on 1. 1. 2013 after abrogation of district offices. With planned changes in public administration, it is assumed that these municipalities should be fundamental for execution of specialised state administration, and in the future might adopt activities of other municipalities with less scope of delegated competencies.

In the article we focus on the financing of delegated activities of municipalities with extended power. The aim is to find in what extent the delegated competencies of municipalities with extended power are financed by the Ministry of Finance of the Czech Republic. The analysis was performed on selected number of municipalities with extended competencies from different regions in the 2006-2011 years. The range of financing varies from 65 % to 85 % by means of the average for examined sample of cities between 2006 and 2011. In addition, we analysed the financing according to the criterion of the size of administrative district (number of residents) and according to the region in which the municipality is located. It cannot be observed any relationship between the region in which the municipality is located or the size of administrative district and the arithmetic mean of delegated competencies financed.

Keywords: Municipalities with extended power; contribution on extended power; district of administration; number of inhabitants

JEL Classification: H71, H76, H77

1. Introduction

Governments in most countries have struggled with tight situation in public finance in recent years. This development influences the financing of sub-national governments too. Structural reforms of public administration and competencies of sub-national governments are currently taking place in many European countries [12], [4], [8]. The reform of public administration is being implemented in the Czech Republic as well. Under the discussion is also the reform of provision of services which are delegated on the municipal authorities. The municipal governments provide, according to the law (Act on the Municipalities No 128/2000 Coll.), two competencies – independent and delegated competencies. The independent competencies are concerned with local matters, while the delegated competencies are delegated on municipalities by a particular state institution and are stipulated by separate Acts.

Delegated competence shall be:

- carried out, in the *basic scope* delegated to a municipality, in this case the territory of the municipality is an administrative district; all municipalities have this basic scope of delegated competences – 6246 municipalities;
- carried out, in the scope of an *authorised municipal office*. A separate Act (Schedule No 1 to Act No 314/2002 Coll.) specifies municipalities with an authorised municipal office – 388 municipalities;
- carried out, in the scope of the *municipal office of a municipality with extended competence*. These municipalities carry out the broadest scope of delegated competencies, in addition to the basic scope of delegated competencies and in addition to the scope of an authorised municipal office. Delegated competencies are provided by municipal office with an extended competence (Schedule No 2 to Act No 314/2002 Coll.) in an administrative district, which is appointed by legal

regulation (Legal regulation No 388/2002 Coll.). At the moment 205 municipalities are in this category.

Municipalities receive subsidies from the central government budget for the fulfilment of tasks within the scope of delegated competencies. According to the central government, these subsidies (contributions) are not intended to cover full costs connected with delegated competencies of municipalities. On the other hand, the municipalities argue, that more delegated competencies are being shifted to them, whilst its financing is not sufficient and they have to subsidised these activities from their own budgets (mostly from tax revenues).

The problem of optimal structure of state administration, the quality of its provision by various levels of municipalities and problem of its financing is under discussion of Ministry of the Interior of the Czech Republic, Ministry of Finance of the Czech Republic and Union of Towns and Municipalities of the Czech Republic. Some studies about problems of financing the delegated competencies have been elaborated in Czech Republic e.g. Analysis of independent and delegated competences financing [14], [3], [11].

The objective of the paper is to calculate and analyse to what extent the actual system of financing of delegated competences is adequate to cover them. The calculation will be provided on the sample of selected municipalities with extended competencies according to the size of authorised office and territorial aspects within the period of 2006-2011 years. This time period was chosen on purpose because of comparability – in 2006 a new method of calculation of subsidies on delegated competencies was introduced.

2. Material and Methods

Ministry of the Interior of the Czech Republic have introduced new method for calculation of subsidy for financing extended competencies in 2006 year. The subsidy depends on the extent of delegated competences of municipality (basic scope of competencies, competencies of authorised municipal office and municipalities with extended competencies) which is expressed by coefficients A, B, C according to the law. Coefficients are prescribed according to the total volume of financial resources for particular competencies in Appendix of Act on State budget for particular year. The construction of the subsidy, takes newly into consideration two criterions: number of residents of an administrative district (*SO*) and number of residents in particular municipality within the administrative district (administrative centre *SC*). The total amount of subsidy is calculated as summation of P_1, P_2 expressed in equations *(1)* and *(2)*.

$$P_1 = \frac{B}{A + \sqrt{SO}} \times SO \qquad (1)$$

$$P_2 = C \times (1 - \frac{SC}{SO}) \times SO \qquad (2)$$

The present design of subsidy does not enable to detect on what particular activity financial resources are used by municipality. It neither enables to reflect changes in provision of delegated competences in particular municipality as well as in municipalities with different scope of delegated competencies.

The subsidy (contribution) has been lump-sum increased by central government in years (2008, 2009 and 2010 years). By contrast in 2011 year the subsidy was decreased due to savings arrangements in whole economy.

As mentioned above, in the Czech Republic are 205 municipalities with extended competencies with various sizes of administrative districts. The smallest one is municipality Králíky (with district less than 19 thousand residents) among the biggest districts are Plzeň and Olomouc with over 160 thousand residents in administrative districts. The special positions have cities Brno and Ostrava with more than 300 thousand residents in their administrative districts [5]. Municipalities in our analysis have been divided into 10 categories according to the number of residents, due to wide diffusion of resident population in administrative district.

Three municipalities from each category have been chosen randomly for our analysis (see Table 1). Municipalities from given size category have been chosen from different regions to eliminate the regional abnormalities from the overall results of our analysis.

Table 1. Size categories and selected municipalities with extended competencies

Category	Municipality	Category	Municipality
less 15 thousand	Náměšť nad Oslavou	40 – 50 thousand	Žďár nad Sázavou
	Králíky		Rokycany
	Týn nad Vltavou		Jeseník
15 - 20 thousand	Aš	50 - 60 thousand	Vyškov
	Rýmařov		Jablonec nad Nisou
	Mikulov		Říčany
20 - 25 thousand	Valašské Klobouky	60 - 80 thousand	Třebíč
	Kravaře		Karviná
	Sušice		Náchod
25 - 30 thousand	Litomyšl	80 - 100 thousand	Jihlava
	Třeboň		Chomutov
	Hořovice		Karlovy Vary
30 - 40 thousand	Židlochovice	over 100 thousand	Olomouc
	Rumburk		Černošice
	Bruntál		Frýdek-Místek

Source: Authors

2.1 Expenditures on delegated competencies calculations

Model of financing of the provision of independent and delegated competencies at municipal level does not ensure matching costs and expenditures spent on these activities. (In most cases officials, during their working hours, provide activities cumulatively without distinction what matter of the service or activity it is – independent or delegated responsibility). The calculation of costs and expenditures on delegated competencies should be expressed approximately by means of expenditure on wages and salaries [6], [7].

The equation (3) for calculating the wage costs on provision of delegated competencies (WC_{DCt}) have been used.

$$WC_{DCt} = WC_{total} \times k \qquad (3)$$

where WC_{total} = total wage costs in particular year, including other payments on social and health insurance (code 50 in budgetary classification),
k = percentage of official's working hours dedicated to delegated competencies.

For coefficient k calculation our own survey among twenty chief executives from municipalities with extended delegated competencies, have been used. The final coefficient was calculated as arithmetic mean of all obtained percentages. For simplification of our analysis, we have used this one value of coefficient k (0,679). The former studies worked with the value of coefficient 0,642 [10], or 0,66 [14] respectively. With respect that those studies estimated the coefficients in earlier period of time, it should be assumed that our estimation is realistic (our coefficient reflects increasing scope of delegated responsibilities of municipalities).

Further item of expenditures are current expenditures (maintenance, energy, postal, rents, insurance, etc.). According to the expert estimation the current expenditures reach in average 40-45 % of wage costs. We have used the same percentage estimation of these costs as the Ministry of the Interior [10] for estimation current expenditure (CE_{DCt}), equation (4).

$$CE_{DCt} = WC_{DCt} \times 0{,}43 \qquad (4)$$

Among one delegated competence belong the social benefits and allowance payments (SB_t). These expenditures are fully reimbursed to municipalities from state budget. Total expenditures on delegated competencies (TE_{DCt}) should be expressed by equation (*5*).

$$TE_{DCt} = WC_{DCt} + CE_{DCt} + SB_t \qquad (5)$$

The other expenditures connected with delegated competencies are lump-sum capital and investment expenditures. We do not reflect these costs in our analysis because municipalities usually obtain special grants for these purposes.

2.2 Revenues on delegated competencies calculations

The subsidy (contribution) which municipalities obtain for financing delegated competencies can be calculated with using budgetary classification [9]. They are included in item *current subsidies obtained from central budget* – code 411. The whole subsidy contains also other subsidies (for school equipment, for selected health institutions, for personnel costs on positions which were established at authorised municipalities after abolishing district offices) than contribution on delegated competencies. To extract these subsidies we multiplied the total subsidy with coefficient q (Table 2). Coefficient q is calculated as arithmetic mean of share of contribution on delegated competence on total subsidy according to the regions and given year.

Table 2. Coefficient *q*

Year	2006	2007	2008	2009	2010	2011
Coefficient q	0,7145	0,8090	0,8090	0,8153	0,8461	0,8206

Source: Authors

As mentioned in part 2.1, on expenditure side the social benefits and allowances (SB_t) have been included. These items are also considered as provision of delegated competences, but they are strictly accountable and have character of flow item. For this reason these payments have been considered on the expenditure as well as revenue side (4116 code of item in budgetary classification). By this operation we obtained the subsidies with unconditional character.

On revenue side, there taxes and other revenues were included, which are immediately associated with provision of delegated competencies. Tax revenues are represented by administrative fees (1361 code of item in budgetary classification) and the other revenues are represented mainly with fines and returned transfers (code 221 of budgetary classification) [9].

Total revenues related to the delegated competencies in given year (TR_{DCt}) should be expressed by equation (6):

$$TR_{DCt} = CS_{DCt} \times q + SB_{PPt} + TAX_{DCt} + OR_{DCt} \qquad (6)$$

where:

CS_{DCt}	current subsidies obtained from central budget,
q	share of contribution on delegated competence on total subsidy obtained from central budget,
SB_t	social benefits and allowances,
TAX_{DCt}	tax revenues related to delegated competencies,
OR_{DCt}	other revenues related to delegated competencies.

For verifying in what extend the delegated competencies of municipalities with extended power are finance the equation (7) have been used. Surplus or deficit is calculated as a result of difference between total revenues and expenditures.

$$SURPLUS/DEFICIT = TR_{DCt} - TE_{DCt} \qquad (7)$$

where:

TR_{DCt}	total revenues related to the delegated competencies in given year,
TE_{DCt}	total expenditures related to the delegated competencies in given year.

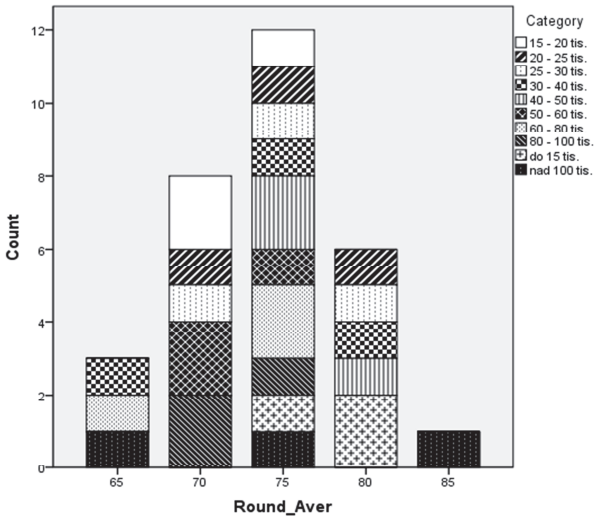
3. Results and Discussion

In analysis the indicators based on formulas (7) for whole sample of 30 municipalities with extended competencies have been calculated for each year for given period of time. Data from open databases ARIS, ÚFIS, CZSO [6], [7], [5] for calculations were used.

From results obtained for individual year we calculated the arithmetic mean of financing the delegated competencies in chosen municipalities for the whole period. We analysed the financing according to the criterion of the size of administrative district (number of residents) and from territorial point of view – according to the region in which the municipality is located.

Arithmetic mean of financing is in range of 65-85 %. Terminal values of financing (minimum) were reached by municipalities in size categories 30-40 thousand and 60-80 thousand of residents (Bruntál, Karviná) and municipality in size category over 100 thousand residents (Olomouc). In this size category also municipality Černošice with maximum value of financing – 85 % was found (Figure 1).

Figure 1. Count of delegated competencies financing based on size of administration district

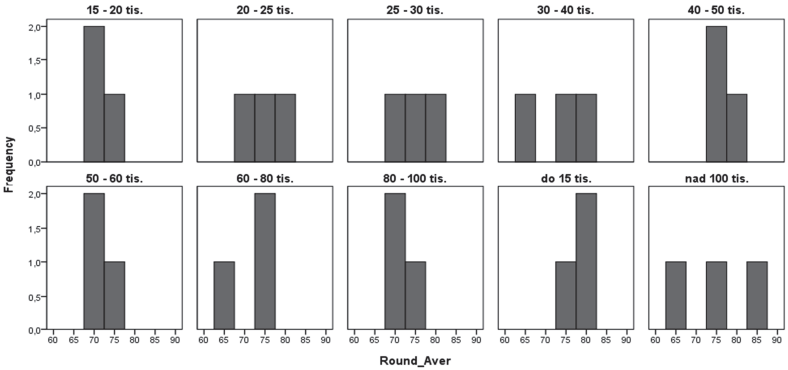


Source: Authors

Figure 1 illustrates the frequency (count) of delegated competencies financing in relation to the size category of municipal administrative district. In 12 municipalities delegated competencies are financed from 75 % in the average (most count of municipalities). This level of financing appears in each size category. Further 8 municipalities have financed delegated competencies from 70 % – this count exhibits in six size categories. In 6 municipalities delegated competencies are financed from 80 %.

The alternative view on delegated competencies financing related to the size category gives us Figure 2.

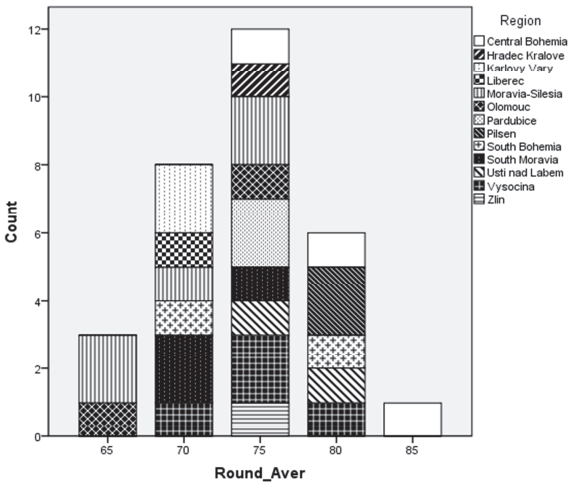
Figure 2. Delegated competencies financing relating to the size category



Source: Authors

Territorial point of view presents Figure 3. Two municipalities with lower level of financing are located in Moravia-Silesia Region, one is from Olomouc Region. The municipality with highest level of financing (Černošice, as mentioned above) is from Central Bohemia Region. Representation of regions in the most numerous group (the 12 municipalities with 75 % of financing) is wide: two municipalities are from Moravia-Silesia Region, two are from Vysočina Region, and two are from Pardubice Region. In the second numerous group (8 municipalities) are two from Karlovy Vary Region and two from South Moravia Region. In the third group (6 municipalities with financing delegated competencies about 80 %) are two municipalities from Pzeň Region. We cannot observe any relationship between the region in which the municipality is located and the arithmetic mean of delegated competencies financed.

Figure 3. Count of delegated competencies financing based on the region



Source: Authors

4. Conclusion

The present model of public administration organization could be characterized by a high number of delegated competencies. The range of delegated competencies in the Czech Republic is broader than is common in countries with similar model of public administration. Our analysis focuses on the municipalities with extended scope of delegated competencies. This category of municipalities is, and should be, the most important provider of delegated competencies in the future. Moreover, they might absorb activities of other municipalities with less scope of delegated competencies. According to the Ministry of the Interior of the Czech Republic, some changes in provision and financing of delegated competencies are planned during the third stage of the public administration reform.

Our analyses [13] illustrate that in the examined period of time the revenues associated with delegated competencies are not sufficient to cover the expenditures on delegated competencies. The range of financing varies from 65 % to 85 % by means of the average for examined sample of cities between 2006 and 2011. In the former analysis [14] the costs of delegated competences where financed more than 100 %. These results are not fully comparable – the analysis was executed in different period of time and on the bigger sample of municipalities (more than 50 %).

The first interpretation of results does not indicate the relationship between the size category of administrative district and the arithmetic mean of financing the delegated competencies. Also, we have not found any relationship between the location of municipality in particular region and the arithmetic mean. We are aware that our research is in the beginning and it should consider other circumstances in our analysis. We are prepared to apply the analysis on the whole sample of this category of municipalities (205) and verify our results.

Under the present scheme of financing of delegated competencies, it is not possible to clearly distinguish the costs associated with delegated competencies. Firstly, it dependents on subjective chief's executive estimation of official's working hours dedicated to delegated competencies (coefficient k). Also the former studies [10], [14] the same methodology to estimation of working hours connected with delegated competencies have applied. Secondly, in our analysis the average value of coefficient k for all size of administrative districts, we have used. The calculation of the wage costs connected with delegated competencies is simplified in this content. In further research we can provide the calculations with coefficient k of particular size of administrative district.

Taking into account the aforementioned reasons, the present model does not allow matching the costs and expenditures spent only on delegated competencies. In relation to this Ministry of the Interior and Ministry of Finance propose to design a new model of financing the delegated competencies based on standards adjusted for each delegated activity [11]. It is expected that introduction of standard will lead to higher transparency of public finance redistribution and will enable better control of it. Standards will ensure the same level of delegated competencies within the regions. Our further research should bring some new ideas on these processes.

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Are We Saving wisely? Default Option in Behavioral Economics

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Abstract

Even after a decade of consideration, no consensus has been found regarding the future of the Czech pension's policy. This paper illustrates one possible feature for the savings system which was included in other countries, a default option. Default is based on the psychological principles of preserving energy and avoiding possible guilt, and as such, it results in an increased share in the preselected option. In this, the experiment conducted on 168 participants confirmed the previous findings. Additionally, it has been debated as to whether people, in a stock market simulation, will, after a bust, follow the heuristic of representation or loss aversion. Strong support for intuitive loss aversion has been found.

Keywords: Behavioral Economics; savings; default option; loss aversion; experimental economics

JEL Classification: H3

1. Introduction

Despite the expectations of half a million people, around only 75,000 Czechs enrolled into the private savings funds, the so-called second pillar, roughly equivalent to the US 401(k) legislature. There were many reasons cited to explain why this attempt at reform was not fully successful - that its parameters are confusing, it is unclear as to whether the decision to participate is financially sound, and the political stability of the reform remains in doubt. This paper aims to illustrate one of the rarely mentioned shortcomings of the reform, namely it did not include any of the recommendations of behavioral economics. Savings behavior has psychological aspects that are sometimes neglected by the policy makers, but have a profound impact on the willingness of potential participants to enroll. Especially the option of default, explained for pension's policy by Thaler and Benartzi [1], arises interest from the policy makers around the world.

This paper is divided into three sections. Section 1 provides the reader with the broader theoretical perspective, mostly connected with behavioral economics. The ideas and concepts of Daniel Kahneman, Amos Tversky and Antonio Damasio create the core of that section. Here, the phenomena of default and representativeness is described. Section 2 describes experimental design and hypotheses. We simulated the choices similar to those people could face when trying to accumulate money in a pension fund. The results of this experiment and their implications are discussed in Section 3.

1.1 Theoretical Background

Behavioral economics is an emerging field of research. It aims to integrate the knowledge of decades of research into psychology with the economic problems in our everyday lives. The position taken by classical economists like Mill, or later Friedman, is that human beings are rational decision makers with defined individual preferences which remain constant over time, and this has been increasingly under pressure from the proponents of bounded rationality. Other convincing arguments have come from mathematics [2] and psychology [3].

Behavioral economics acknowledges that people are often making decisions with incomplete information, and cognitive stress thus limiting their intellectual capabilities [4]. They use heuristics which make their decisions biased, so that choices they make in everyday life are not optimal [5]. But those heuristics also work in a constant way for the majority of individuals. Also, our own feeling that we make decisions based on logic and rationality is self-deception, and

that decision making is undertaken by the parts of our brains associated with emotional processing. One of the most convincing and thorough arguments for this conclusion came from Damasio [6].

The dichotomy of logical and intuitive thinking forms the basis of the Two Systems theory, with Kahneman as its most known proponent. There is no doubt that humans are capable of rational processing and logical thinking. But such evolutionary new procedures are very demanding on the resources of the brain, as measured by glucose consumption [7]. Which is why this logical part, System 2, is only used in need, and System 1 is preferred. System 1 operates much faster, effortlessly, and is capable of a simultaneous conducting of many tasks. If we take driving as an example, the beginner faces a new situation and is overwhelmed with the many complicated tasks, so his skill and driving satisfaction is low. But with experience he comes to use the automatic processing of System 1. The same method is applied when individuals make their economic decisions.

A prime example of heuristics in System 1 is loss aversion, described by [8]. The term describes the human tendency to avoid losses (or a mere feeling of loss), sometimes leading to a bigger loss afterwards. An example of this heuristic is stock market behavior or life-savings investment behavior. Despite proven economic theory suggesting that risky stocks are superior to low risk bonds, especially in the long term [1], people are unwilling to bear the risk of a gamble unless the possible gains are significantly bigger than the possible losses, compared to the initial reference point. Tversky and Kahneman estimate that decision makers need approximately a twice higher amount (2.25) of possible gains to take a risky option [9]. Another heuristic important to this paper is representativeness. If confronted with a situation of randomness, such as tossing a coin, a decision maker wrongly assumes that the likelihood of an event increases when the opposite event has taken place more often. In a stock market situation this could lead to people expecting a bust after a streak of good years.

1.2 Default

A recent development in pension funds management has noted that education and similar options aimed at System 2 have been largely unsuccessful [1]. More promising are the approaches which can be described as libertarian paternalism and nudging. An important principle is that everyone is entitled to any choice, so there is no freedom limitation. But those unwilling to spend their time or are without resources to plan properly are nudged to make a decision calculated to be most appropriate. In the example of the Swedish pension systems, there are many possible funds with different portfolios, risk levels, or fees. The government set one of the funds as default (an obvious advantage of the fund were the small fees), meaning people who, for any reason, did not want to decide, remained with the government chosen fund. Individuals were also allowed, even encouraged, to choose their own.

Default works because it influences the reference point, one of the key factors in loss aversion heuristics. Other reason is inertia – a human tendency to stick with a decision which has already been made. There is also the explanation that default options set an anchor, priming humans for other heuristics and many others. Brown and Krishna [10] provide a full description of a default, along with a list of possible uses.

The paper presents one possible way as to how to test the relative effectiveness of the default setting. Previous research has confirmed that participants are influenced by the presence of default. The question is as to how strong the impact of the default will be in this scenario, and if there are no other differences between the groups. Another interesting question which this research addresses is whether the heuristic of loss aversion or the heuristic of representativeness will prevail in the decision making of participants, when their goal is framed as a long term savings. If loss aversion is dominant, than after a salient stock market decreases, will participants reduce their exposition to stock and increase the share of bonds. On the other hand, using representativeness should result in opposite behavior.

2. Material and Methods

An experiment was designed to simulate the scenario of a person who is in his/her thirties, and is able to save 20 000 every year (roughly 1 000 USD equaling one median monthly income in the Czech Republic). There were thirty rounds in the experiment, each round corresponding to one year of saving. The person has, in every round, a choice between five funds, each with different stocks and bonds ratio. Bonds represented the low risk/low return option, with a constant and guaranteed return of 1 % every year. Stocks represented the volatile option. Their returns, on average, were 2 % per year, but their performance was also the subject of an economic cycle. The cycle lasted 6 rounds, and in each cycle were 3 "good" years, with high returns, 2 "average" years with returns equal to the bonds, and 1 "bad" year, where stock performance was in red numbers and investors were losing money.

Participants could, in each round, transfer all of their money into any fund they wanted; there were no fees in any part of the experiment, and the only way to lose money was to invest in stocks during a bad year. For the sake of simplicity, there was no inflation in the whole experiment, so there was no difference between nominal and real values.

Participants were allowed to take any notes they wanted, and to proceed at their own pace. There were 168 participants in the 9 experimental sessions, mostly economics undergraduates, with a slightly higher ratio of females. Questionnaire conducted after the experiment revealed no substantial differences between the groups in the demographic characteristics, knowledge about financial matters or attitude towards investing and savings. Participants received their reward based on their actual performance measured by the sum of their portfolio at the end of the experiment. The sum of the portfolio was then divided by a coefficient, and that was the amount participants received.

Participants were divided into 6 groups. One control group without any default, and then groups that had each one of the funds set as its default fund. Each group had the same conditions, and the only difference was the default. All the information about the experiment above was known to the participants, with the exception of the future stocks performance. That remained the prime unknown variable and the focus of participant's attention.

The experiment was programmed and conducted with the software z-Tree [11]. On the left side of the screen, participants could put their money into one of the funds (or split them into more). The right side showed the value of their portfolio and the stock's performance in the last round. The Z-Tree also allows for the including of the default option. Participation in the group "Conservative Fund Default" includes a 20000 that can be seen in the field "Conservative fund investment". This value is set by the experimenter, and appears at the beginning of the round, before any action is taken by the participant. If the participant wants to follow the default, he/she can simply click on the OK button. But freedom of action remains, rewriting of 20000 is all that is needed, and there are no penalties for a different course of action.

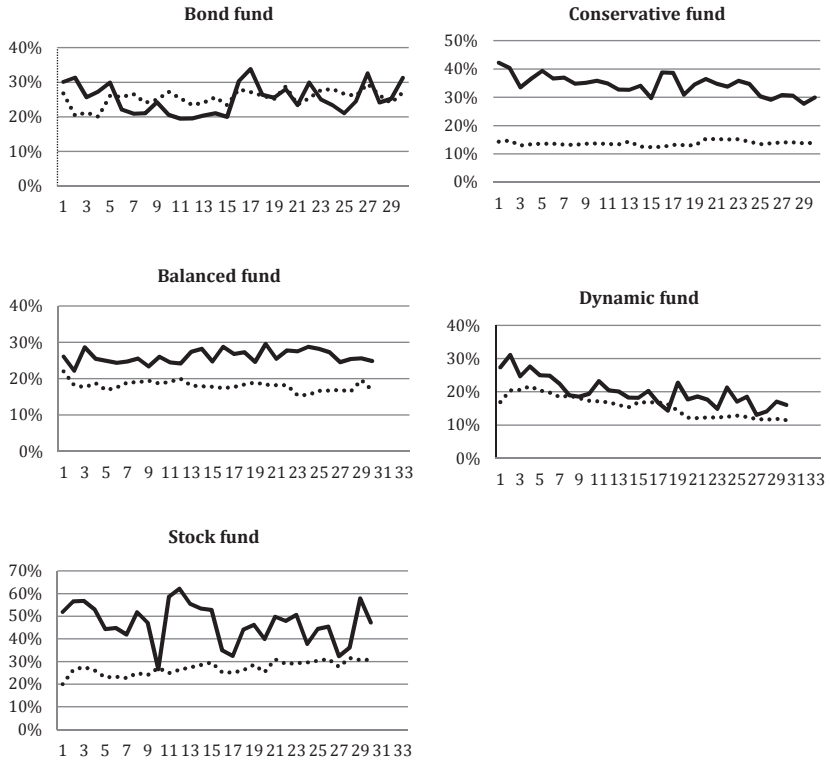
Classical economics predicts no difference between groups with and without default, because the objective situation of the participants is the same, and framing should not impact the decision. Behavioral economics predicts that even such a small framing difference like a default creates an actual difference in the group results. The reasoning of the behavioral economist is based on the assumptions that, despite conditions, such as success based money reward and availability of time promote rational, System 2 thinking, people will still rely on their judgment on the default-influenced System 1. The question was also the scale of the possible impact of default on the ratio of investment that goes into funds with or without default.

3. Results and Discussion

This section summarizes the results of the experiment which tested whether or not there was an impact of default on the subject´s decision-making. In the final stage of the experiment the participants answered the same question - Were you influenced by default? As 125 people said "absolutely not" and 25 "almost not", one can say that people recognized that default gives

no "hard" reason to change their decision, so they do not expect it to have any effect. The results of their behavior during the experiment tell a different story. The investment behavior of the subjects is shown in Figure 1. The vertical axis describes the ratio of the participants'money invested into the fund, the horizontal axis shows the passing of time (30 rounds). The lines show, on each of the following panels, how much the control group has without default (dotted line) and the group with the named fund set as a default invested into the fund (straight line).

Figure 1. Investment behavior of the subjects according to the fund

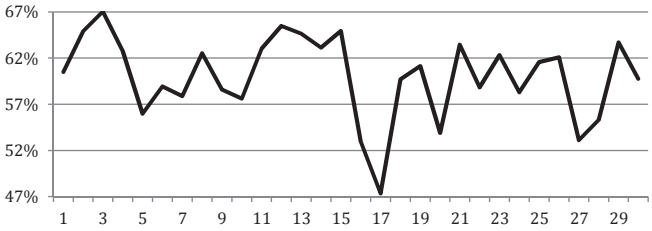


Source: Authors

With the exception of the Bonds fund, there is a significant difference between the decisions of the default or no-default group, and the default group puts into the preselected fund a higher amount of money. Wilcoxon signed-rank test was used to verify the results, as the data were not parametric, and a null hypothesis of no difference between the default and the no-default group was rejected for Stock, Dynamic, Balanced and Conservative funds on $p < 0{,}001$.

Not only is the difference between the groups interesting, but also the behavior of the participants on the stock market should be analyzed. As mentioned, there are two conflicting tendencies to what to do after a stock market crash, one according to loss aversion, the other based on heuristic of representativeness. Figure 2 shows how much money the participants put into stocks and bonds. Values were easily calculated from the amount of money invested in the funds, for example the Balanced fund consisted of 50 % bonds and 50 % stocks. The ratio was known to participants.

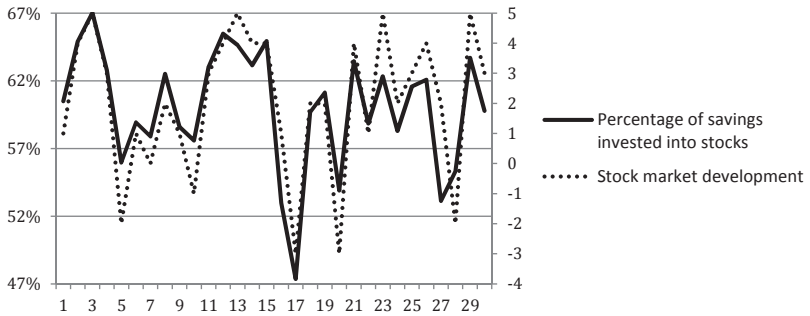
Figure 2. Percentage of savings going into stocks



Source: Authors

To see what happens after a stock market crashes (such as those occurring in the 4th or 16th round), Figure 3 shows the ratio from the upper graph on the same chart as the stock market performance. The stock market performance was one round forwarded, so we can see how much the participant's investment was influenced by the knowledge of performance from a previous round. The left axis shows the ratio of bonds in portfolio and the right axis describes values for stock market development.

Figure 3. Percentage of savings going into stocks compared with the stock market development



Source: Authors

It is very clear that every time the market went up, participants put more money into stocks, and the reverse happened after each crash. There is a substantial correlation of 0,844 (R2). The ups and downs of the development are in fact so similar that values of linear regression: *b0=0,568971, b1=0,015754, explain 70,8 % of variation (adjusted R2), with t(28) = 97,78016, F (1,28) = 69,38878, on p <, 001.*

4. Conclusion

There are three facts to consider before we can make a conclusion from the results. First, the sample of participants was not representative. Young people have a higher tendency to take a risk in many situations, including economic decisions. There were also only about 30 participants in each group, so individual differences could still have played a role. Secondly, the control (without default) group behaved very conservatively, and scarcely transferred money between funds. Finally, there are mental models trying to predict how people behave in tasks such as the stock market [12], but it is rare to come to a simple conclusion. So even though results can be interpreted in a simplified way such as "The base rate of stock investment is 57 %, and this changes at the rate of 1,5% for each percent of the stock market growth (positive or

negative) in the previous round.", more factors probably had an impact and different circumstances would lead to a different outcome.

Even after taking the mentioned anomalies into account, it is safe to note the following. The default option leads to a desired result, e.g. higher rate of savings channeled into the default fund. The findings thus confirm the predictions made by [1], and further confirmed by [13]. The impact seems to be stronger at the beginning, and there is a decrease over time, perhaps as people accommodate default and understand the rules of the experiment. Our experiment also shows that people were withdrawing money at the least advantageous moment, after a stock market fall, even though they should have expected a rise in the next turn. Loss aversion came out as stronger than representativeness, perhaps because participants did not deem the stock market as random, but, as [14] say, a situation where they should use their investor skills to improve the outcome.

Individual decision makers often make choices that can be considered irrational, with consequences potentially destabilizing the whole system, and governments may deem it necessary to nudge them [15]. Default can be seen as one of the possible solutions. Default is also important for policy makers because it promotes the preselected option cheaply, efficiently, and it does not limit individual freedom (the basic premise of the libertarian paternalism). Given the drastic measures of the savings system that have recently taken place in the CEE countries (taking over pension fund assets in Poland being the last example), the Czech government would probably make its population more satisfied with carefully prepared long term solutions.

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Budget Transparency in Prague Districts: An Initial Analysis

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Abstract

Budget transparency is perceived as a tool for efficiency increase, accountability enhancement and mismanagement prevention. However increasing amount of information publicly provided on internet does not lead by itself to these desired changes. There is necessary broader engagement of budget information users and their involvement in a dialogue with the public officials. This is the only way how to achieve efficient transparency. The purpose of this paper is to specify legal budget publicity requirements, to evaluate the compliance of Prague districts with these requirements and to propose the steps of the further research. Our analysis of web pages of the Prague districts and submission of information requests showed, that the availability of budget documents which are required to be published is quite good and that the districts react reasonably on the information requests. The further research has to go beyond the budget documents which are legally required to be published. It is necessary to scrutinize all the documents and steps of the budget process and to find out what and when is published and if someone responds to it.

Keywords: budget transparency; municipal budgets; freedom of information law

JEL Classification: H72

1. Introduction

Budget transparency is perceived as a tool for effectiveness improvement, accountability enhancement [1] and increase of the probability that corrupt or wrong decision is detected [2]. It is usually defined as full disclosure of all relevant fiscal information in a timely and systematic manner [3]. Kopits and Craig define fiscal transparency as "openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities (…)" [4,1]. Ramkumar a Shapiro stress, that „budgets should not only be available to the public they should also be accessible to the public" [5,18].

The interest in public finance transparency grows since mid-1990´s in both international institutions, such as IMF or OECD, and nongovernmental organizations, such as International Budget Partnership (IBP) or Transparency International (TI). The formulation of budget transparency standards [6] and [3] leads also to an attempt to evaluate or measure transparency. A number of studies were conducted also at the local government level: Bronic, Ott and Urban constructed Croatian Open City Budget Index and evaluated transparency in 33 cities [7], Caamaño-Alegre et al. computed Fiscal Transparency Index for 33 Galician municipalities [8] and Jorge et al. developed a Disclosure index and used for transparency analysis in 49 Italian and 45 Portuguese municipalities [9].

In the Czech Republic Oživení realized a comprehensive regional transparency survey [10] and Císařová and Pavel evaluated availability of key budget documents in 39 municipalities [11]. Sedmihradská analyzed the content of approved budgets in 11 statutory cities [12].

Evaluation of budget transparency concerns mostly the availability or the content of budget documents and says little about the impact of the published information. The divergence between the nominal transparency (i.e., publicity of information) and effective transparency (i.e., tool for effectiveness improvement, accountability enhancement and corruption and waste limitation) causes, that the external knowledge of how public finances operate remains limited even when the amount of published information grows [1].

This is because most of the published information has no direct user [13] and it is spread among the public through intermediaries or information brokers who are unlikely to be neutral [1]. Therefore despite high rankings in transparency surveys the news are full of cases of mismanagement in the public sector [13]. Transparency by itself is insufficient for improving governance [14]. It is, however, an important prerequisite for accountability [15] or component of it [16].

The purpose of this paper is to specify legal budget publicity requirements, to evaluate the compliance of Prague districts with these requirements and to propose the steps of the further research. The research combines legal review, analysis of web pages of the Prague districts and submission of information requests. Plan of the further research draws also on [17].

The paper is structured in the following way: The next part of the paper describes the method of data collection and the current legal requirements in case of Czech local governments and the final part presents the results of the surveyed Prague districts and the plan of the further research.

2. Material and Methods

The research concerned the so called big districts of the capital Prague, i.e. Praha 1-22 and focused on two research questions:

1) What type of budget documents are the districts required to publish on Internet or provide based on an information request?
2) Do they really publish and provide these documents?

In this research we focus solely on the availability of the particular document to the public, we do not look at the content of the documents, their level of detail or usability for either the decision-makers or the citizens.

The answer on the first question was determined based on a detailed legal analysis of the budget legislation (i.e., Budgetary rules for territorial entities (250/2000 Coll.), Law on tax assignment (243/2000 Coll.), Law on audit of local government units (420/2004 Coll.), Law on financial control in the public administration (320/2001 Coll.), Regulation on budget classification (323/2002 Coll.) and the freedom of information legislation (i.e., Freedom of information law (106/1999 Coll.) and Regulation on the structure of information published on Internet (442/2006 Coll.). Its results are summarized in part 2.1.

The actual availability of budget documents was verified in two ways: careful search on the web pages of the particular districts and request for accounting statements for the years 2010 to 2012. The information requests were submitted through the web service infoprovsechny.cz. The web search was realized on 4 April 2012, the information requests were sent between 3 and 19 March 2012.

We requested a set of accounting statements (Balance sheet, Profit and loss statement, Cash flow statement and Statement evaluating budget execution Fin 2-12 M -parts I. to X.) in the .xls format, which would allow a further analysis. Almost immediately it became obvious, that these statements are available only in .pdf format, so in the requests send later the requirement of the format was softened (i.e., we did not require the .xls format but we asked if it is possible). Only one of the districts send some of the statements in the .xls format. Explanation given by the official of Praha 4 was, that the accounting system does not support export in .xls format, because it allows modifications of the report, which is not allowed [18].

All of the required statements for other municipalities are publicly available in databases ARIS (2001-2009) and ÚFIS (since 2010) provided by the Ministry of Finance which enable easy export to the .xls format. Districts in Prague and other big cities are required to compile these statements but they are not published systematically. Out of the 22 Prague districts these documents were available on Internet only in two cases, in .pdf format of course.

2.1 Legally required budget publicity for Czech local governments

Publicity requirements regarding local government budget documents are specified in budget legislation and the freedom of information legislation. While the Budgetary rules for territorial entities deal only with publicity of proposed budget and proposed final account before their approval, the Regulation on the structure of information published on Internet (hereafter Regulation) requires permanent availability of the key budget documents. Table 1 presents all publicity requirements and highlights the limited interconnection of the two areas of regulation. Budgetary rules do not introduce the term "amended budget", so it is not clear what exactly should be published. On the other hand the Regulation does not require publicity of existing documents such as budget outlook or audit report.

Table 1. Publicity requirements regarding individual budget documents

Budget document	Publicity requirement based on	
	the budgetary rules (15 days before council debate)	the freedom of information law
Budget proposal (t)	at least revenues and expenditures classified according to individual classes	
Budget outlook (t+2-5)		
Approved budget (t-1),(t)		at least revenues and expenditures classified according to individual classes and binding indicators
Amended budget (t)		amended budget, i.e., inclusion of budget measures/amendments in the approved budget
Final account (t-1)	information on revenues and expenditures classified in the full detail, on property management and other financial operations and on creation and usage of funds	information on revenues and expenditures classified in the full detail, on property management and other financial operations and on creation and usage of funds
Audit report	yes	

Source: Budgetary rules for territorial entities and Regulation on the structure of information published on Internet

The fact that the Freedom of information law refers to all functional areas and that the Budgetary rules are quite general and leave significant space for municipalities regarding the individual steps of the budgetary process and the content of individual budget documents leads to quite limited publicity obligation. This, however, holds only for information on Internet. The right to submit an information request allows obtaining basically all budget documents which are available at all. The Freedom of information law defines reasons for refusal of information provision: secret facts, personal information, business secrecy, internal guidelines or copyright. None of them is applicable in case of budget documents. Czech, not only local, governments do not systematically monitor performance indicators, so it is unlikely to obtain ready information regarding performance.

3. Results and Discussion

3.1 Provision of budget documents by Prague districts

The results of the web search and information requests are shown in Table 2. The approved budget for the current and previous year was available on Internet in all but one district. The availability of the final account was lower – only in 14 districts (64 %). Information on the amended budget was available only in three municipalities and the information in Praha

1 did not cover the whole year. This is a consequence of the non-existence of such document in the budget legislation. Low availability of published information on budget amendments showed also [19]. Finally we were able to get the statements from all the districts, however two districts were not able to provide them electronically and two districts did not want to provide the 2012 statements before their approval by the district council. 19 districts answered in time, in case of three districts a reminder was send and then they replied very quickly. The case of Praha 11 was complicated because of the request of the .xls format: they wanted a payment for the conversion of the document which is not in compliance with the law. Our complaint was considered relevant and finally they provided the statements in .rtg format which is almost useless.

Table 2. Availability of budget information

	Available on Internet				Information request	
	Approved budget 2012	Approved budget 2013	Final account 2011	Amended budget 2012	Days for answer	Note
Praha 1	yes	yes		Part of the year	12	Personally, 689 CZK
Praha 2	yes	yes	yes		9	
Praha 3	yes	yes			4	Without 2012
Praha 4	yes	yes	yes		7	
Praha 5	yes	yes	yes		10	
Praha 6	yes	yes			36+8	Without 2012
Praha 7	yes	yes	yes		6	Personally
Praha 8	yes	yes	yes		15	
Praha 9	yes	yes	yes		9	
Praha 10	yes	yes	yes		10	
Praha 11	yes	yes	yes		4+90	Originally requested 1,650 CZK, after complaint for free
Praha 12	yes	yes	yes	yes	3	
Praha 13	yes	yes	yes		44+1	
Praha 14	yes	yes	yes		12	
Praha 15	yes	yes			11	
Praha 16	yes	yes		yes	43+6	
Praha 17	yes	yes	yes		15	
Praha 18		yes			7	
Praha 19	yes	yes			8	
Praha 20	yes	yes	yes		14	
Praha 21	yes				11	
Praha 22	yes	yes	yes		2	

Source: Author

The results of the web search revealed very common misconception of the role and importance of the approved budget and final account. While the approved budget is a plan, the final account shows how well the plan was realized. Reporting, including the final account, is the main way to fulfill accountability obligations [20]. So from the accountability point of view the final account is much more important, but the interest in it is lower. For example in Praha 10 in February 2013 local newspaper devoted to the approved budget for 2013 almost 3 pages [21] but in June there was no notion about the final account, even when the budget was exercised only from 56 %.

The inability to receive the accounting statements in .xls format shows either lack of interest in own analysis (how do they do their own analysis, if the data are only in the .pdf format) or fear that someone would really scrutinize the documents.

3.2 Evaluation of budget transparency: How to proceed?

So far, we focused only on documents, which are legally required to be produced and published. This view on the budget and the budgetary process is very narrow. Therefore it is necessary (1) to identify all the budget documents and steps during the budget process, which is possible to track in publicly available documents, (2) to collect and describe them and (3) to evaluate and compare the state in the individual districts over at least two years.

The results of the first step are presented in Table 3, which was compiled based on the legal analysis of budget legislation, our previous research [22] and [23] and a case study elaborated in Praha 10. In italics are documents analyzed in this paper.

We expect that we can go beyond evaluation of nominal transparency. Although not stated explicitly, it should be possible to track through the records of the debate in the district councils the involvement of the public. Than we want to link together this involvement and the changes in the documentation between the two years analyzed. Bovens stresses that accountability cannot be performed as a monologue without engagement [15]. Therefore we expect, that if there are users of budget information who try to engage in a dialogue with the town hall, the town hall responds to at least some of their requests regarding budget information.

Table 3. Steps and documents in the budget process

1.	Budget proposal – availability on the official board
2.	Record or resolution of the financial committee regarding the budget
3.	Record of the debate on budget in the district council
4.	Council resolution approving the budget
5.	Extent of delegation of the responsibility to realize budget amendments to district commission
6.	*Approved budget (tables, commentary, etc.)*
7.	Multiannual budget outlook
8.	In-year budget reports
9.	Records or resolutions of the financial committee regarding the in-year reports
10.	Council resolutions on the in-year reports
11.	Records of the debate on in-year reports in the district council
12.	Final account proposal – availability on the official board
13.	Audit report - availability on the official board
14.	Record or resolution of the financial committee regarding the final account
15.	Record of the debate on final account in the district council
16.	Council resolution approving the final account
17.	*Final account*
18.	*List of all budget amendments*
19.	Audit report
20.	Accounting statements

Source: Author

4. Conclusion

Budget transparency is perceived as a tool for efficiency increase, accountability enhancement and mismanagement prevention. However increasing amount of information

publicly provided on internet does not lead by itself to these desired changes. There is necessary broader engagement of budget information users and their involvement in a dialogue with the public officials. This is the only way how to achieve efficient transparency.

The realized research showed, that the availability of budget documents which are required to be published is quite good and that the districts react reasonably on the information requests. On the other hand the usability of the numeric information in the .pdf format is questionable.

The research dealt only with budget documents which are legally required to be published. This extent is, however, insufficient. It is necessary to scrutinize all the documents and steps of the budget process and to find out what is published and if someone responds to it.

The next steps of the research comprise a detailed mapping of the budget process and related documents in the 22 Prague districts based on the information available on the Internet and interviews with relevant stakeholders (council members, employees of financial departments or active citizens)

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Standard or Implicit VAT Rate?

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Abstract

This paper deals with the standard and implicit VAT rates. The VAT is a key tax collection resource, representing an average of 7.7% of GDP. Standard VAT rates may not provide a simple key to defining VAT collection (as % of GDP). The implicit VAT rate, rather than the standard VAT rate, is relevant for defining VAT collection. This paper focuses on whether the VAT rates correlate with the VAT share of GDP revenue, and compares standard and implicit VAT rates to determine which has a stronger correlation to the VAT share of GDP. The aim is to show which rate of VAT (standard or implicit) is better for comparing and gives more complex information for decision. We analysed the data of European Union and the ten-year period from the beginning of 2002 to the end of 2011. We used an analysis tool set comprising the theory of sets and correlation analysis. The results of the analysis did not provide a clear answer, especially as regards the standard VAT rate. It is not possible to say that there is any definite causality between the standard VAT rate and tax revenues. In contrast, causality was confirmed with the implicit VAT rate.

Keywords: Value added tax; standard rate; implicit rate; tax revenues

JEL Classification: H21, H25, H83

1. Introduction

Value Added Tax (VAT) is one of the most successful and prodigious phenomena in the contemporary fiscal structures. Developed in the 1950s, it has rapidly become the most widespread consumption tax in the world, deeply entrenched in the tax systems of more than 140 countries [1]. Despite the strong harmonization of taxes within the European Union (EU), especially in the field of indirect taxes, VAT rates are far from unified. Each EU member state sets its own VAT rate according to Council Directives, especially 2006/112/EC. The standard VAT rate may not be less than 15% (Article 98). Member states are not limited by tax brackets, only by minimum rates.

Differences between the (standard) rates are possible, such as the difference between Hungary (27% VAT) and Luxembourg (15% VAT). Each member state can freely decide the VAT rate while observing different goals, e.g. budgetary, including increased tax income, the stimulation of aggregate demand or the level of consumption, increasing or decreasing the relative emphasis on indirect taxation (in the overall tax burden), etc. To mitigate the regressive impact of indirect taxation, reduced rates are sometimes applied.

The list of goods and services to which reduced rates may be applied is set forth in Annex III to Directive 2006/112/EC. There are also super-reduced and zero rates. The original objective of VAT (enshrined in the first VAT directive, Directive No. 67/227/EC), i.e. taxation in the country of origin, has not yet been pushed through, and it seems probable that this objective will remain a theoretical vision in future decades; see [1] where abandoning the objective is mentioned explicitly. However, VAT as such, including its parameters, continues to be a key issue. Is it actually possible to compare VAT revenues (as a relative share in GDP) considering the aforementioned considerable differences in the application of various VAT rates?

Indirect taxes, including VAT, gained increasing importance in total tax revenues. This is true even though the VAT actually collected represents about 50% of the theoretical VAT revenues that would be collected if there were no evasions and all final consumption was submitted to a standard rate [1]. This is one of the main reasons why exploring standard VAT rates may be insufficient and why we decided to further extend the research conducted in 2012 [3] with implicit rates. Moreover, according to the neoclassical assumption, an efficient

(economic) tax rate has a greater impact on economic decisions on savings and investments, and hence on the Gross Domestic Product (GDP) of a country in general, than the standard rate.

As already mentioned, changes in VAT, applications of various rates (basic, reduced, zero, etc.), tax exemptions, etc. are based on EU directives on the one hand, and serve as political tools aimed at stimulating domestic consumption, etc. on the other hand. The issues related to the tax revenue level and increases in the VAT rate used as tools for filling public budgets have recently come to the fore in connection with the economic crisis.

If this policy instrument for increasing revenues, i.e. increasing VAT rates, does not result in increases in VAT revenues, it is appropriate to ask the question: Is increasing the standard VAT rate actually a suitable and relevant political tool for increasing tax revenues? To answer this question, we analysed the strength of the relationship between standard VAT rates and the amount of VAT revenues (% GDP). To extend the analysis and discover the importance of the issues related to the tax base in comparison with standard rates, we supplemented this analysis with an analysis of the relationship between the implicit VAT rate and tax revenues.

The aim of this paper is to compare the relationship between the standard tax rate and the amount of tax revenues, and to subsequently compare the relationship between the implicit tax rate and the amount of tax revenues. It´s because the implicit tax rate provides information that standard rate or tax revenues do not. On the basis of both analyses, it will be possible to answer the question of whether the standard VAT rates are a relevant policy instrument in relation to tax revenues. If increasing the standard rate of VAT should lead to decrease implicit rate of VAT, then the consumption and tax revenues would be reduced. The increase in VAT rates would prove as ineffective, even counterproductive. In this respect, the ITR serve as an indicator of political instruments VAT Rates. We relate both rates to the macroeconomic tax base, exploring the interconnected development of these rates with respect to the proportion of tax revenues in GDP. We chose a 10-year time period from the beginning of 2002 to the end of 2011, and all 27 EU member states are covered by the analysis. We consider this set of countries to be sufficiently comparable in terms of historical, political, and other factors.

The paper is based on prior studies. According to Mathis: [4] *"The EU average for standard VAT rates is at 20.6% with a statutory minimum of 15%. For the implicit VAT rate, which takes into account all the VAT rates in force, the EU average is lower, at 15.9%, which corresponds to about a 20% discount of the previous EU average standard rate. But the dispersion is to a certain extent higher, with a minimum and maximum of 10.9% and 25%."* From this perspective, there is a big difference between the standard and implicit VAT rate.

Cnossen [5] compared implicit tax rates in the EU and USA for various taxes, including VAT. Aizenman and Jinjarak [6] dealt especially with political and structural factors influencing VAT collection efficiency in terms of the implicit VAT rate. The implicit and standard VAT rates from the point of consumption were studied in [7] and [8].

Keen's [10-13] approach to VAT is more complex, studying VAT rates in terms of the overall concept and anatomy of VAT.

In the Czech Republic, the issues related to implicit taxation were studied by Vašková [12], who compared implicit average tax rates as parameters of economic decision making for selected taxes (including VAT), illustrating this with examples of the Czech Republic, Hungary, Poland, and Slovakia. Klazar et al. [13] addressed the issue of VAT rate harmonisation in the Czech Republic. Pavel Vitek and [14] addressed the question of the effectiveness of tax collection, also dealing with VAT.

2. Material and Methods

We used data from the Eurostat statistics database [15] and from publications of the European Commission [15]as the sources of information on the share of the VAT revenue in GDP, the total household consumption, and tax revenue from VAT for our subsequent calculation of implicit rates. All these data were for the 27 EU member states (without Croatia) for the period of 2002 to 2011.

The data on which we focused were:

- the standard VAT rate (STR),
- the implicit VAT rate (ITR), and
- the share of VAT revenues in GDP (%).

In the analysis, we compared the relationship between the standard and implicit VAT rates. The implicit rate was constructed as follows:

$$ITR = \frac{VR}{C} \qquad (1)$$

where ITR is implicit VAT rate for the period,
VR are VAT revenues for the period, and
C is the private household consumption for the period[2].

The G_{SIR} indicator, i.e. the gap between the standard and implicit VAT rate in % points, which was already used by Mathis [4], was supplemented for the sake of completeness:

$$G_{SIR} = STR - ITR \qquad (2)$$

where STR is standard tax rate of VAT.

In the analysis, we used a tool set comprising the theory of sets and a correlation analysis in which we divided the basic set of the EU member states into individual subsets in a breakdown according to their specificities.

For the basic analysis, we divided the basic set of the EU member states into four equally large subsets, each comprising 7 member states, depending on the average amount of the standard and implicit VAT rate in the whole studied period. The only exceptions were the subset of countries with the lowest standard VAT rates - Low, which contained only 6 countries, and the Lower Middle subset of implicit VAT rates, which also contained only 6 countries. The subsets were made so that any two countries with the same average rates were always included under the same subset. We titled the subsets (groups) according to the VAT rate amount, as shown in Table 1, which contains the titles of the subsets and the ranges of rates in the breakdown by the standard VAT rate and implicit VAT rate.

Table 1. Division of member states into subsets according to the amounts of tax rates

The tax rate amount	Standard VAT rate interval	Implicit VAT rate interval
High rates	< 21.0, 25.0>	<15.5, 20.7>
Upper middle rates	<19.8, 20.9>	<13.3, 15.4>
Lower middle rates	<18.6, 19.7>	<11.8, 13.3>
Low rates	<14.8, 19.6>	<9.9, 11.7>

Source: Authors

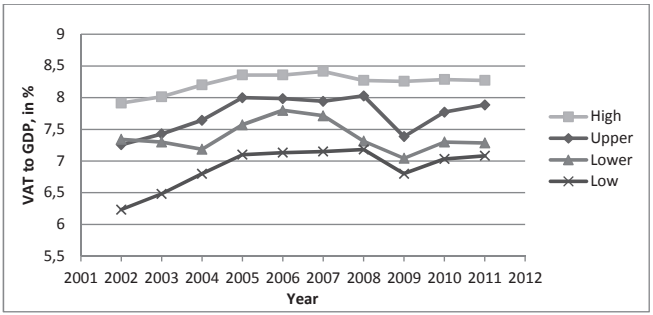
We supplemented this analysis with a correlation analysis on the same sets. We then showed the relationship between the standard and implicit VAT rates for individual EU member states to support the analysis outcomes.

3. Results and Discussion

The following graph shows the outcomes of the analysis of the relationship between the standard VAT rate and the share of tax revenues to GDP for four groups of member states according to their standard tax rate.

[2] We use C because private household consumption is relatively stable indicator. Private household consumption cannot fall below a certain level (people cannot stop consuming). We know that ITR is possible to construct also using investments VR/(C + I), but we wanted to focus more on consumption.

Figure 1. Share of VAT Revenues to GDP for the standard rate of VAT



Source: Authors

The chart suggests that the member states with higher rates also have a higher average share of VAT to GDP. Obviously, the member states with the highest tax rates (BE, DK, IE, HU, PL, FI, SE) from the High Rates subset then have the most stable tax revenues.

The decrease in revenues that occurred in 2009 in all groups except for the member states from the High Rate group is considered of interest for the subsequent analysis. The most significant decrease was in the group of member states from the Upper Middle Rates group. This is particularly interesting when taking into account that, within the whole EU 27 set, the standard VAT rate was increased in 5 countries (IE, HU, EE, LV, LT) and decreased in just 1 member state (UK) in 2009. We expect that the tax revenue loss was caused by the global financial crisis resulting in reduced consumption, although, holding other things constant, the decline in GDP would otherwise mean an increase of VAT revenue to GDP, even though this would not change its nominal value as compared to the previous period. A correlation analysis has been added to complete the analysis. Its outcomes are shown in Table 2.

Table 2. Correlation coefficients, standard rates

	EU27	High rates	Uper middle rates	Lower middle rates	Low rates
2002	0.602	0.806	-0.488	-0.349	-0.030
2003	0.591	0.807	-0.414	0.098	-0.007
2004	0.608	0.878	0.359	0.457	-0.083
2005	0.494	0.791	0.250	-0.412	-0.027
2006	0.438	0.860	0.363	-0.753	-0.072
2007	0.400	0.830	0.344	-0.827	-0.191
2008	0.383	0.901	0.296	-0.416	-0.195
2009	0.520	0.849	0.381	-0.102	0.180
2010	0.451	0.936	-0.075	0.148	-0.335
2011	0.529	0.883	0.464	-0.021	-0.106
μ[3]	0.502	0.851	0.148	-0.218	-0.087
c_v[4]	0.155	0.054	2.223	1.771	1.494

Source: Authors

Interestingly, there are large differences between the results of the High Rates group and all the other groups. Not only did the correlation for the High Rates group work out positively in all cases, but the lowest value of the correlation coefficient was 0.791 and the average for the

[3] Mean

[4] Coefficient of variation equals standard deviation by the mean. This is a good indicator of volatility. The higher number is, the more volatile the situation.

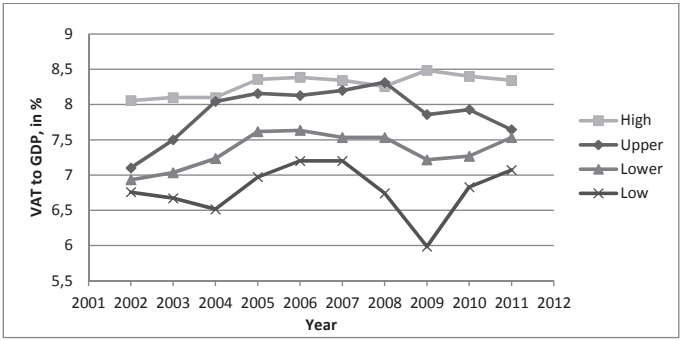
whole period was 0.851, which indicates a correlation between the amount of the standard VAT rate and the amount of revenues. Moreover, this group had the lowest standard deviation of the set. The correlation for the other groups was significantly weaker and often negative, which can be partially explained by the negative impact of the standard rate increases on consumption. Especially during an economic recession, consumer behaviour may be influenced by negative expectations associated with uncertainty. In combination with an increase in prices, tax revenues may decline subsequently as compared both to previous periods and original objectives resulting from the existing tax measures. This is because the fluctuation in tax rates may result in price changes, which will subsequently have an impact on consumption. The impact of increased rates on consumption (and consequently on savings) were studied by Alm and El-Ganainy [17], who stated that: *"VAT tax rate is negatively correlated with the level of aggregate consumption" when "one percentage point increase in the VAT rate leads to about a one percent reduction in the level of per capita aggregate consumption."* In contrast, the impacts of the temporary rate reduction in the UK in 2009, when the standard rate was 15%, were studied by Crossley, Low, and Wakefield [18], who stated that the temporary VAT cut also caused a decline in prices, though generally speaking, the market does not necessarily respond with declines in prices. Regardless of the revenue situation, there was an increase in consumption which approximately corresponded with the price decline. Crossley, Low, and Wakefield [19] hence assumed a temporary shortfall in revenues from VAT, which was also confirmed. Compared to 2008, when the share of VAT in GDP was 6.3%, it decreased to 5.6% in 2009.

It is possible that the differences in correlation coefficients between the High Rates group and the other groups were caused by a small number of changes in the rates for the studied period. There were three changes for the High Rates group, compared to ten changes for the Lower Medium Rates group and seven changes for the Upper Middle Rates and Low Rates groups. Thus, in addition to the development of rates and the VAT share in GDP, the frequency of changes in the rates may be another issue to be discussed.

Since we assume that, in accordance with the neoclassical assumption, the effective (economic) and implicit tax rates influence tax revenues more than the standard rate, we analysed the influence of the implicit tax rate on the amount of tax revenues.

The relationship between the implicit VAT rate and tax revenues with respect to GDP is shown in Figure 2 and Table 3.

Figure 2. Share of VAT Revenues to GDP for the implicit rate of VAT



Source: Authors

Comparing the graph with the table of correlations, it is noticeable that while the graph shows very similar results to the standard VAT rates, the table mostly provides different information. Dependences, which are also similar, were proved for all sets. Differences between subsets are not so significant here. It is interesting that the sets with lower rates (Lower Middle Rates and Low Rates) show the highest correlation coefficients.

In general, it can be concluded that the correlation between the implicit rates and VAT revenues with respect to GDP was not negative in any of the studied groups or periods. The most stable group here is the one with the lowest implicit rates (EL, ES, IT, LV, LT, RO, UK).

Table 3. Correlation coefficients, implicit rates

	EU27	High rates	Uper middle rates	Lower middle rates	Low rates
2002	0.774	0.811	0.566	0.698	0.527
2003	0.720	0.679	0.239	0.829	0.555
2004	0.706	0.642	0.168	0.770	0.226
2005	0.625	0.559	0.142	0.815	0.749
2006	0.592	0.533	0.613	0.799	0.817
2007	0.559	0.490	0.612	0.784	0.893
2008	0.641	0.511	0.907	0.504	0.903
2009	0.809	0.564	0.660	0.754	0.880
2010	0.681	0.401	0.645	0.727	0.768
2011	0.579	0.203	0.487	0.706	0.897
μ	0.669	0.539	0.504	0.739	0.722
c_v	0.120	0.288	0.464	0.120	0.291

Source: Authors

The comparison of the standard VAT rate and implicit VAT rate can be summarized as follows:

- The standard and implicit VAT rates correlate with revenues from the perspective of the whole EU set. If we divide the set into smaller sets according to the rate levels, great differences emerge between the correlation coefficients for standard VAT rates.
- In general, the relation between implicit rates and VAT revenues was more important.

It can be assumed that there are significant differences between individual member states as there are significant differences between individual rate levels. Therefore, the analysis will be complemented by a correlation analysis for all the studied member states for the whole period of 2002 to 2011, and the average gap between the standard VAT rate and implicit VAT rate and the coefficient of variation related to them will also be specified.

This analysis is shown in Table 4. Because one-third of the studied countries did not change their standard rates over the whole period, it was not always possible to determine the correlation coefficients. However, in the other cases, it turned out that there are significantly higher correlations between the implicit rate and the share of VAT in GDP (the correlation coefficients higher than 0.8 indicating a strong degree of dependence are highlighted in bold type in the table). The only exception is Finland; however, both values are relatively low there.

Most notable are CZ, IE, ES, LV, and SK, as they have a negative correlation for the standard rates (with the value being even lower than -0.5 in CZ and LV), while the correlation of the implicit tax rates and VAT revenues is concurrently high and positive (always above 0.9). The gap between the standard rate and implicit VAT rate is more varied in these countries than is the average for the EU 27 countries (6.17), but it still does not rank among the highest.

Table 4. Correlation Coefficients and the Gap between the STR a ITR in % points

	Correlation coefficients					Correlation coefficients			
Country	***STR***	***ITR***	G_{SIR}	c_V	**Country**	***STR***	***ITR***	G_{SIR}	c_V
BE	na	**0.851**	7.57	0.04	LU	na	0.617	-2.24	0.76
BG	na	**0.929**	5.78	0.28	HU	0.681	**0.929**	8.36	0.23
CZ	-0.636	**0.929**	6.47	0.29	MT	0.921	**0.958**	5.53	0.10
DK	na	**0.923**	4.31	0.10	NL	na	0.344	3.71	0.17
DE	0.959	**0.977**	5.73	0.10	AT	na	0.754	5.48	0.04
EE	0.237	**0.831**	3.00	0.28	PL	0.262	**0.971**	9.84	0.10
IE	-0.375	**0.944**	6.39	0.24	PT	0.56	**0.945**	8.07	0.14
EL	0.191	0.788	9.59	0.21	RO	0.437	**0.905**	8.54	0.18
ES	-0.132	**0.993**	6.48	0.24	SI	na	0.204	4.50	0.11
FR	0	**0.964**	7.06	0.05	SK	-0.059	**0.967**	7.27	0.21
IT	na	**0.857**	9.86	0.03	FI	0.415	0.052	5.88	0.13
CY	0.693	**0.984**	1.29	0.87	SE	na	**0.893**	5.95	0.12
LV	-0.559	**0.988**	7.60	0.31	UK	0.943	**0.971**	7.28	0.09
LT	0.421	**0.957**	7.27	0.16					

Source: Authors

4. Conclusion

This paper provides an analysis of the relationship between the standard VAT rate and the share of VAT revenues in GDP. The relationship between the implicit VAT rate and VAT revenues to GDP was also analysed.

The analysis suggests that it is not possible to confirm an unequivocal causality between the standard VAT rate and VAT revenues. In contrast, it can generally be said that implicit VAT rates are a more relevant tool in terms of the relation to tax revenues, as we had assumed.

The objective of the analyses was to determine, at least at the theoretical level, whether changes in VAT rates are a relevant political tool for increasing tax revenues. No universal answer can be given to this question. In the UK, the answer so far seems to be yes. Nevertheless, this country has shown a stable rate in the long run (with the exception of the rate increase in 2011), with its temporary decrease. In general, however, the causality between the standard VAT rate and tax revenues cannot be confirmed.

In contrast, this causality was confirmed for the implicit VAT rate. We realize that the implicit VAT rate is not something what the government has under control. ITR reflects many economic contexts that may affect rate changes. Many of them are mentioned above. Therefore ITR is giving supplement information on how the economy (consumers) can respond to changes in VAT rates. The fact that the differences between the ITR and SR are not the same just shows that we cannot indiscriminately adopt conclusions: Higher tax means higher return and vice versa.

If we were to summarize the findings as recommendations for the Czech Republic, we definitely would not recommend any unilateral increases in VAT rates to stimulate tax revenues. There is a significant risk that the result would be the opposite of what was intended. For most EU countries, the rate should be a supporting tool and the focus should also be on the tax base, as it ensues from the results of the analysis for the implicit VAT rate.

Acknowledgements

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Corporate Taxation in the EU between 1995-2012: Convergence or Divergence?

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Abstract

The article deals with the corporate tax competition and coordination between the EU states. The main goal of the article is to verify the hypothesis whether or not there is a convergence or a divergence of corporate taxes within the EU. To evaluate this, we have used the indicators of convergence / divergence of corporate tax rates, implicit tax rates and tax bases in 1995-2012. The results show that during the analyzed period, the statutory and implicit tax rates variability has decreased more in EU15 countries. On the contrary, the variability of the corporate tax bases has increased more heavily in EU15 countries in the same period.

Keywords: Tax policy; tax competition

JEL Classification: H20, H25

1. Introduction

Ever since the EU foundation, a discussion has been underway on the necessity or harmful effects of the coordination or harmonization of corporate taxation in both tax base and tax rates. In the past decade, a significant development has occurred in the area of the so-called common consolidated corporate tax base [1], albeit it is unlikely that the proposal will be adopted at any time soon. However, no formal harmonization steps are currently being taken as far as the corporate tax rates [2] are concerned.

Numerous authors dealt with the topic of tax competition and tax coordination and with the relation of structural elements (tax rates, tax base) of corporate taxes to various variables (economic growth, corporate decisions, FDI, tax system structure, corporate expenditures, etc.). Wilson provides a basic overview of the theoretical concepts of tax competition [3]. As one of the indicators of tax competition he applies the rates of convergence or divergence of certain elements or parameters of tax systems. Bretschger and Hettich [4] analyzed the data of 14 OECD countries collected within the period of 1967-1996 and found out that globalization has a negative significant impact on corporate taxes. They also tested the "efficiency" and "compensation hypotheses" only to ascertain that they are not competing. Pereira [5] assesses the development of the standard deviation of corporate tax rates within the EU between 1999-2002 and shows its decline. Chen et al. [6] discusses whether or not the governments in the emerging Asia and Pacific region independently set corporate tax rates, and they find the evidence of fiscal policy interaction. They conclude that countries in the Asia and Pacific region seem to become more competitive in corporate tax rates. Rivero and Casquero [7] analyzed the tax policy convergence in EU15 during the period 1965-2005. They assessed the convergence of the main components of tax revenue and their results show little evidence of tax convergence in EU15.

Krajewska and Krajewski [8] compare the nominal and effective corporate tax rates in EU15 and EU12 and discuss their development from the tax competition point of view. Gupta and Newberry [9] analysed the US tax reform in 1986 and suggested that corporate effective tax rates are not associated with the size of the company but with the company's capital structure, asset mix and performance. Janssen and Buijink [10] also analyzed the relationships between the variation in average effective tax rates (among Dutch companies) and company characteristics, such as size, asset mix, extent of foreign operations, etc. The results show that the taxation of corporate profits in the Netherlands is fairly neutral. Bellak et al. [11] analyzed

the connections between tax-rate elasticities of FDI to CEECs and statutory tax rates. According to the authors, the statutory tax rates are problematic measures of tax burden. Bušovská et al. [12] and the European Commission [13] then evaluate the variability of corporate taxation within the EU by means of similar indicators (standard deviation, coefficient of variation).

The objective of this paper is to analyze the following issues by means of standard indicators:

- Variability of structural elements of corporate taxation (statutory tax rates and tax bases) and variability of indicators reflecting the effective taxation of corporations (implicit tax rate on corporations),
- Find out how the homogeneity of these variables differs between EU15 and EU12 and how it has been developing in the past 15 years,
- Analyze the impact of the crisis in 2009 on the degree of variability of the variables concerned.

The methodology applied in order to resolve these objectives is based on the monitoring of the variability indicators, such as the standard deviation and the coefficient of variation. Given a low information value, the variation range is not applied. The deviation is used in the form of a standard deviation. The quantile characteristics of values of selected variables is not applied due to the limited scope of this paper. The data used in this analysis has been retrieved particularly from the Eurostat database and from the official publications issued by the European Commission.

Paper on this topic has not been published yet. Bušovská et al. [12] compare only statutory corporate tax rates with using the standard deviation. European Commission [13] used standard deviation, range, and weighted and arithmetic averages for implicit tax on corporate income and share of taxes on capital (as % of total taxation and of GDP). The study, which compared the variability of the statutory and implicit tax rates and tax bases, is not available. There is also no measurement of the variability of these indicators using the coefficient of variation, which allows a better comparison of the relative degree of variability. Also, there are no papers show how the variability of these indicators has changed due to the economic crisis (and how the variability has changed for the EU15 and EU12).

2. Material and Methods

The analysis of convergence or divergence of the corporate taxation within the EU and the differences between EU15 and EU12 is based on the application of standard descriptive statistics' methods, which are used in order to ascertain the variability of the sample. A low level of variability means a great or, as the case may be, a small diversity of the values of a variable. Since the characteristics of the center of the sample do not make it possible to ascertain how the values in the sample are distributed, it is not just the average indicators that are applied in the analysis but also the variability rates described below:

- The Sample Standard Deviation σ, the standard calculation of which is depicted as square root from the deviation according to the formula below:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{N}(x_i - \mu)^2}{n-1}} \qquad (1)$$

in which x_i are variable's values in the sample, μ is the average of the values and n is the size of the sample.

- The Coefficient of Variation V, which is easily applicable to compare the variability of two or more samples because it enables to remove the influence of a general level of the given values. The standard calculation of the coefficient of variation is depicted in the formula below:

$$V = \frac{\sigma * 100}{\mu} \qquad (2)$$

As opposed to the EU (2013), this analysis does not apply the range nor the quantile characteristics, such as the quantile range, quantile deviation or relative quantile range.

The data which serves as a basis for this analysis follows from the official statistics of the European Commission – Eurostat [14] and from the OECD data [15]. In Eurostat, it is the Annual government finance statistics (gov_a), Government revenue, expenditure and main aggregates (gov_a_main), and Main national accounts tax aggregates (gov_a_tax_ag). In the OECD, it is the data retrieved from the OECD.Stat Database OECD Tax Statistics. Annual summaries of the development of the EU tax systems serve as other sources of the data on the development of rates and CIT bases [13].

The data on the implicit tax rates of corporate income in Ireland, Greece, Luxemburg, Bulgaria, Malta and Romania in the period concerned is not available. The missing data from 1995 (ES, EE, HU) and 2009 (PT), 2010 (DK, ES, PT) and 2011 (DK, ES, PT) has been interpolated. The capital tax base is a variable replacing the missing estimates of corporate tax bases. The data is retrieved from the EU [13], p. 39, and is measured as % GDP. The data on Luxemburg, Bulgaria, Malta and Romania is missing completely. The data on the period of 2002-2004 and 2011 for Greece are missing and has been interpolated.

Missing values of time series can be replaced by a central characteristic (of the sample or the surrounding values) as a mean or median, linear interpolation between adjacent points or trend of the whole sample. For this article, the missing data has been interpolated via three-year average of the following (or preceding) years according to missing year (for example for 1995: three-year average of 1996-1998). The data on corporate tax bases and Luxemburg, Bulgaria, Malta and Romania is missing completely and therefore has not been interpolated.

3. Results and Discussion

3.1 Statutory tax rates

The first step in the evaluation of convergence (coordination) or divergence (competition) of the corporate taxation is an analysis of the statutory tax rates (including surcharges and average local taxes). The corporate tax rates in all developed states have been on decline since the 1980s. It generally applies that the key motivation of the tax rate decrease was the "tax base broadening, tax rate reduction" policy, which was to stimulate the supply side of an economy and also promote capital inflows.

Within the EU, the corporate tax rates are decreasing throughout the period concerned (by 12.5 ppts.). The greatest drops of the CIT rates occurred between 1999-2005 when they dropped in average by more than 8 ppts. within EU27. The EU enlargement by EU12 accelerated the drop in the average nominal rates in EU27 as the new member states had and currently have lower nominal tax rates. Since 2008, the decline has stopped and slightly increased in both groups of the countries in 2013 for the first time in the past two decades. According to [16], one explanation of the rate volatility in 2008-2012 may be the effort to support businesses at the time of a recession.

If we use the standard deviation σ as a criterion of convergence or divergence of rates, there is an obvious declining variability in EU15 throughout the entire period concerned, except for 2000-2002. In EU12, the variability had been on decline until 2002 but then it grew and continues to stay on a higher level. As a result of the rate variability growth in both groups of the countries in 2000-2002, the variability in EU27 sharply rose from 2001 and started to slightly drop only in 2005. Since 2010, however, it has been on the rise again due to increasing differences in rates among the EU15 countries.

Figure 1. Statutory tax rates: standard deviation

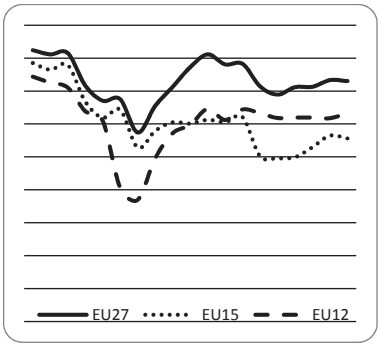
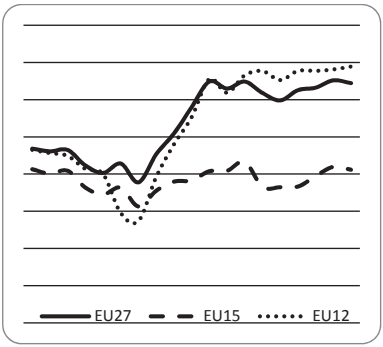


Figure 2. Statutory tax rates: coefficient of variation



Source: Data from [13] and author's calculations

Using the variation coefficient V, the influence of a differing level of rates' values in both samples (EU15 a EU12) may be removed. The results are shown in the figure above, which, as opposed to the standard deviation, shows that the rates' variability grew in each group of the countries, particularly due to the growth of the rates' variability in EU12 countries at the beginning of the 20th century. The main reason was a sharp drop of rates in some of the post-transition countries, which was not applied in a blanket manner by all EU12 countries.

The average standard deviation and the average coefficient of variation depicted in the table below show a more global view of the development of rates' variability. The average coefficient of variation shows a growth of the rates' variability in the crisis and post-crisis period, which is not the case in the average standard deviation. The same conclusion applies to EU12: *V* grows but σ is not really changing. In the EU15 countries, the variability measured by *V* in 2009-2013 is not changing and the variability measured by σ is falling.

Table 1. The impact of crisis on CIT rates variability: average standard deviation (σ) and average coefficient of variation (V)

$\bar{\sigma}$	1995-2013	1995-2008	2009-2013	$\overline{V}$	1995-2013	1995-2008	2009-2013
EU15	6,1	6,4	5,3	EU15	19,20	19,07	19,57
EU12	6,1	6,0	6,2	EU12	26,76	24,26	33,77
EU27	7,3	7,4	7,2	EU27	27,01	25,40	31,51

Source: Data from EU [13] and author's calculations

3.2 Implicit tax rates

The implicit tax rates applied on corporate income (ITR_{Corp}), which replaced the original concept of average effective tax rates [17], measure the average tax rate affecting the tax subject (usually the consumption, personal or corporate incomes, energy consumption, etc. – see [13]). The last ITR_{Corp} data [13] for 2011 shows that at the beginning the ITR_{Corp} in EU12 were significantly lower than in the original EU countries. However, from early 21th century, the rates in EU12 are lower than in the EU15 countries, whereas the difference in the average corporate taxation stays around 5 ppts, except for 2009. Since 2009, the average corporate income taxation in the EU12 countries drops rather quickly compared to EU15 and the difference in the average corporate income taxation in 2011 now reaches more than 8 ppts.

The standard deviation σ for ITR_{Corp} shows a growing variability in EU15 in 2003-2007 and a decline or stabilization since 2008. In EU12, σ had been falling until 2004, then stagnated or slightly fluctuated . After the initial decline at the turn of the decade, the variability in EU27 also slightly fluctuates in the upcoming years.

Figure 3. ITR_{Corp}: standard deviation

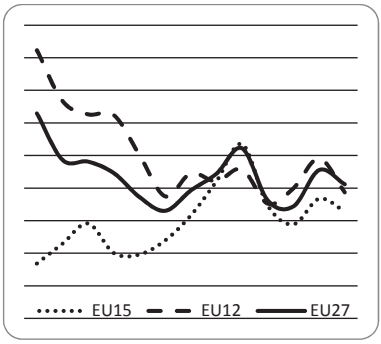
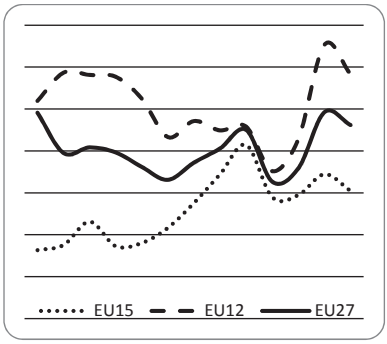


Figure 4. ITR_{Corp}: coefficient of variation



Source: Data from [14] and author's calculations

The coefficients of variation show a rather significant growth of heterogeneity of values of the ITR_{Corp} in EU15 until 2007 and, after a drop in 2008, also a stabilization of the results. The variability in EU12 throughout the period is higher than the variability in EU15 and it sharply increases after 2008. The coefficient of EU27 variation is rather high (40 %) and, after a stabilization in 2000-2005, it fluctuates for the rest of the decade.

The average standard deviation shows a decline of the ITR_{Corp} variability in EU12 and EU27 after 2008. The average coefficient of variation shows a post-crisis increase of variability in all groups of countries.

Table 2. The impact of crisis on ITR_{Corp} variability: average standard deviation and average coefficient of variation

$\bar{\sigma}$	2000-2011	2000-2008	2009-2011	$\bar{V}$	2000-2011	2000-2008	2009-2011
EU15	6,3	6,2	6,6	EU15	27,0	25,6	31,5
EU12	9,6	9,9	8,5	EU12	50,8	49,2	55,5
EU27	8,4	8,5	8,1	EU27	39,7	38,3	43,7

Source: Data from EU [14] and author's calculations

3.3 Tax Base

The last parameter of the corporate taxation compared herein is the tax base (TB). The tax base is estimated [13] by means of the national account statistics and the data provided by member states % of GDP.

Except for the period of 2008-2009, the tax base stagnates or slighly grows. In 2008-2009, it sharply dropped as a result of the recession and it nearly returned to its pre-crisis level in 2010-2011.

As opposed to the preceding structural parameters of corporate taxation, the standard deviation points to a higher variability among the EU15 countries compared to the EU12 countries, in particular within the period of 2002-2007. The standard deviation in EU15 grew in 2001 and has been higher since then (except for 2009) compared to the EU12 countries. Again, it is not possible to determine from the data whether or not it is a result of any ad hoc government changes or a result of an increase of the number of businesses and their profit. The analysis carried out e.g. [18] and [19] suggests that the size of the corporate sector (and until 2009 also its profitability) has been growing on a long-term basis in the developed countries.

Figure 5. Tax base: standard deviation

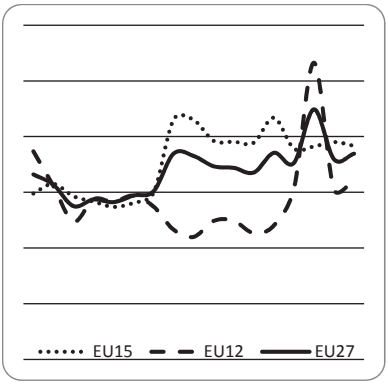
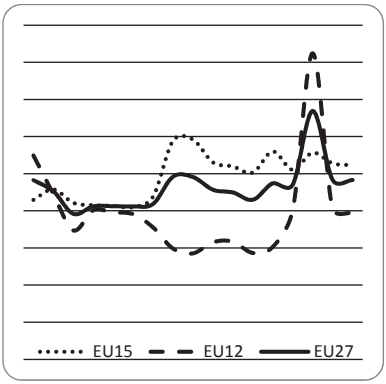


Figure 6. Tax base: coefficient of variation



Source: Data from [13] and author's calculations

The coefficients of variation show a similar picture: an average higher variability in the EU15 countries, a sharp increase of the data heterogeneity in 2009 in both groups of countries but a higher acceleration in EU12, and a slight increase of variability throughout the entire period concerned. However, the limitation of the analysis caused by the missing data concerning Ireland, Greece, Spain and Estonia in 1995-1999 must be taken into account in analyzing the tax base.

The comparison of both variability indicators shows a significant impact of the recession on the tax bases' heterogeneity in both groups of countries, i.e. also in EU27. The tax base fluctuation was significantly stronger in EU12 where the recession reflected more intensely in a GDP decline.

Table 3. The impact of crisis on tax base variability: average standard deviation and average coefficient of variation

$\bar{\sigma}$	1995-2011	1995-2008	2009-2011	∇	1995-2011	1995-2008	2009-2011
EU15	7,1	7,0	7,7	EU15	24,7	24,2	26,8
EU12	5,8	5,4	7,7	EU12	19,8	18,2	27,1
EU27	6,8	6,5	7,9	EU27	23,2	22,3	27,3

Source: Data from EU [13] and author's calculations

The results of the analysis show that the variability of structural elements (the statutory rates or tax base) and the indicator expressing the effective corporate taxation (ITR_{Corp}) within the EU is rather increasing, which means that the systems of corporate taxation within the EU are further diverging. These conclusions may be influenced to a certain point by the applied variability-measuring indicators, albeit according to [20] the standard deviation as well as the variation coefficient may be applied to the situations analyzed herein.

Similar results concerning the corporate taxation variability are reached in [12] and [13]. Chen et al. [6] conclude that countries in the Asia and Pacific region seem to become more competitive in corporate tax rates.

Without the interpolation of the data in 1995, the results for the ITR and the coefficient of variation for EU15 change from 16 to 12%, for EU12 from 52 to 40% and EU27 from 49 to 47%. Direction of the changes is similar for standard deviation: for example, for EU27 standard deviation decrease from 12.6 to 12.3. Missing data for ITR and for example year 2010 changed the variation coefficient for EU15 from 34 to 27% and for EU27 from 49.2 to 48.9%. Without interpolation, in the case of Greece and corporate tax bases, the coefficient of variation in the EU15 fell by 1-2 percentage points but conclusions for the development of variability in the

EU15, difference in variability between the EU15 and the EU12 and the impact of the economic crisis on the variability would not change.

4. Conclusion

The results of the analysis show the following conclusions:

- Although the statutory corporate tax rates within the EU are on a long-term decline and their variability fluctuates (σ) or grows (V), the key cause are the EU12 countries. The economic crisis increased the variability of rates only in EU12.
- ITR_{Corp} within the EU fluctuate, so does their variability due to the 2009 recession. A greater scope of variability as well as the statutory corporate tax rates are reflected in EU12.
- The size of the tax base is increasing on a long-term basis and the variability fluctuates. In this single case, the variability in the EU15 countries is higher than in EU12 and it sharply increased in EU12 in 2009.

It is also desirable in a follow-up research to analyze some other variability measures, in particular the quantile characteristics. It is also necessary to analyze in more detail which factors affect the deviations in the tax base and whether or not these are just ad hoc changes in the tax legislation or changes associated with the growth of the corporate sector and profitability of businesses. It is also necessary to compare the ITR results with the results of the effective average tax rates.

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Pensions: Hard, Soft or No Compulsion?

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Abstract

The liberal, conservative, and social-democratic pension models basically differ in their philosophy and parameters. They agree on the obligation to have 1 - 2 pension pillars. The neoliberal pension model, with its typical construction, tries to combine individual choice (and liability, including the exposure to investment risk) with government regulation. This is difficult and associated with objectively high transition and overhead costs. To facilitate the reforms and increase the coverage, three methods of soft compulsion have been elaborated: opt-out, automatic enrolment, matching contributions. The Czech pension reform of 2013 has relied on the opt-out method in the second pension pillar while continuing to subsidize heavily the third pension pillar with extremely high coverage. This use of two soft compulsion methods is counterproductive; for a neoliberal pension policy one soft compulsion pension pillar is enough. One funded pension product with hard or soft compulsion feature may serve the voluntary pension pillar as well.

Keywords: Pension reform; opt-out; mandatory savings; social insurance; soft compulsion

JEL Classification: H55, G22, H24, G28

1. Introduction

The so-called second pension pillar was introduced in Czechia as of 2013; however, less than 2% of potential clients have taken advantage of the opt-out option for the pillar so far. The issue of compulsory or voluntary participation in this pillar has been discussed since the commencement of activities relating to the pension reform. The Bezděk Pension Committee came to a conclusion that participation in the second pillar shall be compulsory for all individuals under 40 and that the individuals who are over 40 at the start of the reform will remain fully within the first (PAYG) pillar [1]. The Committee ruled out any voluntary participation in the pillar in any form, considering the high overhead of the private sector in countries that had previously introduced the 2nd pension pillar.

The Government of Nečas stated in its Government Policy Statement that it would strive to apply the conclusions of the Bezděk Committee as much as possible. In spite of this, Nečas considered it useful to publicly pronounce the following at the beginning of January 2011: "We are supporters of voluntary savings; however, if the reform were to fail due to this, I have to underline that we are also in favour of compulsory pension savings" [2]. Representatives of the coalition parties then agreed on compulsory participation in the 2nd pillar for insureds of up to 35 years of age. This was followed by a strongly negative standpoint of President Klaus in respect of any compulsory pension savings. The smallest coalition party then forced a major modification of the reform. The Government subsequently agreed on the opt-out of 3% of wage, a part of contribution paid by employees to the state budget, to a private account of such person with the private pension company of their choice. Furthermore, this was preconditioned by the fact an employee would add another 2% of wage to the aforementioned opt-out. This construction was not backed up by President Klaus either, as it is far from the liberal concept of pension security. Furthermore, Klaus emphasized that the "new voluntary pension insurance subsystem" would also come into existence at the expense of the existing supplementary pension insurance [3].

The whole concept of the paradigmatic neoliberal pension reform was elaborated by the World Bank in 1994 [4]. This totally newly formulated concept envisages a mandatory privately managed pillar, which would be in the form of personal savings plan or occupational plan. The

2nd pillar conceived in this manner is the economically most significant pillar; the first, public pillar is in fact solely of subsidiary, solidarity nature. The third pillar is voluntary under the World Bank concept.

The World Bank took inspiration from Chile, where it was newly not possible to enter the existing social pension insurance scheme as of 1981. Those, who were insured under the existing system, could opt-out, without the possibility to return later. The major economic motivation for the opt-out was the immediate substantial net wage increase by more than 10% on average, given by the considerably lower rate of contribution under the new system, compared to the former pay-as-you-go social insurance. The reason is the fact that a much lower insurance premium is required under a funded system with high investment returns.

The concept of the neoliberal pension reform, with the mandatory private 2nd pension pillar at the core, originally strongly promoted by the World Bank, has only been implemented in a few non-European countries in the full extent. As from 2003, the World Bank team has been promoting a system that comprises two mandatory public pillars and an absolutely voluntary third pillar. At the "core" of the system is a modern version of social pension insurance [5].

The 2012 World Bank Conference, dedicated to MDC (matching defined contribution), came to a conclusion that, in order to promote higher universality of pension security, it is possible to use the matching of individual contributions in favour of their voluntary pension security – on the part of employers and of the state, in combination with auto-enrolment [6]. The intensive subsidizing of voluntary pension savings or insurance alone results in similar behavioural reactions as the auto-enrolment – and it is thus possible to allocate it to the soft compulsion concept.

The OECD discussion paper of 2008 states that "the most obvious route to encourage private-pension provision is through compulsion, which achieved both high overall coverage and a uniform distribution of coverage across age and income levels. … An important, but sadly unresolved question is whether compulsion is necessary" [7]. The authors also dispute the initial hypothesis for the existence of public pensions in public economy, according to which people are myopic about saving for their retirement; they state that evidence is mixed on this key issue; furthermore, compulsion has some drawbacks. It is possible to classify four groups of arguments for this thesis: a) the losses in terms of individual welfare from forcing people to over-save can be as great as the losses from myopia and under-saving; b) formal pension plans are not the only way people can and do save for their retirement; c) mandatory contributions to pensions are often perceived as a tax, which is likely to discourage people from working; d) the providers of voluntary pension arrangement, especially occupational pension schemes, have often opposed compulsion because it would crowd out these existing plans. There is also risk that existing provision is levelled down to the amount of the mandate [7, p. 20].

The cited OECD study comes to a conclusion that the compulsion's disadvantages and the risk of under-saving with purely voluntary private pensions, has prompted the development of a "third way": automatic enrolment. The idea is that people have to opt out of saving for retirement rather than opt in – this is often called soft compulsion. The authors also mention three examples of the auto-enrolment application (UK, US, NZ). To conclude, they state that unfortunately, the evidence on the effectiveness of these schemes is very limited. However, the introduction of a scheme with auto-enrolment does not preclude shifting to compulsion at a later time should take-up prove small [7, p. 20]. The study summarizes findings on soft compulsion in 2008. Meanwhile, a number of years have gone by and it is already possible to discuss sufficient experience with auto-enrolment in New Zealand. We will also address the pension reform in Great Britain. At the same time, we will mention MDC – this method is used in both countries simultaneously. The soft compulsion analysis will also include the already "historical" opt-out in Chile and in Great Britain, as well as the present Czech opt-out. Moreover, we cannot leave the Czech MDC out either, in the form of extremely successful state subsidies to the supplementary pension savings. For each specific case, we will attempt to integrate the relevant pension policy under the corresponding pension social model.

The objective of the paper is to analyse the use of the specified soft compulsion methods; we will derive from the entire range of pension models and products in the course of the secondary analysis of the sources.

2. Material and Methods

We rely on our previous research of pension models and benefits associated with entering the 2nd pillar. In conformity with most authors, we rely on the generally known principle that no pension system is ideal. The comparison of existing pension systems, our material in this paper, is of practical importance. We will first examine, whether and how the individual pension social models – or the particular pension schemes of the specific countries, as appropriate – use the three soft compulsion methods: opt-out, automatic enrolment, and matching contributions.

The modern liberal pension model is very simple: the liberals only accept an absolutely voluntary pension savings and insurance, supplemented by a purely solidarity pension. With regard to OECD countries, such construction of the pension system is only found in Ireland – and even with some exceptions. Until recently, however, these models formed the basis of the pension systems in New Zealand and Australia. However, New Zealand introduced a new pillar KiwiSaver in 2007 that applies two soft compulsion methods. Prior to that, the tax neutrality principle in respect of all savings vehicles applied for nearly two decades and New Zealand was basically an exemplary liberal country with a relatively high universal pension – at 40% of average nationwide wage (for singles).

KiwiSaver is a combination of pension savings, savings for the acquisition of one's first house; the funds may also be utilized in case a client runs into serious financial problems (e.g. due to disease or disability). The employer is required to contribute to his employee if she/he takes part in the KiwiSaver. Moreover, an auto-enrolment system is applied, under which new employees of the given institution are enrolled automatically; however, they may apply for annulment from the start – after 2 weeks of contribution payments, but only for a relatively short period of the next 6 weeks. They may not exit the system otherwise. Liberal advocates of this construction appreciate the option not to participate in the system, usually underlining the social aspect – specific poor employees or citizens may not be able to afford the product. At the same time, KiwiSaver was in principle intended for the middle class. Poor old people are well provided for by the universal pension in New Zealand.

Originally, the employer's contributions were optional. Several amendments later, a mandatory contribution of an employer was set down as of April 2013, amounting to 3% of wage, whereas the minimum contribution of employees amounts to 3% of wage as well. The state also provides substantial support: each person is given a kick-start payment of $ 1,000 and, in particular, a regular state contribution. The state originally matched the member contributions up to $ 20 per week in the form of a 100% tax credit. The tax credit for employee contributions was reduced from July 2012 to 50% up to a maximum equivalent to $ 10 per week. The reduction of the state contribution took place as a result of fiscal pressures; the product sales were extremely successful, due to the huge state subsidies and mandatory contributions of employers. The coverage was 64% of the population at the age of 18-64 years in March 2013.

Australia has had a means-tested "age pension", increasing income of single pensioners in excess of 25% of average nationwide wage of males. As of 1992, a new pension pillar – superannuation guarantee – was launched; the pillar "evolved" from occupational schemes basically into personal pensions of employees, with compulsory contributions of employers – originally in the amount of 3%, currently at 9.25%; in 2020, the rate is to amount to 12% of wages. Therefore, there is a hard compulsion in case of the "Super". Moreover, Australia also introduced the Superannuation Co-Contribution Scheme in 2003; there is a state contribution to voluntary contributions of participants in the Superannuation fund. In this case, the state originally matched employees' contributions in the amount of 150%; in this manner, employees (with lower wage) could get up to $ 1,500 per year. Several rounds of reductions of rates and amounts have come, the state co-contribution currently amounts to 50% of a contribution made

by an employee with annual wage of up to $ 33,516; the annual maximum for the state contribution amounts to $ 500. So Australia also applies soft compulsion – in the form of matching contributions!

The modern liberal pension scheme tends to be associated with Beveridge, because the post-war British Government introduced – based on the Beveridge's Committee Report – a universal (flat-rate) pension. However, occupational pension schemes evolved in the UK "from the bottom" in the subsequent decades and the 2nd pension pillar was supplemented by, among others, the state earnings-related system (SERPS) at the end of 1970s, from which it was possible to opt out to an occupational scheme of corresponding quality, provided an employer offered it. During the reign of Thatcher, another possible opt-out was introduced – from occupational pensions to personal pensions, in the spirit of neoliberalism. The opt-out was carried out by financial advisors, resulting in the acquisition of about 75% of employees for the opt-out to personal pensions, but also in a great extent of misselling, where advisors urged clients to opt-out for the true private financial sector even when it was clearly disadvantageous for clients. Other, slightly smaller reforms were implemented; for example, the SERPS was transformed into the state second pension (S2P). As of 2012, the new major pension reform is gradually being implemented; opt-outs have already been eliminated. The reform will also result in, among others, elimination of the S2P (by 2030), with simultaneous significant increase of the universal pension. Company pensions are, once again, becoming important under the reform. Although personal pensions remain, they are now absolutely voluntary. Mandatory employers' contributions are only provided in favour of company pensions; the rate of such contributions should increase to 3% of wage for DC plans by 2018. Following the transitional period, the overall minimum contribution to the DC system will amount to 8% of wage in that year, of which 4% would be borne by employees and the remaining 1% is in the form of tax relief for employees. Employers must offer qualifying pension scheme for auto-enrolment to employees; it may be acquired on the market, as well as via a public provider – NEST – formed as a low-cost vehicle for lower earners with no access to a good company pension arrangement. Therefore, two soft compulsion methods are applied here: auto-enrolment and matching contributions.

The conservative pension model was originally mainly associated with Bismarck, with the social pension insurance scheme that arose at the time. Today, the Bismarck's model is often simplified as earnings-related pensions. However, the conservative pension model features deeper social-economic characteristics: it reflects and underlines the existing social structure of the given country. It is based on hard compulsion.

The social-democratic pension model combines earnings-related universal social insurance with significant solidarity pillar. In general, it is not relevant whether social insurance is financed on a pay-as-you-go (PAYG) basis or whether it is funded. As stated by Soede and Vrooman: the entire social-democratic social model (welfare regime) "aims to realize a high level of social protection for all inhabitants. Benefits and provisions are accredited at a level that corresponds to the wishes of the most critical among the new middle classes, and no distinction is drawn between the rights of the working class and those of the better-off. This is achieved through compulsory collective insurance schemes with earnings-related benefits" [8].

The neoliberal pension model was basically characterized in the paper introduction. Hard or soft compulsion plays an important part of the model. The private sector regulation is of crucial importance here, comparable to the administration of the public earnings-related pillars. It is also associated with a considerable political risk and, moreover, the state may be under a strong pressure of the relevant financial groups. From many perspectives, the neoliberal pension model rises and falls with the effort to use funded schemes, with their micro- and macro-economic effects. In this case, investment returns and the system overhead represent significant economic parameters.

The pension experience of the developed countries represents a valuable material for the post-communist countries. The soft compulsion methods are to be analysed within the whole regulatory framework of the pension system. Our main research method is the literature reviewing, extracting representative, reliable sources.

3. Results and Discussion

Neoliberal pension constructs rely on the underlying economic advantage of the private sector in the provision of pension security. This is the main reason why the public sector is to subside. If it is not possible to privatize the public earnings-related schemes immediately and to the full extent, then arguments on the necessary diversification of individual pillars emerge; in this case, it is necessary that the product provided by the state or social insurance institution be different, not comparable to the product provided by the private sector in the 2nd pillar. Professional marketing support may be simple in many regards, because public pensions are usually in the form of DB (defined benefit) pensions. And the private sector does not find these DB products too attractive, as they are associated with investment risks on the part of the provider. Moreover, they also comprise the longevity risk: individual insurance companies may easily underestimate the risk – and this could lead to considerable losses on their part. Lifelong pension insurance is a contract for 60 to 70 years – on average! The optimal solution for the private sector is to divide this product into two phases: savings and pay-out phase. At the same time, the pay-out phase alone represents a significant risk. The easiest "solution" of the pay-out phase is to eliminate it: either literally or by replacing the annuity with another product, e.g. by the guaranteed pension payments – a banking product. A unilaterally beneficial solution of the savings phase of the product is the transition to a DC system, which is associated with the full transfer of investment risks to clients. In order for clients to understand all this, we will do anything to increase their financial literacy.

Typical clients do not behave in line with the notions of the neoliberal pension theory. However, in case a country did in fact introduce mandatory private pension savings in accordance with the process implemented in Chile or, in Eastern Europe, politicians were generally more interested in other aspects of such pension reforms than clients' financial literacy. Unlike in Czechia, the numbers of clients increased very dynamically in other countries. In Poland, the reform commenced in 1999, with 78% participation one year later – although the participation was mandatory for people up to 30 years of age and insured persons at the age of 30 to 50 years were eligible for an opt-out. Prior to the global economic crisis, which did not affect Poland much, the average investment returns under the 2nd pillar were very high: 7% per year (inflation adjusted). In spite of this, the rate of the insurance premium transferred to the 2nd pillar decreased dramatically in Poland – from 7.3% to 2.3% of wages. Both the Polish Government and the opposition object to high public debt, (also) induced by the pension reform, as well as the high share of Polish government bonds in the assets of the Polish pension funds. Another significant reduction – or even overall elimination – of the 2nd pillar is currently imminent [9]. The economic development of Czechia has been considerably worse and, for this reason alone, a successful opt-out would have much more significant fiscal effects in Czechia than in Poland.

The Government has wanted to resolve the opt-out failure in Czechia for several months, first by intensifying the marketing and then by modifying the 2nd pillar product to increase its client attractiveness. Ideas emerged in respect of the product innovation, which would in fact lead to the weakening of the opt-out method, thus further weakening the role of lifelong annuity in the pay-out phase. There were efforts to implement these ideas quickly; however, the fall of the Government, for other reasons, was even quicker.

Under the neoliberal system of mandatory private pension savings, the opt-out "only" plays the role of a bridging instrument or accelerator to the mandatory private pillar. The application of the opt-out method increases the costs of the entire system; however, this was clearly not relevant for the decision-making process of politicians. In Czechia, this resulted in an opt-out for insured persons under the age of 35 and the possibility to enter the system solely during the first half of 2013 for others. The restriction for insured persons over the age of 35 may only be interpreted as a marketing trick: you have to decide within six months; otherwise you will lose this great opportunity forever. However, this is a short period and, moreover, the state strongly limited the provisions for acquisition of clients under the 2nd pillar.

The opt-out without the parallel obligation to enter the 2nd pillar – at least for the youngest employees, e.g. those who are entering the labour market for the first time – has only been applied in Lithuania; the reform in Lithuania took place as from 2004, and it was possible to opt-out 2.5% of wage. There was no time limit set for older employees and it is the case to this day. A reform of the pillar, currently taking place, is remarkable. In 2013, all clients were faced with three alternatives for further actions. First, they could continue with the 2% rate (of wage) until 2014 – they did not have to take any actions for this option. The second option was to add 1% of wage using one's personal funds, whereas the state would match the contribution in the same amount as an incentive. As of 2016, the add-on rate would increase to 2%, with the 100% matching preserved, i.e. the state budget would pay another 2% of wage. The third, also surprising option was the possibility to leave the 2nd pillar [11].

Estonia introduced mandatory private pension savings solely for insureds born in 1983 or later. Other insureds could opt out; the opt-out was very successful. After a year, the coverage was at 35%; today it is at about 90%. On the other hand, the coverage within the 3rd pillar is only 7%. The "strong incentives created by the government", specifically the matching of a 2% contribution of participants (of wage) with a 4% state contribution (of wage), are quoted as one of the key factors of success of the 2nd pillar in Estonia. The providers and the government succeeded in explaining the "matching" as a state contribution. The timing of the launch of the Estonian 2nd pillar is mentioned as another factor of success – it was executed during the period of very strong growth of returns on the global equity markets [12].

In 2013, the Czech pension savings providers as well as the Government of Nečas attempted similar interpretation of the high "state contribution" to the participants' contributions – as in Estonia. The Czech opt-out of 3% plus add-on of 2% does definitely not mean that the Czech state would match the participants' contributions to the extent of 150%; the thesis of the Association of Pension Funds, mentioned in the "Ten Commandments" of the 2nd pillar, is not true at all: "No other savings product with such high state contribution exists." The truth is, actually, that the state only considerably complicates the entry of the 2nd pillar by its unsubstantiated requirement for participants to contribute additional 2% of wage to the 3% opt-out. Although participants receive 3% of wage from the state to their private account, it is fully compensated by the equivalent state pension reduction – at least for people with earnings on the nationwide average. Following widespread public criticism, the blatant claim of the government was supplemented with a statement in the relevant advertisement that the state pension is reduced in case of the opt-out – however, in small print only, below the image. In Estonia, the state pension is also reduced upon entry of the 2nd pillar; however, maybe, not fully equivalently.

The Czech financial product with the highest subsidies on a long-term basis is the supplementary pension insurance (savings). This is the reason why the supplementary pension insurance is so widely spread in Czechia. The situation is different in Estonia – the third pillar there is virtually insignificant. To the highly subsidized – and thus successful – system of personal pensions under the 3rd pillar, the Czech government added an unsubsidized personal pension system (2% of wage), illogically attached to the 3% of wage opt-out. This alone could represent a sufficient reason for the failure of the 2nd pillar in Czechia.

Another disadvantage of the 2nd pillar in Czechia – compared with the third pillar – is the considerably worse product construction – purely from the subjective perspective of an average client. The significant, subjectively perceived defect of the product within the 2nd pillar is the requirement for settlement in the form of a lifelong annuity, alternatively in the form of a guaranteed pension for the period of twenty years. Clients "do not like" lifelong annuities; this is the reason why almost no one selects them under the supplementary pension insurance. Clients prefer a lump-sum settlement, even to a guaranteed pension for twenty years. Another advantage of the supplementary pension insurance is the possibility of the surrender of the policy. The aforementioned product differences clearly favour the 3rd pillar product. Therefore, if Czech clients may and wish to choose, they will preferably use the 3rd pillar. Moreover, we can also take this opportunity and recollect the succession of the "large" pension reform, which "simultaneously" reformed the third pillar as well. The providers and their sales networks first

evoked psychosis that the great supplementary pension insurance product ends and it would no longer be possible to negotiate the product with a guarantee of nonnegative (nominal) valuation. This resulted in mass arrangement of new contracts and increases in the contributions paid by participants in order to take advantage of the upper limit of the monthly contribution for the purpose of drawing on the state contribution. During the campaign, most potential participants of the 2nd pillar could be financially "exhausted". All this took place at the end of 2012. It was only possible to opt out for the 2nd pillar as from the first day of 2013. The succession also could have contributed to the low sales of the 2nd pillar.

The successful application of soft compulsion is derived from the overall economic and social development of the relevant countries. Opt-out, auto-enrolment, and matching contributions may considerably contribute to the development of personal and occupational schemes, but it largely depends on the quality of all products of this type, as well as their harmonization and interaction. The relations on the relevant markets in the relevant countries, including the overhead and the business practices, are also essential for their use. The pension policy is a great ability to harmonize all of these instruments. The public administration quality is also of utmost importance.

4. Conclusion

The modern liberal model is built on individual choice of pension savings and providers. The tax-financed public pension system is used for the purpose of the basic pension security of elderly. In other pension models, solidarity supplement or pillar plays this role.

The conservative pension model mainly utilizes the mandatory social pension insurance schemes, predominantly built on the equivalency principle as well as on the solidarity principle. Moreover, employer-based pension funds are also used in conservatively oriented countries. They may be voluntary as well as quasi-mandatory. Furthermore, a significant solidarity pillar may exist, having a comparable role to that of the mandatory insurance pillar. Another subsidiarity pillar is the voluntary pillar of personal and occupational pension schemes.

The social-democratic pension model emphasizes the universality of pension security, which is mainly reflected in the existence of universal system of social pension insurance. In the modern version of the model, the social aspects are concentrated in a solidarity pillar, whereas the mandatory insurance pillar is fundamentally built on the equivalency principle.

The neoliberal pension model relies on the mandatory private pension pillar, strongly regulated by the state. The investment risk is usually fully borne by clients. Investment returns and providers' overhead are significant for the success of the mandatory private savings and insurance. A solidarity pillar and voluntary private pillar are used as subsidiary pillars.

The neoliberal pension reform, associated with the public insurance pillar privatization, usually results in extremely high transition costs, paid from public funds. Most post-communist countries have implemented the so-called second pillar, in parallel and in detriment to the public insurance pillar. The second pillar was usually only mandatory for younger employees; older employees were eligible for opt-out, as one of the soft compulsion methods. Two other soft compulsion methods – auto-enrolment and matching contributions – were also applied in a number of countries, usually western countries (of liberal and conservative nature). The objective of these methods was to facilitate the expansion of – otherwise basically voluntary and not really demanded – private pension security.

The Czech pension reform of 2013 represents an immature attempt at diversifying the pension security. While the third pillar is truly beneficial for participants on a long-term basis due to high state subsidies (in the form of matching contributions), the government was not able to demonstrate the benefits of the second pillar and – furthermore – it decided to apply the opt-out method (i.e. soft-compulsion) at the end. The implementation of the neoliberal pension policy is very challenging and particularly problematic, due to the high overhead of the neoliberal pension model – notwithstanding the currently absolutely unfavourable economic conditions. The failure of the Czech pension reform is relatively easy to explain – also using the

experience of other countries. The timing of the reform was not good as well, including the high unemployment of the young people, targeted by the Czech reformers.

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The EU Emission Allowance Spot Price Development and its Possible Consequences for Public Economics

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Abstract

This paper is focused on an analysis of the EU emission trading scheme (EU ETS) and development of the EU emission allowance (EUA) spot price. Besides this issue, we analyze also possible relationships between EUA spot price and representative economic indicators and try to find "EUA price drivers". For the purposes of this article, we use correlation analysis, based on both the Pearson´s and Spearman´s coefficients. The results of correlation analysis show, that the EUA spot price is negatively correlated both with time and with final consumption expenditures of EU27, in the short time period also with some energy prices. Regarding the EUA traded volumes, there is visible a strong positive correlation between traded volumes and both time and energy prices. Finally, the possible consequences of the EUA market development for managerial decision making in public economics are discussed, focusing especially on CO_2 tax rates setting.

Keywords: EU ETS; EUA spot price; EUA traded volumes; correlation analysis; CO_2 taxation

JEL Classification: H23, Q48

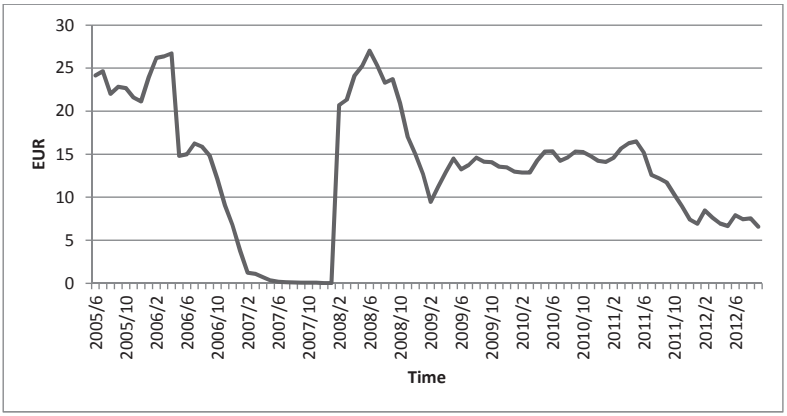
1. Introduction

Emission trading is a market based instrument of the environmental policy, which is used for the purposes of the negative externalities internalization. Emission trading, also called as "cap and trade program", originally started up in the USA and currently it is frequently used throughout the world. Besides trading with emissions (mainly CO_2, NO_x, SO_2), there are also tradable fish quota or trading in waste sector, water protection sector and land protection sector [1; 2; 3]. The EU trading system for greenhouse gas emissions (EU ETS) has been designed as a flexible instrument to help the EU and the Member States to achieve the targets of the Kyoto Protocol [2]. Currently, there is the third phase of the EU ETS, in the period 2013 – 2020. Taking account of public economics and public budgets, the third phase of the EU ETS is the most important, since the major share of the EU emission allowances is auctioned and the obtained revenues represent significant additional income of public budgets.

Generally, regarding scientific papers dealing with CO_2 emission allowances trading, scientists have focused mostly on modelling and forecasting the prices of CO_2 emission allowances [4; 5; 6; 7], the incidence of the carbon price [8], the EUA price drivers [9; 10], the marginal cost of both energy intensive companies and power sector [11; 12], the influence of emission allowance trading on electricity producers [11; 12; 13] or its innovation impact [14; 15]. Focusing on the efficiency and impacts of CO_2 emission allowances, there are economists supporting the idea of this kind of transferable rights [3]; on the other hand, there are economists preferring the other economic tools influenced CO_2 emissions, mainly CO_2 taxation [16; 17].

Regarding the EU emission allowance (EUA) spot price, it fluctuated significantly both in the first and the second trading period; in year 2005, the spot price of the EUA fluctuated between 20 and 25 EUR per ton CO_2, than in year 2006 started to fall and in the end of the first trading period was nearly zero. In the beginning of the second trading period, the EUA spot price was in the range 20 – 25 EUR per ton CO_2, in the period 2009 – 2011 between 10 and 15 EUR per ton CO_2 and in year 2012 in the interval 6 – 10 EUR per ton CO_2 [18; 19]. The EUA spot price development is showed in figure 1, particular points represent monthly averages.

Figure 1. Development of EUA spot price 2005 – 2012



Source: Authors, [18,19]

The price of an allowance in a cap and trade program can be expected to reflect the cost of reducing the next incremental ton of emissions [20, p.1]. Many other factors including fuel markets, weather, and technology availability and performance can also potentially apply pressure on allowance prices [10]. When there are real or perceived changes in market fundamentals that impact this cost, there are subsequent adjustments in allowance prices. These adjustments can stem from market forces, including the price of coal and natural gas, the demand for electricity related to weather and other factors, and the availability and reliability of technology. They can also stem from regulatory forces, which can impact the overall supply and demand of the market [20, p.1].

The main goal of this paper is to analyze the development of the EUA spot price both in the first (2005 – 2007) and in the second (2008 – 2012) trading period. We are also interested in possible impacts of the EUA market development on public economics. We will focus on general economic indicators, which can influence the EUA spot price. Than we will discuss how the final EUA spot price development can influence managerial decisions in public economics.

2. Material and Methods

The main data sources used to analyse the market with the EU emission allowances are the following: BlueNext statistics [18], EEX statistics [19] and the statistics published by the Eurostat [21].

For the purposes of the correlation analysis, the following data from exchanges are used: daily closing prices of EUA 05-07 [18], daily closing prices of EUA 08-12 [18; 19], total volumes of EUA 05-07 [18] and total volumes of EUA 08-12 [18; 19]. These data are originally available as daily data, for the purposes of the correlation analysis we adapt the original data to other economic indicators format availability. Regarding general economic indicators, the following data are used: GDP of EU27 in current prices, not seasonally adjusted data [21], final consumption expenditure of EU27 in current prices, not seasonally adjusted data [21] and gross fixed capital formation of EU27 in current prices – total fixes assets, not seasonally adjusted data [21]. These data are available as quarterly data.

Focusing on methods, firstly the data are arranged for the analysis purposes, especially data connected with EU emission allowances spot prices and total volumes. The data are adjusted to the structure and period of the data from Eurostat as follows: the average quarterly prices of EUA are based on daily closing prices of EUA, total quarterly volume of marketed EUA are based on daily total volumes summary.

As a next step of the analysis, the correlation analysis is used with the help of the Pearson's correlation coefficient and the Spearman's correlation coefficient. These correlation coefficients were successfully applied by the authors in the previous research for the ex-post analysis of solid fuels, natural gas and electricity taxation introduction in the Czech Republic [22].

The correlation analysis is performed for period 2005 – 2012 as a whole. For verifying our results and simultaneously for avoiding false correlations, we also applied correlation analysis on the first differential of analyzed variables and also Durbin-Watson test has been used.

3. Results and Discussion

3.1 Results

Now, we can focus on the key issue – the relationship of representative economic indicators and the EUA spot price both in the first and the second trading period, in years 2005 – 2012. Generally, it can be the development of HDP of EU27 and its particular components, as consumption and investments. As is mentioned by EPA [20], the changes in the EUA prices can be influenced also by market forces, including the price of coal and natural gas, the demand for electricity related to weather and other factors, and the availability and reliability of technology.

The relationships between the EUA spot prices (P), the EUA traded volumes (Q), GDP of EU27 (GDP), final consumption expenditures of EU27 (CONS), gross fixed capital formation of EU27 (CAP) and the time (TIME) have been analysed. The table 1 shows the results for the Spearman's correlation analysis in the area of the economic indicators. Regarding the Pearson's correlation analysis, there is no linear relationship between analysed variables.

Table 1. The Spearman's correlation analysis – economic indicators

		P	Q	CAP	CONS	TIME	GDP
P	**Correlation Coefficient**	1,000	-,126	-,044	-.426*	-.397*	-,333
	Sig. (2-tailed)	.	,507	,818	,019	,030	,073
	N	30	30	30	30	30	30
Q	**Correlation Coefficient**	-,126	1,000	-,111	,190	.479**	,142
	Sig. (2-tailed)	,507	.	,561	,315	,007	,454
	N	30	30	30	30	30	30

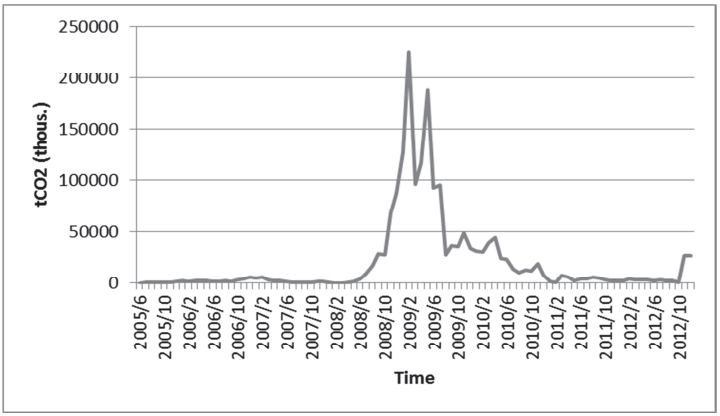
Source: Authors

** Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).*

The Table 1 shows significant correlations between analysed variables. It is apparent, that there is a significant negative correlation between the EUA spot prices and both final consumption expenditures of EU27 and time. Regarding the EUA traded volumes, there is visible a strong positive correlation between Q and time. This result can be influenced, besides other things, by different amounts of available tradable emission rights in the first and in the second trading period.

Regarding verification of our results, we also applied correlation analysis on the first differential of analysed variables and also Durbin-Watson test has been used. The results show, that there is no correlation between the first differentials of analysed variables. However, regarding the shape of the curves both EUA spot price (see Figure 1) and EUA traded volumes (see Figure 2) in the analysed period 2005 - 2012, there is visible nearly zero or weak trend component, so we can say that the false correlation is not possible in this case.

Figure 2. Development of EUA traded volumes 2005 – 2012



Source: Authors, [18,19]

The table 2 shows the results for the Spearman's correlation analysis in the area of the energy products price indices, precisely the EUA spot price (P), the EUA traded volume (Q), Harmonized Index of Consumer Prices (HICP) of electricity (HICP_El), HICP of natural gas (HICP_G), HICP of liquid fuels (HICP_LF), HICP of solid fuels (HICP_SF) and HICP of heat (HICP_H). Regarding the Pearson's correlation analysis, there is only a significant negative linear correlation between the EUA spot prices and the EUA traded volumes. Dealing with the price indices of energy products, the linear correlations are not significant.

Table 2. The Spearman's correlation analysis – the energy products price indices

		P	Q	HICP_EI	HICP_G	HICP_LF	HICP_SF	HICP_H
P	**Correlation Coefficient**	1,000	-,039	,071	,168	,193	,080	,120
	Sig. (2-tailed)	.	,720	,514	,118	,072	,458	,267
	N	88	88	88	88	88	88	88
Q	**Correlation Coefficient**	-,039	1,000	.437**	.367**	-,136	.406**	.373**
	Sig. (2-tailed)	,720	.	,000	,000	,206	,000	,000
	N	88	88	88	88	88	88	88

Source: Authors

** Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).*

Based on the table 2, you can see that there is a strong, statistically significant positive correlation between the EUA traded volumes and the price indices of energy products, excluding price index of liquid fuels. It is obvious, that higher price indices of electricity, natural gas, solid fuels and heat can influence higher activity of particular stakeholders on emission rights exchange and simultaneously higher amount of the EUA traded volumes.

Regarding the verification of the results, we can repeat, that dealing with the shape of the curves both EUA spot price (see Figure 1) and EUA traded volumes (see Figure 2) in the analysed period 2005 - 2012, we can see nearly zero or weak trend component, so the false correlation is not possible in this case. Moreover, we also applied correlation analysis on the first differential of analyzed variables and also Durbin-Watson test has been used. Based upon the results of the Spearman index application on the first differential of analyzed variables (see Table 3), we can say that the statistically significant positive correlation exists between the first differential of the EUA spot price (PmD) and the first differential of HICP of liquid fuels (LFmD) and the statistically significant negative correlation between the first differential of the EUA spot price (PmD) and the first differential of both HICP of solid fuels (SFmD) and HICP of heat (HmD).

Table 3. The Spearman's correlation analysis – the first differential of analysed variables

		PmD	QmD	EImD	GmD	LFmD	SFmD	HmD
PmD	Correlation Coefficient	1,000	-,082	-,170	-,182	.347**	-.366**	-.257*
	Sig. (2-tailed)	.	,449	,115	,091	,001	,000	,016
	N	87	87	87	87	87	87	87
QmD	Correlation Coefficient	-,082	1,000	-,085	,037	-,103	,063	,140
	Sig. (2-tailed)	,449	.	,434	,732	,342	,562	,195
	N	87	87	87	87	87	87	87

Source: Authors

** Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).*

The results show that besides the "long time" correlations between the EUA traded volumes and the price indices of some energy products, there exist also so called "dynamic correlation" – the reaction of particular variables in the short term period. Regarding the negative correlations between the firsts differentials of the EUA spot price and both HICP of solid fuels (SFmD) and HICP of heat (HmD), we can say, that in the short time period the higher EUA spot price (per 1 ton of CO_2ekv.) can lead to reduction in consumption of particular carbon fuels (coal, coke) and heat produced from carbon fuels.

3.2 Discussion

Based on the above described correlation analysis, we can say, that both the EUA spot price and the EUA traded volumes can be influenced by some of the representative economic indicators.

Focusing on the relationship between the EUA spot prices, the EUA traded volumes, GDP of EU27, final consumption expenditures of EU27, gross fixed capital formation of EU27 and the time, the results show, that there is neither positive nor negative linear correlation between them. On the other hand, you can see significant nonlinear correlations between some of the variables. Precisely we can observe significant negative nonlinear correlation between the EUA spot prices and both final consumption expenditures of EU27 and time. The time is very important factor regarding the EU ETS development, since the rules of the EU ETS are changing in time and as it is visible in figure 1, the EUA spot price has been significantly decreasing in the end of particular trading periods. At the beginning of the following trading period, with the new "cap", the price was immediately higher. Generally, the EUA spot price is decreasing in the time; probably the abatement costs of polluters involved in the EU ETS are lower than it was originally anticipated.

Regarding the EUA traded volumes, there is visible a strong positive correlation between traded volumes and time. This result can be influenced, besides other things, by different amounts of available tradable emission rights in the first and in the second trading period. The first trading period was pilot; therefore the total amount of the EUA was also pilot and more or less experimental. On the other hand, the second trading period includes huge amount of CO_2 tradable permits and also the amount of the total regular trades on the EUA market is higher than in the first trading period.

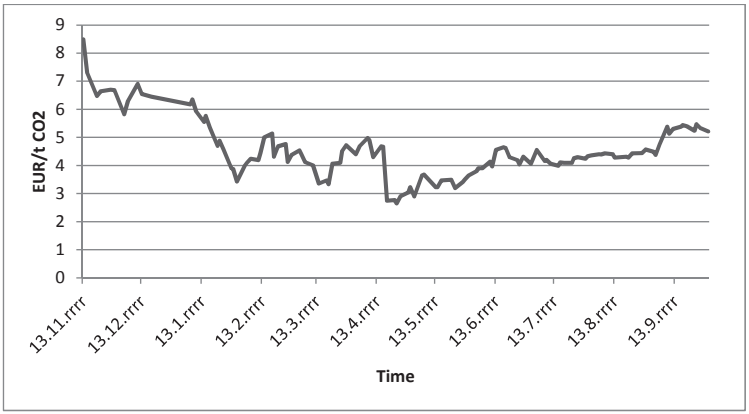
Regarding energy prices, we can observe a strong positive correlation between the EUA traded volumes and the price indices of electricity, natural gas, solid fuels and heat. However, it is only in case of nonlinear Spearman´s correlation coefficient application. The linear correlations between energy prices and both the EUA spot prices and the EUA traded volumes are not significant. Based on these results, we can summarize, that higher prices of electricity, natural gas, solid fuels and heat have influenced higher activity of particular stakeholders on the emission rights exchange and simultaneously higher amount of the EUA traded volumes in the analysed period 2005 - 2012.

It should be mentioned, that the results support the results and conclusions of Lutz [10], Aatola [9] and EPA [20], mainly in the area of influence of fuel markets. We can say, that also

regulatory forces have the important yield on the EUA spot price changes, in the correlation analysis it can be represents by indicator of time.

Now, we can discuss the EU emission allowance trade development and its possible consequences for CO_2 tax rates setting as one part of the managerial decision process in public economics. Generally, comparing the actual EUA spot price (see figure 2) with CO_2 taxation proposed by EU Commission (see table 4), it is obvious, that the proposed CO_2 tax rates are almost 4-times higher than the EUA spot price in September 2013.

Figure 3. EUA spot price in the third trading period



Source: Authors, [19]

Table 4. Proposal of CO_2 tax rates – revision of 2003/96/EC

	Light fuel oil	Heavy fuel oil	Brown coal	Black coal	Natural gas
Tax rates - revision 2003/96/EC (€/tCO_2)	20	20	20	20	20
Conversion	61 €/tonne	60 €/tonne	36 €/tonne	42 €/tonne	42 €/1000 m3

Source: [23,24]

The revision of the Directive 2003/96/EC provides a framework for the use of CO_2-related taxes as a complement to the EU emission trading scheme. CO_2 taxation should serve as a complement to the carbon price signal established by the EU ETS. Based on the revision of the Directive 2003/96/EC, the market price of emission allowances should be closely monitored in the periodic review of the Directive. The Commission should report to the Council on the application of the Directive, examining besides other things the minimum level of CO_2-related taxation in the light of the evolution of the EU market price of emission allowances. If appropriate, the Commission should propose the tax rates modification [7].

Supposing the current EU ETS rules unchanged, we cannot anticipate the significant change in the actual EUA price on the spot market. Therefore, we should recommend the responsible authorities to modify the proposed CO_2 tax rates.

The future research in this area can be focused on possibilities of the EUA prices predictions as a one of the sources of information for managerial decision making in public sector, for example for CO_2 tax rates setting or additional income from the EUA auctions planning. For the future research we also suggest to analyse other relevant factors, which can influence the EUA spot price, as well as application of other research methods such as time series analysis based upon the ARIMA models.

4. Conclusion

This paper is focused on development of the EUA spot price and simultaneously tries to find so called "EUA price drivers". Based on the correlation analysis, we can conclude, that the EUA spot price is negatively correlated with both time and final consumption expenditures of EU27 (as a part of GDP EU27). In the short time period, there was proved negative correlations between the EUA spot price and both heat and solid fuels price indices. Regarding the EUA traded volumes, there is visible a strong positive correlation between traded volumes and both time and energy prices.

We can state, that presented correlations are statistically significant, however there can be also other relevant factors and variables that are affecting and influencing the EUA spot prices.

The EU ETS development and the market price of CO_2 emission allowances have currently significant influence on managerial decision making in public economics, since the major share of the EU emission allowances is auctioned and the obtained revenues represent significant additional income of public budgets. Moreover, based on the revision of the Directive 2003/96/EC, the member states of EU are going to introduce CO_2 taxation as a part of energy taxation and the overview of the market price development of the EU emission allowances can be important information for final CO_2 tax rates setting.

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SESSION II:
PUBLIC ADMINISTRATION AND PUBLIC SECTOR

Motivation of Investors in the Process of Brownfield Remediation: the Role of Public Opinion on the Example of the Liberec Region

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Abstract

Brownfields constitute a significant obstacle for the development of municipalities. Their re-utilization is in the interest of the local administration and namely of citizens, who are directly affected by the existence of these brownfield lands. In order for brownfield remediation to be successful and to make the area part of the urban structure, it is necessary to identify the needs of the affected public. Structural EU funds provide financial options to draw financial funds for projects contributing to the harmonic development of municipalities. The utilization of funds should correspond to the sustainability and efficiency criteria. This paper deals with the motivation of investors who utilized public funds for brownfield remediation or for the realization of concrete projects, considering the possible added value and involvement of the affected public in these projects.

Keywords: Brownfield remediation; public funding; public participation

JEL Classification: H39, R140, R530

1. Introduction

In the Czech Republic, brownfields mostly refer to unused or under-used lands, for which new usage must be found in compliance with the general urban context of the environment and with municipality's needs [1] The general prevailing opinion nowadays is that the decisive say in the question of future utilization of concrete devastated areas belongs to local authorities [2, 3, 4, 5]. Even though this requirement is supported by arguments referring to the Local Agenda 21 and the decentralization element, the overwhelming majority of public financing resources that might be taken into consideration for the brownfield remediation is concentrated in support programs at higher levels of public administration [2, 5]. Due to the fact that the financial support comes from higher levels of the public administration than the initiative for solving concrete devastated areas, there might be a disagreement between the formal requirements (following from the necessity to meet the efficiency criteria of invested public resources) and the real needs of citizens of municipalities or direct surroundings of the remediated area. It is therefore necessary to ensure that the remediation of the given devastated area meets the real needs of the affected public by using more elaborate tools than mere compliance with current planning documentation.

The issue of active participation of the public in the remediation of brownfields is pressing not only in the Czech Republic, but is also intensively discussed in countries that have been dealing with brownfield lands for a long period of time. In the Anglo-Saxon environment, which was a significant inspiration for the creation of Czech government documents dealing with brownfields, a whole range of studies mapping the role of local citizens in the revitalization process of neglected areas are being created.

First American studies, which put emphasis on the cooperation of investors with local citizens during the brownfield remediation, stemmed from the criticism of the financing for revitalization of contaminated places using the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, often referred to as the *Superfund*) [6]. Focusing on the most ecologically damaged brownfields had, according to American critics, caused urban and economic imbalance in cities – unilateral support of development on contaminated places slowed down economic development on brownfields where pollution was not so severe, and

thus contributed to the poverty and imbalance of economic development of the city [7, 8]. Local representatives reacted to this prioritization of one category of brownfields by focusing on generally deserted areas in poorer districts, whose regeneration should have contributed to the improvement of the standard of living in excluded locations [6, 9]. In this case, cooperation with local citizens plays an important role, since in addition to revenues from the utilization of new areas, the investors also contribute to the revival of the local real estate market [10], creation of jobs [11] and general revitalization of the location. Developers themselves consider the contributions for local citizens a very important result of brownfield remediation [12]. The contribution of brownfield remediation for the local market is represented by the potential of stable growth of real property prices in the surroundings [13]. Remediated lands might increase the attractiveness of the place, which tends to apply to architecturally or culturally valuable objects [14].

Participation of the public in the brownfield remediation process is viewed in the Czech Republic namely in terms of contact with contaminated areas. Local citizens are considered the primarily threatened group during the assessment of ecological pollution of contaminated areas, when brownfields are taken as a sub-set of contaminated places [15]. The most successful participation of the public in the remediation of brownfields in the Czech Republic in the long term is the Brno project of the Vaňkovka Shopping Center, which was created in the city centre in place of decaying industrial buildings [1].

People living in the near the location of brownfields are not only most affected by the existence of devastated areas, but they often become users of these remediated areas. It is therefore important to actively involve local citizens into the remediation process. This paper deals with the motivation of investors for *brownfields* revitalization and how the role of the public in remediation processes is perceived by them in this context.

2. Materials and Methods

Brownfields refer to *"real properties that are insufficiently used, neglected and might be contaminated. They originate as remains of industrial, agricultural, residential, military or other activities. Brownfields cannot be suitably or efficiently utilized without completing a remediation process"* [16:3]. So far, 2355 brownfield areas namely of agricultural and industrial origin have been localized in the Czech Republic [16]. It is generally believed that public resources, namely grants within Structural funds of the EU [1, 5, 17] play an important role in the remediation process. The most frequently mentioned funding programs that are best accessible for brownfield remediation funding are Regional Operational Programs (ROPs), namely axes focusing on the development of municipal and country-side areas, and the Real Property program from the Operational Program – Enterprise and Innovation (OPPI).

The aim of ROPs is to increase the competitive strength of regions and their attractiveness for business namely via reconstruction and equipment of the objects with civic amenities, preparation of development areas for residential purposes, business and services, restoration of public areas and removal of unused buildings. OPPI focuses on direct support of the business environment and on increasing the competitive strength of the industry; the aim of the Real Property program is to develop entrepreneurial real properties and related infrastructure, including project realization on brownfields. Since this paper focuses on the role of the affected public and its participation in the brownfield remediation, it was more appropriate to focus on remediated brownfield areas which were partially financed by ROP. This program, as opposed to OPPI, emphasizes the public benefit of the projects so that increased orientation of investors towards the needs of local citizens might be expected. For analysis was selected region of Liberec, since the data of brownfield sites were updated in 2012 [18]. This region is situated in North-East Bohemia, which is operated by one of the seven regionally delimited operational programs (namely NUTS II Severovýchod) available for drawing support from Structural Funds of the European Union.

This program includes projects realized in the regions of Liberec, Hradec Králové and Pardubice. The program is divided into five priority axes, which represent the priorities of the support. Financial resources in the amount of € 671 million were allocated to this operation program for the program period between 2007-2013. A total of 30 projects have been realized – the subject matter of these projects was the reconstruction of buildings designated as brownfields by the applicants themselves. Funding that contributed to the remediation of solved brownfields, came mainly from axes focusing on the development of urban and rural environment (Priority axis 2), development of business environment (Priority axis 3) and in a negligible degree also from the axis for the development of basic infrastructure and accompanying activities in the tourism industry (Priority axis 2). In the Liberec region, a total of CZK 480 million was invested within brownfield remediation projects, out of which CZK 2740 million (almost 60 %) was funded by the EU. The highest average extent of the support was in the sphere of development of rural areas, where the financial coverage from EU reached almost 80 % of the total project costs. Average funding in these cases exceeded CZK 41 million.

A total of 74 projects financed from ROP, implemented in locations marked by the applicants themselves as brownfields, were approved for realization in the Czech Republic between 2007 – 2013. There are 6 projects per region in average (this average is significantly increased only by the Moravskoslezský region, which has 21 projects). In the Liberec region there was located 8 projects (which is also the median for all regions).

The most frequent obstacles for brownfields referred to in the literature include unclear disputes regarding property rights, occurrence of ecological burden, higher capital intensity as opposed to construction from scratch [19]. In the Liberec region there are 377 brownfield locations, whose structure according to previous utilization is outlined below including comparison to the nation-wide data:

Table 1. Number of brownfields in Liberec region and the Czech Republic by previous utilization as of 30th March 2012 (or 1st December 2007)

Previous utilization	Liberec region			Czech Republic	
	Amount	Share	Share in Czech Rep.	Number	Share
Residential purposes	34	9 %	36 %	95	4 %
Tourism	13	3 %	60 %	22	1 %
Transport	5	1 %	---	---	---
Civic amenities	84	22 %	28 %	304	13 %
Industry	135	36 %	17 %	785	33 %
Mining	4	1 %	---	---	---
Military objects	8	2 %	5 %	151	6 %
Agriculture	94	25 %	11 %	821	35 %
Other	---	---	---	177	8 %
TOTAL	377	100 %	16 %	2355	100 %

Source: [18]

The data clearly indicate certain deviations in the structure of brownfields in the Liberec region in comparison to the nation-wide data. The structure of brownfields in the studied region is different to a certain degree from the economic and socio-demographic development of the area. The region is located near the border, where German-speaking citizens used to constitute a large portion of citizens before World War II. These people, however, were removed in the post-war period. This event, during which the number of people living the region decreased by one third within a short period of time, caused an artificial shock to the settlement, which was reflected in numerous brownfields of residential character and namely in activities related to civic amenities. In the first half of the last century the region was one of the most industrial parts of the Austrian-Hungarian Empire thanks to its developed textile production. This fact is reflected in the number of industrial brownfields, which constitute approximately 20% of all former industrial areas and cover almost 5% of land in the Czech Republic. On the contrary, the

mountainous character of the region results in under-developed agriculture, which is also reflected in the number of agricultural brownfields.

The research subject consisted of eight projects financed within the Regional Operational Program for the North-east realized in the Liberec region. Due to the number of analyzed subjects, the selected method consists of quality-focused research in the form of controlled interviews intended to determine the motivation of investors leading to the remediation of areas labeled as brownfields by the investors themselves. Respondents included employees of organizations realizing projects who were responsible for the project creation process. The research focused on the role of public interest and benefits brought by the remediation for the local environment and citizens in the investor's decision. 8 respondents were asked to answer a questionnaire; these respondents were responsible for the realization of projects funded from structural funds. In total, five questionnaires of qualitative character were carried out and involved representatives of two self-administration units, one organization receiving contributions from the State Budget and two private business entities. Thanks to the diversity of the structure of investors, it was possible to record the approaches and opinions whose mutual divergence might be attributed to the legal structure of respondents and their relationship to the public.

3. Results and Discussion

The questions asked were divided into several thematic sections. In the first part the respondents were asked to define the term *brownfield* and their general un/suitability for further use. The following set of questions focused on the motivation of respondents for the realization of projects on devastated areas, the problems they had to face during the realization and the contributions brownfield remediation brought to local citizens. The last set of questions concerned technical parameters of the project, financing and evaluation of its benefits.

3.1 General characteristics of brownfields

Within the definition of the term, all respondents agreed on the fact that the basic characteristics of brownfields include the dilapidation of buildings and areas. Dilapidation refers to technical inability to use buildings under the current conditions. Investment events are required for new utilization – the scope of these investments was defined differently by individual respondents. The definition of required reconstructions does not allow observing a direct connection between the general scope of works identified by the investors as necessary for further utilization of brownfields and the investment intensity of individual realized projects. It was, however, possible to observe that the surveyed representatives of the public administration as opposed to private entities perceived brownfields namely as developing areas that are characterized by high development potential. These areas can be further used for activities improving the social, economic or business environment of the municipality. Concrete presented proposals for possible utilization included business incubators, council apartments and community centers. In general, former industrial or agricultural sites were considered to be brownfields, which corresponds to the structure of remediated brownfields, where six out of eight locations were of industrial or agricultural origin.

The respondents agreed that complications accompanying brownfield remediation include the higher costs following from additional works caused by realization of projects on already built-up areas. An identical feature in the identification of higher costs in all cases was the fact that the constructional documentation has often not been preserved due to the age of brownfields. There is also a risk that the statics of brownfields are disturbed, which could lead to enforced demolition of the whole building in extreme cases. Before the reconstruction, it is necessary to perform investigations to find out the used construction methods and determine required construction methods for the following reconstruction. The determination of the reconstruction methods including the calculation in an advanced project stage is considered by the respondents to be a significant obstacle in brownfield remediation. The whole remediation

might not only be delayed but also become significantly more expensive due to newly discovered facts, which is not – as the respondents believe – sufficiently taken into consideration in the existing funding instruments. Dilapidated buildings might be a part of the cultural heritage, which was the case of one building reconstructed by the local self-administration to a community center. In these cases, the observance of requirements of the historical heritage authority causes additional costs, delayed realization and increased bureaucratic burden.

The advantage of brownfield remediation, as unanimously specified by the respondents, is the absence of the necessity of the application for occupation of vacant and so far unbuilt-up areas. Representatives of self-administration units emphasized namely easier traffic accessibility of re-utilized brownfields, since the construction of additional infrastructure is not required. At the same time, they pointed out the fact that many brownfields are located in central parts of municipalities and the place is thus attractive due to higher number of people living in the subject area. Representatives of private investors and organizations receiving contributions from the State Budget on the other hand appreciated decreased bureaucratic burden as compared to the construction of new buildings. All respondents included better social environment and appearance of the municipality in their list of advantages of brownfield remediation. Also there was an opinion that brownfield remediation might reduce criminality, which could accumulate around deserted buildings. It is surprising that this remark concerning social aspects was raised by only one private investor.

3.2 Motivation for remediation

The motivation of responding investors for brownfield remediation clearly reflected the requirements for more efficient utilization of built-up areas identified above. All respondents stated that the decisive factor, which led to the project realization on brownfield lands, was the ownership of the building. The importance assigned by the respondents to this fact might be understood as the feeling of responsibility for the owned property towards the surroundings. This responsibility approach was accentuated among the representatives of local self-administration bodies by them claiming that the main motivation was the effort to improve the state of the owned property. Private owners and contributory organizations understood this responsibility namely in relation to the prosperity of society, which is motivated in principle by the efforts to use the owned properties as efficiently as possible in order to achieve profit. Within the investigation of main motifs, the majority of respondents indirectly confirmed that the possibility of funding from public resources also played a role that was not negligible. For one of the respondents representing a business entity, the possibility of external financing constituted the main motivation for the company to realize brownfield remediation.

The extent of participation of the public in the project was influenced by relatively small areas of individual remediated brownfields[1], where the remediated area did not exceed 2 000 m^2 in any single case. At the same time, it applies that more extensive brownfields have been remediated within operational sites of individual private companies, where any significant effort to involve the public or pressure from self-administration authorities cannot be expected. Higher involvement of the public was identified in projects realized by municipalities. Responding municipalities realized projects whose aim was the construction of civic amenities / facilities (specifically a community center and headquarters of the municipal police). The increased involvement of the public in the whole process followed from the public character of these projects. The construction of headquarters of the municipal police is not primarily intended to be used by the public, which was also reflected by the form of communication with the public. Within the communication, the self-administration body issued press releases, provided information in town hall bulletins and at municipal council meetings. On the other hand, during the construction of the community center in the middle of the municipality, citizens were actively involved during the whole process of project realization. Participation in the decision making on the future use of dilapidated project was crucial and these decisions were

[1] Principles and approaches for increasing the interest of the public in brownfield remediation listed in the introduction of the paper were based on significantly larger projects in densely inhabited areas.

discussed at public meetings of representatives and citizens. The population of the municipality, in which the project was realized, is approximately 700, which contributed to the natural interest of local people in the progress of construction works as such and to the numerous participants in the official center opening.

3.3 Projects

It is desirable to set indicators for the investment of public resources which enable measuring the efficiency of spent resources. The indicators must reflect the determined objective(s) of the project; the fulfillment of these objectives can be measured by the fulfillment of the indicators. In order to be able to determine whether public resources are spent efficiently, we need to be able to compare the projects with outputs of similar projects, which is done by comparing indicators which quantify the benefits of projects. Private entrepreneurs and organization receiving contributions from the State Budget measured only outputs for monitoring the economic return of projects and the outputs which could be used to evaluate the sustainability of the project in terms of the grant title requirements. Responding self-administration bodies set their success criteria with regards to the future use of the buildings. In the evaluation of the municipal police headquarters, the monitored values included the remediated total and floor area of the building, which changed due to the project and constitutes the biggest contribution for the immediate surroundings of the location. The selected method for the evaluation of the success of the community centre was based on the satisfaction of citizens, corresponding with the purpose of the reconstructed premises, which are mainly used as a clubroom for local sports and cultural clubs.

4. Conclusion

Brownfields constitute a significant obstacle for the development of regions. Devastated areas and accompanying aspects often create imbalance in the morphological structure of settlement and they might affect the immediate surroundings by a whole range of negative impacts (economic, ecological, urban, social). It is therefore in the interest of the public administration authorities to support the removal of brownfields. In the planning period 2007-2013, which is now approaching its end, there have been several grants within the EU structural funds available for the support of brownfield remediation. This paper identified the motivation of recipients of these programs which lead to their interest in brownfield remediation, as well as the role played by the public opinion.

Several conclusions can be made from the completed questionnaire investigation; to a certain degree these conclusions can be generalized beyond the regional level to the whole Czech Republic also due to the expertise of respondents. Investors understand brownfields as existing buildings that cannot be used without reconstruction due to their dilapidation. During the questionnaire survey, the respondents did not mention ecological contamination, which is usually the determining feature of brownfields in Europe and US. Even though there is a real risk that brownfields are burdened by ecological contamination, in Czech conditions it cannot be said clearly that ecological burden is the defining feature of brownfields.

The main motivation for regeneration of brownfields stated by the respondents was the fact that they were the owners of the property. This finding supports the significance of property-law relationship in the location for successful brownfield remediation. The generally accepted thesis that unclear property structure is the main obstacle for regeneration even for attractive locations is thus confirmed. I see the benefit of the carried out survey in the finding that Regional Operation Programs, whose aim is to improve the quality of municipalities also via brownfield remediation, are not equipped with evaluation tools that could be uniformly applied to these projects. Sustainability is interpreted only in the economic sense, and this then influences the evaluation indicators. The social or environmental aspect of sustainability is not taken sufficiently into consideration, which might lead to inefficient distribution of public resources in supported projects. The invested sum related to remediated area cannot be

considered a relevant indicator because available results do not correspond to the benefits for the local citizens that have been identified by the investors.

It followed from the research that private and semi-private investors were not motivated to involve the participation of the public in remediation of brownfields in the solved projects. This might have been caused by the relatively small scope of remediated areas that were often located in functional sites where the investors are authorized to assert their interests. As far as the public sector is concerned, the scope of involvement and participation of the public in the project was influenced by long-term conventions of the communication of the town hall with the public. In smaller towns the municipal council is regarded the controlling element of public discussion on the development of the town, where the public plays an indispensable role. In larger municipalities (e.g., district/county town), the acquired statements indicate that this model cannot be applied due to technical reasons (high number of affected citizens, mutual conclusions cannot be reached by discussion with them), which was reflected in the form of participation of the public in the project.

The issue of brownfields has not been comprehensively processed by the public administration so far [20], which is reflected in the structure of investigated remediations. All locations were located either in functional company sites, or – in case of public investors – in central parts of municipalities. Provided funding therefore enabled revitalization of buildings that showed signs of attractiveness in terms of location or relationships based on property rights. The fact that grants were not equipped with more suitable tools for brownfield remediation was reflected in the number of remediated areas. These constitute only 2 % of the total number of brownfields located in the region.

The future research should focus on differences in the approaches towards the issue in private and public sector. More detailed results could be obtained by different structure of the investigated sample of respondents, i.e. by focusing the investigation on different regions and comparing and generalizing the results up to the nation-wide level. At present there does not exist a unified database of revitalized brownfields, and therefore this data needs to be looked up in other sources, such as project databases of projects financed from Structural Funds used in this paper. Furthermore, project budgets need to be analyzed in more detail in order to be able to define efficiently invested resources and their contribution to the increase of the standard of living of location citizens. Results should be accompanied by research of the approach of the affected citizens or areas and their perception of devastated areas.

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Corruption Game in Laboratory Experiment – Do the Economists Behave Differently?

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Abstract

Corruption has been identified as a major concern for social and economic development. An important step in understanding and addressing corruption is measuring the extent of this problem. Various approaches have been applied on investigating this phenomenon, from surveys describing current situation from sociological point of view, through more complex surveys focusing on beliefs about corruption (Transparency International's Corruption Perception Index, or World Bank Governance Diagnostic Survey), to laboratory experiments [25].

This paper discusses an economic experiment in corruption behavior, which follows modified experimental design created by CAMERON. Obtained data sets show that behavior of economic agents diverges from predicted equilibrium, meaning that human beings do not achieve subgame perfect equilibrium of the game. The laboratory experiment was run at the Faculty of Economics and Administration, Masaryk University in Czech Republic.

Keywords: Economic experiment; corruption

JEL Classification: C90, C91, H30

1. Introduction

Corruption is social phenomenon considered the main threat of democracy. Corruption is with human species from the very beginning, belongs to every establishment and every place. It endangers functionality of market economy, economic and social development [1], [2], economic competition, social stability, social equity [3] and weakens moral foundations of society. Corruption constrains citizen's access to public services, leads to lack of confidence in institutions, increases anarchy and indifference [4], [5], [6]. Research also shows that corruption negatively influences efficiency of courts [6], application of law [7], working of political institutions [8], liberalization of trade [9], education [5] and economic growth [10], [11], [12].

Among the most serious impacts of corruption are the waste of public resources, transformation of long-run investment to less corrupted areas, non-effective allocation of resources as a consequence of non-transparent economic environment [13], [14], market deformation and overcharged goods and services.

As corruption is currently a social phenomenon influencing numerous fields of the society, we chose to investigate it using the methods of experimental economics. This paper provides evidence of the effect of the field of study on corruption behavior in laboratory experiment conducted at the Faculty of Economics and Administration, Masaryk University in Brno, Czech Republic.

1.1 Literature review

Most of the laboratory experiments around the world make use of students of particular faculties or universities, since they are within the reach of the researchers. Their field of study represents an interesting variable not only to our experiments; many papers have been discussing different behavior of the economists and others.

Marwell and Ames [15] were among the first who examined influence of economic training on this behavior. They used the design of contribution to public goods experiment,

applied the free rider hypothesis and examined different behavior of economists as opposed to others. After a series of experiments, they proved that the behavior of economists is different. The graduate students of economics contributed only 20%, which was the lowest percentage across all other subjects.

Carter and Irons [16] used simple ultimatum bargaining game with four different groups of students to find out whether economists are born or made. The conclusion after many experimental sessions was that the economists (without significant difference between freshman and senior) tend to behave closely according to rational model and accepted less and kept more than other subjects in the ultimatum game. Therefore, the authors assume that the behavior of economists follows their innate characteristics which distinguish them already at the beginning of economic studies.

Another experiment focusing on how the economic training influences their behavior dealt with cooperation problems. Yezer et al. [17] let the economic and non-economic students play structured games and had them answer surveys on cooperation. They found large variations between the cooperation of economists and non-economists.

Labnad and Beil [18] extended the problem of behavior comparison to a realm of other related scientific fields. They did not examine the problem using laboratory experiment but analyzed real data of different professional associations and ram a survey. They agreed that the behavior of economists differed, however they were no less cooperative than the political scientists. On the other hand, degree of cooperation of sociologists was much lower.

Frey and Meier [19] provided evidence of natural experiment at the University of Zurich, comparing behavior of business students, political economists and others in voluntary contribution to two social funds at the university. They found out that including all economics students into one group might not be correct. The behavior of political economists and business students differed. The business students contributed significantly less than other students in all stages of their study. Therefore, it supports the findings by Carter and Irons [16] that the difference is caused by the nature of the students and not their training.

Similarly, the Faculty of Economics and Administration in Brno has engaged in research of differences in economists behavior in past. Seneklova and Spalek [20] employed laboratory experiment and compared economic students to students of other faculties and universities in Brno. They used voluntary contribution experiment and ultimatum game for their research and confirmed general assumption that the economists behave differently than others for Brno as well. They assume that economists tend to follow the economic models of behavior.

One of the most recent investigations on the differences between the economists and others concerns their ability to lie. López-Pérez and Spiegelman [21] used the experimental design to evaluate the lie aversion with students at the University of Madrid. They found correlation between the subjects' major and ability to lie. Students of business and economics lied more than others, as expected. What seems contradictory to the previous literature is, as the authors suggest, that the ability to lie and not behave honestly is not caused by their nature, but it is a consequence of economic training.

Investigation of the corruption or motives of corruption behavior has been off the radar of the experimental economics for quite a long time. ABBINK et al. [22] is considered to be the first corruption experiment. The authors created a reciprocation trust game where two people play against each other, acting as briber and official. The output of their research is that the potential punishment lowers the level of corruption in experiment.

Abbink et al. [22] was further elaborated by Jacquement [23]. The role of principal was added into the game and it was shown that if the official gains larger income from the principal, the corruption is less likely to appear.

The corruption experiments also focused on examining anti-corruption measures. Apesteguia et al. [24] compared three potential anti-trust policies using market games and focused on a situation where one firm of the cartel decides to be a whistleblower.

Cameron et al. [25] created a design of three players and focused on explaining cultural or country effect on the corrupt behavior. They ran series of experiments in Australia, India, Indonesia and Singapore with more than 1700 subjects. The research by Cameron et al. [25] had

significant impact on corruption investigation using experimental methods and influenced other scientist in their research. We also build our experiment on their design, while making slight adjustments (described below).

Berná and Špalek [27] replicated the experiment Cameron et al. [25] in Czech and Slovak environment. They focused on explaining the differences in corruption behavior between Eastern block and traditional Western democracies. They also used a traditional Public Goods Game experiment with punishment to support the debate why Czechs and Slovaks do behave more corrupt than citizens of the West countries. The results shown, that there is significant difference in level of corruption tolerance between these two nations. Czechs are more likely to punish corruption behavior than Slovaks. Also the results of Public Goods experiment support the findings.

2. Material and Methods

To investigate corruption using traditional methods might be complicated. Collecting data through surveys or any other estimation about corrupt behavior have been limited, for the activity is generally illegal. Also traditional methods investigate corruption from a general point of view, its impact on the society or economics, but do not focus on determinates of the behavior itself. On the other hand, experimental economics provides a tool to research the corruption behavior in microeconomic level and reveal determinants which traditional way of corruption investigation expects but may fail to corroborate. Observing corruption in controlled environment, lab, allow us observe how economic agents react on various motives and stimuli. Furthermore, during economic experiment, results cannot be influenced by backward causation; experiments make possible to observe intrinsic motives causing corruption behavior; and low costs of economic experiments are big advantage comparing to other methods of corruption measure [27].

The laboratory experiment was conducted in 2013 at the Faculty of Economics and Administration, Masaryk University in Brno, Czech Republic. The subjects were addressed via an advertisement at the official faculty website and promoted on the Facebook page of the faculty. The experiment was programmed and conducted with the z-Tree software [29]. For the purpose of this and future experiments, cardboard boxes were acquired to visually isolate each working station since there is no stable experimental lab at the Faculty of Economics and Administration.

At the beginning of each session, the subjects were seated into the boxes, asked to remain quiet and follow the instructions on the computer screen. Twice per each session, written instructions which supported the screen were also distributed. Questions were answered in private, after the participant raised his/her hand. At the end of each session, which lasted approximately 45 minutes, the subjects got paid according to their decision. In average, they were given 124 CZK (app. 5 €).

Altogether 7 sessions were conducted with 21 to 24 subjects, totaling to 150 participants. They were mostly students of different faculties of the Masaryk University. The structure of the sample according to the faculty is given in Table 1. For the purpose of this paper, we analyzed the differences in behavior between students of the Faculty of Economics and Administration and the others.

Table 2. Structure of the subjects according to the faculty

Faculty of Economics and Administration	Faculty of Arts	Faculty of Education
86	13	1
Faculty of Informatics	**Faculty of Law**	**Faculty of Medicine**
3	13	4
Faculty of Science	**Faculty of Social Studies**	**Faculty of Sport Studies**
10	18	2

Source: Authors

2.1 Experimental design

Experimental design simulates real-life situation, in which three subjects come into interaction. Experiment uses modified experimental design created by Cameron et al. [25]. Subjects have been assigned the role of a bribe proposing PRIVATE CITIZEN, a PUBLIC OFFICIAL, or OTHER MEMBER OF SOCIETY. Participants were supposed to identify themselves with the role that had been given to them and make decisions the same way as if it was a real-life situation. The authenticity of behavior during laboratory experiment and real life behavior was stimulated with financial reward.

The money earned during the laboratory experiment is called payoff. The payoff is calculated in an experimental currency EMU – Experimental Monetary Unit. At the end of the experiment, it is converted into cash in CZK (Czech crown) using conversion rate that was common knowledge. At the very beginning of experiment, participants received numbered card signed by supervisor. This number corresponded to the number of subjects' computer. All of this was done for the sake of anonymity, thus no one could associate subjects behavior with his/her personality. All the information they provided and decisions made are treated as confidential.

As mentioned above, three individuals interact within the experiment: a PRIVATE CITIZEN, a PUBLIC OFFICIAL and OTHER MEMBER OF SOCIETY.

Those assigned the role of the PRIVATE CITIZEN will make up their minds whether or not to offer a bribe to the PUBLIC OFFICIAL. The PUBLIC OFFICIAL has to decide whether he or she would be willing to accept a bribe if any is offered, or to refuse it. The OTHER MEMBER OF SOCIETY decides whether he or she would report corruption if a bribe is offered AND accepted.

Each individual begins with 100 EMU – Experimental Monetary Unit. If corruption occurs (i.e. a bribe is offered AND accepted) the PRIVATE CITIZEN and PUBLIC OFFICIAL gain 20 EMU each, and the OTHER MEMBER OF SOCIETY loses 40 EMU. If corruption occurs and is reported, the OTHER MEMBER OF SOCIETY pays 10 EMU, and the PRIVATE CITIZEN and PUBLIC OFFICIAL lose the 20 EMU they have gained.

2.2 To summarize

If the PRIVATE CITIZEN chooses to offer a bribe, the PUBLIC OFFICIAL chooses to accept a bribe if offered, and the OTHER MEMBER OF SOCIETY chooses not to report corruption, the PRIVATE CITIZEN ends with 120 EMU, the PUBLIC OFFICIAL with 120 EMU, and the OTHER MEMBER OF SOCIETY ends up with 60 EMU.

In all other cases (for example if a bribe is offered but not accepted, or if the official would have accepted a bribe but none was offered) , the PRIVATE CITIZEN ends with 100 EMU, the PUBLIC OFFICIAL with 100 EMU, and the OTHER MEMBER OF SOCIETY ends up with 100 EMU.

We assume that in perfect subgame equilibrium of the game, the strategy is rational, payoff maximizing and OTHER MEMBER OF SOCIETY doesn't report corruption. Knowing so, the PUBLIC OFFICIAL accepts bribe and the PRIVATE CITIZEN offers the bribe.

3. Results and Discussion

Among 150 participants of an experiment, 86 were males and 74 were females. Average age of participants reached slightly less than 22 years and – among all of them – 81 have already work experience in some administrative or bureaucratic position. Thus, we can conclude that our sample is well-balanced in terms of population.

3.1 Results for PRIVATE CITIZENS

In total, 51 participants played the role of the PRIVATE CITIZEN. Here we were interested in how many of them proposed a bribe. Among all, 35 did. Actually we can say that 69 % of population behaved in corrupted way and is ready to offer bribe in real life situation. Of those, 32 participants were from Faculty of Economics and Administration and 19 were from other faculties. Participants in PRIVATE CITIZEN role from Faculty of Economics and Administration

offered bribe in 22 cases, meaning that malfeasance was committed by 69 %. PRIVATE CITIZEN participants from other faculties proposed bribe in 13 cases, meaning that they behaved in corrupted way in 68 %. Here we conclude that there is no systematic deviation in behavior between students of economics and other students. Anyway, we can state, that 31 % of participants behaved in another than payoff maximizing, thus strictly rational way.

3.2 Results for PUBLIC OFFICIALS

Another 51 participants acted as PUBLIC OFFICIAL. Here we studied how many of them accepted proposed bribe. 35 accepted did, meaning that 69 % of population is ready to commit a crime in similar real life situation. As for PUBLIC OFFICIAL role, 30 participants were from Faculty of Economics and Administration and 21 were from other faculties. PUBLIC OFFICIAL participants from Faculty of Economics and Administration accepted bribe in 23 cases, meaning that 77 % of them behaved in corrupted way. As to the others, participants from other faculties accepted bribe in 12 cases, i.e. 57%, which makes them less prone to corruption than economic students. Interesting thing is that 31 % of population did not behave in rational manner, which means they are driven by other than profit maximizing criteria.

3.3 Results for OTHER MEMBER OF SOCIETY

Among all participants, 51 participants represented OTHER MEMBER OF SOCIETY. Here we surveyed how many participants in this role report corruption. In total, 31 OTHER MEMBER OF SOCIETY subjects reported corruption, which is 61 %. 24 participants in OTHER MEMBER OF SOCIETY role were from Faculty of Economics and Administration and the rest was from other faculties. Participants from Faculty of Economics and Administration reported corruption in 15 cases, meaning that in 63 % they behaved in lawful way. Participants from other faculties reported corruption in 16 cases, which signifies that they behaved in accordance with law in 59 %. On the other hand, only 39 % behaved in strictly rational way by not reporting corruption.

3.4 Binominal test

We tested hypothesis that field of study (faculty matter) affects the susceptibility to corruption. 35 participants proposed a bribe in PRIVATE CITIZEN role. 22 of those were from the Faculty of Economics and Administration and 13 from other faculties. For the PUBLIC OFFICIAL role, the bribe was accepted in 35 cases. 23 of these were from the Faculty of Economics and Administration and 12 were from other faculties. Corruption was not reported in 20 cases by subjects in role of the OTHER MEMBER OF SOCIETY. 9 participants were from Faculty of Economics and Administration and 11 from other faculties.

H_0: In sample of 90 subjects which broke the law, 54 were from economic faculty and 36 were from other faculties. We can generalize that more than one half of corrupted subjects come from economic faculty.

H_1: In sample of 90 subjects which broke the law, 54 were from economic faculty and 36 were from other faculties. However, we cannot generalize that more than one half of corrupted subjects are from economic faculty.

Respective p value is 0.0363, therefore we reject H_0, and there is no systematic difference in behavior between students from economic faculty and other faculties' students.

One of the interesting results of the presented study is the fact, that 31 % of subjects did not offered a bribe, 31 % of subjects did not accepted a proposed bribe and 61 % of subjects reported corruption. We assume that 41 % of participants deviate from equilibrium based on expected utility theory and thus were driven by other than profit maximizing criteria.

Despite prevailing stereotype of economic students' dishonesty, our study found no significant difference in behavior of economic and non-economic students. Only striking exception were observed in bribe acceptance issue, where non-economic students are less likely to behave venally.

4. Conclusion

Many laboratory experiments suggest differences in behavior between students of economic and non-economic faculties and expect that the economics students behave according to rational models and are in many cases more self-oriented than others. We provided evidence via a corruption experiment which simulates possible roles in the bribery process and focuses on the impact of the field of study on the behavior of the subjects.

The rational behavior in our experiment would be for each role to "break the law" and offer bribe, accept it and not report. However, we found out that many subjects did not behave in this way, no matter what faculty they came from. There was no significant difference in the behavior of students of the Faculty of Economics and Administration and the rest of Masaryk University students. Therefore, we may conclude that the decision to offer bribe, accept it or report the illegal behavior is not influenced by the field of study and there are other determinants which influence the behavior. The explanatory power of our results is, however, limited by the bounds of laboratory experiment.

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Current Trends in Evaluation of User Interface of Public Administration Information Systems

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Abstract

This paper is focused on new approach of public administration information systems user interface usability testing and evaluation. As case study usability testing and evaluation of electronic forms is discussed. Objective of this case study is to design a suitable methodology for usability testing of electronic forms and their description and distribution. In the last part of the work test and evaluation of selected forms is performed based on the proposed methodology. The main benefit of the work is the design of testing methodology and proposition of the set of recommendations for new public administration electronic forms design.

Keywords: Public administration information system; usability; usability engineering; software engineering; software quality

JEL Classification: L86

1. Introduction

1.1 Usability Engineering and Public Administration Information Systems

As [1] shows information systems (IS) manage information that can have a very high value. End users of these IS prefer such user interfaces that are understandable to them and that do not put obstacles – that are usable. The main source that formulates the issue of software usability is standard ISO/IEC 9241 that specifies how software should look like to be usable.

One of the first usability definitions has been established by [2] for software quality and defines the usability as a set of attributes. However, a more precise usability definition selects certain usability attributes and is stated by [3], [4] as: "The effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in a particular environment". One of the current definitions of usability can be found for example in [5]: "Usability is the extent to which users can use a computer system to achieve specified goals effectively and efficiently while promoting feelings of satisfaction in a given context of use".

As indicated above, an interface is the link between the user and the product. In principle, the interface represents the user's interaction with the product in order to achieve some goals. Designing an effective interface is a complex task and it does not happen by chance [6]. In order to achieve good interface specification, the designers should understand following three aspects presented in [7]:

- the users of a specific product,
- the environment users work in and with,
- targeted tasks for the interface.

It is important to realize that usability is not a single, one-dimensional characteristic of an user interface. Usability has multiple components and is traditionally associated with these five usability attributes found in [8], [9]: learnability, efficiency, memorability, satisfaction anderrors.

Usability engineering is the discipline that provides structured methods for achieving usability in user interface design during product development [10]. Usability evaluation is part of this process. While theoretically any software product could be evaluated for usability, the evaluation is unlikely to produce good results unless a usability engineering process has been followed [11]. At present, the usability engineering is a fundamental part of software engineering. It can reveal qualities of product as well as lack of functionality, which usually arises during the design phase of the product. It is necessary to note that the usability may not

be related only with the graphical user interface of software [12], but also for example with cartographic products [13], product manuals, cars, home electronic devices as well as a usability of Web sites.

In relation to the usability the next specifics of public administration information systems (PA IS) can be formulated [14]:

- public services providing,
- high diversification of PA IS types,
- high diversification of users, their skills, knowledge and equipment,
- high diversification of user requirements for information,
- high diversification of user demands for services,
- inability to training outside users,
- legislative requirements,
- lack of research on the usability of PA IS.

1.2 Problem Formulation

As an example of user interface of PA IS electronic forms that are located on public administration authorities' websites were selected. The reasons for this choosing are follow:

- availability to a large number of users,
- minimal restrictions on use,
- their use is free,
- understanding of their content does not require any special knowledge,
- a representative group of typical users can be easily selected,
- are continuously available,
- assessment of the usability has a benefit because the results of this evaluation may lead to an increase in quality if the evaluation reveals any usability problems,
- results from the testing of these sites can be easily compared.

Electronic forms of public authorities must comply with the principles of the accessibility of public authorities' web pages established by the order 64/2008 Sb. This order establishes in its annex thirty-three rules for accessible websites [14] development. However, the issue of usability is not discussed in any act or order. It depends only on forms developers whether they will test usability of a form or not [15]. But if electronic forms should replace their paper fellows, it is necessary the electronic forms should be user-friendly and all citizens should use it without any difficulty. Usability tests of public authorities' electronic forms are also of great importance for institutions that finance their development because test data provide a basis for assessing the quality of the delivered product.

Therefore, an objective is to propose an electronic form appropriate testing and evaluation methodology and validate this methodology in a case study. The results obtained from the usability tests can be used to create recommending proposals for found problems fix and thus improving the quality of electronic forms.

1.3 Justification of Formulated Problem Significance

In the recent time some cost-benefit models related to usability has emerged (e.g. [16], [17]). The main lack of these models is that they consider the common commercial software as desktop applications and websites only. The sphere of public authority is certainly quite different from a commercial sphere. The important difference of public administration is that the business objective of public authorities is not revenue. Public authorities offer public services that can be thought as a form of a public property. It means a public authority has not customers in the original meaning. Different expenses reductions and benefit increase can result from usability engineering activities. Some of them are listed in [18] but not all of listed items suit to PA IS. For example an increasing of purchases does not suit, because public administration does not sell any product, but offer public service. Next example is increasing of market share

(competitive edge) that cannot be used as well because public administration does not have any competitor in original meaning.

But it is possible to select from existing business case studies and research works adequate components of revenue of usability investment in PA IS and to suggest the own ones if some aspects are not published so far:

- Reduction of user errors, increase success rate – in one study of 15 large commercial sites users could only find information 42 % of the time. The websites of public administration present some amount of information as well [19]. Next, wrong filled up a tax return can lead to next superfluous activity.
- Decrease support costs – well designed electronic forms do not need calls to an office.
- Decrease cost of traditional customer service channels – website has relatively low operating costs compared with more traditional channels for service distribution.
- Increase user satisfaction – in one study usability engineering methods raised user satisfaction ratings for a system by 40 % [20].
- Increase trust in system – Stanford University's Web Credibility Project showed that "ease of use" was the second highest factor contributing to a customer's overall perception of credible Web site [21]. If the user will trust in system he will use this system effectively. For example a lot of people do not trust in electronic tax return and therefore they visit offices.
- Increase trust in public administration – One study clearly showed that user's trust concerns can significantly be alleviated by providing relevant information when and where users need it [22].

2. Material and Methods

2.1 Method Selection

Currently, in the field of usability engineering there exists a big amount of different methods, such as Cognitive Walkthrough [24], Feature Inspection [24] , Heuristic Evaluation [25], Eye-Tracking [26], Coaching Method [27], Co-Discovery Learning [24], Performance Measurement [27] , Question- Asking Protocol [26], Remote Testing [28] , Retrospective Testing [24], Thinking Aloud Protocol [27], Focus Groups [28] , Field Observation/Ethnography) [27], Individual Interview [27] , Logging Actual Use [28], Questionnaires [26] and User Testing [29].

When selecting appropriate usability testing and evaluation method the knowledge gained from [23] was used. In addition, questionnaire survey where usability engineering experts were asked about important criteria for appropriate method selection was carried out. These criteria are:

- Developmental stage – as possible methods are only those methods that apply in the deployment phase of the software therefore considered.
- Place of testing – comparable computers that are under control. Not remote testing, which needs specialized software.
- Type of output data – those that provide both quantitative and qualitative data.
- Number of participants – at least one participant, because of the efforts of tests verify the ability of real users interact with the form.
- Number of experts on usability testing – the number of experts is required greater than one, so that testing can only be performed by one person with knowledge of the usability testing.

Some of these methods provide only qualitative or quantitative outputs, some methods require special equipment, the presence of large number of experiments and so on. Based on the literature research we choose the method of User Testing that meets the criteria formulated above.

2.2 Methodology Formulation

The proposed methodology is designed for stage when public administration electronic forms are turned on. It is therefore it is expected public administration does not create these applications itself. Suggested methodology has three possible applications. The first is its use for detection of major and minor faults located in the existing forms. Another option is to compare two development versions of same electronic form. The last usage of this methodology is to compare two electronic forms from different vendors from usability point of view.

1. Testing goals formulations
2. Representative participants selection
3. Task selection and scenario design
4. Metrics selection
5. Preparation of tests and testing
6. Data analysis and results

2.3 Testing Goals Formulation

The purpose of this step is to define the objectives and concerns. Firstly it is necessary to define general goal, on the basis of which are created more specific goals and concerns. Defining goals and concerns for each test is different and unique because it is based on concrete form and web pages on which this form is located. But there are typical examples of goals and concerns and their usage is suitable for testing. Example of general objectives can be testing the ability of users to work with the form menu quickly and easily. From this general objective, specific objectives and resulting concerns to the question whether users will be able to use the menu to save the completed form, print it, make its electronic filing, find the necessary information in the help, and check the entered data and so on. At the same time it is necessary for this step to answer the question of whether a thorough test, which is time-consuming and financially, in turn, provide better and more comprehensive results than the simple test, or whether it will be made simpler test, which is compared to a thorough test depth less costly and time consuming.

2.4 Representative Participants Selection

Using of public administration forms usually does not require any specific knowledge or skills, and therefore test subjects selection is not particularly limited. User of electronic forms can be any person who handles the minimum basic computer and internet, so to be able to make the completion and submission of a form. The only factor limiting the selection of participants is their age. Serving the electronic form, as well as their paper equivalent , that is , persons with full legal capacity, i.e. adult persons 18 years or older. In the case of testing some forms there are certain requirements regarding their education and skills. Examples are tax forms, because to fill these forms is required user knowledge of the tax administration and the laws.

Determination of the number of participants is closely related to the chosen type of the test. For the purpose of simple tests is ideal to use four or five participants, because testing with this number of participants can detect 78% and 85% of problems tested in the forms [30], [31]. For a thorough test is advisable to choose ten or more participants, because using ten participants is testing identified more than 97% of the problems [31]. If thorough tests conducted using subgroups of participants, each of the subgroups is composed of five persons. Total number of participants for this type of test is therefore then depends on the number of subgroups.

2.5 Task Selection and Scenario Design

Another point that needs to be drawn up before the start of testing is to define a set of tasks that participants will solve during tests. The first source is the objectives of testing. Another area used for identification tasks are typical actions that a user can carry out electronic forms. For example completion of personal data, checking for errors on the form, print the form, electronic filing out forms and much more. Scenarios of the participants are presented in written

form, need to be developed to be brief, written in the language of the user, give participants all the necessary data and are clear to each participant easily understood.

2.6 Metrics Selection

Determination of data that will be recorded during the test again depends on the type and purpose of the test and also linked with defined goals and concerns, and in particular by specifying different scenarios. In thorough tests designed to detect errors in the test form, leading to its enhancement is especially important to monitor these performance data: the number of incorrectly filled fields, the number of blank fields , the number of unselected items, number of keystrokes, press the number keys for deleting text, clicks the left mouse button, use the number of functions for checking completion data , the number of errors in the entered data , the time required to complete the form, time spent at work with menu form tested and time spent reading help. If carried out a thorough test, whose task is to compare two form versions, or comparing competing forms is the previous observation still important to observe user frustration, confusion and expressing his satisfaction. Subjective data you need to record the ease of learning, ease of use, ease of production of specific tasks, the overall impression of the test form, the impression of menu format feel of the layout menu form. After determining which data is recorded, it is important to determine how they will be recorded. For this purpose, you can use specialized software, whose task is to record the required data, video sequences and sound recordings. Another way to obtain the data is to entrust this work to individual members of the test team. To capture the subjective questionnaire data is used when drawing up the questionnaire is based on defined measurement data appropriate to use structured assessment scales , such as: the form I tested worked very easy - easy - not easy but not difficult - difficult - very difficult . A simpler evaluation scale is a type where answer is yes - no.

2.7 Preparation of Tests and Testing

In common tests it is possible to recommend simple test room in which the participant, moderator and observers are. The necessary equipment of this testing room, where the testing will take place, includes a computer connected to internet. It is necessary to specify the hardware and software parameters that are similar to expected real user's equipment parameters. Testing involved a team of people, so it is necessary to assign members of the test team to roles. It is important to establish the team leader, test administrator, moderator and observers. It is recommended to conduct a pilot test that looks exactly as planned real test. Its purpose is to reveal the shortcomings and problems in each designed scenarios and questionnaires, as planned during the test and in the materials and data prepared for the test.

2.8 Data Analysis and Results

The first step after the tests themselves is to perform summarization and tabulation of acquired data. Data obtained during the test must be divided to the performance and subjective data. For comparison of competing forms or individual developmental versions of a same form can be used scoring method. The tests focused on bugs finding whose removal leads to the improvement of a tested form as the most important indicator for identifying data records is the number of mistakes made by the participant during the test. For thorough tests it is important to classify findings on the base of both severity and frequency of their occurrence. Based on the seriousness these errors can be classified as critical errors, frustrating errors, and errors having little effect on the usability and minor bugs.

Results of this methodology depend on the goals defined in the first phase of suggested methodology. Result can be in the form of better solution selection or in the form of usability deficiencies list with importance denotation.

3. Results and Discussion

As a case study the forms of state social support located on the web of the Ministry of Labor and Social Affairs of the Czech Republic were selected.

The reason for the testing of these forms is the fact that there are many forms that do not yet have their complete electronic equivalent and therefore it seems very appropriate to test the existing electronic forms to improve the creation of new electronic forms and eliminate errors in existing ones. As the representative tests were selected application form for child benefit and claim for a grant because they are in their structure, layout and content very similar to other electronic forms that are located on that site.

In this case study following objectives and concerns were defined:

- Will be users able to find the desired website and the information on them? (Will users find the necessary electronic form? Will be users able to determine whether the form can be submitted electronically?)
- Can users fill in the electronic form? (Do users complete the application form for child benefit? Can users complete the form without errors?)
- Will be users able to properly use the form menu items? (Will users use correctly the navigation menu items?)

Next, the suitable participants were selected, appropriate tasks were selected and 4 scenarios were designed. During tests different data was recorded. The examples are: completion of given task (yes or no), the number of mistakes made by the participant in each task, the time required to fulfill the specified scenarios, the number of clicks of the left mouse button and the number of keystrokes. Recording of monitored data was in charge of the test team. For timing stopwatch and was used and for a record of the number of keystrokes and clicks simple monitoring software was used. Subjective data were acquired by a questionnaire. Data acquired by test were analyzed and usability deficiencies were formulated, for example:

Scenario 1

Issues:

- The problem with finding a suitable form through a menu for form selection on the left of the page because it does not contain complete form names.
- On the menu it is not possible to see if it is possible to send the filled form electronically.

Recommendation:

- The top rows of folders on the main forms of state social support should be pronounced to her users are accessing the site immediately noticed and quickly find what they need.
- The description of the individual form in the tab selection should has an indication whether is possible an electronic submission of the given form or not.

4. Conclusion

After establishing the criteria and requirements for usability testing and evaluating of public administration electronic forms on the base of literature review User testing was selected. Subsequently, a methodology for usability testing and evaluating of public administration electronic forms using this method was suggested. The proposed methodology includes the formulation of the subject and objective testing , selection of participants , selection of tasks and the creation of test scenarios , the method of measuring usability, appearance of a test environment , how to build a test team, the implementation of the pilot test and the acquired data analysis. Based on the suggested methodology usability testing and evaluation of electronic forms of state social support located on the web portal of the Ministry of Labor and Social Affairs was carried out. Specifically, it was the application form and a grant application for child benefit. With testing, we identified deficiencies and usability problems in both test forms and recommended redesign to eliminate them.

The suggested approach is not expensive and can be used for usability lacks identification. We were surprised by the big amount of this lacks in the electronic forms we tested. We hope that usability engineering methods will be applied to PA IS in future to help the end users to use them.

Our future aim is to modify this suggested methodology so that natural language can be used during evaluation phase. We expect that using of natural language will not harass to participants and participants will concentrate to subject of evaluation and not to a way how evaluation is done.

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Performance-related Pay in Slovak and English Local Governments

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Abstract

The article deals with the topic of performance management and in particular performance-related pay (PRP) in Slovak and English local governments. Both systems of local government possess considerable level of freedom in terms of their performance management which allows performance-related pay to be implemented. However, due to various levels of public administration development, reform models and trajectories, it is worthwhile to find evidence and test whether theoretical models of public administration reform are also reflected in a day to day basis. The purpose of the article is to evaluate to what extent Slovak local governments employ performance-related pay schemes compared to England. Collected empirical data shows a striking contrast in the use of unconsolidated performance-related pay and also in the use of staff performance measurement appraisals.

Keywords: Local self-government; performance management;performance-related pay; Slovakia; England

JEL Classification: H11, R50

1. Introduction

Research conducted in the field of performance management has so far concentrated on comparison between Western European countries separately from Eastern European countries [1, 2, 3, 4, 5]. Hence, one of the key aims of the article is to take a different and original approach and bring two contrasting countries into a comparative perspective.

England has a much more complex, non-uniform local government structure with numerous options regarding the organisation of local authorities and local government leadership. English district councils can be compared in terms of their size only to the largest municipalities in Slovakia. With a complex 4-tier system of local government in England (regional level, county level, district level, and parish level) and with numerous special arrangements, the local government structure and system seems all but the same compared to Slovakia. By contrast, Slovakia's constitutional arrangements set strict rules which allow hardly any special arrangements. Slovakia has close to 3000 self-governing municipalities (i.e. villages, towns, boroughs) – each with a directly elected mayor and assembly, two cities with a special status (Bratislava, Košice) and 8 self-governing regions with their own regional assemblies (regarded as regional government). By comparison, England has around 10,000 units of local government without any devolved regional assemblies. However, most English villages and towns belong to district and county councils which carry out similar functions to Slovak municipalities and regional assemblies combined.

Public administration, both as a field of study and in particular as a system and organisation of public sector is naturally at different levels of development in the UK and in Slovakia. England and the United Kingdom is regarded as the cradle of NPM and the first major public sector reforms started with the arrival of Margaret Thatcher in the late 1970s. Later, these also included the introduction of performance management, performance measurement and to some extent performance-related pay [6]. On the other hand, Slovakia, arguably in a number of aspects still a transition economy, has attempted its first public administration and public sector reforms with various level of success in 1990s. Nevertheless, Slovak legislation has included various options for local governmental staff PRP already in the 1990s. Also, due to a considerable level of decentralisation and the resulting legislation both English and Slovak municipalities and their executives have a significant level of freedom to select and execute

human resources management policies of their choice, or adjusted and suited to their needs. It is the purpose of this article to show to what extent they practise this option.

With an increasing pressure on local governments in Slovakia and England to save public resources and cut public spending, the question of implementing more New Public Management-driven or other types of reforms still remains very topical. Research shows that human resources management if carried out well can lead to an improvement in 3Es (economy, efficiency, effectiveness) and overall performance of public organisation. Hence, the question of improving and assessing human resources management and performance management in particular ought to be high on the agenda.

The catch-all term *performance management* generally refers to what Colin Talbot calls "measuring, monitoring, and managing the performance of public system" [7, p. 491]. The primary purpose of performance management is to increase overall performance of an organisation. Performance management includes among other topics a number of approaches and models to measure and reward performance. They might include consideration of groups efforts - collective or group performance; some measure and reward outputs only; others also seniority, social skills, traits, behaviour, competences, etc.

Talbot also makes an important reference to New Public Management (NPM). He talks of a *close alliance* of performance tide to the NPM trends in the last part of the twentieth century [7]. Furthermore, he makes an important distinction and mentions "three different foci in terms of what is supposed to be for 'performing' in current theory and practice: organizational performance; performance of policies or programs; and performance by public servant" [1, p.494). It is the third type only which this article will be concerned with. Hence, the focus of the article will be individual performance of local bureaucratic public servants.

However, having performance measurement put in place without any connection to a reward system does not make much sense. So the emphasis of the article will be on performance-related pay as a means of rewarding performance of individual staff. According to McCourt, *performance-related pay* (PRP) is "one approach to using pay to provide an incentive to individuals to work more effectively" [8, p. 158]. Armstrong and Murlis use it to describe schemes which "base additional financial rewards on ratings of performance, contribution and competence" [9, p. 258; quoted 8, p. 158). Furthermore, they also add that it is "the main method of determining pay progression for non-manual workers" [ibid]. Prior to PRP systems, private sector too used fixed incremental pay systems which are expected to be still largely present in Slovak local government offices to this day - very much in line with the Weberian model of bureaucracy.

1.1 Unconsolidated PRP

By unconsolidated PRP, the author refers to any additional payments which are treated as a bonus on top of base salary and need to be 're-earned' in each review period. It is important to make this clear distinction in order to be able to more precisely compare research data from the two countries. For instance, annual incremental pay rises in English local governments could be by some regarded as PRP since they are awarded under the condition of satisfactory performance. However, as quantitative and qualitative research later revealed, some local governments award them automatically unless there is a serious case of underperformance. Hence, incremental pay rises and other forms of pay which do not need to be regularly re-earned, were not included in the research and the author instead focused on unconsolidated PRP only. Typical examples of unconsolidated PRP which are awarded in Slovak local governments and hence need to be re-arned each review period, mostly include financial rewards and end of year bonuses and personal premia. Based on theoretical knowledge and the level of public administration development and influence of NPM and other public sector reform movements, the author expected unconsolidated PRP to be used more often in English local governments than in Slovak local governments. Hence, the tested hypothesis suggested that Slovak local governments use unconsolidated performance-related pay schemes to a lesser extent compared to English local governments. However, this premise was proved to be totally wrong.

2. Material and Methods

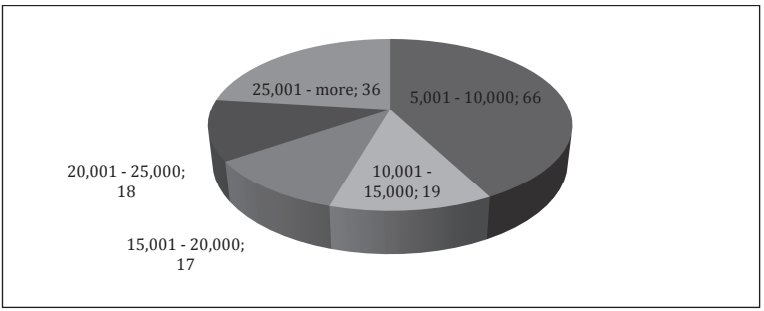
The author used fixed and flexible research methods for acquiring quantitative and qualitative data. However, this article will only draw from the acquired quantitative data due to the limited space. The primary objects of the proposed research were Slovak and English local governments and their bureaucratic staff. By local government bureaucratic staff, the author refers to the bureaucratic apparatus (white collar workers) employed at town and city halls/district councils. These are staff that do not usually get into contact with the public, perhaps apart from the first contact centre employees. Hence, the research did not include what Lipsky calls street-level bureaucracy [10], although local government staff in England and Slovakia also include street-level bureaucrats. The reason for this omission is the complexity and variety of tasks performed by all local government employees.

In terms of *data collection*, the author measured the extent of the use of different means of individual staff performance measurement and PRP by conducting a quantitative research survey distributed in 100 Slovak and 100 English local governments (i.e. Slovak towns and other municipalities, and English district, borough and city councils). The author chose the number 100 in order to secure representative, comparative and statistically relevant data and results.

Proportional stratified random *sampling* technique was used in order to attain a representative and statistically relevant result. First, all Slovak municipalities greater than the size of 5,000 (i.e. total of 156 local self-governments) had been divided into 5 groups or strata according to their population size (see also Figure 1 below):

- 5,001 – 10,000
- 10,001 – 15,000
- 15,001 – 20,000
- 20,001 – 25,000
- 25,001 and more

Figure 1. Slovakia - municipalities' population strata



Source: Author

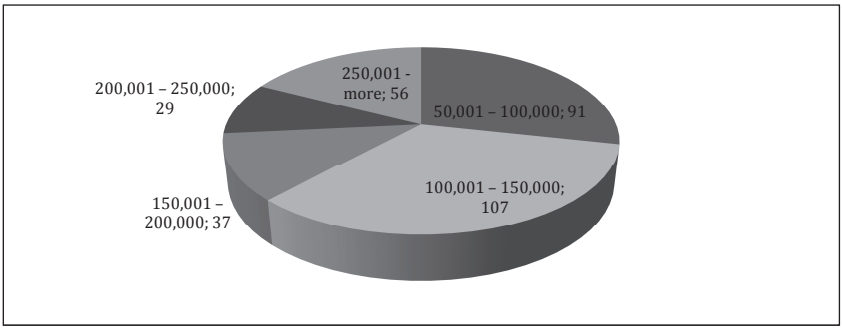
For each of these 5 groups, a proportional number of Slovak municipalities (i.e. 42, 23, 12, 12, 11) were randomly chosen, hence making a list of 100 local governments which were contacted and included in the research. The reason for selecting only municipalities with populations greater than 5,000 is the low number of municipal staff in small municipalities and hence likely and arguably a natural absence of systemic performance management schemes. Of the 100 Slovak municipalities that had been contacted, 34 responded (i.e. response rate 34%) and filled in the questionnaire.

Because of the difference in structure and functions of municipalities, the author used stratified samples of the 326 English districts instead of the 9,000 parish councils which delegate most of their functions to the 326 higher districts. Population size of district and city councils varies considerably between 35,000 (West Somerset) and 1 million (Birmingham). Hence proportional stratified random sampling was used and the author again proportionally and

randomly chose 100 samples to reflect the population size and the 5 numerically corresponding groups (see also Figure 2 below):

- 50,001 – 100,000
- 100,001 – 150,000
- 150,001 – 200,000
- 200,001 – 250,000
- 250,001 – more

Figure 2. England - municipalities' population strata



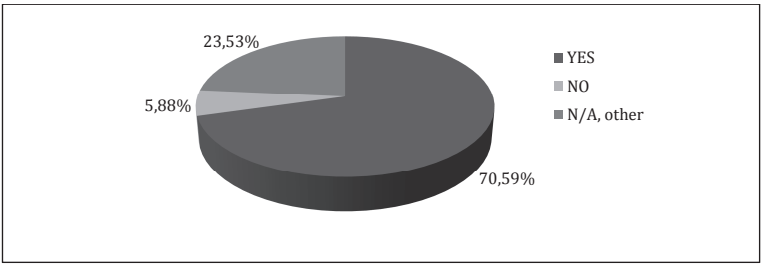
Source: Author

Of the 100 English municipalities that had been contacted, 31 responded (i.e. response rate 31%) and filled in the questionnaire. Once the quantitative analysis (using data from the 100 + 100 local governments in Slovakia and England) was completed, the author randomly selected at least one typical and one atypical case study from each country – based on the level of performance management/measurement policies in use. It is important to note that the selected case studies were not used to primarily conduct a typical case study research, but merely to further illustrate and explain attained quantitative data.

3. Results and Discussion

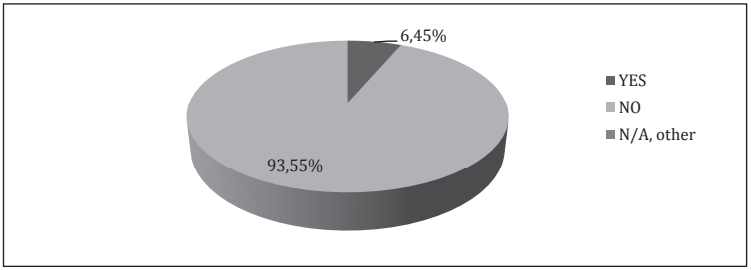
Quantitative results (Fig. 3 and 4) clearly refuted the hypothesis and proved the exact opposite. Slovak local governments use unconsolidated PRP to a far greater extent (70,59%) compared English local governments (6,45%). Data from quantitative research also showed that PRP in Slovakia can be anything from 3 to 38% of the base (tariff) pay, and both the average and median value is 15%. In terms of PRP in England, most English district councils award incremental pay rises on annual basis only, but regarding unconsolidated PRP, an overwhelming majority (93,5%) of councils do not offer their staff to earn any financial or pay bonuses. Instead, at least all case studies showed that performance is also rewarded through non-financial means.

Figure 3. Use of unconsolidated PRP in Slovak local governments



Source: Author

Figure 4. Use of unconsolidated PRP in Egnlish local governments



Source: Author

Quantitative research showed that unconsolidated PRP is used in only very few local governments in England. However, case study research in England revealed that some local governments which officially do not award unconsolidated PRP might make an exception in case of their *senior management staff*. Such staff might be awarded pay bonuses based on overall council results or personally delivered tasks. It is understandable that in order to retain high-calibre staff, they need to be paid correspondingly or at least similarly compared to private sector conditions. However, councillors, council managers and chief executives before setting and deciding on pay conditions should carefully consider the effects on other lower ranking staff who would not qualify for any PRP and whose pay levels are already considerably lower.

To illustrate the English case, despite not awarding unconsolidated PRP, many South Northamptonshire District Council staff have the option to work certain days from home, and to some extent can have flexible work hours and other work and social benefits such as a generous pension scheme. Work and social benefits including contribution to the society have been also stated by the South Oxfordshire District Councils' staff as motivational factors. However, the untypical case study revealed that although not officially, some councils might award unconsolidated PRP for senior executive staff only.

Based on the literature review and the effects of the current economic crisis, the author anticipated that Slovak local governments would exercise their power to award unconsolidated PRP to a lesser extent compared to English local governments. Since the current economic crisis broke out around 2008, both English and Slovak local governments have also been influenced, particularly in terms of a greater pressure on public expenditure. As a result, one would also expect local governments to limit their staff expenses; including awarding only *well justified* performance-based pay bonuses for staff.

However, results also show that this is not the case in all Slovak municipalities and although 62% of them award unconsolidated PRP and also measure staff performance; a relatively high number - 9% of towns award unconsolidated PRP despite lack of any staff performance measurement system. Hence, unconsolidated PRP is heavily employed by Slovak

local governments although towns do not in all cases measure staff performance, nor do it systematically. This raises the question of the ability and practice of awarding PRP without any objective and systematically collected staff performance data. Thus this can lead to various risks and problems such as bias, favouritism, and even corruption which can then end in further consequences. Moreover, PRP can be used and clearly is used in some local governments in order to game the nationally set local government staff pay bands and/or to subsidise low staff pay without any relation to performance.

One of the interviewed Slovak town managers explained some of the reasons why their town hall is not measuring individual staff performance but is nevertheless using PRP including unconsolidated PRP in the form of annual salary bonuses and personal monthly pay bonuses. The explanation given is the lack of political will (in this case) of the mayor who decides on town hall's internal policies, including staff performance and pay. In other cases, town managers who are by the law chosen by mayors can be appointed not based on merit or personal preference, but because of political pressure and calculations. This can be arguably seen as a mayor's rational decision in order to secure a working town council for her priority programme policies to be passed. As a result, some town managers might lack necessary managerial experience and skills and hence do not push for any formal performance measurement schemes – what in Slovakia is often dubbed as "lacking political will". However, in most cases they do not restrain from awarding unconsolidated PRP and data from quantitative research shows that it can be between 0 to 38% but in most cases a maximum of 20% pay bonus of the base (tariff) pay. Because of the absence of any performance measurement system, PRP if used, is more or less based on the sole discretion of the town manager and/or mayor, who might use some basic internal guidelines on awarding PRP but also might act purely based on their personal preference. Furthermore, having a sophisticated PRP system limits much political leverage and power to reward "cronies" and potentially also minimises space for corruption and political patronage.

4. Conclusion

The article has analysed the use of individual staff performance measurement and performance-related pay in Slovak and English local governments. Both systems of local government possess considerable level of freedom in terms of their performance management which allows both performance measurement and performance-related pay to be implemented. The purpose of the research was to evaluate and analyse the current state of performance management and in particular to provide an answer to what extent Slovak local governments employ performance-related pay schemes compared to England. Collected empirical data showed differences between the two countries, namely the striking contrast in the use of unconsolidated performance-related pay. Based on the research and presented results, the author suggests three key recommendations for local governments in both countries: to award PRP based on holistic performance measurement appraisal and data; to have PRP rules universally valid for all staff; and to invest in getting the message across and make rules and information available. Ideally, the local governments would implement such recommendations but at the same time they should be careful not to create an environment which would turn them into what Gareth Morgan describes as "machines" and "psychic prisons" [11].

The research has provided original, comparative and internationally compatible sets of data which could be used for further analysis. Also, population strata were used only to secure representativeness of research. Researchers could use the data for further comparative purposes and also in order to test any further correlations between or among strata. Also, a more geographically or politically-oriented research could be undertaken, taking into consideration the geographical location and the political composition or leadership of the respective local governments. The author also did not intend to test and provide answers on the following topics and issues: performance measurement effectiveness, overall local government

or organisational performance, effectiveness of PRP. Thus, these might be also considered in further research.

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Neuroeconomics: „Great Expectations“ or „Much Ado about Nothing“?

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Abstract

Over the past decade, we had a chance to observe a formation and steady grow of new science called neuroeconomics. Since its beginnings, it has attracted much attention. The novel methodology which the science brings has been by one side perceived as “revolutionary”, while the other part of scholars has doubted its relevance and possible contribution to the economic theory. The aim of this paper is to introduce neuroeconomics and main controversy that relates to this science and to discuss possible contribution of neuroeconomics to economic theory. The paper begins with a short explanation and history of neuroeconomics, which is followed by a description of tools that are commonly used in the research. The next section is devoted to the discussion over a potential contribution of neuroeconomics to the economic theory. Main arguments in favor, as same as against, neuroeconomics are presented. The last sections introduce some of the findings made on the field of neuroeconomics and it shows how these findings are relevant to the economic theory.

Keywords: Neuroeconomics; economic methodology; economic models

JEL Classification: D87, D01, D03

1. Introduction

What economics, psychology and neuroscience have in common? It’s not so long since the answer would probably be „nothing“. All the disciplines differ from each other in its aims, objects of studies and even in its methodology. In spite of that appeared a science that attempts to combine all of these disciplines into one united theory. The science is called “neuroeconomics”. Since 1996, when the first paper was published [1] the science has been continuously gaining on popularity. As Marchioni and Vrobel say: *Neuroeconomics is hot. Over the last few years, all over the world many leading universities have started their own lab or centre for neuroeconomics. Papers explicitly presented under the banner of neuroeconomics frequently appear in leading science journals such as Nature and Science* [2]. In spite of that, the science of neuroeconomics raises many essential questions that still remain to be answered. Thus the aim of this paper is to introduce neuroeconomics and main controversy that relates to this science and to discuss possible contribution of neuroeconomics to economic theory.

One of the ambitions of the paper is to provoke a discussion about possible usage of neuroeconomics in the sphere of Public Economics. A legitimate question whether there exists a connection of neuroeconomics and public sector research might arouse. Though a major part of the neuroeconomic research has been focused on a field of microeconomics, I believe that it would be unfortunate to claim that the science is not offering interesting research opportunities even for the scholars dealing with the public economics. As an example of the research related to this field can be mentioned neuroeconomic studies of decisions about tax avoidance [3], motivation of voters’ turnout [4] or reasons of altruistic behavior and charitable donations [5, 6]. Other topics that have not been yet explored would be also of a great interest to public economics. (e. g. sources of corruption behavior, voluntary contributions to the public goods provision etc.)

To introduce the science and main points leading to strife between traditional economists and neuroeconomists, I will present papers dealing with the topic. Though the majority of the discussion about possibilities of neuroeconomics has been held in a relation to the microeconomic theory, I believe that there is no need to distinguish between arguments in favor

(or against) the possible contribution of neuroeconomics to the microeconomic theory and public economics. One of the reasons is that many of the raised points are rather of a general character. Another reason is that main behavioral assumptions of the microeconomic theory, as same as of the public economics, are based on the similar principles (e.g. assumption of the rationality and maximization of one's own utility).Therefore I believe that arguments stated bellow can be applied on both of the fields.

1.1 Neuroeconomics "101"

The following section serves as an introduction to neuroeconomics to those, who are not yet familiarized with it. As mentioned above, neuroeconomics has raised many questions and controversy. The first controversy begins with the conception of neuroeconomics itself. For better understanding I will begin with a short excursion to its history.

The roots of neuroeconomics stem from two independent sciences. First of them, behavioral economics, can be tracked back to the 1950s. By simple experiments behavioral economists proved, that people commonly behave in contradiction with expected utility theory and other assumptions of neoclassical economic theory. As result many theorists conclude that *empirical critiques of the simple axiomatic approaches, in the form of counterexamples, could lead to more general axiomatic systems that were more sensibly rooted in principles of psychology.* [7]. To support theirs theories, they decided to conduct experiments also in thebrain scanners. This led to a born of a neuroeconomic fraction that was later called "behavioral economics in the scanner" (BES). [8]

The second source of neuroeconomics comes from the cognitive neuroscience. In, 1990s, a discovery of fMRI, nowadays most used type if brain scanner (see below) started a rapid development of this science. It provided neuroscientist with a possibility to test many theories about the brain functions. However they were missing a theoretical frame, in which they would set theirs theories. And that is where economics comes handy. Many neuroscientists believe that *kinds of models and tasks economists use routinely can contribute to „systems neuroscience "understanding of higher cognition* [9]. Ross latter named this fraction as "Neurocellular economics" (NE) [8]

Looking on the two different sources of neuroeconomics, it is not any surprise that the science became to be somewhat "schizophrenic". A two camps of scientist declaring themselves to be neuroeconomists aroused, each of which with almost opposite way if the science interpretation. The NE part considers neuroeconomics to be a *specific application of economic theory to neuroscientific modeling and theorizing* [10], while BES thinks of neuroeconomics as of *an application of conceptual structure and experimental techniques widely used in Neuroscience to the study of economic behavior* [11]. Some authors however state, that the recent development shows trend of the science to be more unified. Glimcher, who is commonly considered to be one the representatives of NE side, *now seems to agree with BES that neuroeconomics wants to contribute to the development of new economic theory with superior predictive power* [12]. Nevertheless, at the last meeting of the society of neuroeconomics held on October 2013, the division of the two sides was still quite apparent.

2. Methods of Neuroeconomics

Neuroeconomists use a wide range of tools and methods. Due to a limited extent of this paper I am including only its brief summary. For further information I refer e.g. on Harmon-Jones & Beer [13]. In last years, the majority of the research has been done using functional magnetic resonance imaging (fMRI). fMRI is an non-invasive tool that enables researchers to measure brain activities based on an analysis of "BOLD" signals (blood oxygen-level dependence). The whole principle builds on the magnetic properties of hemoglobin, which varies depending on level of oxygenation: while oxy-hemoglobin is diamagnetic, deoxy-hemoglobin is paramagnetic, therefore deoxy-hemoglobin produces stronger magnetic signal than oxy-hemoglobin. Knowing that neuronal firing requires increases amount of the oxygen, we

can construct an image of brain activities. [14] Measurement of brain activities is also possible using Positron Emission Tomography(PET) or Electroencephalography (EEG). However theirs usage has been recently on the wane, because *fMRI is less invasive, less expensive, and has good spatial and temporal resolution* [15].

Another method, commonly used as a complement to a brain scanning, is repetitive transcranial magnetic stimulation (rTMS). It is non-invasive and painless methods that in short-term influences activity of selected part of the cortex. This can be achieved by stimulating nerve tissues using an oscillating magnetic field [16]. Depending on intensity of frequencies the activity can be either stimulated, or weakened [17].

Except of above mentioned, variety of other neuroscience techniques can be used. Rilling&Sanfey include also *studies of brain-damaged neurological patients, pharmacologic manipulations, genetic association studies, and studies of psychiatric patients with pathological social decision-making.* [15].

3. Discussion

Is neuroeconomics a flimsy fad that is likely to pass without leaving a discernible trace in economics, or a promising new field with the potential to enrich and improve economic theory? [2] Economists never believed that watching into the brain, "reading" emotional states and understanding causal consequences of physiological state would be possible. By enabling researchers to view the mind at work, neuroeconomics appears to contradict a methodological premise of twentieth-century empiricism, sometimes called positivism or behaviorism: that people are black boxes to one another. [18]. For the first time in our history we face the choice whether we should incorporate emotions and other brain processes into the economic theory, which naturally raises several questions and discussions.

Many believe that neuroscience can contribute to economics by inspiring new models, helping to distinguish models that have similar implications for readily available data, and guiding interpretations of decision-making processes by policymakers [19]. However looking on the long tradition and well-established roots of traditional economic approach, it is no surprise that not all scholars share the overall excitement. A few topics are commonly raised when discussing the relevance and possible contributions of neuroeconomics to economic theory. In the following section I will attempt to briefly cover them.

Gul & Pesendorfer, obvious critics of neuroeconomics, doubt the core idea of neuroeconomics itself. They argue that economics and psychology address different questions, utilize different abstractions and address different types of empirical evidence. Neuroscience evidence cannot refute economic models because the latter make no assumptions and draw no conclusions about the physiology of the brain [20].Many neuroeconomics agrees that it is true, that neuroeconomics and economics ask different question. But they add that it does not make neuroeconomics irrelevant... Neuroeconomics informs economists about aspects of economic phenomena that they did not consider investigating. This is how it helps us answer more what-if questions and improve our understanding. [21]. It appears to me, that insisting on keeping arbitrary boundaries between sciences is quite limiting. Neuroeconomists, of course, respect classical approach and its findings. However they believe that by understanding the neurological underpinnings they can improve the theory, so as it gains better predictive power. After all, it is one brain that economics, psychologists and neuroscientist are talking about. Bernhaim states that even the most skeptical economists must acknowledge that the standard data required to address questions of interest are sometimes unavailable, and are rarely generated under the ideal conditions. Surely we should explore the possibility that new types of data and methods of analysis might help us to overcome those limitations [22]. Camerer address Gul&Pesendorfer saying that they perceive economics as the traditional revealed preference approach and accompanying tools and applications... while he defines economics more broadly, as the study of the variables and institutions that influence „economic" (large, consequential) choices. [9].

Another source of traditional economists' objections is based on the theory of revealed preferences. Economists claim that behavioral data are sufficient for the economic research and what is going on in the brain is irrelevant [23]. But this idea was challenged by behavioral economists asking what would an economist do if she found that an agent selected meat over fish at time zero and fish over meat at time one? They add that the theory of reveled preferences is not able to distinguish between different sources of behavior. In case of above cited example the change of the choice could be caused by the fact that the choice situations were not identical…, or the agent has a taste for diversity, the choice depends on other factors (the choices of dining companion) or – presumably the last resort- the preferences have changed. [24]. Camerer argues, that while behavioral economists and neuroeconomists admit, that axiom of revealed preferences is an easy and elegant way to find out "what people want", there are many, who believe, that choices and preferences are not always the same [25]. Seeing what the driving factor behind observed behavior might be helpful also in other theoretical aspect. While classical economics is based on the ceteris paribus condition, neuroeconomics searches rather for the principles of decision making and for behavioral patterns. Therefore the models might be potentially able to predict behavior even if the environment is changed. [26] From the economic point of view, this might be potentially very interesting.

However in spite of the discussions and many stated potential contributions, we haven't seen many models based on the neuroeconomics findings yet. An ability of neuroeconomics to create new models was in fact questioned, because it is not clear how the complex system of physiological underpinnings should be incorporated into economic models. In this matter I agree with Rubinstein, that one of the possible outcomes can be identifying types of subjects that will tend to have same choices across different decision situation. We could then create models in which distribution of types is a primitive of the model. Using such models we would probably be able to derive stronger analytical results. [27]. But in one breath he adds that neuroeconomics is far from creating such models.

Even though some critics accept the assumption that economics can be improved by way of neuroscience, they raise question, whether it is what we should do right now. For example, Vromen states, that while the potential importance of an improved utility theory for economic theory cannot be denied, however, it remains to be seen whether an improved utility theory is something economic theory needs most badly or most urgently? [12]. Harrison puts forward that we have conceptual work to do before we fire up the scanner [28], meaning that at first the theoretical framework should be done and only after that we should try to validate the theory in the scanner. Opponents of this argument object that behavioral economics has been here already for decades and they believe using neuroscience might speed up its development. For example if we knew what is going on in the brain, we could adjust the experiments so as they better answer our questions. [25]

3.1 Methodological objections

Up-to now discussion was related mainly to the philosophical background of the science. However there have also been raised serious objections on the methodology. Critics most commonly point out insufficient amount of subjects participating the experiments, which may significantly impact the representativeness of results. *The small sample size of neuroscience experiments complicates analyses of individual differences, and even well-conducted, adequately powered experiments may lead to equivocal conclusions, because inherent limitations in the experimental method* [23]. *Sample sizes for many neuroeconomic studies relying in imaging are small if we count a brain as the unit of analysis.* [28]. Reason for this apparent weakness, which would be unacceptable in any other social study, is high costs and labor intensiveness of the neuroscientific research. Neuroeconomists attempt to defend saying *that knowledge is produced by a series of studies with different tools.* [29]. For example theories suggested on the basis of fMRI scanning can be later tested using rTMS. I find this to be an important aspect for neuroeconomic research. The reasons for low amount of subjects are pretty pragmatic and so I don't believe that there are good prospects that it would significantly change in the nearest

future. Therefore it seems that conducting replications of the experiments is very important for giving neuroeconomic results a true "a credit".

A critical point is also a data analysis, since the data evaluation is demanding and sophisticated process. More than other economic research it is predisposed to an inappropriate interpretation. Neuroeconomists should be therefore careful before jumping into conclusions. An example of inappropriate interpretation brings a "research" of Bennet et all. The team scanned a dead salmon under the fMRI scanner while presenting pictures of different persons to him. *The salmon was asked to determine what emotion the individual in the photo must have been experiencing.* [30] Their results report an activity in some parts of salmon's brain (not exactly specified due to *a relatively small size of the salmon brain* [30]*)*. Indeed, the conclusion of theirs work is not a proof about eternal life of the salmon, but a fact that researchers should be careful about noises and should use correct (multiple) comparison corrections.

4. Results shown on Examples

Probably most complete and up-to-date review of neuroeconomics findings bring Fehr and Glimcher in the second edition of the book "Neuroeconomics: Decision Making and the Brain" [31]. It the following chapter I am introducing some of the neuroeconomic findings. The topics were on intention selected each from the different area with an aim to illustrate potential contribution of neuroeconomics. However it is not purpose of this chapter to provide readers with a survey of neuroeconomics research. Those, who would be interested in finding more, I refer to the above mentioned book.

4.1 The Case of money

Neoclassical economics consider money to be exclusively a tool of change with no additional value. The theory is based on the assumptions, that people demand money only on the basis of who much they can get for them. It is just a *mere counter, only valued for the goods and services it can procure* and so that *marginal utility of money depends on what money buys* [9], i.e. the utility gained from money is indirect. But in the reality we can observe, that people often tend to perceive rather nominal than a real value of money. It motivated neuroeconomists to consider, whether there is "something more" in this.

If the economic theory was right and the utility of money was indirect, than pleasure gained from receiving goods should be a different phenomenon than pleasure gained from receiving money [9]. But experimental research shows, that in both cases the same brain area in the midbrain is activated (see e.g. [32, 33]). This suggests that money provides people with the same utility as food, drugs or any other goods. It seems probably that *people value money without carefully computing what they plan to buy with it* [34]. It might be possible explain how money illusions are created as same as it can explain "hunger" for money even at situations where the economic reasoning might not be obvious.

While receiving money activates reward brain areas, losing money activates areas connected with strong negative emotions, such as fear (especially the area of amygdala). [35]. This finding seems to correspond with prospect theory and the theory of loss aversion.

4.2 Hormones and a human behavior

One of the commonly used economic experiment is so called „Ultimatum Dictator game" (Players are divided into pairs, where one is randomly selected as a "dictator". He is then endowed with a certain amount of money that he can (but doesn't have to) share with his anonymous co-player. The co-player, so called "receiver", has the only choice: accepting the offer or rejecting it, in which case both of the players receive nothing). A simple logic suggests that every non-zero offer should be accepted. However it turns out, that many subjects choose to refuse the offer, although its high was positive. *It was a great surprise...when it was found (in labs and in field experiments) that humans are willing to punish at a cost to themselves. Why would a rational human chose less money over more money, ceteris paribus?* [36]

Zak et al. Attempts to explain this through a hormonal background of human beings. His team repeatedly conducted the ultimatum dictator game, while manipulating with the hormones of the tested subjects. They found out, that subjects with a higher level of oxytocin (sometimes also called as a „hormone of love") showed higher „pro-social" behavior [37]. Other study, where testosterone was administrated to subjects proved higher competitive behavior of subjects with an increased testosterone level. [38].

The results suggest that level of pro-social and competitive behavior is influenced by our biological nature. The same exact task might therefore have a different outcome if a particular hormone is in high or low levels in the body—and these hormones change naturally given external environmental and internal changes in the human body. [36] As the level of hormones is naturally changing, it could explain changes in preferences in the situation of ceteris paribus condition. It might also shed light a led on gender effect, which was commonly observed in the economic experiments although economic theory has no explanation for that.

5. Conclusion

Usage of neuroeconomics is a subject of many discussions. Although in the field of microeconomic theory, the usage has been growing, researchers in the field of Public Economics have paid much less attention to this emerging science. Therefore author hopes to raise a discussion about usage of neuroeconomics amongst the scholars dealing with the public sector research.

The paper introduced neuroeconomics and presented issues that relate to the topic. Although there have been many critics, I believe to be natural that every newly establishing science raises many discussions. In fact, I find this to be a positive sign, as discussions stimulate the science, they "separate the wheat from chaff" and help to form the final shape of the science. I believe that in a long run, neuroeconomics has a great potential- but it still seems to be far from now. The critics shouldn't forget, that *the field of neuroeconomics is barely into its teenage years* [36]. Any conclusions done at this point would be premature. To show its real potential, the science needs a time to "grow up".

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Deployment of Big Data Analytics Approaches in the Public Administration and Comparison of IT Performance Indicators

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Abstract

This paper addresses the issue of the big data analytics in the Czech public administration and the comparison of IT performance indicators, which define the suitability and possible implementation of these approaches for the selected public institutions and introduce the advantages of cloud computing and distributed processing of public data for the Czech public administration. The basic issue for this paper is to define some IT performance indicators for Czech municipalities, compare them and assess the degree of their suitability.

Keywords: Public administration; big data analytics, IT performance indicators, distributed computing,; cloud computing; e-government

JEL Classification: H11, H83, L86, M15

1. Introduction

There are a lot of data sources, which can be used for the improvement of the public services quality. However, most of these sources consists only raw data, which need to be processed. This contribution deals with the definition and comparison of IT performance indicators which are connected to the public sector institutions and big data analytics. This will be later used for developing a model for deciding which of these indicators have the most suitable predicative value for the implementation of big data analytics tools in the public sector. Projects and strategies in the Czech Republic rarely deal with the processing of large-volume data, especially spatial, and access in the meaning of cloud computing, especially for the purposes and requirements of the municipalities. There are also the other projects, which have links to the European Union (EU). The EU provides funding and grants for a broad range of projects and programmes, especially the structural funds, which finance regional policy and can be used by municipalities (the principle of subsidiarity). The main goal of this contribution is to describe the possibilities of the current state in the Czech public sector (identify advantages) and choose the technologies, methods and approaches, which can be deployed and used for the processing of large-volume data in the municipality as a low-price solution with dedicated IT performance indicators.

2. Material and Methods

This paper extends the results of the practical research previously presented in [1], where authors used point elevation data, both regular grids and Light Detection and Ranging (LIDAR) clouds, to create Digital Surface Models (DSM). During the calculations they have experienced significant problems with computational performance of available clustered hardware. To improve the computational performance, they decided to use distributed data processing powered by several commodity PCs and run by an open-source solution – Apache Hadoop which implements MapReduce approach. Authors focused on a purely distributed solution which can be easily implemented in small laboratory conditions, with low costs and without utilization of a cloud service [1]. Thus, this approach could be also used in the Czech public administration.

The research is mostly based on literature review of foreign and domestic resources which should lead to make recommendations on the definition and development of IT performance

indicators system on the basis of study of the scientific publications in the field of a public administration performance. In the first part of the paper the theoretical research is conducted which is based on the evaluation of literature and scientific publications on the data processing, spatial data and the existing IT performance indicators. The result of this theoretical research is the comparative analysis of the system of IT performance indicators and different concepts of IT performance indicators, which are suitable for the deployment of big data analytics approaches in the Czech public administration. The last part contains recommendations for further research.

2.1 Municipalities' financing, performance indicators and public sector data

Sharing public funds between the state and local government gives also new opportunities for the big data analytics. The own income of municipalities is defined by law and can be used for the improvement. When assessing the public administration performance, the formation of indicators for the "3E" criteria rests on the fundamental meanings of individual criteria [2]. They are [2]: Economy expresses costs for performed service and thus frequently demonstrates other organizational characteristics of a service provider and his capacities; efficiency denotes the volume of services or things performed by an organizational unit with regard to capacities, or in other words, what capacities would suffice to carry out the discussed volume of services or things; effectiveness expresses the achieved effects or success in service performance [2].

Information and communication technologies (ICT) nowadays influence the efficiency, effectiveness and quality of all public administration services. Most of these services exist only in electronic form (e-government). There is a gradual shift from a government-centric/supply-driven paradigm to one that is citizen-centric and demand-driven. This puts greater focus on the context (e.g., social, organizational, and institutional factors) in which e-government is developing and on the outcomes for users. These include "soft" factors, such as awareness, digital skills, and trust [3]. IT performance management can be defined as the area of setting goals, responsibility accounting and monitoring (analysing), governing and improving the performance of IT. Benefits of IT performance management are that a focus on the realization of strategic, financial and non-financial goals is applied and that Key performance indicators (KPIs) are made explicit and measurable. Performance indicators are used to govern measures and need to match the goals of the organization [4].

Especially in the public administration, measuring of performance is not possible with one indicator, each institution has to develop a suitable system of indicators to this end. The services performed are measured with the satisfaction of users of services and with the achieved benefit of the service. Effectiveness assessment involves also the assessment of service quality as well as performance. The performance of a public sector institution can be assessed from the following aspects: fulfillment of IT performance indicators according to the set goals and standards (e.g. response time), comparison of institution with similar ones (e.g. institution's place among institutions classified according to the values of a chosen criterion) and changing of the criterion value within a time period [2].

Access and spatial data sources

Spatial (geographic) data originate from actual locations and physical characteristics of features on or near the surface of the Earth. These raw, positional data are the start points for every Geographic information system (GIS) by providing the basic geographic information needed for attribution, dataset modelling, relationships, and analysis. These types of digital and non-digital geographic resources are readily available and, in many cases, are plentiful, well designed, and comprehensive. In addition, spatial data are fundamental for the public administration to prepare, implement and evaluate its policies with regard to many areas of interest such as land use, environmental policy, transport or national defence. Additionally, many digital sources are free, especially for the public sector. Other more intensive sources are field data and measurements collected from site visits, and transformed maps, whereby old hardcopy maps are first scanned into a computer and then digitized [5], [6].

Access to public sector information (PSI) is extremely important in a democratic state. Citizens should be able to consult data held by the public bodies in order to participate fully in

the democratic society, and to hold their government accountable for its actions. In addition, the broad availability of PSI can increase transparency and the legitimacy of the government. Indirect impact of sharing is also citizen's benefit from the better policy, there is a competition between municipalities – sustainable development, as well as tax advantages and funding from EU. Spatial data have always been important for the public sector. From local communities to countries and beyond – e. g. EU and its institutions, governments need information on issues as land ownership, road infrastructure, land use, population registration, economic activities etc. The updating, maintenance, and use of address data is based on different procedures for the different national/regional/local databases that are available. There is also a need of interaction with the private sector – more in [7]. There has however been a movement away from national small-scale data to more people relevant large-scale information, generally derived at a sub-national level (municipalities in the Czech Republic) [5], [6].

In the Czech Republic, municipalities can use national sources of spatial data, as well as the other projects – INSPIRE or Shared environmental information system (SEIS) – more in [6]. The EU is funding a 2-year-long Big Data Public Private Forum through the Seventh Framework Program to engage companies, academics and other stakeholders in discussing Big Data issues. The project aims to define a strategy in terms of research and innovation to guide supporting actions from the European Commission in the successful implementation of the Big Data economy. It is called BIG – Big Data Public Private Forum. The most suitable level for the implementation of a small cluster is probably municipality level currently, there is a total of 6,249 municipalities in the Czech Republic, of which there are 20 chartered towns, 496 towns and 5,733 municipalities. However, there are some law and legal restrictions for the processing of large-volume public sector data (open data), which need to be analysed. The potential benefits for municipalities by their own processing of large-volume data, can be not only the cost savings, but also the availability of these data to the citizens and businesses as a e-service [6].

Analysis of the current state in the Czech public administration

Before the selection and implementation of the selected technology and IT performance indicators for the processing of large-volume public sector data, there should be an analysis of the current state, especially opportunities and needs vs. the real situation in the Czech public administration. The most important questions and answers for them are in the table 1.

Table 1. The list of the selected questions and answers for them

Question	Answer
How many municipalities could use the proposed approach of the processing of large-volume data?	More than 6240 lower local administrative unit or 205 upper local administrative unit.
Has the public sector (municipalities) the required IT resources (commodity PCs)?	Yes. Configuration of PCs should be similar, in this case it is a cluster, with different configuration it is a grid.
What is the main purpose of commodity PCs? Are there any conflicts?	Thanks to the system of EU's funding, municipalities have more PCs and IT resources than they need.
What about the municipal finance? Are there adequate financial resources (IT infrastructure as well as people)?	Low-cost solution – spatial data are free, small cluster/grid only needs 4-5 commodity PCs. Otherwise the possibility of the money from EU's structural funds.
Are there any law restrictions or conflicts for deployment of this approach?	No, it is open source. Another detailed analysis of valid legal regulations is needed.
What about people and their knowledge for deployment of this approach?	All of IT employees should handle with it (there will be manual and documentation).
Another use of the architecture for the big data analytics?	Yes, not only spatial data, but also the other analyses – open data sources. Again what the public sector need and want to do vs. what really can do.
What about terms of access, reuse, and sharing of results?	Yes, for citizens as a competitive advantage, increasing interest in municipality. Another detailed analysis of the importance of spatial data and GIS for the public sector.

Source: Author

Cloud services for the public administration – focused on the metrics for spatial data

Due to business benefits offered by cloud computing, many organizations have started building applications on the cloud infrastructure and using flexible and elastic cloud services. But moving applications and/or data into the cloud is not straightforward. Existing applications have specific requirements and characteristics that need to be met by cloud providers. Cloud computing can help the public administration institutions in cost reduction management and maintenance of ICT, increasing in productivity and service quality, which is mainly related to standardization of processes at lower levels of the public administration, when municipalities should have access to centralized resources of the cloud (e. g. the strategy Klaudie). However, it is important to choose such a deployment models and distribution models of cloud computing, which are the most suitable for the processes in the public administration. It is therefore appropriate to establish a common cloud solution for institutions engaged in similar activities – regions, municipalities with extended competence and municipalities [8].

Service measurement index (SMI) is a set of relevant KPIs that provide a standardized method for measuring and comparing a business service regardless of whether that service is internally provided or sourced from an outside company. SLAs about uptime and performance are regarded as the most crucial, and they are generally tied to KPIs. Designed to become a standard method to help organizations measure business services based on their specific business and technology requirements, the SMI enables individual preferences to be the basis for what defines a good service. SMI is currently being developed by the Cloud Service Measurement Initiative Consortium. The SMI framework provides a holistic view of quality of services needed by the customers for selecting a cloud service provider based on: accountability, agility, assurance of service, cost, performance, security and privacy, and usability [9].

2.2 Architectures and technologies for big data analytics

Distributed data processing and big data analytics

Distributed data processing is a method of organizing data processing that uses networked computers in which data processing capabilities are spread across the network. It provides greater scalability, allows greater flexibility in structure, more autonomy, however, it requires more network administration resources, incompatibility of components, difficulty of controlling information resources and more redundancy. This method is increasing because dramatically reduced hardware costs, improved user interfaces and new frameworks like MapReduce [10].

Big data analytics is the process of examining large amounts of data of a variety of types (big data) to uncover hidden patterns, unknown correlations and other useful information. These other data sources may include Web server logs and internet clickstream data, social media activity reports, mobile-phone call detail records and information captured by sensors (spatial LIDAR data). And cloud computing offers scalability, which makes it a practical vehicle for big data analytics. The technologies associated with big data analytics include NoSQL databases, Hadoop and MapReduce. These technologies form the core of an open source software framework that supports the processing of large data sets across clustered systems, which are owned by the institution [11].

IT performance indicators for big data analytics in the public administration

Main indicators for the deployment of above mentioned approach [1], connected with the needs of public administration, are mostly technical aspects: optimize hardware performance in cluster / grid / cloud for big data, expand storage at lower cost for archiving, up-time and disaster recovery. Thus, the basic categories and IT requirements for a deployment of a small cluster / grid / cloud in the Czech public administration institution are in the Table 2.

Table 2. Categorization of IT requirements for the definition of IT performance indicators for the Czech public administration

Key area (categories)	IT requirement	Importance / connection
ICT strategy (e-government).	Architecture frameworks from both the technical and information management level.	High / eGON, Klaudie, regional e-government strategies.
	Access level and channels for e-services.	Medium / data interchange, web portals of municipalities.
ICT architecture and asset management (IT resources).	Connectivity requirements – what links between components are necessary.	High /open source solutions, interoperability standards.
	Availability requirements – percentage of time application or data is available to users.	Medium / one time processing of data vs. backups and availability of service 24/7.
	Percentage of users who are able to access the network and systems remotely.	
	Processing time for a single file.	
	Size of file and number of files.	
	Response time requirements.	
	The bandwidth bottlenecks.	High / performance management, less resource solution with Hadoop and MapReduce architecture.
	Upload / download time.	
	Frequency.	
	Number of tasks / time.	
	Requests PUT / GET.	
Configuration, development and integration	Cost of the solution / investment in the ICT infrastructure.	High / low-cost solution, EU's structural funds.
	Cost performance index	
	ICT competence of users.	Low / IT staff of institution.
	Integration time.	Medium / project management.
	Compatibility of software, systems and applications.	Medium / open source solutions, cloud computing.
Data security	Authorization, encrypted storage and services.	High / security rules, policies and privacy laws.
	Percentage of incidents resolved within agreed service levels.	
	Number of incidents per user.	
Service delivery and support	The solution effectively supports delivery of the institution's strategic objectives.	High / benchmarking, increasing the competitiveness of municipality.
	The solution is proactive and innovative in providing technological options.	
	User experience (application design) and user interface.	

Source: Author

The most suitable IT performance indicators for the Czech public administration (in order of importance) in the meaning of big data analytics and cloud computing then will be:

1. performance and response time – time savings compared to the traditional ICT solution,
2. cost effectiveness – advantages of cloud computing and distributed processing of data,
3. integration cost – open source solutions like Hadoop and own ICT resources (PCs etc.),
4. compatibility – national sources of public sector data, INSPIRE, SEIS etc.,
5. security – this solutions deals with keeping cloud services in-house (public sector cloud),
6. archive and backup – single data-center, technologies, reduction government spendings,
7. reliability – decrease of hardware, software and application failures,

8. scalability – on-demand services, time savings,
9. customization – for the concrete level of the government in the Czech Republic,
10. internet connection quality – eGON and its parts in the Czech Republic,
11. usability – for the IT staff in the institutions.

The most important indicators will be always performance and response time of the proposed solution, which should lead to decrease of investment costs. For the public administration's needs it is also important to choose the right model of the storage system connected with the approach for big data analytics and the above mentioned IT performance indicators. Table 3 then shows the extended criteria comparison and the suitability of them for the proposed solution.

Table 3. Extended criteria comparison and the suitability of them for the Czech public administration

Suitability of the proposed solution for the concrete criterion High / Medium / Low	Focusing on the storing of raw data (archiving, security)	Focusing on the processing of big data (operational data)
Large amount of public sector data as well as open data (in TB).	Medium	High
Maximal size of a single file – big data files etc.	Low	High
Number of people with the access to data (more than 10).	Low	Medium
Frequency and flexibility of the access.	Low	Medium
Compatibility with the other services (e.g. framework OpenStack).	Medium	High
Only browser access.	High	Low
Desktop application access to the cloud storage.	Low	Medium
Security (authentication, authorization, encrypted storage).	High	Medium
Reliability of the cloud storage services.	Medium	High
Focus on the performance of the cloud storage.	High	Medium
Focus on the portability – both data and services.	Medium	High
Procedural steps work with data - updates, backups, deleting (data from cloud storage cannot be restored).	Medium	High
Various restrictions in terms of the size of uploaded files or types of files that can be uploaded.	High	Medium
Synchronization (with various computers, folders sync, file or folder sharing, files versioning).	Low	Medium
Platforms (PC compatible, Mac compatible, mobile device access, Android, iPhone).	Low	Medium
Customer service (live phone or live chat customer service request, email).	Low	Medium
Focus on the technical support.	Medium	High
Focus on the user interface and usability.	Medium	High
Provider's country and location of virtual machines and data.	High	High

Source: Author

3. Results and Discussion

For the further research procedure it is necessary to identify the areas of suitable municipalities in the Czech Republic which may be the relevant subject for this issue as seen in table 4 below. The main differences between cluster, grid and cloud solutions can be found e. g. in [10]. Cluster computing and other cloud computing services for storing and accessing public sector data can be useful just right for municipalities with limited financial resources. Both grids and clouds have adopted the concept of IT as a service, although grids are more likely to offer

free access to shared resources (in the case of municipalities it can be limited by valid legal regulations), while cloud computing have pay-as-you-go approach, for which financial resources may be missing.

Table 4. The comparison of suitable platforms for big data analytics

Level of the government in the Czech Republic	Number in the CZ	Cluster	Grid	Cloud
Municipalities	6249	YES	NO	NO
Municipalities with extended competence	205	YES	YES	YES
Districts (only territorial units)	77	NO	YES	YES
Regions (NUTS 3)	14	NO	YES	YES
Regions (NUTS 2) – direct financial resources from EU	8	NO	YES	YES
Central – CZ	1	NO	NO	YES

Source: Author

Municipalities can use this solution e. g. for spatial LIDAR data and create 3D realistic surface models as well as GIS oriented calculations and spatial analysis. Another option is to use this solution for the processing of open data, which are available for free to everyone, more in http://opendata.cz/ or http://publicdata.eu/. These outputs can also serve as an extension of already existing online public services for citizens as well as for businesses. The implementation of cloud computing and distributed processing of public sector data is one of the current trends in the increasing of regional competitiveness. More about decision-making process is in table 5.

Table 5. Decision table for the choosing the right architecture

	Public sector needs computing power, high-performance solution and distributed data storage (HARDWARE).	Public sector needs services – application, storage for backups, other web cloud services (SOFTWARE).
WHERE?	municipalities with extended competence	information systems, email, office applications
FOR WHAT?	for land use plan, digital surface models, high performance, open data sources	faster work outside the office, online connection, competitiveness
HOW TO DO IT?	open-source, outside the public procurement system (under limits)	regional solution because of law restrictions – EU funding
	Public sector needs computing power, high-performance solution and distributed data storage (HARDWARE).	Public sector needs services – application, storage for backups, other web cloud services (SOFTWARE).

Source: Author

4. Conclusion

Clusters, grids and clouds, they are after all distributed systems and use scalability, as well as the low-cost solution as their main advantage. While clusters and grids are application oriented, clouds are service oriented and also use all the web 2.0 approaches and technologies. Distributed data processing can significantly improve computational performance and decrease time needed to process data. The main aim of this research area could be to propose a fast, easy and less resource solution for processing of public sector data based on the comparison of IT performance indicators. In line with these indicators described above, this solution also puts greater focus on the context of these services (social, organizational and institutional factors) in which e-government is developing and on the outcomes for users (citizens and businesses), which is related to the actual use of online public services.

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Consolidation of Small Municipalities as a Solution of Territorial Fragmentation in the Czech Republic

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Abstract

Local government is one of the fundamental parts of public administration of a democratic state. Municipality is a basic territorial unit and a basic unit of local government in the Czech Republic, which is entitled to a degree of independence from the state and to manage own affairs in own interest. There are almost 6250 municipalities in the Czech Republic and every municipality has its own elected mayor and councilors and must provide basic public services. The high degree of territorial fragmentation is connected with the most serious problems of small municipalities. For this reasons, the politicians and experts talk about the need to amalgamations of at least the smallest municipalities.
The aim of this paper is to provide literature overview and to assess current knowledge in the area of territorial structure of municipalities and optimal size of municipalities. The most essential arguments for territorial fragmentation are primarily based on democracy-related arguments and the most important arguments for territorial consolidation are connected with economic theories such as economies of scale. However, it should be that deciding on the size structure of municipalities cannot be only based on the assumption that small local governments are dysfunctional in comparison with the larger ones.

Keywords: Municipality, territorial fragmentation, territorial consolidation, optimal size of municipality, Czech Republic

JEL Classification: H11, H83

1. Introduction

Municipality is *a basic territorial unit* of the Czech Republic. The form of Czech municipal system is adjusted in [1]. Territorial structure of the Czech Republic has a considerable historical continuity. It gained its current appearance in the 17th century. It is characterized by a high number of municipalities that are equally spread over the territory and there is a relatively small number of large cities. After 1990, *decentralization and a paradigm of local autonomy* were often understood in a way that gave the right to become a separate local government to almost each settlement unit, even if that unit was a tiny village. Attempts to create or maintain larger territorial jurisdictions (as in the previous decade) were seen as a violation of local autonomy.

Since 2001, the total number of municipalities has stabilized at about 6,250, with a slight oscillation around this figure since then. The settlement structure is dense, consisting of a large number of villages, townships and small towns. But there are relatively few medium and large cities. According to the data from [2], absolute majority of municipalities are the villages with a very small population size: 77.6% consisted of municipalities with less than 1,000 inhabitants and even almost 24% of the municipalities have fewer than 200 inhabitants. The average size of the villages is 1,482 inhabitants (without the capital city) and median size is only 421 inhabitants. From 6,250 municipalities only 597 have a city status. There are only 20 cities which have more than 50,000 inhabitants. The fragmented settlement structure in the Czech Republic is accompanied by a fragmented structure of local authorities. According to [1], even very small villages have their own elected mayor and councillors. And every such village must provide basic public services such as public administration, public lighting, waste management or community development.

Although at the beginning of the 90s, territorial fragmentation has showed as one of the main barriers for decentralization and effective functioning of the local government system [3]. However, most small municipalities ("small municipality" is municipality of less than 1,000 inhabitants) in the Czech Republic still enjoy their autonomy and are not willing to give it away

or to accept its reduction [4]. Politicians and experts talk about the need to amalgamations of at least the smallest villages but concrete steps are not implemented. And in spite of the problems which these small municipalities face, the fragmented structure of local governments has remained fairly stable.

The aim of this paper is to provide literature overview and to assess current knowledge in the area of territorial structure of municipalities and optimal size of municipalities. The part goal is to discuss the arguments for and against amalgamation of small municipalities as a one of solutions of territorial fragmentation in the Czech Republic.

2. Material and Methods

The paper is focused primarily on theoretical arguments and this way also the conclusions are made. The core of the research is based on literature review of foreign and domestic sources. This paper uses positive and qualitative approaches and also some normative recommendations as research outcomes.

The methods of deduction and synthesis of acquired knowledge were used to identify of research outcomes. The last part of this paper has normative character and contains recommendations for further research in this area.

3. Results and Discussion

Literature deals with the question about territorial structure for a long time. The most essential *arguments for territorial fragmentation* are primarily based on democracy-related arguments. They include both the idea of localism [5] and the idea of public choice [6]. Although they are based on very different theoretical assumptions, both theories come to a very similar conclusion that *"small is beautiful"*.

[7] found that contacts between councilors and citizens are much closer in small municipalities, the flow of information is easier and politicians are more accountable to their local communities. However, the studies by [8] and [9] on Hungary and the Czech Republic show that this rule does not apply to tiny municipalities with fewer than 1,000 citizens. In such cases perhaps the low functional capacity of the local government overshadows the socio-logical beauty of small municipalities and negatively influences popular perceptions of local government performance [10].

According to the classical *Tiebout model* [11] people migrate to local governments, in which the ratio of taxes versus services is closest to their personal preferences, i. e. in small municipalities citizens can vote "with their feet". Thus, territorial fragmentation decreases the costs of migration and increases the chances of reducing the gap between implemented public policies and the individual preferences of citizens [12]. [6] concluded that fragmentation supports experimentation and innovation. However, it is interesting to note that the most well-known program, which focused on stimulation of innovations and experiments in local governments, was introduced in the Nordic countries, where the territorial system is consolidated rather than fragmented [13].

The last argument says that small local governments are less bureaucratic [6]. For example, in the administrative function, economy of scale is overshadowed by problems related to the co-ordination and management of large units. And argument of economy of scale is irrelevant since it is possible to separate responsibility for service from actual delivery, because many local services are contracted-out to the private sector and in such a situation, economy of scale depends on the size of the private company [14] – [17].

The most important *arguments for territorial consolidation* are connected with economic theories. [18] found that small local government's budgets are mainly expended by administrative spending – in some extreme cases and not much is left for any other purposes. In small municipalities, the number of services provided is much lower than bigger cities and the unit costs of public services are higher. The paradox is that for example in 2009, total revenues

per capita in small municipalities amounted to almost 79% of the average of all municipalities. Surprisingly, municipalities with less than 200 inhabitants almost approached to the average (97%), although the smallest local governments do not provide - in comparison with larger communities - many public services, such as public transport, theatres, museums or libraries [19].

The most frequently discussed economic problem, which is associated with the problem of municipalities' consolidation, is the *existence of economies of scale* that can be achieved after amalgamation. From a production point of view, municipalities can be seen as production units where the production function and economies of scale are the decisive factors [20]. The municipalities have to be large enough to minimize average costs and there must be forces working to ensure efficient exploitation of these factors.

Potential economies of scale at municipal level are primarily related to administration and the costs of political representation. The costs per capita of having a local council may decrease as the number of inhabitants increases, as well as the costs for having a Chief Executive Officer, in addition to other administrative personnel. Every municipality will need a minimum amount of personnel, buildings, and machinery to even start a production, and this also includes having a minimum of administration [20]. However, after a certain level of production, diseconomies of scale may begin to emerge and unit costs rise [21]. Thus, marginal costs are larger than average cost. The personnel can be so specialized that they can only focus on their own narrow field, no longer capable of being flexible and their potentials not optimally used [22]. Thus, the average cost of production therefore is U-shape.

In a multipurpose municipality, the U-shape could mean that there are different optimal sizes in different service areas. Municipal economies of scale have been, over the years, the basis for many studies. Most of them have used expenditure models with per-capita expenditure as the dependent variable. However, it is difficult to compare these analyses of municipalities among different countries because of differences in institutional settings, tasks, local autonomy, etc. [20].

3.1 Advantages and disadvantages of the territorial consolidation

Analyses that deal with the question of advantages and disadvantages of larger municipalities are quite common in the last twenty to thirty years. [23] summarized results of the analyses in his work. He divided the advantages and disadvantages of larger municipalities into four groups according to the terms of efficiency, local democracy, distributive justice and development perspective [see 23].

For all terms and arguments advocating greater size municipalities, also some disadvantages could be found and they will result in a better performance of smaller municipalities. But to sum up, consolidation is usually promoted on the grounds of efficiency or functional capacity of local governments. Fragmentation is often defended on the grounds of local democracy. In that sense, there is no universal answer to whether consolidation is better than territorial fragmentation, or vice versa [10]. The answer depends on the value of local governments, which are at the top of political agendas ([4], [10]).

And the simple conclusion – consolidation is to ensure better provision of public functions, and territorial fragmentation works as a tool to ensure the "natural perspective" of the local government – was challenged by [24] in his research. He concluded that empirical evidence suggests that the negative effect of the size of a local government for democratic performance is nowadays less significant than 25-30 years ago. As the main causes he states homogenization of daily lifestyles, an explosion of information, which is easily available everywhere and local bureaucracy that acts in a more impersonal, professional way across the county, regardless of the size of the local government.

Then the question is if these causes can reduce the expected positive correlation between the size and capacity of a local government, i.e. for example that bigger municipalities have a better access to financial and human resources [10]. And the second question is, if this conclusion is valid for all developed countries, because there is a significant difference in the

development and performance of local governments in the countries of Central and Eastern Europe and Western and Eastern Europe.

Based on the above, the Tab. 1 summarizes the arguments for and against territorial consolidation, which are often mentioned in the literature.

Table 1. Arguments for and against territorial consolidation

FOR	AGAINST
Democracy-related arguments - better representation of various minority groups - better accessibility of local administration - more competent candidates for elected functions	**Democracy-related arguments:** - violation of local autonomy - poor accountability of politicians - more bureaucracy - worse participation in and effective control of political decisions - lower total non-electoral participation - worse accessibility of local administration - worse human relationship - possible conflicts among different parts of the amalgamated municipality
Economy-related arguments - economies of scale of public services delivery - better specialization and professional bureaucracy - lower costs related to spillovers - reduction of bureaucracy - more financial and employment opportunities for inhabitants - sufficient personal, economic and political resources - more ambitious development projects - better technical infrastructure	**Economy-related arguments** - more administration spending - worse co-ordination of management - widening of the gap between implemented public policies and the individual preferences of citizens - reduction competition for financial resources among local governments - corruption

Source: Author based on sources in literature

3.2 Is there any optimal size of municipality?

The question, how big the territorial unit should be, is closely related to the debate on territorial consolidation. This issue has a long and varied history. Considerations and ideas about it can be already found in the works of ancient philosophers (Platón) and later by Renaissance thinkers and social utopians of the19th century [25]. Their approach was only based on the population, more precisely families. In these concepts, the thinkers required cities in which for example 5,000 families lived, or the number of citizens ranged from 1,600 to 1,800.

A similar concept, although created on the basis of substantive arguments, appeared in the context of criticism of industrial cities in the 19th and beginning of the 20th century. In practice, these concepts were later attempted to implement by urban planners in the countries of the Soviet bloc.

In Western European countries, the views of the optimal size of municipalities changed several times after the Second World War II [20]. In the 60s and 70s of the last century, there was a tendency to integrate municipalities into larger units because of the increasing the welfare state and the use of strategic planning and implementation of technocratic approaches in the public policy [25]. In the 80s, however, the onset of neoliberalism slowed the integration efforts and in some cases even led to a break-up large of municipal units [26]. Since the 90s, the atmosphere in Western Europe changed again. The globalization forces the municipality to withstand a wider and sharper competition. There is also an increased pressure for further democratization of public administration through an implementation system known as “governance”. Thus, the discussion about the optimal size of a municipality is again developed.

An optimal size of local governments is a question that has attracted a lot of attention, it is not easy to solve. Looking for an optimal size of local jurisdictions is similar to the search for the "philosopher's stone". There are various analyses to lead to variety of conclusions.

There is a series of studies suggesting that jurisdictions below 3,000-5,000 inhabitants cannot be given significant public sector responsibilities, and such fragmentation will make functional decentralization difficult and costly (see [27] – [31], [3]).

Many empirical analyses, based on the concept of economies of scale, were done in the United States. The consensus among these researchers who have studied consolidation efforts is that nearly 80% of municipal services and activities do not possess economies of scale beyond a population of approximately 20,000 inhabitants [32]. Finally [33] reviewed the literature to determine if empirical bases existed for greater economic efficiencies and larger municipalities. They did not find any strong evidence of significant economies of scale in provision of municipal service. [34] presents a review of empirical studies of public service performance. He concludes that there is a little support to the proposed relationship between the organizational size and service performance and many factors which were considered to be important have little or no impact on the performance.

It can be said that these analyses lead to very different results, depending on assumptions and indicators used in the model. The literature also points to the fact that the above mentioned studies do not reflect many of the characteristics that may significantly affect the application of democratic principles and the efficiency of public services, such as: population characteristics, effect of character of use of land, natural features, age of inhabitants, infrastructure, stress on the property tax base (see [31]).

3.3 Experience with consolidation and the praxis in the Czech Republic

In other European countries the process of territorial consolidation has become very popular [35]. For example in Denmark the number of municipalities decreased from almost 280 to 98 between 2000 and 2010, in Finland from 436 to 342 and the Netherlands plans to reduce the current number of 400 municipalities to no more than 150 by the second half of this decade [36]. And this phenomenon is not limited to Europe. The municipal amalgamations have already taken place in Australia [37], or in several Canadian provinces [38].

The fragmentation of small municipalities in the Czech Republic could be resolved by territorial consolidation [39]. Literature distinguishes between structural and functional integration (see [25]). While structural integration means consolidation of small municipalities and a creation of a larger size, the functional integration maintains an existing structure of local governments and only some functions are transferred to a large municipality. Functional consolidation as a less radical form does not affect the autonomous identity of municipalities and thus it is better politically accepted. Its disadvantage is that another level of local public administration is created.

In the Czech Republic, the integration can be realized through both structural and functional forms. The structural form is based on a mutual agreement. Two or more neighbouring municipalities can consolidate or a municipality may connect to the neighbouring municipality. Consolidation or connection agreement may be concluded by municipal councils of these municipalities, without the obligation to announce a local referendum. It must take place only if there is an application for its action, whether by a citizen or a member of council. But this option, the structural consolidation, is used only minimally [1]. According to [2], the last amalgamation of municipalities took place in 2009, as no other municipality ceased to exist.

The state thus at least seeks to reduce the disintegration attempts by strict conditions that must be met, if a part of the municipality wants to become independent or an entirely new municipality will be developed. Although the conditions for separation are more difficult than in the case of consolidation of municipalities, they use this possibility far more often. New municipalities were created in 2009-2011. In each of these cases a small part of the original municipality separated from a larger city [2].

The function form of consolidation is very developed and utilized in the Czech Republic. It is based on the differences in the scope of the delegated competences, i.e. competencies that municipalities also exercise for the state, and on the differences in the sizes of territorial districts. There are three categories of municipalities. The first type is so-called basic municipality which performs delegated competences only on its territory. The municipality with a commissioned municipal office performs basic delegated competences and in addition to some other for a neighbouring local government, usually for smaller municipalities. Finally, the third type, municipality with extended powers procures further delegated competences to the entire surrounding region [1]. In these cases the municipalities with extended powers are cities. Sometimes they are also called a small district.

The establishment of municipalities with extended powers was connected with the reform of public administration which took place intensively from 1997 and this is the most radical integral act which has been introduced in the Czech Republic since 1990.

The Municipalities Act provides municipalities with one more opportunity to cooperate, but that does not meet the criteria of neither structural nor functional integration. It is a voluntary partnership based on the public-law agreement. Czech municipalities have an option of voluntary cooperation in areas such as tourism, regional development, protection of environment and infrastructure. They create some associations of municipalities which have their property, institutions and a financial budget. In practise, it is possible to encounter names such as "the voluntary union of municipalities", "microregions", "region" or "the associations of municipalities".

According to [40] in 2011 there were 763 associations of municipalities in the Czech Republic which worked mainly in the field of regional development and construction of water purifying plants. Almost 87% (i.e. 5,420) all municipalities were a member of a microregion. And one microregion was composed of an average of 12 municipalities. This form of cooperation is very popular and this is a way how to reform territorial fragmentation in the Czech Republic. Many municipalities understand that they can achieve their goals more easily through cooperation and the state is trying to create favourable conditions for consolidation of municipalities, voluntary consolidation does not occur. The question is what factors influence the decision-making of municipalities in the Czech Republic, that their voluntary cooperation is not transformed into voluntary upscaling.

The literature already provided some explanations of these decisions. First, as [41] concluded, the existing political and bureaucratic institutions have some degree of inertia and their officials interested in defending the status quo. The consolidation reform would mean a reduction in the number of available political posts and this may mean losing their job security or prestige. [42] states, that local municipal elites are unlikely to vote for territorial suicide.

Second, the autonomy of small villages is often seen as important by local communities, even if, in practice, this autonomy is more symbolic than real. A reform may lead to potential negative side effects, which are feared by the local population, and whose importance may be highlighted by opponents of the reform, trying to cover up their own selfish interests with arguments calling for protection of local communities [3]. These negative side effects include worse accessibility of local administration, the lost identity of local communities and conflicts among different parts of the new (amalgamated) municipality.

It would be naïve to expect that the reform proposals will not meet with opposition. According to [42], reducing the resistance of opposition has to respect three conditions: the reform should meaningfully address local preferences and needs; the reform should be transparent and a relatively accessible process and compromise. Moreover, the territorial organization of some states and a municipal government is deeply rooted in the historical tradition and in the discussion about territorial consolidation there are several main dilemmas which are caused by the overall capacity of local units, different characteristics of the territory, history of local institutions, European standards of local governments promoted by the Council of Europe and the European Union, demography, the structure and the changing size of settlements and a need for responsiveness and accessibility of local bodies to citizens and the nature of the contact between central and local governments [43]-[44].

4. Conclusion

The aim of this paper was to provide literature overview and to assess current knowledge in the area of territorial structure of municipalities and optimal size of municipalities. The part goal was to discuss the arguments for and against amalgamation of small municipalities as a one of solutions of territorial fragmentation in the Czech Republic.

The most essential arguments for territorial fragmentation are primarily based on democracy-related arguments and the most important arguments for territorial consolidation are connected with economic theories such as economies of scale (see Table 1). However, it should be that deciding on the size structure of municipalities cannot be only based on the assumption that small local governments are dysfunctional in comparison with the larger ones. The possible reform of territorial structure in the some country should respect three conditions: the reform should meaningfully address local preferences and needs; the reform should be transparent and a relatively accessible process and compromise.

In the Czech Republic the form of voluntary cooperation among the municipalities is very popular and this is a way how to reform territorial fragmentation. Many municipalities understand that they can achieve their goals more easily through cooperation. However, the state is trying to create favourable conditions for consolidation of municipalities, voluntary consolidation does not occur and the number of the associations of municipalities does not increase. The question is what factors influence the decision-making of municipalities in the Czech Republic that their voluntary cooperation does not increase and what is the reason that it is not transformed into voluntary upscaling.

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The Utilization of Benchmarking for Strategic Management of Municipalities in the Czech Republic

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Abstract

In the public sector there is a significant aversion to strategic management (we defined it in our research as being the everyday effort to reach long term and measurable goals) and also particularly to benchmarking (a structured comparison to find good practices). The main aim of this article is to introduce the result of the study focused on Czech cities: The benchmarking of integrated approaches to city development and it´s utilization in strategic management. The results are as follows: 1) the utilization of benchmarking was approved 2) several recommendations for cities were established, which were, in particular cases, implemented 3) possible weak strategic positions are very often connected with a lack of interest of the responsible political representation in strategic management.

Keywords: Benchmarking; strategic management; EU funds; municipalities

JEL Classification: H00, H70

1. Introduction

In the Czech Republic, modern methods of management were implemented only in the last century in connection with New Public Management Reforms [1],[2]. These reforms were not only made in the Czech Republic but in a whole range of eastern and central European countries [3],[4],[5],[6]. The crucial weak point of these reforms is the fact that most of them were not implemented properly, without a feasibility analysis and without the desired skills and competence [7],[3],[8].

1.1 Strategic management

NPM reforms triggered the beginning of requirements in the public sector to change the orientation of management in the public sector: a formal focus on structures, processes and inputs were replaced by strategic orientation in outputs and outcomes. Chiefly, there is an emphasis on better mission statements and establishing the main goals of an organization and higher performance measurement in the public sector. These trends were described by many authors e.g. Schick [9], Kettl [10], Hinţea [11], in Czech or Slovak condition e.g. Nemec, Ochrana, and Šumpíkova [12].

The main aim of strategic management (sometimes "strategic approach", "strategic process") is generally to reach long term goal oriented organizational behavior [13], [5]. Something which is typical for strategic management in the public sector is the necessity to respect bureaucratic administrations and political influence, it does not mean that strategic management should be neglected. The whole process of strategic management is strongly determined by current legislation, which creates the formal framework, formalizes procedures of planning approval, and establishes basic values of public sector activities. Legislative framework could require components of strategic management (e.g. plans) in particular areas of public sector activities. In legislative framework or above the legislative framework, the community is engaged in strategic management processes and the information is published openly [15], [14] ,[16], [17].

Strategic management is not at the centre of interest of the central authorities in the Czech Republic. The strategy of implementing Smart Administration in the period 2007-2015, which was approved by the government in the summer of 2007 [18] considers the following to be crucial problems in local government: a disunited system of strategic planning and it´s connection to financial management and strategic management, and a lack of qualification and competence of the management. Issues of strategic management in conditions of the Czech Republic's public sector have been dealt with in such works such as Afonina [19], Sobotka [20], Půček [21], Špaček [22] . The issue of strategic management is focused on in the article of Daňo and Hanuláková[23], Ježek[24] .

1.2 Benchmarking

The concept of benchmarking has several definitions, however the author agrees that benchmarking is a structured comparison, which should help to introduce the best practices in an organization [25],[26]. One form of benchmarking, typology, is strategic benchmarking, which is the aim of this article.

Benchmarking in the public sector can be utilized for the objective measurement of processes, methods and systems by the production of public goods or services financed fully or partially from public resources [12], [25]. These methods can help to evaluate the quality of publicly delivered services especially in the framework with an absence of defined quality standards [26]. In the Czech Republic there was a special project to support local government organizations in the Visegrad countries supported by a Canadian government agency CIDA [27], on the basis of this project, several benchmarking initiatives were created . As is shown in many studies e.g. Široký [27], Pavel [28] (related to optimization of cities e.g. Janáček[29], Kostelecký and Patočková [30]) benchmarking is an established tool of quality improvement on the municipal level.

The main goals of this article are the following: to introduce the results of study regarding Czech cities Benchmarking to integrated approaches to municipal development and it´s utilization in strategic management[31].

In order to fulfil the paper's objectives, we used a combination of normative and non-normative methodologies and corresponding research methods. Positive methodology was applied in analysing and describing the problem, studying the resources, analysing the data and reviewing international experiences.

2. Material and Methods

The main aim of this research was a description of the current situation for the following issue: The integrated approaches to municipal development and it´s utilization in strategic management.

As the focus group, cities with more than 50 thousand inhabitants were chosen, of which the responsible authorities are in charge of versatile local development. It total, 12 cities were included in this project, placed in all regions of the Czech Republic, except Prague. The sample was 50% of the aggregate.

The sample contained the following cities: Ústí nad Labem, Mladá Boleslav, Karlovi Vary, Hradec Králové, Brno, Kladno, Most, Chomutov, Olomouc, Ostrava, Plzeň and Pardubice.

The sources for the primarly data were a questionnaire survey and structured interviews. Qualitative and quantitative research methods were utilized. The obtained data were the following: financial data, process descriptions, and the subjective evaluation from officials and politicians. The quantitative research instrument was an electronic questionnaire, it was used to obtain financial data. The target respondents were the responsible officials of the city. The questionnaire, aimed at city officials, was also a part of the qualitative research. Another method which was used were structured interviews, which were attended by both officials and political representatives. The structured interviews were based on pre-defined open-ended questions,

which were followed by a number of complementary questions. The time of interview ranged from 60 to 90 minutes.

Qualitative data were collected in 2012. At the beginning of 2013, the cities were notified of the results of the research. Based on informal discussions with the responsible officials, who were in charge of these areas in cities tested positive feedback for carrying out benchmarking. For more than half of the city benchmarking resulted in the preparation of projects to implement the recommendations.

The research was organized by MEPCO Ltd. (a subsidiary of the Association of Towns and Municipalities), together with GRANTIKA České spořitelny with two authors of this article being employees of MEPCO Ltd and main authors of this research.

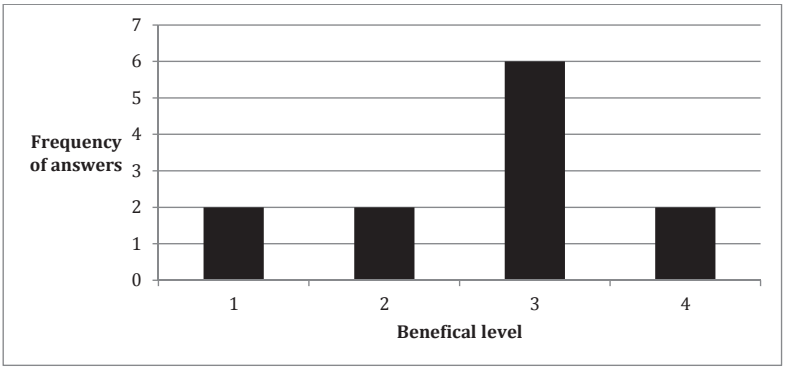
3. Results and discussion

All the observed have prepared a strategic development plan, and also realize the importance of strategic planning and the necessity of linking its strategic plans with the higher levels at the national and international level. The main motives for the preparation of the strategic plan are as follows:

- Long-term development concept
- Formal requirements of higher authorities, the necessary condition of drawing subsidies
- Initiatives by city employees
- Efforts to improve the city's image

The following graph shows how various cities answered the question regarding the level (from 1 (least) to 4 (most)) of how beneficial strategic planning is to their municipality

Figure 1. Benefical level of strategic planning



Source: Authors

The following table illustrates significant results from the questionnaire.

Table 1. Results of questionnaire

Question	Affirmative responses	Negative responses
Do change of political leadership change strategic priorities?	42%	58%
Is there an objective set of performance indicator estabilished in order to measure strategy?	50%	50%
Is assigned responsibility for the implementation of strategy of the individual members of the local government?	33%	67%
Is the strategic planning linked with budgeting?	17%	83%
Is modern management methods used in order to manage strategy?	42%	58%

Source: Authors

The relatively surprising finding is that the cities answered that the change of political leadership does not change strategic priorities. The influence of the political cycle [32] was not confirmed. What is problematic, however, is that the monitored cities had not established the objective set of performance indicators in order to measure how successfully strategy was being implemented and only 33% of the cities had assigned responsibility for the implementation of the objectives and priorities of the individual members of the local government. The situation is very similar with issues of linkage of strategic planning with financial management and the use of management tools for control of the strategic plan. A minority of the sample use modern management methods in order to manage strategy. This confirms the existence of common problems related to strategic management described in the literature (eg, Horváth & Partners [13], Aslani [33], Vodáček and Vodáčková [34], Cepiku, Corvo and Bonomi, Savignon [35]).

The key outputs of structured interviews focused on the evaluation of the importance of the strategic plan are:

- Cities would like to update the strategic plan with respect to the requirement of strategic continuity
- To update the plans, the respondents also intend to focus on performance indicators of the strategic plan, linking to the budgeting process and the definition of political responsibility
- Although cities have developed strategic plans, they do not work actively with it
- Plans are not regularly evaluated and the political representation are not involved with strategic planning
- There is no connection to the city's budget
- Strategic plans usually do not respect the financial capacity of municipalities
- Towns would appreciate more information about modern management tools

Something very important is the finding that, 83% of cities surveyed responded that the strategic plan is used as a support tool for the city management. Most of the cities (92%) process some form of a report about the implementation of the strategic plan, the majority are regular or ad hoc reports that contain brief information about the description of the activities and status of individual projects. Evidence from structured interviews on this topic are as follows:

Cities begin to prepare guidelines for the strategic management and form committees in order to evaluate strategic projects and analyze the risks

- Elected city officials are not involved in the process of strategic planning
- Cities do not use software applications for strategic management

Other issues in the electronic questionnaire focused on setting organizational structures in strategic management. 7 cities indicated that in the organizational structure, a department exists, which is in charge only for the implementation and evaluation of the strategic plan, 3

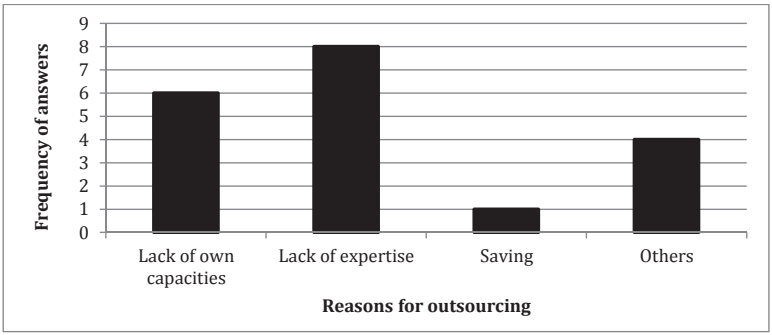
cities aggregate management of specific projects and strategic management into one department. In two cities, no such department exists. If departments of strategic planning are not defined separately in the organizational structure, they are usually part of the finance department, the city architect, or Mayor's Office. The number of team members of the department for strategic planning ranges from 10 to 15 members. Most cities also state that the employees were trained in strategic management. The situation is worse in political representation, only 33% of cities, states, had a responsible politician who had been trained in the field of strategic management.

The results of structured interviews are as follows:

- There are frequent conflicts between the department which is responsible for strategic planning, and the financial and investment departments
- Bureaucrats deem departments of strategic planning as departments with special and exclusive agendas
- Departments of strategic planning should ideally be divided into 2 departments, namely department of strategic planning and the department of project implementation

Except for two cities, the majority of those surveyed cities use for the preparation of the strategic plan external services. The following graph shows main reasons for outsourcing:

Figure 2. Main reasons for outsourcing



Source: Authors

Most outsourcing is used for public relations and data mining; the obtaining data through surveys and polls.

The survey results confirmed the general conclusions that we know from existing theory and previous studies[12],[36]. Responsible officials recognize the importance of strategic management for the city's development. However, the effective use of these tools is limited by numerous barriers to implementation.

4. Conclusion

If we focus on strategic management issues, we can consider the absence of the link between strategic planning and budgeting to be the most problematic. Strategic plans often do not respect the current financial situation and budget outlook. This situation implies a risk that a substantial proportion of the targets resulting from the strategic plan is not feasible due to the financial situation of the city. Another major weakness, but not unknown in the public sector is the unclear assignment of responsibility for the implementation and results of the strategic plan and from this, the resulting complicated formalization of the department of strategic management in the organizational structure of the office. In contrast to previous conclusions, cities claim that the strategic plans are used as an instrument for city management. A very positive finding which can be considered is that due to political changes strategic priorities are

not changed. The main reason could be that the politicians are not connected to a process of strategic planning. Survey showed that there is a significant gap in their level of education and training in the area of strategic management[37]. From a political point of view it is very difficult to identify a link between the results of strategic planning and political success in a four year period. The second aspect of this problem is of course financial. The budgets of municipalities are under pressure and it is complicated to vindicate the legitimacy of this type of public expenditure.

The survey shows very extensive utilization of outsourcing in the area of the strategic planning and strategic analysis, this solution can be seen as suboptimal, because the main part of strategic initiative should be driven by internal staff. External advice should be used predominantly for methodical help.

To improve the current situation, it would be more appropriate to apply benchmarking in order to identify good practices. In strategic planning, benchmarking should be done in the following areas: linking strategic planning with budgeting, setting up a strategic department in the organizational structure of the office, and the use of appropriate indicators to measure the implementation of the plans. It is very important to communicate all successes in these areas and increase the importance of strategic management from political point of view. Training in the field of strategic management should be undertaken not only by employees from the strategic planning department, but even staff from the financial department, investment department, as well as the responsible politicians. In order to obtain a very effective level of strategic management, it is very important to communicate all issues among the responsible officials in an open manner and support internal management initiatives.

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Overcoming Path Dependence: Development of the Civil Service Remuneration System in Slovakia from 1918 - 2012

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Abstract

This article explores the path dependency by examining the pattern in the development of the civil service remuneration system in Slovakia from 1918 until 2012. The empirical case looks at four legislatively distinctive periods: 1. Work pragmatics period (1918-1950) 2. Labour law period (1950-1989), 3. Transition period (1990-2002), 4. Civil Service Act period (2002-2012). Within these periods, it studies the most important elements of remuneration systems, as defined by literature: payment structure (tariff salary vs. salary components), purpose of components, decompression ratio in context of salary grades and scales, as well as on criteria for assigning employees to salary grades and scales. The goal is to look at the development of transparency understood as more predictability of the system, internal fairness understood as maintaining differences between salary grades and scales in order to motivate better performing individuals, as well as whether the criteria applied by the system lean more towards seniority or meritocracy. Beyond this empirical question the Slovak case gives rise to a profound set of theoretical questions on institutional change: has there been a fundamental institutional transformation of the remuneration? In other words, did Slovakia with its reforms in four distinctive periods break away from its path?

Keywords: Civil service; remuneration; decompression ratio; seniority; salary structure; salary scales

JEL Classification: J33, N44, Z18

1. Introduction

This article draws on recent theoretical work on path dependency and institutional change to identify the mechanisms of institutional reproduction and the mechanisms of institutional change in the Slovak case of remuneration system. It is not feasible to undertake a systematic review of recent works on institutional change, rather the article will focus on the key issues of the concept of path dependence. The base for the analysis are the works of Mahoney [1] who has elaborated the theory of path dependence. According to Sewell's [2] influential definition, path dependence means "that what has happened at an earlier point in time will affect the possible outcomes of a sequence of events occurring at a later point in time." Mahoney [1], Karl [3] and Noteboom [4] claim, on the contrary, that path dependence is more than just the past influencing the future. When an event is path dependent, it is *determined* by earlier events, meaning that „directions for future development are foreclosed or inhibited by directions taken in past development" [4]. Early events are contingent, i.e. cannot be explained or predicted on the basis of initial conditions. Hence an important condition for path dependence is the existence of so called *critical juncture* in which events trigger a move toward a particular path out of two or more alternatives.

For Pierson [5] every path begins and ends with a critical juncture and is followed by causal patterns or sequences. According to Mahoney, they can be *self-reinforcing* (initial steps in a particular direction induce further movement in the same direction) or *reactive (*each event in the sequence is both a reaction to antecedent events and a cause of subsequent events). Events starting a path dependency pattern tend to bring outcomes that 1) contradict the predictions of a theoretical framework employed by the investigator; and 2) are reproduced by processes associated with the very theoretical framework they contradict. [6]

The key institution (formal rule) governing the remuneration system is the main focus point. The goal of any remuneration system is to motivate civil servants to carry out their tasks in a way that enables the government to achieve its strategic objectives in respect to the state

budget as well as fairness [7]. A remuneration system should have such a structure that it attracts a reasonable number of qualified employees to work for the civil service and, that way, ensure effective and efficient governance [7].

The analysis of remuneration systems focuses on two crucial elements – its internal and external fairness [8]. External fairness refers to the competitiveness of civil servants salaries with the private sector, whilst internal fairness points to transparency and predictability of the remuneration system. It can be generally said that the system is more transparent when additional salary components account for a low percentage of the overall salary. The ideal percentage according to OECD is around 10-20%. In countries, that had suffered most because of the effects of the financial crisis, such as Greece for example, this percentage was around 80%. Salary components are often connected to a particular purpose, such as the component for managing a department or standby duty, although personal components exist, that allow directors to decide on to whom, for what and in what amount should they be given. Components, depending on their amount, have the ability to motivate employees to the activity they are for. That is why components for performance are considered to have an effect on the quality and quantity of work in public sector. Components for managing, on the other hand, may motivate to create managerial positions or for civil servants to become directors.

Another important element of remuneration systems is the decompression ratio, i.e. the difference between the lowest salary in the lowest salary grade and the highest salary in the highest salary grade. According to OECD, this ration should be 1:4-5, whilst World Bank recommends an even higher ratio 1:7-10, but taking into account also political positions [2]. This means a reasonably big difference between salaries of civil servants in different positions. A small difference between salaries of civil servants, who have different responsibility creates a feeling of internal unfairness and de-motivates from career growth. That is why the number of salary grades and scales is also important, as a higher number implies smaller differences between individual grades and scales.

Remuneration systems are closely connected to career growth systems in that promotion is ideally linked to salary increase, which enhances motives for promotion. It becomes increasing important, based on what criteria one is promoted. The criteria of promotion usually express the values that the system supports. When analyzing civil service systems, literature usually uses the dichotomy between the traditional Weberian-type bureaucracies, and the New public management reform [9]. While the former accents seniority as a value typical for promotion, the latter emphasizes pay for performance. This dichotomy may be applied to analyzing the remuneration systems as subsystems of civil service.

The goal of our research is to compare defining features of remuneration systems from in Slovakia from 1918. We will concentrate on the elements mentioned above, i.e.: payment structure (tariff salary vs. salary components), purpose of components, decompression ratio in context of salary grades and scales, as well as on criteria for assigning employees to salary grades and scales. Based on the legislative framework which provides the basis of a remuneration system, we have identified four periods in the development of remuneration system in Slovakia: 1. Work pragmatics period (1918-1950) 2. Labour law period (1950-1989), 3. Transition period (1990-2001), 4. Civil Service Act period (2001- 2012). The periods relate to periods induced by critical junctures – i.e. contingent events of political regime change, which may have triggered a new path dependant development in civil service remuneration. The question is, if they really did so, or if we can witness a path dependent pattern throughout all the periods.

Our research question is: "Did each critical juncture of political regime change trigger its own path dependant pattern in civil service remuneration or is there a pattern that exceeds all periods? If so, which critical juncture has triggered it?" The "pattern" that we will look at is a pattern of elements associated with internal fairness.

2. Material and Methods

We studied three elements that constitute internal fairness of the remuneration system:

1) the guiding principle of remuneration (whether seniority based or meritocracy based),
2) predictability of the system (ratio of salary components on the overall salary),
3) salary differences between employees (de-compression ratio).

For each period, we gathered data on all three elements. To answer the question of the guiding principle, we looked at the structure of tariff systems, i.e. what criteria is evaluated when placing a civil servant in a particular salary grade. Criteria such as education and work responsibilities were regarded meritocratic, while criteria of time being spent in civil service was regarded as seniority based. We then confronted that with rules for promotion, which also may be seniority or meritocracy based, to get an overall picture of the remuneration system. The more merit based the system, the higher the internal fairness.

For the second question, we basically looked at the ratio of salary components on the overall salary. The higher the ratio, the less transparent and internally fair the system. The eligibility criteria for obtaining components was also assessed. If the component was related to work performance or work tasks, it was considered more fair. If it was related to other circumstances, such as family allowances, it was considered less meritocratic and hence less fair. Similarly, if the components were related to managerial tasks, we considered the system less fair, as it does not affect meritocratic principles.

The third element involved calculation of the decompression ratio, which we calculated by dividing the highest salary in highest pay scale and grade, by the lowest salary in the lowest pay scale and grade.

Our research required mainly qualitative methods, namely content analysis of legal documents, such as laws, regulations and explanatory notes. They are the following:

- Work pragmatics (Act no. 15/1914 of 25th January 1914 on work relations of civil servants and civil attendants)
- Act on pay (Act no. 103/1926 of 24th June 1926 on emoluments of civil servants) (including explanatory note)
- Act No. 66/1950 on work and emoluments of civil servants
- Government Resolution No. 68/1950 of 30th May 1950, which issued the remuneration order for administrative employees
- Act No. 143/1992 on remuneration in budgetary organizations (including explanatory note)
- Government Resolution No. 249/1992 on emoluments of employees of budgetary organizations and some other organizations
- Act No. 312/2001 on Civil Service (including explanatory note)
- Amendment No. 551/2003 of the Act No. 312/2001 on Civil Service (including explanatory note)
- Act No. 400/2009 on Civil Service (including explanatory note).

The last period studied (i.e. 2002 – now) also allowed us to use more documents, due to their availability:

- Analysis of the status of civil servants
- Reports on the implementation of the Act No. 312/2001 on Civil Service (2002 – 2005)

3. Results and Discussion

3.1 Work pragmatics period (1918 – 1950)

The first critical juncture which may have determined the development of the Slovak civil service remuneration system was the creation of Czechoslovak republic. It was a contingent event that had lead to adoption of new legislation and new institutions, one of them being the

civil service remuneration system. Whether it really determined the development of the system in the following period is the question to be answered in this section.

The act that provided a legislative basis for managing personnel issues of civil servants was the Work Pragmatics, a law inherited from the Austro-Hungarian empire legislation and transposed into legislation of the first Czechoslovak republic in 1918 (Act No. 11/1918). The system of remuneration was initially based on education and job content criteria, referred to as "work performance". The act introduced seniority as the main criteria of promotion, to solve problems caused by systemization, i.e. forward planning of civil service posts, which made promotion of employees rather difficult and random, depending on which position was vacant. The seniority principle completely overthrew the work performance principle, which was inherent in salary classes, but diminished with the rules of promotion. It soon lead to an excessive number of civil servants in highest positions, damaged competition based on merit as well as internal fairness by attributing the same entitlement to promotion to servants with different qualifications and work performance. [10]

In 1926, a new Salary act was proposed, attempting to solve these problems. [10] The Salary Act meant a return to systemization of civil service positions [10]. Promotion was made possible only into a vacant systemized position *upon appointment, i.e. as it was before the introduction of seniority principle in Work pragmatics*. Systemization gave way to promotion of "specific cases" of exceptional employees [10]. This enhanced once again the importance of tariff salary, which was dependent on the importance of work responsibilities and level of education required for the types of positions. Seniority as a principle for promotion was, however, not completely abolished. As it is explicitly stated in the explanatory note, it was kept for those employees, who were less ambitious, but nevertheless completing his work tasks and deserving a certain level of pay rise for staying loyal to the civil service. [10]

The authors of the Salary Act aimed to preserve diversity in tariff salary, which was one of the negative consequences of seniority principle that made it possible to leverage salaries of employees with different work responsibilities, just because one was longer in service than the other. The new law made sure that each civil service grade had a different range of salary scales, meaning that those in the lower grades assigned to them according to their education and work tasks would always, even after years of experience, have a lower salary that those in the higher grades. The decompression ratio was 1:8, which would meet the standards of international organizations today.

Salary components, such as the "alimony" and "expenses" component, were introduced into Work pragmatics during WWI and their goal was to support civil servants in times of austerity. Their value often made up to 70% of the tariff salary and lead to injustice in overall salaries of employees [10]. The Salary reformed the components by reducing their value and eligibility. Three salary components were available: 1. "service" (*náslužné*) component, based on civil service grade and salary scale, 2. "active" (*činovné*) component, based on grade, scale and the size of the city, where a civil servant worked and presumably also lived, 3. "up-bringing" component (*výchovné*) for civil servants with children. The highest one was the active component, which represented max. 15 000 Czechoslovak Koruna/year, which is approx. 20% of the highest tariff salary. [10]

The rise of the Czechoslovak state was a critical juncture for the creation of the civil service remuneration system. The choice of Austro-Hungarian legislation in the area of civil service remuneration may be seen as contingent, because any legislation may have served as a template for new legislation. Also, given the long term struggle for independence from the empire, transposition of the empire law may seem paradox, in line with Mahoney's definition of contradictory outcomes of the events triggered by critical junctures. The amendments of the remuneration system dealt with elements of the remuneration system introduced by Work pragmatics, such as systemization, seniority as a principle for promotion, existence of salary components and salary grade system, used to compress salaries in order to prevent leverage. The 1926 Salary act represented solutions to problems caused by the Work pragmatics – solutions, which were solved by its reversal, not by new innovations. This proves that the adoption of the Work pragmatics was a critical juncture, because it determined the development

of the civil service remuneration system as a chain of incremental changes made to the adopted system.

3.2 Labour law period (1950 – 1989)

Work Pragmatics and the Salary Act were abolished with the introduction of the new Labour law in 1950. During the communist era, the public and private law was not distinguished and so the civil service became a part of the general work relations legislation [11]. Due to the cast changes in the civil service regulation, we suspect that this period may present another critical juncture that influenced the development of civil service remuneration rules.

Details on salaries of public servants, who were known as "administrative servants" were in the Government Resolution No. 68/1950. Systemization persisted and was annually approved by the government. The system introduced more grades (9) and less scales (6), which accounted for a much lower decompression ration of 1:3. The salary level was fixed and increases in salary were only possible by transferring to a higher scale based on seniority principle, or to a different work grade, which would require a change in work tasks and systemization to have a free position available.

The remuneration system introduced the so called "functional" components for management and control of work (§14). Only employees of the grade 3-8 were eligible, whilst the employees of the highest grade had this component automatically included in their monthly salary. The component accounted for roughly 11 do 34% of the tariff salary and its level was decided by the organization based on the value of the function performed by such an employee. This value was established by his education and experience, degree of responsibilities, consequences of his function for the political and economic wellbeing, degree of independent decision-making, level of subordinates' dependence on him, number of subordinates and degree of necessary organizational skills (§13). This component obviously promoted directing and control, rather than specialization in work tasks or increase in their performance. More specialized work on lower positions was therefore rewarded less than less specialized work in higher positions. [12] The system also enforced dependency of subordinates towards their directors, i.e. some sort of master and servant relationship due to linking the component to number of subordinates and also making superior employees competent to decide the level of a relatively large salary component.

The only salary component that could be characterized as promoting meritocracy was the component for using languages at work. It represented 200 Czechoslovak Koruna, i.e. 15% of the average salary (3174 Czechoslovak Koruna). Other components were unrelated to meritocracy, such as bonus for working overtime, although civil servants, who reached a salary level set by the government, were not obliged to enjoy this benefit.

This system allowed a rather wide discretion of superior officers over establishing the total salaries of their subordinates. Superior officers decided over assigning employees into a relevant grade, based on their education and work responsibilities as in the previous system. They could also decide over the granting and the amount of the functional salary component. Components generally supported activities that were unrelated to content of work and hence had no effect on performance or work specialization. Low decompression ratio, higher number of grades while having few salary scales, accounted for low differences between salaries in the civil service and hence did not provide incentives for greater performance either. The system took away the merit dimension, whilst giving more room to seniority and arbitrary decision-making.

The remuneration system in the communist Czechoslovakia did not structurally deviate from the Work pragmatics. It made us of the same elements of the remuneration system – it employed systemization, used salary grades, salary components, as well as seniority principle. However, the evaluation of the system based on internal fairness shows us major deviation from the previous system. Differences between salaries were low, seniority principle became dominant and salary components increased – all of which made the system less internally fair. We can therefore regard the communism era for another critical juncture in the civil service

remuneration system. We assume, that this critical juncture set the path for the rest of the communist era, as we have not noted any significant reforms or amendments of legislation regarding "administrative servants" in our research.

3.3 Transition period (1990 – 2002)

After the fall of communism, civil servants were still left subject to the Labour code. Remuneration was modified by Act No. 143/1992 on remuneration in budgetary organizations and Government Regulation No. 249/1992 on the salaries of employees in budgetary and certain other organizations and bodies. The Act introduced a central classification of posts in budgetary organizations based on staff qualifications and seniority of employees, which contrasted the practice in Western countries, where the classification is set according to the type of positions in the civil service [13].

There were 12 grades and 10 salary scales, based on seniority principle. Although the difference between the lowest and highest salary rate accounted for just below 1:4 decompression ratio, the differences between each grade and scale were only small, which moderated the incentive effect usually caused by an increase in decompression ratio. The remuneration system used in the transition period is not much different from the one that was used in the communist era, when it comes to calculation of tariff salary.

The law kept the communist "functional" salary component for management and control of work and also other components, e.g. work at night or weekends. Special components have been allowed to staff who have been at your job at risk. The system introduced personal allowances (§12), i.e. salary components for above the standard work performance and long-term results. Personal allowances seemingly tried to introduce an element of merit, but granting this allowance as well as establishing its amount was up to superior officers, which of course increased the risk of abuse. Personal allowance could go up to 100 % of the tariff salary, but only in the case of employees of the highest grade, i.e. 10-12. Lower grades were limited to 40 %.

The system of remuneration used during the transition period stemmed from the communist legislation, making personal allowances the only new component, presumably to make civil service positions more attractive for new employees, which were at the time very much needed. The component itself was very non-transparent, as it gave discretion to superior officers who could grant the component to almost anyone under a very wide set of conditions. This had impact on the internal fairness of the system, but because it had not much deviated from the previous communist era system, we regard it an incremental change, while all other elements maintained their level of internal fairness. The transition period until 2002 can, therefore, not be considered a critical juncture.

3.4 Period of the Act on Civil Service (2002 – 2012)

The final critical juncture we analyze in our research is the adoption of the Act on Civil service. We regard this event as contingent, because it was associated with the EU accession. Although the adoption of the law was not part of the Acquis Communautaire, the EU put this up as an informal request for entry of Central and Eastern European countries in 2004. The reason was mainly the uncertainty about the quality of administrative capacities of individual states [14], most of which had a communist past and the corresponding state of the state administration.

The initial Civil Service Act of 2001 followed the complex and rigid approach of the Labour Code: tariff salary based on grades and categories with a fixed amount in each category. The Civil Service Act brought only small incremental changes in the systematisation (classification) where the civil servant was assigned to a grade and a tariff salary based on the number of years of experience, qualifications, training, duties and activities. The Civil Service Act of 2001 recognized 9 salary grades (responsibility and education) and 9 scales (seniority with performance elements), which are essential for the calculation of the salary. Salary components from the previous periods, such as functional component or personal allowance were cancelled. The lack of reform in salaries has led to the "freezing" of salaries in the public sector for a long time, while

salaries in the private sector, especially in Bratislava, increased rapidly, causing more problems in the recruiting new employees.

In 2003, an endogenous reform of remuneration system took place that brought about innovative elements and change from the path. It followed up on the strategy for reform of employment, whose goal was to create a competitive, high-quality, flexible and impartial public administration [15]. According to the strategy, it was necessary to introduce greater differentiation in pay, but also in demands on performance so that the public sector could keep up with the private. The reform abolished seniority due to indirect discrimination according to the EU directive on equal treatment, and introduced innovative features to attract and motivate young candidates.

The 2003 reform abolished the salary scale used in the communist era and raised the number of grades from 9 to 11, reserving the highest grade reserved for the so called nominated civil service, e.g. those, who would be regarded senior civil service. As Staroňová and Brown [16] pointed out, this did not lead to a significant change in the decompression ratio, which was still around 1:3.

Innovative changes were made to the salary components. The 2003 amendment introduced the "performance" salary component based on assessment of performance using a "point" system for which a bonus up to 3 % of tariff salary could be granted or, alternatively, scoring low could lead to termination. It was an attempt to introduce an element of merit, which should help motivate civil servants to better performance [17]. The lack of coordination among ministries, however, accounted for differences in setting performance parameters and their evaluation. Similarly, lack of training in how to use the tool effectively had a negative impact on the actual effect. Evaluation of the system by the Civil Service Office in 2004 [18] found that 45 % of officials received the maximum 3 point evaluation and another 41 % 2 points. From these data it is clear that this mechanism had not been used for the actual evaluation of the performance, but as the possibility of further salary increase. The new Civil Service Act of 2009 completely abolished the performance evaluation system and re-introduced the seniority principle with establishing a staff bonus, which raises the tariff salary by 1% each year. Thus, the process of institutional reform and change in this regard is a path dependent one, since it is clearly propelled by increasing returns or positive feedback effects.

Other "old-new" salary components included the component for management and personal allowance. Personal allowance could be up to 100 % of basic salary, but where there are no rules for its allocation. In practice, personal allowance has often been agreed when entering the civil service. To be able to pay this component, the ministry could, according to the amendment, "save" money by staff reduction or unfilled vacancies and use that for component payment or other rewards [17] [19].

In addition to the salary of a civil servant, the Civil Service Act introduced other specific forms of pay: special salary and personal salary. Special salary was introduced during reform in 2003 and was granted to staff in positions of special significance approved by the government. These employees could have received also a special salary component up to 100% (and up to 50% for nominated civil servants). The new Civil Service Act of 2009 followed up on this institute and established the so-called personal salary whose granting is solely in the hands of the ministry service offices.

Currently, according to the new Act on civil service No. 400/2009, there are still 11 salary grades based on the degree of responsibility and education, which are the basis of the remuneration system. The new act got rid of the performance component and the special component, but the others have remained. The system currently has a component for management (up to 90% of tariff salary), personal allowance (up to 100% of tariff salary), staff bonus (1% of tariff salary) and other components, such as for filling in for another civil servant or for performing civil service in crisis management.

The period of the Civil Service Act can be seen as a period full of changes in system of remuneration. But as suggested at the beginning, the new path was not completely different from the old one. The new path of the remuneration encompasses elements of the merit system and those of the seniority. The new path or model is a hybrid. Generally, we can see a shift

towards more merit, although the latest Act on civil service does remunerate years of experience with a staff bonus. Initially, the civil service Act had virtually no salary components, which was very quickly changed by the 2003 amendment and components for management and personal allowance. These components currently represent a high percentage of tariff salary (up to 90% and 100%). On one hand, they replaced the rigid pay system based on seniority and introduced more managerial flexibility to provide a temporary solution to the problem of how to attract and keep highly skilled workers in the civil service. However, the lack of clearly defined criteria for the allocation of components, as well as ad-hoc nature of the system based on artificial wage budgets, makes the system vulnerable, non-transparent and subject to politicization, and the wage budgets distant from the real needs of the administration.

Path dependence theory asserts that exogenous change can move actors off a current path. The internal dynamics of the system led to developments which altered the interests of key/central actors (not marginal ones) who initiated a series of institutional changes designed to serve their interests. Ultimately, a mixture of endogenous and exogenous pressures led to a series of path-changing initiatives. This case suggested that a 'critical juncture' can emerge (at least partly) out of normal processes of change inside a path [see also 19].

4. Conclusion

Through the examination of the institutional change of the remuneration system, in this paper we looked at path dependence in four different stages, which were divided according to the four main critical junctures – regime changes – that brought different legislative treatment of the remuneration system: 1. Work pragmatics period, (1918-1950) 2. Labour Code Period (1950-1989), 3. Transition Period (1990-2002), 4. Civil Service Law Period (2002-2012). During these periods, we studied elements that constitute the internal fairness of the system, namely: 1. The ratio of the salary and bonuses, which reveals the transparency of the system, 2. Decompression ratio, i.e. the ratio between the lowest and highest salary, 3. Guiding principles of remuneration (whether merit or seniority) and were looking to what extent path-dependence occurs.Self-reinforcing mechanisms can be observed at work in simultaneously preserving the old path and promoting a new one. The development of the remuneration system in Slovakia shows, that although details of the system changed, a dominant feature of the system are the salary components, regardless of whether the system was inclined to seniority or meritocracy. They became increasingly significant as can be sensed from the rise in number and share on tariff salary. The salary components were seldom linked to performance, the exception being the 2003 performance component, which due to flaws in implementation did not fully show its positive effects. Decision-making over their granting and amount has been traditionally in the hands of individual ministries. This allows us to say that there is a strong tendency towards a system with flexible discretion over salaries.

The decompression ratio and salary scale/class development tells us that apart from the first period, the diversity of tariff salaries has been low, which could lead us to call the system egalitarian. We cannot say that, however, because in practice the salary components ensured diversity within the system. The only problem with that is, that the criteria for granting a component were blurry and decision-making arbitrary. Lack of transparency and predictability obviously has effects on how employees perceive the internal fairness of the system.

Nevertheless, the case has shown that exogenous factors, notably the EU pressure prior to the accession, do eventually become quite significant sources of change but only after endogenous developments initiate a process of institutional change that ultimately cumulates into a new path – innovative elements brought about with 2003 reform. Thus the internal dynamics of the system led to developments which altered the path. Not for long though.

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Institutionalization of Regulatory Impact Assessment in the Czech Republic and Slovakia: Do Reforms bring RIA Closer to be a Decision-making Tool?

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Abstract

Regulatory impact assessment (RIA) has been developed throughout the 1980s and 1990s as a tool to analyse the economic, social and environmental implications of policies. The European Union considers impact assessment to be a modern process for evidence-based policy-making, providing a structured framework for policy decisions at all levels of policy development and decision taking. It has long been acknowledged that RIA provides decision-makers with valuable empirical data and a comprehensive framework in which they can assess their options and the possible consequences of their decisions. A poor understanding of the problems at hand or of the indirect effects of government action can undermine regulatory efforts and result in regulatory failures. At the same time, the research has showed (particularly in Central and Eastern Europe) that RIA is taken as a formal exercise that does not serve its original purpose. Many of the countries have reformed their RIA processes to improve the efficiency, including the Czech republic and Slovakia. This paper looks at the reform processes conducted and reviews if there was a learning curve on how to institutionalize RIA to bring the desired outcome: RIA is a decision-making tool.

Keywords: Regulatory impact assessment; decision-making; institutionalization; regulatory reform; oversight body

JEL Classification: H11, L50

1. Introduction

The notion of ex-ante Regulatory Impact Assessment (RIA) was introduced in the late 1990s in OECD countries, followed by CEE countries in early 2000. With the OECD declaration on regulatory quality in 1995 [1], it provided the first international standards in this policy area, endorsed at the highest possible level by its Member States. RIA became a fundamental component of the smart regulatory state advocated by international organizations [2] because of its systematic consultation, criteria for policy choice, and the economic analysis of how costs and benefits of proposed regulations affect a wide range of actors. Modern legal systems have introduced the obligation of regulatory authorities to perform an ex ante Impact Assessment (during the process of drafting and prior to law approval).

RIA is currently experiencing a remarkable level of attention in many countries [3, 4, 5]. In fact, it is now diffused in all of the EU and OECD member states (OECD 2009). Many of the countries are in fact reforming their processes since there has been learning experience on producing and using RIAs. For example, European Commission reformed its processes in 2005.

The adoption of RIA has a set of institutional implications: simply the political context within which individual countries institutionalize RIAs shape the actual implementation and practice. Various authors tried to identify important factors influencing the implementation of RIA such as, differing bureaucratic contexts, governmental capacities and policy processes [6], strength of institutional oversight and coordination and their support activities [7]. The OECD has prepared a set of recommendations, among which it shows on the necessity of a centralised oversight mechanism. Thus, one of the major implication is weather an oversight body on RIA exists or not. Indeed, a widespread consensus seems to be emerging on the merit of having a strong oversight body for the regulatory impact assessment [8], [7]. Based on this, Wiener [9] started to look at the diffusion of regulatory oversight bodies as a parallel process to the diffusion of RIA itself. There exist many types and models of oversight mechanism, perhaps the

most studied ones are the US Office of Information and Regulatory Affaires, the UK Better Regulation Executive and the European Commission's Impact Assessment Board. The latter one was created in 2007 within the SecGen to check the quality of draft IAs. The SecGen also coordinates the machinery of inter-service consultation and manages the Commission policy on transparency and access to documents. The European Commission formally and officially speaks of "impact assessment" (instead of "regulatory" impact assessment) because the scope of application of the system covers both the legislative proposals and non-legislative proposals (in particular White Papers, action plans, expenditure programmes) included in the annual Legislative and Work Programme.

RIAs are often understood as tools in the hands of a principal seeking to control an agent [10, 11, 12, 13, 14]. The principal is the centre of government which introduces the new system of impact assessment with the aim of improving regulatory outcomes, whereas the agents are line ministries which implement RIA when preparing legislative proposals for cabinet decisions. In order to encourage the agent to engage with RIA substantively rather than formally, the principal sets up an oversight mechanism. Oversight may also be reinforced through the presence of an enforcer or supervisor – a special type of agent whose role is to monitor and report on the actions of other agents [17] - in our case of an oversight body. Renda [8] ascribes to such an oversight body a number of powers and duties, such as advocacy, consultation, guidance, coordination, training, annual reporting and maintaining institutional relations. A key hypothesis is thus that the more power the oversight body has, the better the quality of the RIA process and its outputs. Conversely, the weaker the oversight body, the less oversight in place and the more ministries will treat RIA as a exercise that involves little more than 'ticking the boxes'.

The adoption of a two-stage system (also 'dual stage') was also recommended by the Mandelkern Group [14] and can be found, among others, in the European Commission where „roadmaps" are in place since 2005. The Commission applies this approach to RIAs, on the basis of the so-called "principle of proportionate analysis" [15]. This translates in practice with the obligation to produce preliminary "roadmaps" on all proposals, while more comprehensive "Impact Assessments" are carried out only on selected items. It is the SecGen, the IAB and individual DGs that decide, on an annual basis, which proposals undergo an IA. The services are then invited to match the depth of the analysis necessary with the time and financial resources at disposal. The EC guidelines [15] explain in details the nature and various steps and provide advice on how and when to prepare it. Similarly, in UK, four phases can be identified to reflect the on-going process of policy formulation which also differ in the scope and depth of IA prepared: a) an *initial IA* which should be prepared as soon as a policy idea is generated. It consists of a rough-and-ready analysis based on what is already known. It should include the options and best estimates of the possible risks, benefits, and costs. The intention is to identify areas where more information is needed (it can be quite short if the expected impact is likely to be small but quite substantial if it is likely to be bigger); b) a *partial IA* which builds upon initial IA, is produced prior to the consultation exercise and must accompany the consultation document as well as be submitted with any proposal needing collective agreement from Cabinet; c) a *full IA*, building on the information and analysis in the partial IA, which is prepared for the Minister's signature; and d) a *final IA*, that is signed by the Minister and accompanies the draft regulatory proposal submitted to the Parliament.

This article engages with the discussion on the RIA institutionalization by studying how governments in the Czech republic and Slovakia have reformed their RIA processes in order to increase the efficiency. In studying the patterns, the study focuses on formal and informal rules and procedures of institutionalization.

2. Material and Methods

The analysis relies on qualitative data analysis of formal documents institutionalizing RIA in each country, guidelines, methodologies, reports and other RIA related documents as well as

interviews with civil servants in RIA units / experts in the RIA Committee in the Czech republic and Slovakia.

Both countries were selected since they reformed their RIA processes, with focus among other things on two most important institutional aspects: oversight body and two-stage process. In Slovakia, the Joint Methodology was approved in 2008, piloted in 2009 and came fully into effect in 2010. In the Czech republic, the new system of RIA, including amendments in the process of RIA and institutional framework of RIA was approved by the Governmental Resolution in December 2011.

3. Results and Discussion

3.1 Comparison of RIA systems in the Czech republic and Slovakia

Typically, RIA is often adopted as part of a wider better regulation agenda. Both the Czech republic and Slovakia have followed a different path in this respect, since RIA was adopted prior to the development of better regulation programmes. Overall, the rhetoric of 'better regulation' was largely absent when RIA was initially adopted. With the adoption of the Better regulation strategy, Slovakia reformed its RIA processes in 2008, coming into affect in 2010 to be in accordance with the strategy. The Czech republic, on the other hand, conducted an internal audit on RIA performance after which it redesigned its RIA processes as of 2012. The new system of RIA brought the same changes in the process of RIA and institutional framework of RIA: a) introduction/streamlining of a supervisory body, b) two-stage system.

3.2 Two-stage system

RIA should ideally work as an iterative learning process which starts early in the policy making process and runs in parallel with the **decision-making process**. As the assessment evolves, it may give rise to new questions, or new data may require the re-interpretation of original assumptions. One approach to this issue may involve official division of the impact assessment process into different *phases*. Some of them must be compulsory, while others can be optional.

Prior to the RIA reforms in both countries, formal RIA was typically a one-off activity which took place at the wrong place and time within the decision-making process, i.e. towards the end of the policy formulation process, notably once a draft law is ready and written in articles, with no time for options or consultations. Nevertheless, both the Czech Republic and Slovakia have reformed their RIA processes after few years with better regulation in mind (and programs in place) in order to increase the efficiency of the system and bring RIA closer to decision making processes. This was done by introducing a two-tier system that brought several phases either by a) requiring an application of "regulatory test" to provide for the information on the policy at the very early stage of the work (Slovakia in 2008, coming into full effect in 2010, b) linking RIA to the legislative planning stage (the Czech republic).

In Slovakia new system has introduced a two stage process with a requirement for applying the so called „quick test" on draft legislation going to Government sessions. The test is in the form of 5 questions to be answered in yes-no form (see Figure 1) intended to provide for the information on the policy at the very early stage of the work – before the actual draft law and (extended) RIA is being prepared. In order to support the two-stage system also Preliminary Inter-Ministerial Review Procedure was introduced to provide possibility for the supervising 4 ministries to provide comments on the quality of RIA submitted prior to the regular inter-ministerial review process. The procedure was changed from obligatory to voluntary as of September 2011 by amendment to the Legislative Rules of Government. Thus, the supervising ministries usually see this table in the Statement of Impacts attached to the Explanatory Note for the first time during regular Inter-ministerial review process, only few days prior to Government meeting with no real possibility to check the quality (and validity) of the answers. Only, where "yes" answer is provided a more detailed Analysis of Impacts is requested which in reality is almost never done.

Figure 1. Quick Test Questions

A.1. Identification of the Problem:

A.2. Scope of Impacts:

	No Impact	Impact (positive or negative)	Any alternatives considered?
1. Scope of impact on public finances			
2. Scope of impact on business environment – is there sign of regulatory burden?			
3. Scope of Social Impact – economic stance of population; social exclusion; equal opportunities, gender equality, employment			
4. Scope of impact on Environmnet			
5. Scope of Impact on Information Society			

Comment: Provide "yes/no" answers. In case of "yes" answer, it is possible to detail down the impacts in the column on Positive/Negative Impact.

A.3. Note

If the originator was considering any alternative sollutions, please provide in more detail which ones, why and which alternative is used in the submitted materil

A.4. Comments of the Supervising Ministries

Source: Author

The Czech republic, on the other hand, has undertaken a complex RIA reform explicitly linking RIA to legislative planning and not only drafting, making it a continuous process in parallel with decision making. Initial assessments (so called „preliminary RIA") are obligatory to all originators of draft bills and are produced for all proposals to be included into the Plan of Legislative Works of the Government. Preliminary RIA is a short statement devoted to the identification of a problem and goals, analysis of alternative regulatory options, preliminary indication on the expected impact and an indication of whether a full RIA would be needed, identification of stakeholders and summary of consultation. The result of the first part of the RIA process is the Plan of Legislative Works of the Government that among others states, to which legal acts shall be conducted the full RIA. The aim is to retrench resources and oblige the ministries, before they start drafting a new regulation, to go through a logical sequence of questions for identifying whether the regulation is at all necessary. The full RIA contains among others a detailed assessment of impacts of the alternative solutions and their ranking. After both RIA and the legislative proposal are completed, they are passed to the inter-ministerial review process.

There are four important features of the reformed RIA process in the Czech republic that does not occur in Slovakia and which link RIA to real decision making: a) the works on RIA start even prior to the Plan of Legislative tasks with description of the problem, analyses of different policy options, and identifying the need for regulation and determining which items need to be analyzed more in-depth in comprehensive RIAs (and later on reported with draft law), b) once the preliminary assessment has been drawn the oversight body has to be involved in its approval c) the works on comprehensive RIAs is not for ALL items but limited to priority issues which tackles the capacity problem, d) all the items that go to government sessions outside of the Plan have to have full RIA by default. In this way, any overpass of the system is tackled. Once items are identified (and approved by the oversight body) where full RIA is expected, the works start immediately and not at the end of the process.

However, both countries have a formal exception for RIA utilization – so called "fast track procedure". Although, this mechanism should only be used in exceptional cases, but practical

experience in all of the countries shows the contrary. The arguments for speeding up the process range from “we do not have time for it and it is not necessary either" particulary on EU issues to avoid potential conflict by skipping inter-ministerial review process. It can be stated that arguments stressing "EU priority" seem to be the most efficient way of speeding up processes Thus, this practice is a fully political instrument for adopting a preferred policy with no knowledge or broader consultation input and directly contradicts RIA principles.

3.3 Oversight Body

Prior to the reforms in both countries, there was a different understanding for the need of an oversight body. Slovakia has never had a central coordinating body or any strategic centre of government, and only when the government adopted better regulation programs, it created a small *better regulation* (rather than RIA) unit at the level of the line ministry, at the Ministry of Economy. In the Czech Republic, on the other hand, there was some effort to set up a unit for coordinating RIA, but this was only partially successful. Prior to 2006, there used to be a special Department for Regulatory Reform at the Government Office. It operated under direct supervision of the Deputy Prime Minister for Economic Affairs and consisted of analysts who were to assist in RIA development in line ministries. In 2005-06, the department piloted RIA and developed a methodology, which was later adopted by the Government. The Department was moved to the Ministry of Interior in 2006, with unclear duties as regards quality assurance, until 2010 when it was moved back to the Government Office with the change of the government.

Thus, renewed interest in RIA started in 2010. As a first step the RIA unit from the Ministry of Interior was moved back to Government office under the direct supervision of Deputy Prime Minister charged for Legislative process. Also the reform created an independent oversight body – RIA committee consisting of 16 independent experts from outside of the civil service – which provides nonbinding opinions to the Legislative Council. Nevertheless, the Council values the opinions highly and on the basis of these has the power to stop the legislative process. In fact, the RIA Committee has stopped the legislative process entirely for 7 items out of 64 in 2012 (Government Office report). Additional 36 items were returned back for redoing. Only 21 RIAs (and items) were sent without any additional comments further in the decision making process. The key feature of the RIA committee in the Czech republic is the reliance on expertise and professionals that are external to the public administration and perceived by both politicians and civil servants (and public) as experts in their field. Otherwise, ‘any oversight body lacking expertise or headed by a non-expert political appointee may simply exercise politicized influence over expert regulators’ [16].

In Slovakia, joint methodology document charged four different ministries with oversight for particular areas of RIA: the Ministry of Finance for fiscal RIA, the Ministry of the Economy for economic RIA, the Ministry of Environment for environmental RIA and the Ministry of Labour, Social Affairs and Family for social RIA. To that end, the supervisory ministries have created specific analytical units whose task is to assist and supervise the quality of RIAs conducted, particularly via “quick test”. Thus, the Ministry of Economy has created the Economic Analysis Division, Ministry of Finance the Finance Institute and Ministry of Labour, Social Affairs and Family the Social Institute as an analytical unit. Despite these efforts, the individual ministries face fragmentation and hierarchical problems vis-à-vis other line ministries. The quality control function occurs at the end of the legislative process during inter-ministerial review process when an opinion must be provided on each proposal (legislative item) prior to its submission to the Cabinet. Usually, this opinion is an assessment of whether the proposal contains RIA with all necessary clarifications. The opinions are not binding and thus there are no sanctions if the quality of RIAs is low. Only the Ministry of Finance is strong enough and is able to send back draft laws (RIAs) if of low quality.

3.4 Consultation

Stakeholders play a central role in the knowledge utilization literature as they provide expert or lay knowledge. In RIA literature, the process of consultations serves for developing

shared idea of problem, assists in finding options and helps to understand the impacts of proposals and assesses the potential of societal acceptance as well as feasibility of implementation. To this end, the consultation process has to start early and with broad range of stakeholders. Generally, the studied jurisdictions relate consultations to formal inter-ministerial review process within traditional legal framework of law drafting, related mostly to legislative preparation of material. Inter-ministerial review process is, however, a different process compared to the consultation [17]. First, the inter-ministerial review process is reserved for gathering of legal opinions on draft legislation (written in articles) and thus, the opinions address mostly nomo-technical solutions in legal language. Second, opinions are saught from public agencies rather than broader stakeholder circle. Third, inter-ministerial review appears very late in the process of policy making, usually to gather opinions for a ready made draft law rather than for the design of regulation when options are still open.

Nevertheless, only the Czech republic specifically asks for consultation which is anchored in the Rules of Government. Slovakia still equals consultation with inter-ministerial review process.

4. Conclusion

This article has examined the reforms conducted in RIA process in the Czech republic and Slovakia and tried to assess if these reforms bring RIA closer to the decision-making process. Using IA can help decision-makers in a number of ways, including by producing new knowledge of the policy problem; by better grasping the implications of their decisions; or again by contributing to enhance relations between relevant actors. This can lead them to modify the design of a policy proposal or to exploit IA to justify a given political position.

The main challenge seems still to link RIA to the existing legislative process by ensuring a timely "flow" of relevant and objective findings from the various analytical stages. Organisational culture, such as strong legalistic tradition, constitutes major barrier to the effective use of RIA. It simply does not allow for thinking in options unless a step is introduced prior to providing draft law with explanatory memorandum (and RIA) for government meeting. Although, both countries have tried to achieve smoother process by introducing a two-stage RIA process, only the Czech republic suceeded in doing so by linking preliminary RIA to legislative planning and preparation of the annual Plan of Legislative Tasks. In Slovakia, the first test is still a box-ticking exercise that is done at the end of the process – once a draft law has been prepared. Thus, RIA still takes place at wrong time and wrong place and no real reform happened.

The other important issue is the strength of oversight body that can enhance the RIA capacity by both support and sanctions if low quality RIAs are produced. Again, the Czech republic has a relatively strong oversight body that is linked directly to the Legislative Council and whose expert opinions are taken seriously to such an extent that on the basis of these the Legislative Council can veto the items going for Cabinet sessions. The Slovak oversight body not only does not have such a power, but is fragmented in four line ministries and even the basic checking function (not quality control) is not coordinated among the four.

Future research should look into the outputs of these processes and try to establish correlation among the mentioned differences and output qualities.

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Design of Employee Evaluation in Public Administration in the Czech Republic

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Abstract

Employee evaluations are one of the most important personnel activities in the human resources management system, regardless of whether the context is a private organization or the public sector. For this reason, researchers have focused on the evaluation system as a whole for a number of years, particularly in terms of individual methodologies. In this paper, we focus on practice in regional government offices in the Czech Republic. Our goal was to determine which methods of employee evaluation the offices selected make use of, and the extent to which these differ. We were interested to find out whether public administration institutions in the Czech Republic follow NPM recommendations and attempt to introduce best practice management methods into the private sector. We determined that in all three cases selected, offices introduced new progressive methods of evaluating their employees (in two cases, competency-based and in one case, using the BARS method) and are not lagging behind the private sector in this organizational area. The paper undertakes a detailed comparison of the evaluation methods used in these offices and a brief evaluation of them.

Keywords: public administration; evaluation; employee

JEL Classification: H83, O15

1. Introduction

Employee evaluations are one of the most important personnel activities in the human resources management system in both private organizations and in the public sphere. Evaluations are an important source of information for employers, who have the right to have regular information at their disposal on the performance of their employees. But such information is also, of course, targeted at employees who, as part of the evaluation process, may counterpose their own impression of their job performance to that of their superiors. Evaluations may also serve as the basis for employee compensation and may be used in planning their further training and career advancement.

A number of authors (e.g., [1], [2]) describe early employee evaluations as being carried out in an isolated, formalized manner not tied to the needs (objectives) of the organization. Employee evaluation and compensation systems have often been introduced willy-nilly, unsystematically and have failed to bring the desired results. Furthermore, employee evaluations have been targeted strictly at the issue of job performance. But employee evaluations serve more purposes than simply evaluating job performance. Just as employee performance itself may be evaluated, so too may we evaluate whether employees possess the prerequisites needed for the work at hand or on-the-job behaviour. According to Hroník [3], employee evaluations may be divided into three areas: input (i.e., prerequisites = potential, adaptability, practice), output (performance) and process (on-the-job behaviour, approach). These findings stress the need to create a new system which not only evaluates employees, but also takes into account their development and other processes. At the end of the 1980s, the reasons noted above led to the formation of a system which viewed job performance as a continuous process aimed at the future, one which attempted to overcome the deficiencies noted above [1].

In the public sector, this new approach appears in practice primarily in connection with criticism and recommendations heard in the approach to public management which has been influential to this point, known as New Public Management (NPM), whose ideas have found a

home to some extent in the Central and Eastern European region (CEE), as well (see, for example [4], [5], [6], [7]).

In this paper, we will attempt to answer the question of how employee evaluations are carried out in practice (including the methods used) at three regional offices. At the same time, we will explore the extent to which these three offices implement the thinking behind Czech administrative reform, as well: increasing the integration of new management tools into public administration, including the improvement of human resources management. It should be added that Czech law makes no specific demands concerning human resources management. Specifically, only Section 302 of the Labour Code references employee evaluations, noting that it is the duty of managerial employees to "manage and monitor the work of subordinates and evaluate their working performance and results." For officials in the institutions selected, Act 312/2002 on local government employees is relevant. But its primary focus regarding HRM is the choice of candidates and the training of officials (including planning training).

2. Material and Methods

Many authors have focused either on individual method for employee evaluation or on the entire evaluation process (performance management). The approaches taken normally differ in terms of number and classification of the methods these authors describe. This paper builds upon the relatively comprehensive approach (versus other authors) of Hroník [3]. Hronik differentiates employee evaluation methods based upon what areas the evaluation covers. From his classification, we employed only what is used most:

- Evaluation of input (prerequisites) – evaluating potential (competency)
- Evaluation of the process (on-the-job behaviour) – the critical-incident method, the BARS Method
- Evaluation of output (job performance) – MBO method

The evaluation of potential, i.e., the employee's prerequisites for a given job may be carried out using the so-called competency model. This model consists of a set of organized competencies and may by itself serve as the basis for employee evaluations. According to Hroník [3], "Czech companies use the competency model only rarely".

The favoured methods in practice are that evaluating employee behaviour. The organization first defines what sort of behaviour it deems to go hand-in-hand with success on the job (behaviour which helps the organization attain its objectives) and then proceeds to the evaluation itself. It may choose to evaluate using the critical-incident method, in which only particular tasks by the employee are evaluated, or use the BARS Method. The BARS Method (Behaviourally Anchored Rating Scale, [8]) is based upon the already noted critical-incident method. Individual behavioural criteria are selected (e.g., communications or decision-making abilities) and a rating scale with a certain number of degrees (e.g., 5 or 7) specified verbally which corresponds to the job performance level [9].

Output is measured using the employee performance measurement method. The organization may measure the productivity of its employees or it may choose to follow so-called Management by Objectives (MBO). Management by Objectives is a method which attempts to harmonize the objectives of the individual with those of the organization [10]. *"BARS appraisals work best with large groups and subgroups of individuals whose job description can be standardized; ... MBO is best when it is focused on the results to be expected from job performance."* [11]

A number of authors (including [3]) include the so-called 360° Method as an employee performance measurement method. In this case, however, the interest is more in laying out which entities should take part in the evaluation (whether they are managers, co-workers, customers or even subordinates). The actual evaluation as a rule ends up using one of the methods noted above. Every method has its advantages and disadvantages and does not suit all cases of evaluation, all types of employees nor all types of organizations.

Although researchers usually pay attention only to one of the sectors (public or private), we argue that the methods of evaluation do not differ substantially. When speaking about the methods in the public sector, specifics of the public sector are usually defined and followed by the private sector methods.

For this research, we selected three regional authorities (RA) in the Czech Republic, these being regional authorities in the Central Bohemia, Southern Bohemia and Pilsen regions. We have selected three from total of fourteen regions. The three regions which borders on each other are located in Bohemia and has comparable area. [12] We determined the manner in which employee evaluations are undertaken at all three of these regional authorities. We analyzed pertinent documentation and obtained further information from representatives of the personnel departments in question in spring 2013. To our knowledge, there is no investigation on the topic in the Czech Republic.

Table 1. Evaluation at Selected RAs

	Central Bohemia	Southern Bohemia	Pilsen
Number of employees (as of 1/1/2013)	624	498	430
System of Evaluation	Based on the Competency Model	BARS	360° – Based on the Competency Model

Source: Authors

Table 1 shows summary characteristics for the regional authorities: the number of employees in individual regional authorities and the evaluation system in use. What follows specifies and discusses in greater detail information on the evaluation systems used by regional authorities (from a comparative standpoint, as well).

2.1. Employee Evaluation – Central Bohemia RA

A competency model was created at the Central Bohemia RA (using funding from the European Social Fund) which is currently used as the basis for employee evaluations. Evaluations affect both employees in their trial period and other staff members, as part of periodic evaluations. Our focus was on these periodic evaluations undertaken once per year (during the fourth quarter).

The objective of periodic evaluations of employees, according to the evaluators' handbook is (p. 3) "... to improve the quality of leading and managing people, attaining greater equality of performance among employees, making targeted use of training and linking to employee remuneration."

The evaluation process consists of three sections: self-evaluation by the employee, evaluation carried out by the direct superior and the evaluation interview. The entire process and the principles which underlie it are anchored in the Guidelines for Personnel Functions (Part Nine: Employee Evaluations) and in the handbook for evaluators and those being evaluated.

Three variants of the competency model have been prepared, one for management employees, one for office workers and one for employees providing technical/administrative support (i.e., assistants non-office staff) based on job description. The model always includes three sets of competencies for each group of employees – job, general and social. The competency model for management employees is expanded to include so-called managerial competency. Each competency includes a verbal description of several types (attributes) of behaviour which differ somewhat depending upon the group being described.

As part of the self-evaluation process, each employee fills out a form in which he rates each type of behaviour (for all pertinent competencies) with the degree to which it is being fulfilled. A four-level scale is used: low, adequate, optimal and very good level of fulfilment. The employee's superior then uses the same scale to record his evaluation of the employee. The result of an informal evaluation which has taken place during the course of the year is to be used as a basis. A summary at the end allows the employee to express his or her opinion on the

personal bonus, personal development and his or her further training. The entire process centres on the evaluation interview. It is in this setting that the evaluator acquaints the employee with the results of the evaluation (comparing impressions) and together, they work out an individual training plan.

Employee Evaluation – Southern Bohemia RA

The Southern Bohemia RA uses the so-called BARS Method to evaluate its employees in terms of approach to work and on-the-job behaviour. Employee evaluations are carried out once per year.

The declared goal of employee evaluations is to "enable their development and provide the highest motivation in terms of the quality and amount of work done."

As before, the evaluation process consists of three sections: self-evaluation by the employee, evaluation carried out by the direct superior and the evaluation interview. The entire process and the principles which underlie it are anchored in the Rules for Employee Evaluations.

The BARS Method of evaluation is carried out using so-called evaluation criteria, i.e., particular job performance characteristics. These criteria are to be tied to the job description held by the employee being evaluated. Six sets of criteria have been defined for all employees of the Southern Bohemia RA: fulfilling requirements, cooperating with coworkers, contact with clients, adaptation to change/initiative, self management, and personal and professional growth (there are 12 actual criteria points). Evaluations of management employees add one further group of criteria to those mentioned, to do with managing and leading people (with 17 criteria overall). Each criterion is described verbally by three levels of achievement.

Every employee evaluation starts with a self-evaluation. The employee fills out the so-called record sheet, indicating for each individual criterion the level at which the employee sees himself. He also freely chooses any three criteria for which he would like to see improvement in the upcoming period. The employee's manager also fills in this record sheet. He also selects three criteria for which he believes the employee could do more. Both record sheets then serve as the basis for the evaluation interview. Based upon the interview, the employee then modifies the criteria he wants to focus on over the course of the upcoming year and prepares a so-called Personal Development Plan (and updates his Training Plan). The employee's manager may then use this evaluation as one basis for setting remuneration.

2.2. Employee Evaluations – Pilsen RA

The Pilsen RA has also drawn funding from the European Social Fund to create a competence model used to evaluate its employees. For the time being, however, the model has only been used to evaluate management employees. Other employees are evaluated using an evaluation scale.

Existing employee evaluations (i.e., non-management evaluations) take place using three criteria, as follows: 1. Knowledge, work results, performance; 2. On-the-job behaviour, initiative and training; 3. Ethical behaviour, loyalty, communication (and for managers, a fourth criterion: managerial capacity). These criteria are given brief verbal descriptions and employees may be assigned a maximum of 25 points for each criterion. The evaluation process once again consists of a self-evaluation by the employee, the evaluation of his superior (both allocating points for individual criteria) and the subsequent interview.

Since the beginning of 2012, management employees have been evaluated using the so-called competency model. This evaluation is intended to serve a number of objectives, these being: "to recognize the employee's existing level of on-the-job performance, to recognize the employee's strong points and weak points, to allow the person being evaluated to improve his performance, to motivate employees, to become aware of the individual's training and development needs, and to recognize the job performance potential of the employee."

In this case, the evaluation process also comprises self-evaluation by the employee, the evaluation itself and the evaluation interview. But in the Pilsen RA, the evaluation is not carried out only by the employee's direct superior, but also by his coworkers and subordinates. In both theory and practice, such an evaluation method is labelled 360°.

In contrast to the above methods, only a single variant of the competency model is used. Competencies are also divided into three groups, but the membership logic employed is diametrically opposite. There are soft competencies (15), general professional competencies (5) and expert competencies. A description is given of each competency indicating the ideal for the employee. The actual evaluation of competencies is then done using competency levels. Four levels of achievement are available in the evaluation scale used by the model. Three levels contain a verbal description but no such description is available for the fourth. "The evaluator shall indicate if the employee substantially exceeds the required level." [13] Given that in this case both coworkers and subordinates participate in the evaluation, not all evaluators evaluate all competencies (for example, leadership is not evaluated by coworkers, etc.).

The evaluation concludes with a meeting between the direct superior and the employee being evaluated. He acquaints the employee with the results of the evaluation (including the evaluation of other evaluators) and together they conduct a dialogue on the "job performance and development of the evaluatee." This mutual meeting culminates in the creation of a so-called development plan.

3. Results and Discussion

The above overview of employee evaluations in individual regional authorities has served as a basis for their mutual comparison. In each case, we have focused on four areas in detail: the objectives of evaluation, the evaluation process, evaluators and evaluation criteria (e.g., competencies).

All three regional authorities wish to use employee evaluations as a tool for getting employees to recognize their current performance on the job and to motivate them to improve their level. This traditional goal of employee evaluations has been supplemented in the Central Bohemia and Pilsen RAs to include a training dimension, as well as to make use of the knowledge gained during evaluations for further planning and improved targeting. In the Southern Bohemia region, another goal is to set compensation.

In all three regional authorities, the evaluation is divided into three basic phases: filling out the self-evaluation form by the employee, the evaluation by the evaluator (who fills out the same form) and conducting the evaluation interview (comparing mutual notions to do with job performance based upon the forms that have been filled out). But the authorities differ in terms of who conducts the evaluation. Two authorities assign the role of evaluator exclusively to the employee's direct superior. Only in one authority – the Pilsen RA – do the employee's subordinates and coworkers also evaluate him in addition to the direct superior. This evaluation method is by its very nature much more comprehensive and objective. But it requires the involvement of more people, which may place additional demands on processing the data obtained. This is done in Pilsen using special software to eliminate this disadvantage.

The entire evaluation is cantered around the choice of method or the criteria themselves. The approach of the individual RAs differs in this respect. At the Central Bohemia RA, several types of behaviour are listed for each competency which characterizes it. The evaluator then simply assigns a numerical value (1-2-3-4) to express the level at which this behaviour is evidenced. These criteria are lacking in the employee evaluations carried out at the Southern Bohemia RA. On the other hand, the Southern Bohemia RA provides verbal descriptions of the individual performance levels. Precise formulations ease the role of the evaluator, as well as enabling better comparability among individual employees for the criterion in question (when a particular level is to be assigned is clear). This is balanced by the fact that an odd number of achievement levels is used (1-2-3). But heightened attention should be paid to the formulation of these individual levels. Southern Bohemia RA employees have the impression that they have achieved the highest level for every criterion. Combining the two prior approaches leads to a third method of evaluation. Competencies are used in the evaluation process at the Pilsen RA, each of which includes a verbal description of characteristics (as the ideal state of affairs) and a verbal description for three of four possible job performance levels (1-2-3-4). Characteristics for

individual competencies (or criteria) rule out any uncertainty or lack of clarity as to what they designate. At the same time, verbal descriptions for individual levels make sure evaluators have a precise notion of how to assign performance to levels. The result is a comprehensive evaluation of the employee, custom designated competencies and a verbal description of individual levels.

To this point, however, we have not touched on the question on content itself, i.e., which competencies (or criteria) have been included by the authorities in their evaluations. The overview included as an Annex 1 makes clear that all three authorities have made very similar choices in terms of the extent and content of competencies and criteria. Authorities using competency-based evaluations (Central Bohemia and Pilsen), however, differ in many respects. The Central Bohemia RA gives an overview of several types of behaviour attached to each competency which differentiate on a fine scale between groups of office workers and other employees who provide technical and administrative support. The Pilsen RA gives brief verbal descriptions for individual competencies (but does not describe types of behaviour) and does so jointly for all employees in terms of soft and general professional competencies. But the evaluation also includes a set of specific professional competencies which depend upon the particular specialization of the evaluatee. Overall the latter RA evaluates its employees using a broader range of competencies including competencies tied to client satisfaction which are missing at the first noted RA. This is a key job performance competency for employees of regional authorities.

The Southern Bohemia RA evaluates its employees using the BARS Method. The evaluation criteria are similar to the competencies used by the other two authorities. But the choice of criteria should be tied to job performance by the evaluatees. Because these are common criteria for all employees of the authority, we question whether all employees actually have the same job description (with the exception of managers, for whom a further set of criteria – Management and Leadership – has been designated).

An undisputed positive point of both evaluation methods selected is the outcome of the evaluation process. All three authorities have the employee being evaluated and his superior put together a plan as part of the evaluation interview for the upcoming period. At the Central Bohemia RA, this is an individual training plan, at the Southern Bohemia RA a personal development plan, and at the Pilsen RA a development plan.

4. Conclusion

All three regional authorities have chosen novel, progressive methods for evaluating their employees. Testimony to this is the fact that public administration institutions in the Czech Republic are well aware of the importance personnel work plays in the system of human resources management. At the same time, this demonstrates an effort to implement new managerial tools in public administration. Our analysis does not currently permit a unilateral judgment on the success or lack thereof of the individual methods. It represents only a first step toward more detailed research to follow. After a detailed study of the selected methods, it is also necessary to look at the results of the evaluation itself and the impact (reflection) of the evaluation on the functioning of the institution. But we may already draw certain conclusions in this phase.

Two authorities have chosen to evaluate their employees using the competency method, i.e., their classification evaluates the prerequisites of their employees for on-the-job performance. One authority has chosen the BARS Method, which evaluates on-the-job behaviour. Because of the nature of the work being done (employees working in an official capacity), it is often difficult to measure employee performance and it may be maintained that the authorities have chosen wisely. In our estimation, the most sophisticated evaluation system is that in use at the Pilsen RA. Pilsen goes into the greatest detail in specifying its objectives. There, they have committed to using evaluations to recognize potential among employees and thereby aid their further growth. Such an objective shows a great deal of foresight which will be beneficial for

both sides, i.e., for both the employee and the employer. From a formal standpoint, we would evaluate this approach as best. The verbal descriptions of individual competencies it employs, along with a description of individual levels of job performance guarantees an objective evaluation which allows the job performance of individual workers to be compared. It also differentiates employee evaluations in terms of professional orientation, using competencies specific to different professions. Finally, not only direct superiors are involved in the evaluation process but subordinates and coworkers, as well. But in practice this method of evaluation exists only for management employees and only time will tell whether it will prove to be doable and functional at all levels.

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Table 2. Employee Evaluations at Selected RAs – Overview of Competency/Criteria

Central Bohemia RA	Southern Bohemia RA	Pilsen RA
Job competencies	**Fulfilment of requirements**	**Soft competencies**
- professional qualifications	- fulfilment of requirements	-for effective communication and conflict resolution
- quality work	- acceptance of responsibility and independence	- collaboration
General competencies	**Cooperation with coworkers**	- for loyalty
- work organization and planning	- cooperation at the workplace	- for flexibility
- resolving problems	- communication with coworkers	- satisfaction of client needs
- honour and loyalty	**Contact with clients**	- for performance
- resistance to workload and stress	- manner of accommodating client commands	- for independence
- negotiating and reasoning	- communicating with clients	- for resolving problems
Social competencies	- resolving situations of conflict	- for work planning and organization
- interpersonal communication and dealing with others	**Adaptation to change, initiative**	- for further training
- teamwork	- accepting change	- for an active approach
- presentation	- engagement and initiative	- for managing workload
- personal development	**Self-management**	- for getting oriented in information
Managerial competencies	- designating objectives and planning	- leading people
- management and planning strategy	- evaluating his or her own work	**General professional competencies**
- effective management and leadership	**Personality and professional growth**	- foreign language ability
- support and motivation	- professional growth	- computer skills
- evaluation and feedback	**Management and leadership**	- economic awareness
	- creating concepts, designating objectives and planning	- awareness of the law
	- communicating with subordinates	- Class B driving license
	- transferring information and deciding	**Specific professional competencies**
	- organization of work, delegation	- professional knowledge and skills tied to a particular specialization
	- evaluation of employees	

Source: Authors

How to Describe Affinities in Redistribution Systems

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Abstract

The paper introduces so called NM-modified Raiffa solution as the powerful tools for analyzing effects coming from the affinities among members of redistribution systems, it means the system when some resources or goods are taken from some members and given to the other members. The essence of the affinities is described and the effects are analyzed. It is shown how the effects contribute to the corruption and other illegal or immoral behavior.

Keywords: Nash bargaining problem; NM-modified Raiffa sequential solution; redistribution system; social networks based on mutual covering of violatin the generally accepted principles

JEL Classification: C71, C78, D73, D78

1. Introduction

The topic of the corruption, nepotism and other illegal or immoral activities is in the recent years very often discussed in scientific and also in business and popular journals. The paper tries to offer theoretical background for explanation these events. The explanation comes from Nash bargain problem and from Raiffa solution of the problems. It is shown how the, by us introduced and called, NM-modified Raiffa solution can express external factors that affect redistribution systems and how affinity of one player to another affect determines which coalition of the players will be established - the redistribution is happen in favor of the coalition. The paper is organized as follows: The essence of the NM-modified Raiffa solution is introduced in the second chapter. The chapter further shows what concepts the solution is able to express. The third chapter analyses the effect coming from the affinities among the players. Conclusion summarizes our results and discusses possible further research.

2. Material and Methods

2.1 The essence of NM-minified discrete Raiffa's solution

Our approach comes from formal definition Nash bargain problem for n players as a set **B** settled pairs (S, d), where S is compact convex subset R^n and point d belongs to S . The elements $\boldsymbol{B}$ of are called instance (examples) of the problem **B**, elements S are called variants or vector of utility, point d is called the point of disagreement, or status quo. Every example is called d-comprehensive. The theory suggests for the one-point solution several concepts. The term "solution" is understood as function f from **B** to R^n that each example (S, d) from **B** assigns value $f(S, d)$ belonging to S. The most known concept of solution is Nash´s one (Nash 1950), the other is Kalai-Smorodinsky´s one. The egalitarian approach suggested by Kalai (Kalai 1977) can be also understood as the solution. All mentioned solutions can be expressed by axioms. Kalai-Smorodinsky´s solution (Kalai and Smorodinsky 1975) is maximum point on the segment S connecting point and so called utopian point , whose coordinates are defined as $U_i(S, d) = max\{x_i : x \in S \; a \; x \geq d\}$.

From the point of view that we develop it is interesting Raiffa's solution that was proposed in the early 1950's. Raiffa (1953) suggested dynamic procedures for the cooperative bargaining in which the set S of possible alternatives is kept unchanged while the disagreement point d gradually changes. He considers two variants of such process – a discrete one and the continuous one. Discrete Raiffa's solution is the limit of so called dictated revenues. Trockel

(2009), Diskin, A., Koppel, M., Samet D. (2011) have provided an axiomatization of a family of generalized Raiffa's discrete solutions. Let S is a nonempty, closed, convex, comprehensive, and positively bounded subset of R^n whose boundary points are Pareto optimal. They propose a solution concept which is composed of two solution functions. One solution function specifies an interim agreement and the other specifies the terminal agreement. Such a step-by-step solution concept can formally be defined as follows. The pair *(f, g)* functions are called step-by-step solution, if as *f(S, d)* as *g(S, d)* belongs to for each example *(S, d)* from **B**. The set of generalized Raiffa's solution is certain kind of step-by-step negotiation solution $\{(f^p, g^p)\}_{0 < p \leq 1}$, where are f^p a g^p defined as: $f^p(S, d) = d + p/n(U(S, d) - d)$, $g^p(S, d) = d^\infty(S, d)$, where $d^\infty(S, d)$ is the limit of progression $\{d^k(S, d)\}$ of points constructed by induction follows: $d^0(S, d) = d$, $d^{k+1}(S, d) = f^p(S, d^k)$.

The solution that we suggest and that we called NM-modified discrete Raiffa's solution for $n = 3$ can be obtained by stipulating: $d^0(S, d)$, $d^{k+1}(S, d) = f^{nm}(S, d^k)$, where $f^{nm}(S, d) = d + 2/3(NM(S, d) - d)$, where *NM(S, d)* is point derived from utilities (in our interpretation we will use more suitable term pay-offs) of players in the points of Neumann-Morgenstern discrete internally and externally stable set on S. These points have coordinates: $(d_1, d_2, 0)$, $(d_1, 0, d_3)$, $(0, d_2, d_3)$.

Note: from discrete solution which expect full symmetry of possibilities of players in the creation of two-person coalition exists also another NM sets having infinitive many elements. They play also important role, but we do not concerned with them. If we define $S = S(x_1, x_2, x_3)$, it means as the function of payoffs of players, then $d = (d_1, d_2, d_3)$ is given as the solution of following systems of equations: $S(x_1, x_2, 0) = 0$; $S(x_1, 0, x_3) = 0$; $S(0, x_2, x_3) = 0$.

Here it is valid that pay-off of every player in coalition with each other player (e.g. pay-off of first player with second player or with third player) is same. This fact causes the condition that points $(d_1, d_2, 0)$, $(d_1, 0, d_3)$, $(0, d_2, d_3)$ create discrete three-points NM set. The generalized Raiffa´s solution and by us established NM-modified Raiffa´s solution are very similar by their logic of construction. However, they have some important differences, especially from the point of view of interpretation. NM-modified Raiffa´s solution in a certain way connects two situations: In the first case the players (each of them) decide to create only a two-person fully discriminated coalition, i.e. two players who form a coalition, can give to the third player the smallest possible pay-off. In our case this pay-off equals 0. But the smallest possible pay-off can have also different value (including negative) what is important for some interpretations and with them connected application.

In the second case the players form a great coalition, i.e. three-player coalition. The connection between both the cases can be interpreted as follows: Pay-offs of each player in the formation of fully discriminated coalitions can be seen from his perspective as an opportunity cost to the possibility of creating a great coalition. If players create a great coalition, for obvious reasons they will require pay-off higher or at least equal to the one they would have required in a two-person coalition. The problem is how to evaluate player's pay-offs for the creation of fully discriminated two-person coalitions. Here we use (introduced by us) the term average expected pay-off, which is a multiple of its pay-off in a situation where the player is the member of the winning coalition, and the probability of this coalition i.e. $2/3d_i$, where $i = 1, 2$ or 3. We simplify as we do not distinguish between pay-off and utility from pay-off. If the utility function of a player has degressive character, the risk aversion would play its role. The players would in such situation prefers two-person coalition even if the value of pay-offs is lower than $2/3d_i$. The value depends on the degressivity of utility function. But the example is not important for our future ideas. "Bridge" by which we're connecting both the cases mentioned above (formation of two-player coalitions and the great coalitions of all players), i.e. application of the principle of opportunity cost and the introduction of the concept of expected average pay-off, implicitly contains input "step-by-step" process, which results in a single point solution in the case of great coalition.

2.2 What NM-modified Raiffa solutions enables to express

The key importance of the presented concept consists in the fact that it enables us to express external factors that affect various real systems, referred to as redistribution systems, in which the following applies:

- We have a group of people that operate within a certain system. They perform some role and, based on the performance of such role, they are attributed specific funds that are subsequently redistributed among them in a certain manner.
- Coalitions may be formed within the aforementioned group of people, with a view to provide privileges to those who take part in the coalition at the costs of those who do not.
- Such privileges are in the form of the funds the players may divide among them. Two questions arise in this connection: 1. what defines (how to describe) the amount of funds that the players would be able to divide among them; 2. How (based on what rules or regularities) will they divide such funds.
- In social networks operate within the given system we will understand them as one-sided or mutual affinity of certain players within the given system, whereas one and the same network may operate within a number of systems of this type. Generally speaking, a system will be referred to as a redistribution system if funds are divided and redistributed within the system as a result of certain external factors: Formation of coalitions within the given system; formation of social networks within the system; reflection of roles of such networks between different redistribution systems into individual redistribution systems. It is necessary to emphasize the fact that the aforementioned factors characterize, and not define, a redistribution system. The characteristics are used to give us an idea about the types of objects, to which it is possible to apply the tools developed by us.

A game, in which we do not consider any impact of external factors, shall be referred to as the *original game* for the sake of explicitness. *External factors* shall refer to anything that may be expressed by a change in the parameters of the original game, that affects the conduct of players, and that concurrently exists as an independent parameter, the creation/development of which is not directly controlled by any of the players. The expression of the external factors through the change of the original game parameters shall be referred to as the *original game extension.*

Affinity of one player to another shall refer to the benefits (utility) the player gets just by forming a coalition with another player, whereas such benefits (utility) may be expressed in denominations that are used for payoffs within the original game. In case both players generate benefits (utility), it is referred to as mutual affinity; however, the extent may vary for each of the players. Positive affinity may also be referred to as *sympathies of one player to another*, with negative affinity being *antipathy of one player to another.*

Affinity may be expressed as follows: a player, who forms coalition with another player, generates specific benefits (utility) just by forming the coalition, whereas such benefits (utility) are expressed in the same denominations as their payoffs. The total payoff of a player (referred to as x_{ij}^*) within a coalition with another player, under a relationship of certain affinity, shall then equal to the player's payoff in the original game plus the player's payoff corresponding to the benefits (utility) arising from the formation of the coalition (the additional payoff shall be referred to as s_{ij}): $x_{ij}^* = x_i + s_{ij}$. The value of s_i may be both positive (positive affinity – i.e. sympathies) or negative (negative affinity – i.e. antipathy). It would seem that if a one-sided or mutual affinity exists between two players, with no affinity existing between either of the players and a third player, the formation of coalition between the two players is predetermined. However, this may not be the case and if the third player is informed about the affinity of the other two, he may offset such positive affinity through a lower payoff. Let us assume that all players are fully informed about all affinities of the players. The original set of equations shall be modified as follows:

$$S(x_{12}^*, x_{21}^*, 0) = s_{12} + s_{21}$$
$$S(x_{13}^*, 0, x_{31}^*) = s_{13} + s_{31}$$
$$S(0, x_{23}^*, x_{32}^*) = s_{23} + s_{32}$$

Right-hand side of equations shall be interpreted by saying that additional payoffs arise within the game on the basis of the relevant affinities. The following shall then apply to the payoffs within the original game: $x_1 = 1/2(x_{12}^* + s_{12} + x_{13}^* + s_{13})$, etc.

NM modified Raiffa solution shows that without presence of some affinity the probability of creation of any fully discriminated coalition should be same. Further each member of fully discriminated coalition should receive same pay-off as he/she would receive if he/she creates the coalition with reminding member (it means the member outside coalition). NM modified Raiffa solution also shows that pay-offs of all three players in the case when they create great coalition (coalition consisting from all three members of the system) must be higher than average expected value of pay-offs of each player. So it is possible to ask the question: why does some fully discriminated coalition arise? The answer is simple: due to some affinity between the members of the arisen coalition. The value of the affinity can be for each member of the fully discriminated coalition expressed as the difference between the pay-off that the player receives in the case of great coalition and average expected pay-off. This value is part of the pay-off that receives members of the fully discriminated coalition. The affinity is an expression some more or less relationships (ties) among some players (members of some system). So, generally speaking the main contribution of NM modified Raiffa solution (the model presented at this section) is its ability to express the value of the ties (relationships) among members of existing winning coalition (it means the coalition in favor of it some redistribution is made).

3. Results and Discussion

As it is said in the end of previous section our model allows to evaluate the value of ties among some members in any redistribution system (system when some resources or pay-offs are taken from some members and given to different members). We would like to discuss in this section examples of possible affinities. From our point of view the research should concentrate on following affinities:

- Those that arise by investments in social status and are associated with a creation of social networks (affinities between players) derived from investments in social status.
- Those that arise by violations of principles generally accepted within the given system as well as its social environment and that lead to the creation of social networks relying on mutual covering, blackmail, and favoring of those entities that violate the generally accepted principles. We will mainly strive to describe the method of formation, development, operation, and anatomy of the structures based on mutual covering of violations of the generally accepted principles in terms of the potential elimination of their impact. We will distinguish the following:
    - Effects arising through investments in social status.
    - Effects arising as a result of activities of social networks derived from investments in social status.
    - Effects arising as a result of violations of the generally accepted principles.
    - Effects arising as a result of activities of social networks based on mutual covering, blackmail, and favoring of players that violate the generally accepted principles, i.e. as a result of what we call the structures based on mutual covering of players that violate the generally accepted principles.

Next sections bring short description of here mentioned affinities.

3.1 Effects arising through investments in social status

We all have a supply of investment opportunities. If we apply a rational decision making model, it is safe to assume that people will use investments funds available to them (both their own funds as well as funds raised on the capital market) to carry out such investment opportunities based on their respective rates of return. They will thus carry out those investment opportunities that offer higher rate of return compared to interest rate.

Now, let us assume that by investing in social status, it is possible to prevent the utilization of an investment opportunity by those, who cannot afford such investment. The effect of such situation will be an increase of the return from the investments in social status. Based on this, it is possible to draw three conclusions:

- An investment in social status has non-Pareto consequences for the bearers of investment opportunities (i.e. those, who cannot utilize funds into investments in social status, will be worse off).
- An investment in social status reduces social effectiveness (significant reduction of effects generated within the economic environment in case of the utilization of investment opportunities).
- An investment in social status will pay off to those, who make such investment, provided the effect of such investment as a result of higher share in the return of the given investment opportunity – as opposed to a situation, where the investment does not limit the utilized investment opportunities – exceeds the costs of the relevant investment in social status.

3.2 Effects arising as a result of activities of social networks derived from investments in social status

The scope of the primary effects is given by the difference between the expected average payoff, or between the payoff in the together acceptable equilibrium point (as appropriate), and the payoff the relevant player gets within the winning coalition. In order for a player to become (remain) a member of a winning coalition, he/she must make certain effort or act in a certain manner, as appropriate. It is then necessary to analyze, how the expected average payoff (payoff in the jointly acceptable equilibrium point) differs from the net payoff a player gets within the winning coalition (i.e. payoffs within the winning coalition minus all costs of a player associated with his/her participation in the winning coalition). In case it is possible to identify the costs of a player associated with his/her participation in the winning coalition, it is also possible to identify the ways of increasing such costs, through regulation or organization, thus at least partly eliminating investments in social status and their non-Pareto consequences.

3.3 Effects arising as a result of violations of the generally accepted principles

In this case, it is possible to derive from the game Tragedy of the Commons. In case there is a risk that a player might be detected and punished with a certain probability, it is possible to analyze under what conditions players opt to violate the principles. It is possible to use the existing literature - e.g. work of E. Ostrom (Ostrom 2008, Ostrom and Andersson 2008). However, existing analyses usually do not consider the role of the structures based on mutual covering of violations of the generally accepted principles. These analyses rely on the premise that a player, who decides to violate (or already directly violates) the generally acceptable principles, compares the benefits (utility) and costs associated with such violations, whereas the analyses that rely on the examination of such benefits and costs sometimes include proposals for reducing such benefits and increasing the costs. However, the analyses usually do not include, as one of the potential benefits, the fact that – by violating the generally accepted principles - a player wishes to take part in a structure based on such violations, because he/she derives benefits from the participation in such structure. Furthermore, the analyses do not really consider the possibility that other players might actively seek out players, who wish to violate (or are already violating) the generally accepted principles in order to create a social network with them or to involve them in an existing network (also see the following section).

3.4 Effects arising as a result of activities of social networks based on mutual covering, blackmail, and favoring of players that violate the generally accepted principles, i.e. as a result of what we call the structures based on mutual covering

Let us first recall and further clarify the mechanism, on the basis of which the structures based on mutual covering of violations of the generally accepted principles come into existence. A player, who finds out that another player violates the generally accepted principles, has the following options:

- To spread the information about the violation of the generally accepted principles – i.e. to help to punish violating player.
- To overlook the conduct of the relevant player – i.e. no response.
- To start violating the generally accepted principles as well.
- To exploit the information – i.e. blackmail the relevant player. The higher sanctions are imposed for the violation of the generally accepted principles, the higher effect might result from the blackmailing of the player, who violated the generally accepted principles.

In case of an attempt to blackmail the player, who violated the generally accepted principles, the relevant player has several options:

- Refuse the blackmailing, even at the cost of being punished by the community.
- Notify the community of an attempted blackmail, which itself represents a certain form of violation of the generally accepted principles and, as such, may be sanctioned by the community.
- Submit to the player, who is blackmailing him/her, and allow to be blackmailed. In this case, the blackmailed player compares the sanction to be imposed in case he/she does not accept the proposal of the blackmailer and the benefits generated if he/she accepts the blackmailer's proposal.

The higher sanctions are imposed for the violation of the generally accepted principles (in the form of uncooperative conduct in our case), the higher the protection of the community against such behavior, whereas the blackmailing of one player by another may prove to be more effective. As soon as the structures based on mutual covering of violations of the generally accepted principles start to form on the basis of this within the system, it may result in a significant reduction in the cooperative conduct and subsequent losses in effectiveness. In case this concerns a larger system, which creates its own institutional structure, it may result in serious dysfunctions of the entire institutional structure. More detailed analysis of these issues assumes the application and interpretation of other models, and this is the objective of the project solution. However, just the description specified herein shows that a community, which wishes to prevent the violation of the generally accepted principles that allow the development of such community (in general, principles of justice, fairness, and equality), must be able to detect the structures that wish to violate such principles. The given community's system of regulations must then be set up in a way that individual members of the community do not find it beneficial to form (become engaged in) the structures based on mutual covering of violations of the generally accepted principles. One of the project outputs will be the proposal of a structure (design) of such system of regulations, which would lead to the fact that the membership in the structures based on mutual covering of violations of the generally accepted principles would not be beneficial for players (community members).

It is already possible to describe the effects that arise on the basis of a player's involvement in a structure based on mutual covering of violations of the generally accepted principles. It is possible to distinguish several effects of this type. They are as follows: Effect of impunity, effect of predetermining coalitions, effect of favoring.

3.5 Effect of impunity

Similarly as various communities create mechanisms and institutions that make it possible to detect and punish those players, who violate agreements or generally accepted principles, the structures based on mutual covering create various mechanisms and even institutions that allow effective covering of violations of the generally accepted principles. In case a player allows to be blackmailed, he/she gets under the protection of the relevant structure, which considerably or – to be precise – fundamentally reduces the risk that his/her conduct would be detected and punished by the community.

3.6 Effect of predetermining coalitions

Affinity between players given by an inclusion in the same structure based on mutual covering of violations of the generally accepted principles significantly predetermines the formation of coalitions. Players, who are not involved in such structures, virtually do not have a chance to compensate, through their concessions (reduction of the required payoff), the equalizing of chances for the participation in the winning coalition. Since the relevant affinities are covert by nature, they are not informed about them. Furthermore, this concerns very strong affinities, also associated with investments in social status.

3.7 Effect of favoring

We have not yet prepared a suitable model here. These are effects associated with principal-agent problems, when the structures based on mutual covering have the ability to appoint those, who are involved in such structures, to important positions in a organizations (for instance in a police structure to hinder or to stop police investigation of members such structure or in parliament in order to accept such bills that are convenient to the structures). There are two types of effects that arise in this manner: 1. in the form of financial and nonfinancial returns from the prominent position within the given organization. 2. in the form of significant expansion of the possibilities to violate the generally accepted principles with minimum risk of punishment.

The above mentioned verbal description of effects gives the basic conceptual process for solution. From the methodological perspective, the solution will take place in the form of the application of the NM-modified Raiffa solution for the drafting models that allow the assessment of effects arising as a result of the activities of social networks based on mutual covering, blackmail, and favoring of players, who violate the generally accepted principles, i.e. of what we call the structures based on mutual covering. On the basis of such models, we will also look for answers to the following questions: What is the role of the players' knowledge of the existence of affinities? What does a player have possibilities to compensate the impact of affinities if he/she is informed about such affinities? The elaboration of the relevant models within the project is associated with an analysis of real social situations – for example, events of indiscretion and absorption of indiscretion, as disclosed by public sources. From this perspective, the creation of theoretical models may play an important role in understanding the real social events.

4. Conclusion

Our paper tries to express how NM-modified Raiffa solution, which was in the paper introduced, can be used as the base for the description of human reality, especially as the base for describing the process happening in redistribution systems. We concentrate how this solution enables to calculate the value of the affinities among members of redistribution system consisting from three players when two players create the coalition and fully discriminate the reminding player (it means they give him the lowest possible pay-off and the rest yields from his/her effort divide among them). A question arises, whether a three-player model is sufficient to describe events in the area of social reality. It is possible to consider two alternative extensions of the model. The first one consists in the creation of models for more players, which

is associated with certain fundamental theoretical problems. The other one (which we believe to be more in line with the real life) is the possibility to examine, under what conditions a player line-up might change within a specific environment or, alternatively, what environmental change may result in the change of the player line-up and particularly the players' objectives. This is a problem area, which is taken into account by the project team; however, it is currently not the focal point of the project – so as not to make the project too ambitious, among other things. Therefore, when describing the effects arising as a result of the activities of the structures based on mutual covering, we will only confine to some of them.

From the perspective of the description of the proposed conceptual and methodological procedures, it is also necessary to mention another important aspect. The project solution assumes a wide range of theoretical outputs, from the application of the axiomatic approach, design of mathematical models on the basis of the game theory, to the creation of suitable concepts associated with the conceptual description of the social reality and analysis of real situations. On the one hand, this makes the project solution extremely challenging (and it may be rightfully pointed out whether the proposed team has sufficient qualifications); on the other hand, it offers the opportunity to demonstrate the possible application of an exact theory in solving pressing social issues. The team expects to speak to certain leading experts and perform certain required theoretical outputs in cooperation with such experts in the course of the project. This concerns, for example, the axiomatization of the NM-modified Raiffa solution. Using examples, it is possible to demonstrate that it is different from the generalized Raiffa solution and, therefore, should have a different system of axioms corresponding thereto. In case it is possible to explicitly express such differences, the results could be published in one of the leading international journals. However, it would particularly be of a considerable practical importance and demonstrate the possible interconnection of the theoretical (mathematical) bases of the game theory with the solution of pressing social issues, which are currently being discussed in the Czech Republic (corruption, ineffective public administration, operation of the system of political parties, etc.).

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SESSION III:

PUBLIC SERVICES AND NON-PROFIT SECTOR

Two Sided Platforms in the Health Care Markets: The Case of Czech Republic Healthcare Reform

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Abstract

Powerful institutions and weak position of patients became a typical feature of (not only) European health care markets. Since Arrow (1963), these characteristics are commonly explained by the tenet that health care markets differ significantly from the hypothetical perfect markets. Indeed, this difference is essentially arising from the information asymmetries between buyers (patients) and sellers (health care providers). This asymmetry in information seems to predestine the buyer (patient) to have a fragile position in the health care market. The empowerment of the patient seems to lead to higher health care markets efficiency, many questions arise: how to achieve any shift in power between patient and institutions; where to put the focus in health care policy reforms or what managerial tools to use to attain this goal. In this context, some authors [1 - 3] propose to examine the heath care market as so called "two-sided market". [1] comes to the conclusion that if meaningful efficiency gains in health care are to be made, it is necessary to focus the health policy on the insurance and risk management arrangement. In other words, one of the answers to the above raised power shift questions could be to analyse the functioning of the health insurance market, the insurer ´s role and, in particular, the properties of health insurance contracts.

Keywords: health care financing; health insurance companies; two-sided market theory

JEL Classification: H750, I1

1. Introduction

Health care reform is a crucible issue for the majority of European countries for more than a quarter of century. The paper is inspired by the situation in the Czech Republic in this field. During last two years, the main changes in the health care system in the Czech Republic are connected with the insurance market. In relation to [1 – 3],it is the two sided-market theory outcomes that may represent a challenge for the Czech system.

In the light of the two-sided market concept findings, it seems to be crucial to analyze the health financing system – it means the management and the functioning of the Czech health insurance market; the position of the health insurance companies and the properties of all type of health insurance contracts: those between the insurer and the patient/client and those between the insurer and the health care provider. Consequently, it may be interesting to evaluate to which extent the Czech situation is reflecting the outcome of the two-sided markets theory.

Accordingly, the paper aims to (1) define the evolution of Czech health financing system; to (2) explain, on the basis of the two-sided market theory, the reasons why Czech Republic chose the plural insurance model of financing and to (3) study the impact of the plural model to the management of health care system in the Czech Republic mostly from the patient empowerment, cost containment and health care quality point of view.

The findings of the paper propose an answer of whether the international trends in the health insurance markets analyses are inspiring for the directions of changes adopted in the Czech Republic and especially, if they lead to the reinforcement of the patient position as well as to the changes in the strong institutional culture in the Czech health care system.

1.1 Czech health financing system evolution

History of healthcare system in Bohemia as a part of Austro-Hungarian Monarchy has the roots in 1883, when Otto von Bismarck established the health insurance as a part of the Bismarck's model of social security and health insurance system. After Czechoslovakia independence in 1918, the Bismarckian health system inherited from the Empire was expanded.

In 1924, the fragmented system of social insurance was consolidated into one institution - the Central Social Insurance Company. At the same time, the sickness companies were reclassified as health insurance companies (HIC) and their number was limited to approximately 300. The depth of benefits was increased and a significant shift in expenditure from an emphasis on sick pay to one on health care benefits started. By 1938 more than a half of the population of the Czechoslovak Republic was covered by compulsory health insurance.

After the Second World War, Czechoslovakia became a part of the Soviet sphere of influence. In February 1948, the Communist Party became the only autonomous political entity in the country and during the same year, social and health insurance were unified into a compulsory system of insurance for all citizens. The insurance was paid entirely by the employer and amounted to 6, 8 % of wage.

In 1952, the Semashko model of health care was introduced. The State assumed responsibility for health care coverage and financed it through general taxation. Health care was proclaimed free of charge for all citizens.

The so called Velvet revolution of 1989 brought a new stimulus to every part of national economy. In the health sector, the politicians opted for the Bismarckian tradition in the field of health care financing, this served as a transitional bridge toward more market-oriented mechanisms and institutions.

The principle aim of this transformation was to maintain solidarity and universal coverage as the key values of the system; to introduce the multiple sources funding instead of general tax financing and to increase the remuneration of health professionals. The important changes in the financing system were supported as by the Ministry of Finance (that was preparing the tax reform and did not wanted to finance health care from taxes) that by health professionals.

Before describing the changes concerning the financing system more in details, it should be stated that the transformation changes were very quick (even chaotic), the preparation of key health financing laws coincided very often with the implementation of health policy (The General Health Insurance Company was established in January 1992 but implementary regulations were finished during the year 1992 [4]. The reason was the Ministry of Finance precipitancy because of the prepared tax reform). The consequences of what are still seen in the Czech system (see i.e [5]).

The principal changes between 1991 and 2013 in the area of health financing system are detailed in the next table.

Table 1. Principal changes in Health Financing System (1991 – 2013)

Year 1991
Establishment of General Health Insurance Authority (GHIA): provisional body responsible for managing the health insurance; managed by the Ministry of Health.
Ministry of Finance and Ministry of Health responsible for preparing the new system of multiple sources health care financing.
General Health Insurance Act and the Act on the General Health Insurance Fund approved: since then, the healthcare system is slowly moving towards a compulsory health insurance model, with a number of insurers financing healthcare providers on the basis of contracts.
Year 1992
General Health Insurance Company (GHIC) established (GHIA dissolved at the same time).
The rule for reimbursing approved by the Government.
Act on Departmental, Professional, Corporate, and Other Health Insurance Funds approved.
Year 1993
HIC financing plan were approved by the Chamber of Deputies in November.

Many health care laws negotiations, those negotiations are very quick.
Year 1994
Government approves that if problem in GHIC financing – it will be financed from the state budget
Year 1995
First problem in financial instability.
5 HIC financing reports not approved.
Direct payment of basic dental services introduced.
Year 1996
9 HIC financing plan not approved by the Ministry of Health and Ministry of Finance because of financial instability (13 approved). The rules for HIC mergers and abolishment discussed and approved.
The Ministry of Health suggests to GHIC to increase the value of point (each medical procedure corresponding to some number of points).
The Ministry of Health introduces a ceiling of health care that will be reimbursed to the health facilities managed by the Ministry; it was 110% of care in a reference period of time.
Any new contract between HIC and health facility must be approved by regional or national Government.
Profit margin for drugs sellers and pharmacies decreased.
The system encourages the providers in increasing their supply and at the same time, it encourages patients in consuming more health care.
Year 1997
First phase of financial situation solution: the Government approves the possibility for HIC to get a bank credit, the Government guarantying these credits
The Ministry of Health plan to start the provider network reduction, including the big "state" hospitals.
Effort to solve the problem of health premium debtors.
4 HIC financing reports not approved by the Ministry, 3 of them were abolished or merged.
Year 1998
During the state budget approving, the Ministry of Finance authorized to cover the financial instability in the health care system.
Special agreement between the president of Medical Chamber and the director of GHIC: the provider network without any change.
The government obliges the hospital managers to take measures in order to maintain the financial stability.
1 HIC financial report not approved, this HIC abolished.
Year 1999
Financial stability strategy and higher level of GHIC control approved by the Government.
Year 2000
1 HIC merger.
Year 2001
Consolidated Bank undertakes a part of assets of HIC (approximately 5 thousand million CZK, corresponding at 3, 5% of total health expenditures in 2001). The Consolidated bank loss covered by the state budget.
Year 2003
The Government orders to the Minister of Health to prepare a Health System Strategy aiming to assure financial stability in medium run.
Czech Consolidated Agency (Former Consolidated bank) undertakes assets of HIC (approximately 3 thousand million CZK, corresponding at 1, 7% of total health expenditures in 2003). The Czech Consolidated Agency loss covered by the state budget.
Year 2004
The deepening of the indebtedness of GHIC partly because of the system failures, partly because of GHIC management failures.
Year 2005
Special commission within the Chamber of Deputies responsible for analysing the reasons of debt in GHIC.
Czech Consolidated Agency undertakes assets of HIC (approximately 4 thousand million CZK, corresponding at 2 % of total health expenditures in 2005). The Czech Consolidated Agency loss covered by the state budget.
Year 2006
Minister of Health decides that temporarily GHIC will be administered directly by the Ministry of Health because of

problems in financing and managing.
Drug price ceiling introduction (start of HIC financial reserve increase).
Year 2007
First phase of "state" Health insurance contributions increase.
Year 2008
Economic crisis has nearly no impact on health system in Czech Republic (drug ceilings from 2006 and increased "state contributions" from 2007).
The next phases of "state" health insurance contribution increase do not continue, the level of contributions remain the same till 2013.
The regulatory fees introduction.
Years 2009, 2010 and 2011
The health costs increase
The "state contribution" stagnation
Physicians protest because of the salary level, they sign a Memorandum with the Ministry guaranteeing the remuneration increase.
↓
Financial problems of GHIC and of some others HIC
Year 2012 and 2013
The Ministry of Health decides to reallocate the financial reserves of HIC in order to solve GHIC financial situation.
1 HIC merger

Source: Compiled and modified by the author based on [6-8]

Resulting information given in this table, it could be stated:

- At the beginning of the transformation, the return to Bismarckian tradition was chosen. The reason was, among others, to increase the efficiency of the system due to the competition among payers.
- There existed up to 27 HICs that in the early 90´s subsequently merged or were abolished because of financial problems or because of not meeting the law requirements.
- From mid-90´s the number of HICs settled down on 8 to 10.
- The range and depth of "standard" benefits are unusually broad in the Czech Republic, the Ministry forbade the HIC to offer services/benefits above the "standard package". This measure in fact disables the competition among the HIC, or more precisely decrease significantly the level of competition.
- The GHIC has a special position in the system; the Ministry is in fact managing directly this HIC. It means that the position of HICs is not equal. It can be concluded from the table above that there were a lot of steps in favour of GHIC in the Czech health policy in last 20 years. The financial problems of GHIC are very often a starting point for taking these measures.
- Smaller HICs, very often financially healthier, start to be threatened by the measures of health policy and start to merge again.
- At the same time, the Ministry has been proclaiming that increase of payers' competition is one of the aims of the Czech health policy. A rough debate about the number of HIC has thus become one of the evergreens of the Czech health policy.

According to the above mentioned evolution of the Czech health care financing system, it can be concluded that the control, supervision and administration of the Czech health insurance system remain one of the main weak points of the Czech health care system. Furthermore, the level of political influence inside the HICs (especially in case of GHIC), HIC´s management and/or the level of transparency within HICs while contracting the health care providers are problematic issues as well. Many see the HICs as powerful institutions that are in fact making the patient position in the system weaker. The table above demonstrates very well that this needs not to be fully correct. The Government is, in its health care policy, adopting very often measures that do not enable HICs´s managers manage their companies.

These facts re-opened the discussion about the appropriate role and number of HICs in the Czech health care system (plural versus unitary system). In this context, it seems to be logical to come back to the theory to give answers to these questions. In other words, the next part of the article is inspired by this debate when trying to explain, on the basis of the two-sided market theory, the reasons why Czech Republic chose the plural insurance model of financing.

2. Results and Discussion

2.1 Two-sided market theory view

The role of payers in the healthcare systems is an interesting and often discussed issue in many countries. As it can be seen from the previous part of the article, the Czech Republic is not an exception. Since 1993, there has been a debate, more or less intense, of whether it is better to have a single payer system (like NHS) or whether the pluralistic system with more HICs should take place.

The purpose of the second part of the article is to contribute to this polemics and based on the literature review, to think about what is/should be the role of the payer in the healthcare systems and, in accordance to this, to specify and to discuss what the benefits could be if there are more than one payers in the system. This allows achieving the second aim of the article which is to explain, on the basis of the two-sided market theory, the reasons why Czech Republic chose the plural insurance model of financing.

Let´s start by repeating that health markets differ from so called standard (or even perfect) markets (see i.e. [9]). The existence of three players is one of the typical features of the health markets. There are, among these players, those who are offering the services (service providers); those who are demanding these services (consumers/patients/citizens/clients) and those who are paying out those services (payers – i.e. government, HICs).

When simplifying slightly, payers are present in the health market because they collect the health insurance premiums (or health tax) and to provide indemnity when the "insured incident". It results from this easy statement that payers are in direct contact with consumers/clients in the health market. It is also evident that consumers/clients could be sub - classified into two groups: those who are paying the insurance premium and those who are provided the indemnity. Interests of those two clients group differ significantly.

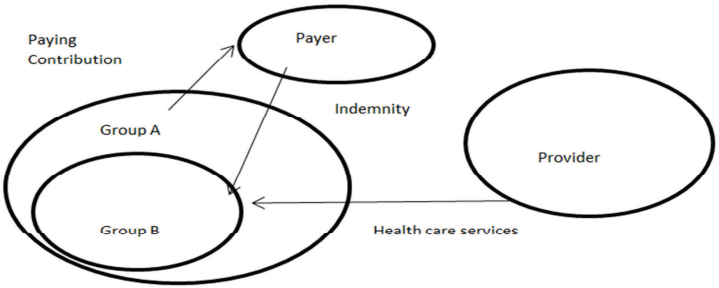
The above outlined statement about two consumers groups encourages interpreting health market as so called markets with two sided platforms [1-3]. According to [10] the market with two - sided platforms can be defined as follows:

- There exist two groups of consumers in the market. They are both better off if they are cooperating.
- The market with two sided platforms is an externality market.
- The level of transaction costs is too high; the individual externality solution is not possible. ¨
- There exist so called common platform that enables to minimise the transaction costs and so to internalise the externality.

As the existence of externality seems to be a generally accepted property of the health markets (see i.e. [11-12]), it remains necessary to explain the categories of two - sidedness and common platform.

Let´s begin with the two - sidedness in the market which (as it was already suggested) is connected with the health care consumer/client characteristic. It has been stated that there were two groups of consumers having different interests in the health market. Based on Danzon [13], the interest of the first group (group A) is a risk management arising from the incertitude about the future health state; the interest of the second group (group B) is to be sure to get the indemnity in order to demand appropriated health care services in case of illness/health problems. This relation could be illustrated in the Figure 2 bellow:

Figure 1. Relations in the health market



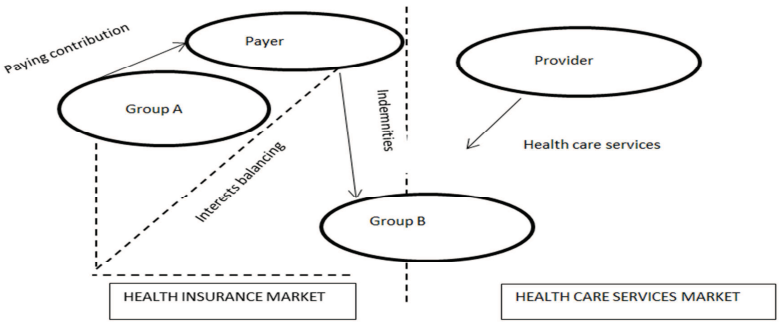
Source: [1], modified by author

The difference in consumer interests logically creates pressures in the health markets. The aspiration to balance those pressures between the consumers groups is the first goal that payers are pursuing in the health market.

The consumers 'groups are, pursuant the Figure 1, interconnected through the payer institution. This means that the payer could be seen as some kind of coordinator who is charged with the consumers´ interest and interaction balancing during the time. This is the reason why [1] states that payers could be seen as so called common platform in the health market. Using the market with two – sided platform logic, Howel claims that it is the payer who is assuring the internalization of externality rising from the health state incertitude (group A) and from the moral hazard problem within the group A caused by behaviour of the group B. The group B will have the tendency to over consume the health care because for it is financed from the group A subsidy. Those two consumers´ groups are unlikely to cooperate in the market or, in case of cooperation; the transaction costs of this cooperation would be very high. It is only because of the existence of the payer institution that they can cooperate.

It can be concluded from figure 1 that there are, in fact, two markets in the health market. The first one is the health insurance market in which the payer is trying to balance the consumers' interests. The second is the health care services. Those two markets are independent but closely interconnected. This interconnection is caused by the fact that group B is active on both markets. This situation is illustrated in Figure 3.

Figure 2. Health markets



Source: [1], modified by author

As it was mentioned, the role of the payer in the health insurance market is in balancing antagonistic interests between groups A and B. If the balancing is successful, the utility of both groups is maximised, the moral hazard (group A) and over consumption (group B) risk is minimised. As group B members are presents in both markets, the payer is not able to fulfil its

health insurance balancing role without knowing health services prices, so without entering at the health services market as well. Here, its role would be in influencing the conditions of health care services delivery.

In conclusion, there two roles that payer should play in health markets. In the health insurance market, the payer is responsible for balancing antagonistic interests between group A and group B members. The second role is played in the health services market and it is the cultivation of this market while influencing the conditions of health care services delivery. And, according to [14], both roles of the payer could be fulfilled only if a clear contract between the payer (HIC) and the consumer (patient) on one side and the provider (health facility, physician...) on the second side exists.

Logically, if contracts with patients and providers are the most important instruments for HICs in order to fulfil their roles, then it seems crucial to study whether the health care system creates conditions for HICs to enable them to really enter into contact with patient/provider. It remains important too if HICs are given the possibility/right to build up and cultivate these contacts. The quality of this relation seems thus to be essential for the health care system efficiency. With a view to increase this efficiency; the quality of contracts must be assured. To do so, both parties must have some level of freedom or autonomy. To have a freedom means to have the right to choose. This would be a prop for the plural health insurance system. Moreover, using standard economic rule concerning the monopoly (see i.e. [15]), more HICs (plural system) are likely to have bigger motivation in behaving efficiently than one HIC (unitary system). The two – sided market theory is thus favourable to the plural system.

In compliance with the second aim of the contribution, this part of the article explained, on the basis of the two-sided market theory, the reasons why Czech Republic chose the plural insurance model of financing.

2.2 Impact of the plural insurance model selection on health care system management

With respect to the aims of this paper, it remains to study the impact of the plural model selection to the management of health care system in the Czech Republic. To fulfil the third objective of the article, the impact is studied mostly from the patient empowerment, cost containment and health care quality point of view.

Let´s start with the patient empowerment and quality of care issues. Both issues are structured in the same way, starting with theoretical impacts that are followed and compared to the real situation in the Czech Republic. The third issue, impact of plural model on cost containment of the Czech system, is closely connected to the two previous (health care services quality and patient empowerment), in fact this issue is directly influenced by the two previous. For this reason, the cost containment issue will close this section when resulting findings of the article.

Patient empowerment

The position of patients' stays rather weak in the Czech health care system even if it is very often one (at least, proclaimed) of the health policy aims. Let´s see thus what impact on patients' position the plural insurance model selection has.

As mentioned above, based on two-sided market theory, the measure that would empower the patient position in the health system is the instrument of payer – patient contract. In this optic, one must study whether those contracts exist and if so how are the concluded, what is their quality , exactness; whether the patient is free to choose the health insurance company and/or the contract type;whether the contract motivates the patient to the prevention and/or healthy life style.

The simple fact that the patient – payer contracts exist in a given health system could be described as one of the positive impacts of plural health insurance model on patient empowerment. It is because this system characteristic (existing contracts) means that the patient is perceived as an equal partner of the insurance company. It is evident that the way how these contracts are concluded is crucial. Bigger level of autonomy contracting parties are having, better is the patient position in the system. In this case, more regulation exists in the system, less

motivation of HICs to compete for the patient. It can be supposed as well that contracts of higher quality will lead to the patient empowerment in the system. Applying the same logic, clearest contract terms are, more powerful patient in the system would be. Generally, with a high level of probability, more insurance companies in the system, more motivation to treat well the patient.

The fact that patients have right to choose the insurance company and the contract type could be denominated as another positive element that plural health insurance model is having to patient empowerment. This freedom will lead to patient and HIC incentives increase. Patient is motivated to search information and to think about the health insurance market. The payer is motivated to compete for patients by offering interesting contact terms. The level of this competition is logically higher in plural system. Once again, more there are regulator´s interventions on this patient-payer relation, less motivation the contracting parties are having.

Let´s pass from the theory to Czech health care system reality. It is unfortunately possible to claim that above described positive impacts of the plural model on patient empowerment are not apparent in the Czech Republic. In fact, there are no real contracts between patient and payer. The patient can choose the HIC (see i.e [16]) but not the contract type, thus his motivation to do it is limited. The level of regulations is rather high. The Czech system is not able to use the potential that the plural health insurance model is naturally offering in case of patient empowerment. Even if the patient empowerment is officially one of the aims of the Czech health policy, there is no tendency to do it through the institution of HICs, insurance companies not having the right to do it. It is evident that HIC could play a key role in patient empowerment problem when allowed to enter into a contact with patients and to cultivate this relation.

Quality of care

Based on two-sided market theory, the measure that would lead to the quality of care increase in the health system is the instrument of payer – provider contract. In this optic, one must study whether those contracts exist and if so how are the concluded, whether they are concluded on the basis of quality;the reimbursement methods;the management of health care (information system).

Like in the case of patient empowerment, the fact that the payer – provider contract exists could be perceived as one of the positive impacts of the plural model but probably, this would be the same as in unitary system. The difference is much more linked with the way how the contracts are concluding. If the plural system is functioning well than, its impact on quality of care should be higher than in case of unitary health insurance system. Once again, bigger level of autonomy contracting parties are having, better should be the quality of care in the system. But, it is the reimbursement policy that remains the key issue here. It is crucial to know whether the price of the health care services is associated with their quality. The payer should have the possibility to advantage those providers that are offering higher quality of health care services (see i.e [17]). It becomes evident that more there are payers in the system, higher pressure to propose the care of quality. In this case, the positive impact of plural model on quality is rather important.

The reality of the Czech system differs from the theoretic impacts described above. There is an effort to increase the quality and it can be stated that the quality is rising in the Czech Republic. But the quality is definitely not rising because of the potential that plural model is offering in this domain. The payer – provider contracts exist but there is no price – quality link. In fact, there are lot of governmental regulations in this area and the trend to artificial price increase is present. This fact reduces the capacity and ability of HICs to advantage the providers that offering a good quality care. This shows that the health care services quality is not a priority of payer – provider contracts. Repeatedly, the potential that the plural model is offering in relation to the quality is not used in the Czech Republic or to stay positive, this potential is used only partly (by estimation, it is about 20 – 30%).

Cost containment

It results from the above described that the Czech health care system is not able to use the potential that plural health insurance model is offering. This fact reduces the efficiency of the health care system. This inefficiency has a negative impact to the cost containment. In fact, the

weak position of the patient in the system that is caused by inexistence of patient – payer provider contract and reimbursement policy in which the price is not associated with the quality of care are negatively influencing the cost containment of the system.

The potential that a plural health insurance company model disposes of is certainly used only partly and unfortunately it is less than 50%. The general reason is a high level of regulation that is typical for the Czech system. The level is, based on actual governmental strategy, supposed to rise.

In reaction to this, it could seem that the solution for the Czech Republic is in quitting the plural health insurance company model and to pass to the unitary one. Concretely, it means to have only the General Health Insurance Company (GHIC) in the Czech Republic. But … one should keep in mind how much the governmental regulations are deforming the behaviour of this insurance company (see the health financing development in section two of this article). It is difficult to estimate the impact of the model change (from plural to unitary one) on the inefficiency of the health care system and so on the cost containment. Based on two – sided market theory and standard economic literature I find hard to believe that the unitary system that is based on monopoly role of the GHIC and high level of regulations could have a long – term positive impact of the system efficiency and on the cost containment.

3. Conclusion

The health reform problematic is a considerable issue in almost every country. The Czech Republic is not an exception. The motives for reform efforts are often linked with the efficiency problem. One of the reasons of this inefficiency is the gap between power of different health institutions and weak position of patients.

The article proposes to study this efficiency problem using the two – sided market theory. Based on its findings, the health insurance companies are perceived as a key actor that could be able to contribute to the system efficiency increase. The instrument, that HICs need to fulfil this goal, is the instrument of payer – patient and payer – provider contract. It results from this theoretical concept too that the plural health insurance company model seems to lead to the efficiency increase. This statement is used in the paper to explain the Czech decision about the health insurance company model in early 90´s. Then, impacts of this decision on health system management from the patient empowerment, quality of care and cost containment issue are studied.

In other words, the paper aims were to (1) define the characteristics and the evolution of Czech health financing system; to (2) explain, on the basis of the two-sided market theory, the reasons why Czech Republic chose the plural insurance model of financing and to (3) study the impact of the plural model to the management of health care system in the Czech Republic mostly from the patient empowerment, cost containment and health care quality point of view.

Accordingly to the aims of this paper, the Czech health care system was briefly introduced and given the target of the article, the emphasis has been put on the HICs position. As an economic transformation took place in the Czech Republic at the beginning of the 90´s, the health care system is relatively young and underwent important changes; a detailed evolution of the health insurance system was specified. Then, the two – sided market theory was presented and its impact on selected issues was studied. The conclusion is that the potential that a plural health insurance company model offers is used only partly in the Czech Republic. The high level of regulation was identified as the principle reason of this situation. At the end, the shift to the unitary system was discussed.

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The Influence of the Type of Replacement Wage on the Economic Value of Volunteering: Emergencies in the Czech Republic

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Abstract

This paper deals with the influence of the type of replacement wage on the resulting economic value of volunteering. It illustrates the issue with selected examples of volunteering during emergencies in the Czech Republic, which is a considerably heterogeneous field of volunteering in terms of the number of activities. The text also provides otherwise scarce information on the economic value of this type of volunteering in the Czech Republic. The paper aims to determine the economic value of volunteering during emergencies in the Czech Republic in selected cases and to compare the results of using generalist and specialist replacement wages. To achieve these aims, we used quantitative methodology based on the methodology of the International Labour Organization and the Czech Statistical Office, using the generalist wage, and then performed alternative calculations using the specialist wage. The results show that the greatest distortion in the generalist wage can be established with respect to those volunteer activities that, when performed as paid activities, are remunerated significantly more or less than the median wage in the respective economy. However, both extremes relate to volunteering during emergency situations, and using wages in this and similar types of volunteering can be very misleading.

Keywords: Emergency; non-governmental organization; economic value; volunteering, distortion; Czech Republic

JEL Classification: L310, Q540, D640, J220

1. Introduction

This text brings together two seemingly unrelated areas: emergency management and the economic value of volunteering. However, in a number of countries throughout the world, including the Czech Republic, emergency management is now inextricably interconnected with the participation of non-governmental organizations (NGOs) and their volunteers. Previous research [1] showed that NGOs and volunteers are part of the Integrated Rescue System, both pursuant to the Integrated Rescue System Act [2], which provides the legal framework for such participation, and in the current practice. The demand for quantification of the abstract value of volunteering has been growing, as demonstrated by a wide range of specialized studies, including Stiglitz, Sen, and Fitoussi [3], Waring [4], and Soupourmas and Ironmonger [5], who concluded that traditional economic indicators such as GDP fail to capture actual economic performance. Sues and Wilson [6], Emanuele [7], Steinberg [8], Handy and Srinivasan [9], Brown [10], Ross [11], and Montmarquette and Monty [12] point out that volunteering has a specific value. Salamon, Sokolowski, and Haddock [13], Colman [14], Soupourmas and Ironmonger [5] state that the value of volunteering is not only measurable, but it should be measured.

To measure the economic value of volunteering, Salamon, Sokolowski, and Haddock [13] offer, in compliance with the International Labour Organization (ILO) [15], quite a voluminous methodological portfolio, for which every researcher in this field must answer the following questions before they start their research: What definition of volunteering will the research be based on? Will the research focus on individuals or, alternatively, individual organisations or will the research be of a macroeconomic character? Will it focus on inputs or outputs? And what evaluation method and strategy will be used? There were other attempt to find an appropriate method of measuring volunteer work, e. g. Novák [16], who suggested a new coefficient of generalist wage, which is supposed to be a more precise. However, in past there were not a big difference between his replacement wage and the replacement wage of Czech Statistical Office

(CSO). Thus this method deal with the same problem as a method of CSO, as it is discussed below.

The Czech Republic, which will serve in this paper as an example, through the CSO, utilizes the following research design based on the above-specified methodological portfolio to carry out official calculations of the economic value of volunteering – the unit of analysis: the macro-economic level; the focus of measurement: inputs; the valuation method: observed market proxy; and the valuation strategy: replacement cost using the generalist wage [17].

Another approach coincides with the CSO's approach on all points except for the replacement cost and in the use of the specialist wage instead of the generalist wage applied by the CSO. Further differences in these approaches will be discussed under the Material and Methods section. It should be noted that the type of replacement wage selected as an equivalent influences the resulting economic value of volunteering.

These differences will be illustrated with selected examples of volunteering during emergencies in the Czech Republic for two reasons: 1) this field of volunteering includes a considerable variety of activities, ranging from cleaning work, which requires neither specific education nor special skills, to highly skilled activities, such as volunteering by firefighters, lifeguards or rescuers. If the resulting economic value of volunteering is distorted by using unified replacement costs, volunteering during emergencies seems to be a good choice for overriding that distortion; 2) research of the economic value of volunteering during the 2013 floods in the Czech Republic has commenced, and the text contains preliminary research to validate the methodology chosen, or vice versa to indicate the need for its adjustment.

The objective of the paper is to determine the economic value of volunteering during emergencies in the Czech Republic in selected cases and to compare the results of using the generalist and specialist replacement wages. To achieve these aims, we will use the quantitative methodology.

2. Material and Methods

A key element in the methodology of this research is the formula for calculating the economic value of volunteering. The formula is based on the work of Salamon, Sokolowski, and Haddock [13], ILO [15], and the Czech Statistical Office (CSO) [16]. The available methodologies and studies provide only written descriptions of this simple formula; however, it is presented in a mathematical form here for illustration. Marking was chosen on the basis of English terms, with V standing for the estimate of the economic value, t for worked hours (time), and w for replacement wage. We distinguish the generalist wage from the specialist wage by means of subindexes: g for the generalist wage and s for the specialist wage.

This general formula can be written as:

$$V = t * w \qquad (1)$$

V = the economic value of volunteering

t = the number of volunteer hours

w = the replacement median hourly wage in the given economy

The replacement wage is the median hourly wage in the non-profit sector. Two basic types of data are required for calculation: the number of volunteer hours and the replacement median hourly wage in the particular economy or, more specifically, in its non-profit sector. In the Czech Republic, this data is available in the Average Earnings Information System kept by the Ministry of Labour and Social Affairs [1].

The economic value of volunteering is measured with respect to selected cases of emergency management in the Czech Republic at various times. The data on the scope of volunteering in emergency management is limited, which is one of the reasons for researching the economic value of volunteering during the floods in 2013 in the Czech Republic. Given that this paper emphasizes the influence of replacement costs on the economic value of volunteering,

if such an influence even exists, using of various cases may be an advantage rather than a disadvantage. Nevertheless, the availability of data partially predetermined the selection of the cases.

The CSO defines a volunteer as a person who is not, with respect to a voluntarily performed activity, in any employment relationship with the respective legal entity, and who performs their activities without any monetary or other remuneration, through or without an organization. It is therefore both volunteer work pursuant to Act No. 198/2002 Coll., on Volunteer Service, and other work performed in the organization without compensation (unremunerated). The Manual on the Measurement of Volunteer Work [16], as well as Salamon, Sokolowski, and Haddock [13], define volunteering as "unpaid non-compulsory work; that is, time individuals give without pay to activities performed either through an organization or directly for others outside their own household." All the cases of volunteering in emergencies in this paper meet both of these definitions.

3. Results and Discussion

We know the economic value of the selected cases of volunteering during emergencies in the Czech Republic (CR) from previous research in which it was established on the basis of replacement costs, specifically the generalist wage, by means of the equation (1). The results of the previous research are shown in the following table.

Table 1. The scale of emergency volunteering in the Czech Republic

NGO	Year	Number of volunteer hours	Economic value (EUR)	Economic value CZK)
People in Need during floods	2002	150,000 during the flood	523,013	13,522,500
Water Rescue Service	2004	72,907 for the year	300,961	7,781,364.11
ADRA during floods	2010	38,400 during the flood	203, 978	5,273,856
Mountain Rescue Service	2011	72,000 for the year	391,955	10,134,000
Volunteer firefighters in the District of Mělník	2012	26,448 for the year	139,190	3,598,779.36

Source: Dostál, Balarinová [1]

It is evident from this research that, using the CSO methodology, the economic value of volunteer work during emergencies in the CR amounts to thousands of EUR per studied case. Other interesting findings included that the members of the Water Rescue Service are exclusively volunteers, and that the ratio of volunteers to professionals at the Mountain Rescue Service is 3.64 to 1 and 11.72 to 1 in the fire protection field [1].

Alternative calculations were executed for volunteering during emergencies, using a methodology that differs from the CSO methodology in only one point: that it uses the specialist wage to determine the replacement cost. This methodology was applied for all organizations except for the volunteers of Člověk v tísni (People in Need), who were deployed in 2002 when insufficient information prohibited the use of the specialist wage. Therefore, alternative calculations were not performed for this organisation.

The tables 1 and 2 shows the results of the economic value of volunteer work during emergencies, using both the generalist wage (the CSO methodology) and specialist wage. The specialist wage was solely applied for volunteer firefighters and rescue workers; the ADRA volunteers were more complicated as they performed four types of activities and so it was necessary to use four types of replacement wages.

3.1 Water Rescue Service in 2004

The employment subgroup of *3258 Paramedics*, which is the nearest equivalent for water rescue services, was not introduced until 2011. This subgroup was not included in the Average Earnings Information System in 2004. The nearest equivalent was the *5161 Firefighters, Firemen* subgroup. A median hourly wage of CZK 114.86 [18] was assigned to that subgroup for 2004. Given that the volunteers for the Lifeguard Service operated by the Czech Red Cross perform the same type of activities (lifeguarding), only the specialist wage will be used as the replacement wage. We will therefore use the following equation *(1)*.

TV_s = the total economic value of volunteering performed by the Lifeguard Service of the Czech Red Cross based on the specialist wage
72,907 = the number of volunteer hours for 2004
114.86 = the median hourly wage for the given employment subgroup in 2004 (CZK)

$$TV_s = 72{,}907 * 114.84 \qquad (2)$$

$$TV_s = 8{,}372{,}639.88 \qquad (3)$$

Based on the research methodology chosen for this paper (using the specialist wage), the following estimate of the economic value of volunteers of the Lifeguard Service of the Czech Red Cross was calculated for 2004: CZK 8,372,639.88 at the price level of 2004. Compared to the more accurate estimate based on the specialist wage, the estimate based on the generalist wage is lower by 7.06%: CZK 591,275.77. This is because the work performed by volunteer lifeguards requires high qualifications; the nearest equivalent (firefighters for 2004) has a higher median hourly wage than the median hourly wage of all employment in the given sector. Both estimates correspond to rough estimates of the Lifeguard Service of the Czech Red Cross in terms of the property saved as a result of volunteer work, running into millions of CZK [19].

3.2 Mountain Rescue Service in 2011

It was necessary to find a suitable replacement wage that would be the closest equivalent for the work of the mountain rescue service. The Information System on Average Earnings provides the employment subgroup no. *3258 Paramedics*. The median hourly wage of this subgroup for 2011 was quite high: 184.2 [20].The alternative calculation of the estimate of the economic value of volunteers of the Mountain Rescue Service in 2011, based on equation *(1)*, is thus:

TV_s = the economic value of volunteering by the Mountain Rescue Service based on the specialist wage
72,000 = the number of volunteer hours for 2011
184.2 = the median hourly wage in 2011(CZK) for the employment subgroup

$$TV_s = 72{,}000 * 184.2 \qquad (4)$$

$$TV_s = 13{,}262{,}400 \qquad (5)$$

Compared to the more accurate estimate based on the specialist wage, the estimate based on the generalist wage is lower by 23.59%: CZK 3,128,400. The reason for the difference is the same as in the previous case: the work performed by the mountain rescue service and its closest equivalent among the subgroups defined in the Average Earnings Information System, i.e. paramedics, is highly qualified.

3.3 Volunteer Firefighters

Volunteer firefighters operating in the District of Mělník were selected because the necessary data (the number of volunteer hours) are not available for a larger area and more units of municipal volunteer firefighting brigades. As in the previous cases, the specialist wage will be used in this case to determine equivalent values in equation *(1)*. The economic value of

the volunteer work performed by volunteer firefighters in the District of Mělník using the specialist wage is thus:

72,907 = the number of volunteer hours worked by volunteer firefighters in Mělník in 2012167.6 = the median hourly wage in 2012 [21]

$$V_s = 26{,}448 * 167.6 \quad (6)$$

$$V_s = 4{,}432{,}684.8 \quad (7)$$

The estimate based on the specialist wage is CZK 4,432,684.8 at the price level of 2012, which is about 18.81% (CZK 833,905.44) more than the estimate based on the generalist wage. The reason is again the same: the professionalism of firefighters, both volunteers and their professional colleagues, with their market wages determined in accordance with the nearest equivalent. Approximately 1/20 of volunteer firefighters who are members of units of volunteer firefighting brigades operating on approximately one hundredth of the territory of the Czech Republic performed work valued at CZK 4,432,684.8 (3,598,779.36). Since it is only a fraction of the territory of the Czech Republic and also a fraction of volunteer firefighters in the Czech Republic, the total value for the entire country is likely to be considerably higher.

3.4 ADRA Volunteers during the Floods in August 2010

It was necessary to find suitable specialist wages in the form of the nearest possible equivalent for the four types of volunteering. Because coordinators are in fact managers, employment group *1239 Managers of Other Units Not Elsewhere Classified* was selected; the median hourly wage here was CZK 200.78. For the second volunteer type, *2446 Professionals in Social Care (except for low-level workers)* was selected, with a median hourly wage of CZK 130.69. For the third volunteer type, *91329 Assistant, Cleaner Not Elsewhere Classified* was selected, with a median hourly wage of CZK 72.13. For the fourth volunteer type, *24709 Professional Office Worker Not Elsewhere Classified* was selected, with a median hourly wage of CZK 143.64 [22].Table 2 gives an overview of the individual values (partial and aggregated) based on the generalist wage (CSO variant used in formulating official data) and based on the specialist wage (of the equivalent option chosen for this research). The fourth column shows the difference between the estimate based on the generalist wage and the estimate based on the specialist wage. A positive value means that the methodology applied by CSO (the generalist wage) would produce higher results than the methodology selected for this paper; a negative value means the opposite. The fifth column shows the percentage of the distortion (the difference between the two values)

Table 2. Estimates of the economic value of volunteers of the ADRA organisation during floods in Liberec in 2010

Type of volunteer work	Based on the generalist wage	Based on the specialist wage	Distortion of the generalist wage (CZK)	Distortion of the generalist wage (%)
Volunteer coordinators	221,501.952	323,818	-102,316	**-31.6**
Volunteering professionals	158,215.68	150,555	7,660.80	**5.09**
Volunteers helping repair damage	4,815,031	2,528,820	2,286,210.43	**90.41**
Volunteers at information centres	79,108	82,736.64	-3,628.8	**-4.39**
Total	**5,273,856**	**3,085,929.6**	**2,187,926.40**	**70.9**

Source: Author

It is worth noting that the official methodology applied by the CSO significantly increased the estimates in some areas of volunteering while significantly decreasing estimates in other areas. The most striking difference was the estimate of the economic value of work performed

by volunteers helping to repair damage, at more than 90%. This difference is because these activities require no special knowledge or skills and the activities are valued as such on the market. However, this fact is ignored when the generalist wage is applied and volunteers are evaluated by means the median wage of the whole non-profit sector. On the other hand, volunteer coordinators must be trained and must have certain abilities or skills for the management of volunteers. In the market environment, executives are evaluated substantially more highly than unskilled workers in positions as cleaners. This fact is also reflected in the specialist wage and the difference in both values for this type of volunteering results from this.

The resulting amounts of the estimated economic value of the volunteer work performed by ADRA volunteers during the floods in the Liberec region in 2010 as determined by the generalist wage and the specialized wage also differed greatly. The official methodology of the CSO generated a result higher by more than 2 million CZK, which represents a value higher by more than 70%. It should be noted that when focusing on the inputs of volunteering, we work on the assumption that all the volunteer work is needed or that there are no downtimes. This assumption has not been verified; nevertheless, it is apparent that there is a high demand for volunteer assistance during emergencies in the Czech Republic [23] and that contracts on assistance are often concluded in the emergency management area between municipalities, regions, and the Fire Rescue Service on the one hand and NGOs and their volunteers on the other hand [24].

In terms of the accuracy of the results, it is preferable to focus on outputs, which is a challenging task in terms of their analysis, considering the dispersion of outputs from volunteering. It would be more possible to achieve by looking at one entity (e.g. river basin authority, municipality, household, etc.) or a limited number of entities, as the case may be. Considering the current lack of data, focusing on outcomes when volunteers are deployed massively as in the above-specified cases is on the boundary of feasibility for the purposes of obtaining total results.

4. Conclusion

This text provides two basic findings. The first is that volunteering in emergencies has a considerable economic value, running into millions of CZK (hundreds of thousands of EUR) for one type of activity in a limited period (one flood or one year). If the assumption that the work performed by volunteers during emergencies is necessary is correct, then in the absence of volunteers, the state would have to provide the financial means for performing that work in the field of emergency management.

Information about the economic value of this type of volunteering can be valuable for public administration, as it provides subsidies to NGOs to support their volunteering during emergencies [23] and often is not aware of the extent of their help or the value of their activities. Information on the economic value of volunteering during emergency situations provided to public administration authorities dealing with crisis management should thus enable better decisions about financial and other support for volunteering [13].

Quantifying the economic value of volunteering entails raising the prestige of volunteering and encouraging the population to volunteer [5], [13]. The quantification may draw more volunteers to Czech NGOs and to municipalities using the services of volunteer firefighters during emergencies, thus increasing their prestige. Furthermore, it will enable them to manage volunteering through their organization, e.g. to compare the costs of volunteering with the economic value, hence helping (by filling their costs on volunteers into VIVA) them to deploy their human and financial resources more efficiently.

Quantifying the economic value of volunteering is also important for volunteers, as it gives prestige to their volunteering [5], [13] which may contribute to changing the societal approach to volunteering and increasing its prestige. Thus, the benefits from volunteering during emergencies may increase for volunteers themselves. Through the improved prestige of volunteering in the Czech society, the volunteering experience may lead to an improved profile

for job seekers. Colman [14] also mentions increasing the abilities and skills of a volunteer who may be then capable of performing better at work.

The second finding of this paper is the confirmation of the general intuition that the application of the generalist wage distorts the economic value of volunteering depending on whether volunteer activities include above-average or below-average evaluated types of employment. If the cost of hiring a paid employee for the respective activity would be (according to the median hourly wage for the respective type of job) the same as the median hourly wage in the respective economy, there would be no distortion caused by the use of generalist wage. If the replacement wage for a salaried worker hired for the respective activity was higher or lower, distortion would occur. The greater the difference between the replacement wage in the respective profession and the generalist wage, the bigger the distortion.

This fact is apparent as regards the ADRA volunteers who repaired flood damage in 2010, because here the application of the specialist wage resulted in a value that was 90.41% lower than that determined through the application of the generalist wage. This also meant that the total economic value of volunteering secured by ADRA during the floods was lower by 70.9% when the specialist wage was applied. This was because most ADRA volunteers deployed during floods perform clean-up work and eliminate damage. In contrast, the application of the specialist wage for volunteer firefighters generated an 18.81% higher value, a 23.59% higher value for the Mountain Rescue Service, and a 7.06% higher value for Lifeguard Services.

It is clear that the application of the specialist wage is a more appropriate method if the necessary data is available, in particular the data on activities carried out by volunteers and the extent of the activities in terms of hours worked. However, when using the generalist wage (when there is no available data about the particular median replacement wages), we should be aware of the distortion, and also that the better paid the activities performed by volunteers, the higher the distortion, and vice versa.

The professional public still knows very little about the scope and structure of volunteering during emergencies in the Czech Republic and elsewhere. This text should be useful for the purposes of further research into how to measure volunteering and, in practice, for measuring the economic value of volunteering during emergencies in the Czech Republic.

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The System Development of Water Supply and Sewage Economy in Ukraine: Challenges and Prospects of Resource-saving Strategy

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Abstract

The aim of the article is to address resource-saving issues in water supply and sewage economy in Ukraine from the global perspective of water supply system development by focusing on the system approach to the analysis of water losses and overuse.

The authors propose a structural and functional model of the analysis of water losses in water supply and sewage economy (WSSE) by developing the concept of "system model of water losses" that can be effectively used to solve various WSSE issues – environmental issues, tariff policy, priority choice, investment calculations, etc. The major questions to be answered here are: What is lost? What do we lose on? Who losses?

It is particularly relevant to strategic planning and management in WSSE. Herewith, the key objectives of the WSSE strategic development in the contemporary conditions are discussed by summarizing the priority changes in WSSE in Ukraine in the dynamics of years.

Keywords: System approach; sustainability; water losses; ecological safety; functional and structural model; strategic development

JEL Classification: L95, Q01

1. Introduction.

1.1 The challenging issues of the system development of WSSE in Ukraine

Water supply system is a complex biotechnical system in which a person plays a dual role. On the one hand, he/she is the operator at various levels of operation, and on the other hand - the consumer. The most important resource of water supply and sewage economy (WSSE) is the natural water – the raw material of production. And here the global world is faced with the major issues which are the poor quality of natural water (high environmental pollution) and limited water resources used in economic activities [12, 15].

In the 1970's public and political forces within the most OECD (Organisation for Economic Co-operation and Development) countries began to demand improved water quality. Since then there has been a virtual revolution in the way the society and industry consume water. The changes began with command and control regulatory 'end-of-pipe' retrofit technology at existing industrial facilities. It was followed by massive programs to upgrade existing and installation of new sewage and public waste-water treatment facilities. These public facilities treated household discharges as well as discharges from businesses. The revolution continued with discharge permit requirements for new or modernized plant and equipment [2].

The world is increasingly turning its attention to the issue of water scarcity. Many countries face water scarcity as a fundamental challenge to their economic and social development; by 2030 over a third of the world population will be living in river basins that will have to cope with significant water stress including many of the countries and regions that drive global economic growth[3].

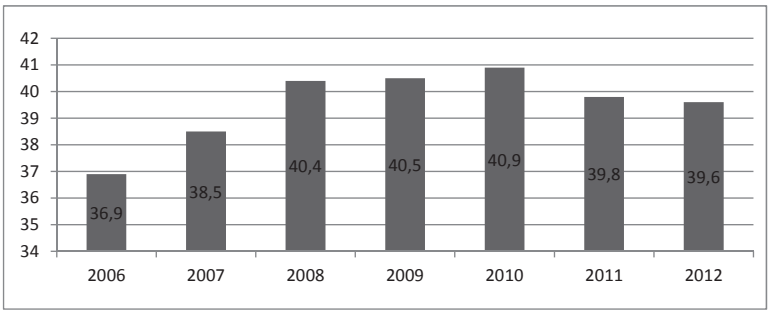
Water efficiency, and particularly drinking water loss, is a widespread issue, which has significant financial and environmental repercussions. However, awareness regarding the scope of the problem and available solutions is lacking. One of the key elements to success in all countries and societies in the world, past and present, is the proper handling of water losses [8].

The need to control water losses and to focus on the importance to the sustainable maintenance of water supply system all over the world, particularly in urban areas (with old and fragile pipes), is becoming more and more well-defined in the domain of science and stakeholders.

Across the globe, policy makers, civil society and the business sector are increasingly becoming aware of the challenge facing global water resources, and the need to carefully manage these resources. Progress has been limited, however, and overall too slow. One missing piece has been the lack of a rigorous analytical framework to facilitate decision-making and investment into the sector, particularly on measures of efficiency and water productivity [9].

In Ukraine, the reform of housing and utilities sector envisages technical renovation of the industry and approaching the requirements of the European Union as to the use of energy and material resources. Nowadays WSSE in the cities of Ukraine is represented as one of the largest branched structures of spatial economy. It is the most voluminous sector of urban economy as to the amount of processed and transported products and one of the main consumers of energy resources. The annual energy consumption of water supply and sewage enterprises in Ukraine is about 8 billion kW/hour [4]. However the transfer to the real market relations in WSSE is slower than in other sectors of economy that has led to the current crisis condition. The technical condition of fixed assets in WSSE of Ukraine is unsatisfactory: the share of depreciated pumping equipment is 20%, sewage treatment plants that require recovery – 25%, networks in the dilapidated and dangerous condition – 35% [4]. The technical condition of the WSSE fixed assets preconditions significant water losses (Fig. 1).

Figure1. Dynamics of water losses and non-revenue water in water supply system, Ukraine, %



Source: [16]

Thus, during the analyzed period the percentage of water losses and non-revenue water in the water supply system has increased by 3.6% reaching the peak in 2008-2010. It should be noted that in Europe, unproductive water losses in the water supply system of cities ranges from 10 to 18% compared to 40% in Ukraine [4].

The current situation in Ukraine affects the prime cost of 1 m3 water sold (and the average tariff level, respectively) as a water supply enterprise has significant costs for electricity (on water rise and its supply to the water supply network) and chemicals (for water purification) calculated per full volume of water, and while determining the prime cost it divides these costs by significantly less amount of water sold. Herewith, the increase of the prime cost (in terms of direct material costs) occurs more rapidly than the increase of water losses.

Even these estimations are enough to say that the development of WSSE is an urgent and significant issue which solution is at stake for the state, regions, businesses and consumers of water supply and sewage system in Ukraine.

2. Material and Methods.

2.1 The system approach to the analysis of water losses in WSSE

For the research the authors use some of the basic methods of the scientific research to obtain the information necessary to the complex systemic processing of the issue. The methods usually complement each other and, in consequence, overlap. The authors predominantly use methods of qualitative research.

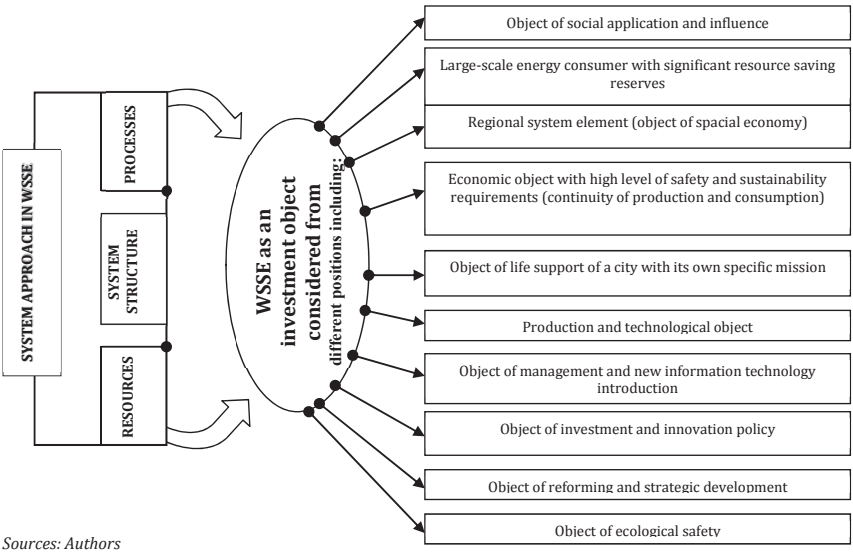
The first part is about the empirical research. The authors describe and synthesize, with the use of statistical data, the dynamics of water losses and non-revenue water in water supply system in Ukraine. The second part is about the system approach to the analysis of water losses in WSSE of Ukraine from the theoretical endeavour. In the research the structure-functional model of losses in WSSE of Ukraine is elaborated with their reasons and consequences by developing the concept of "system model of water losses". The concept of "system model of losses" can be efficiently used at all levels: formation of tariff policy in WSSE, definition of priorities of strategic development of the region, substantiation of investment projects on resource saving, etc.

At the conclusion of the previous observation the research moves to the discussion, supporting it with the structural and functional model of the analysis of water losses and overuse in WSSE of Ukraine.

The main contribution of this line of research is to elaborate a model with the basic criteria of WSSE evaluation and determinants of strategic goals of WSSE development with the innovative character of WSSE characterizes the change of the priorities in the dynamics of years.

The current methodology for solving the issue of water losses and non-revenue water directs researchers to consider the object as a spatial system [11, 14], i.e. holistically but from different prospects and different points of view (Fig. 2).

Figure 2. The structural model of a WSSE object based on the system approach



Sources: Authors

The presented structural model of the most significant characteristics of WSSE can be applied for the analysis of the potential of the analyzed object, specification of the factors of integral consistency and fulfillment of the tasks of its strategic development.

In terms of evaluation of the WSSE potential researchers are focused on the efficiency of use of fixed assets, indicators of financial activity and volumes of production, which is rightful for the rational economic thinking [7, 13]. However, in the contemporary renovating conditions the detailed research of water losses and overuse is to be one of the major tasks in the WSSE system.

The issue of water losses, overuse, irrational use of materials and energy in WSSE is of high urgency and at the same time, it remains to be quite underdeveloped [14]. Analysts provide data on the losses of water supplied: energy consumption of 1m3 water in Ukraine is 2 or more times higher than in Europe that emphasizes the economic unprofitability of WSSE in Ukraine. But the issue is actually much broader: it is concerned with rethinking and re-evaluation of opinions of experts and the public on the role and nature of this large-scale system of urban economy.

To do this, first the essence of the notion "loss" is to be defined. Along with generally recognized direct losses, other kinds of losses should be taken into account: damage, over-expenditure, lost profit, time lag of payment means, unused potential, i.e. losses of resources, potential, development rates, financial stability level and ecological safety. On losses one can dwell in terms of stakeholders in the service system: "Overcharged prices in monopoly mean the consumer's underconsumption or additional costs" [10 p.269]. The diversity of types of losses in WSSE includes those that need a special attention because of their almost complete ignorance in economic research.

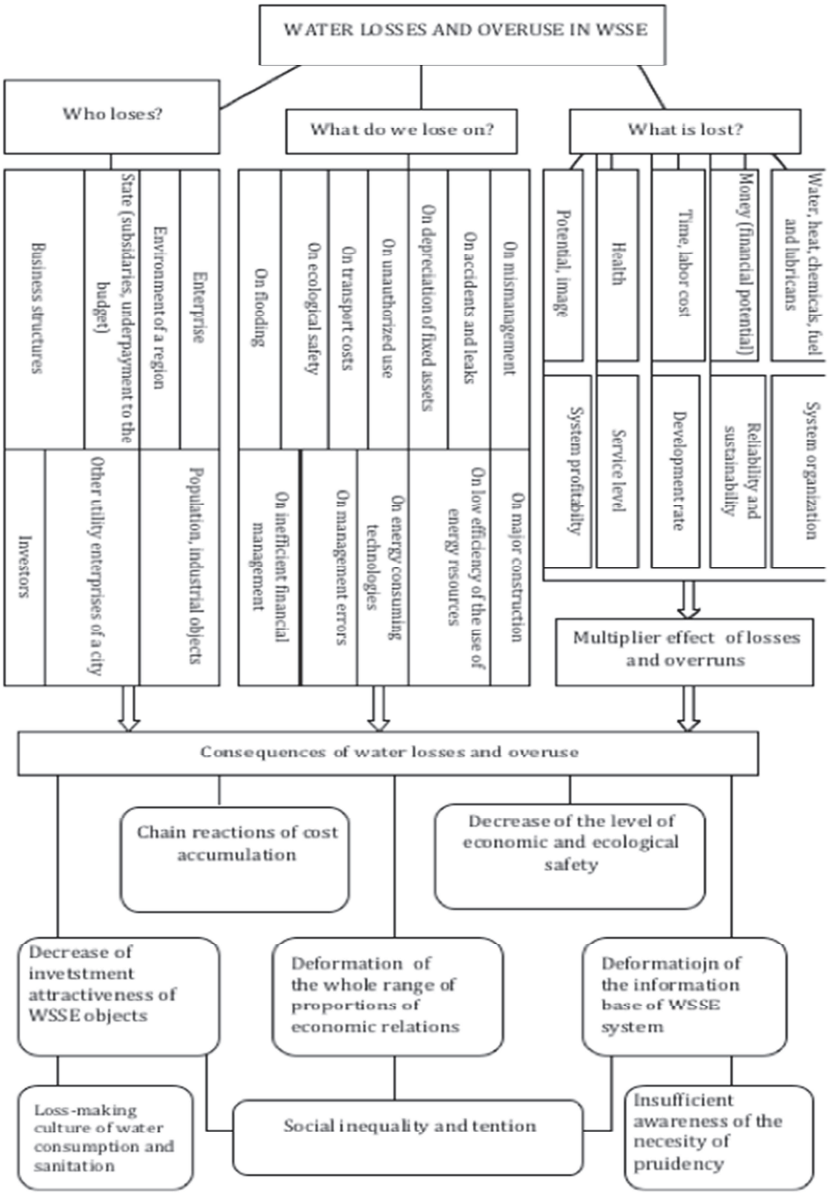
In Ukraine, first of all, these are ecological losses including damage to the health of people by low quality water; losses due to road accidents because of breaks of water supply and sewage systems and water leaks; losses due to unauthorized connection as well as losses due to flooding estimated by millions of dollars. Losses of state finances emerge due to compelled subsidizing of mismanagement and non-payments. Industries and businesses have to pay in addition at high tariffs for the low tariffs for the population. Decline of sustainability and reliability belongs to the types of losses as well. Thus, the structural and functional model of losses in WSSE is a multi-contour, multi-element and multi-profile scheme of interrelations (Fig. 3).

Unfortunately, the system of water losses has not been studied as an integrated phenomenon. For example, in Ukraine more than 80 % of drinking water supplied to a city is spent on technical needs [4]. The overall range of water losses and overuse fails a qualitative analytics by many characteristics including the breakdown by the features: regular, occasional, acceptable, seasonal, emergency, technical, economic, organizational and other losses. The generalizing negative result of this situation leading to social tensions is the lack of water consumption culture in the society, economic thinking aimed at the prudent attitude to drinking water.

Thus, in Ukraine the current practice of reconciliation with large-scale losses should be considered not just as a fact of mismanagement but as the poor quality foundation of the old system unsuitable for its development in the new conditions. This outdated foundation of assessment of the situation and experience of management has a direct negative impact on the WSSE performance, well-being and quality of life of the population as well as development strategy of the region as a whole. Based on the above mentioned characteristics of the issue of losses in WSSE, there is a relevant target task to study it as to the structural model of losses, chain reactions in their system, the multiplier effect of accumulation and display of the negativism (as opposed to synergism), etc.

The concept of "system model of losses" can be effectively used to solve various issues – environmental issues, tariff policy, priority choice, investment calculations, etc. It is particularly relevant to strategic planning and management [4].

Figure 3. Structural and functional model of the analysis of water losses and overuse in WSSE



Sources: Authors

By applying the correlation and root cause analyses one can build dependency and receive the final result of water losses though not by all the criteria. One can derive those that have the greatest impact, for example, by applying the expert method – which causes have the greatest impact (the largest share) in the total structure of criteria (100%).

Even though the model has been developed based on the features of WSSE in Ukraine it can be applied globally to any WSSE system.

3. Results and Discussion

3.1 The key objectives of the WSSE strategic development in the contemporary conditions

The basic criteria of WSSE evaluation and determinants of strategic goals of WSSE development are:

- *reliability and sustainability*: WSSE as a life-support system of the city must function continuously in the optimal regime providing for the normative needs and normative quality of goods and services though certain local failures and disorders can be accepted in case of their efficient elimination.
- *profitability and efficiency* means the use of all the existing resources with high output-input ratio, minimization of expenses, energy saving, decrease of waste, and it requires work with sufficient profitability and capacity building that are provided by innovative technologies, high level of organizational culture, scientifically substantiated decisions.
- *safety (including ecological safety)* involves drinking water compliance to quality standards, the necessary capacity reserves, economic sustainability, ecological safety (minimum impact on the environment). Security involves a range of works to protect from the damage (intentional).

The issue of safety is no less complex than the issue of efficiency and development management. Its basis comprises actions of explicit and hidden threats. Its solution is aimed at increasing resilience to threats, accumulation of reserves, development of standard technologies (scenarios) of preventing threats and eliminating its consequences. Safety is ensured by reserves which goals are the protection from "overloading" technologies, from chaos and uncontrolled manifestations, from emergency situations and intentional damage. As with the losses, safety involves a complex structure of components, among which are: technical and technological aspects of safety, sanitary, industrial, economic, environmental, information, spatial, organizational, managerial, etc.

- *manageability* is an ability to adapt, to efficiently function in non-standard situations, readiness to innovation, a stimulus to cooperative organization of activities, easiness of transformation onto a new regime of work, etc. Reform transformations and strategic management are also included here.
- *incorporation in regional system* refers to balanced inclusion of engineering blocks both in WSSE and the sector of urban economy [6] as a whole, observance of normative relations, synchronous changes with other industries in regard to changes of tariffs, work with public.

It should also be noted that the dual nature of housing and utilities sector (social security and economic norms) "also shows the complex and contradictory nature of utilities that do not fit into the framework of one model of economic relations" [1 p. 381].

The mentioned features of the object (WSSE) play the role of key objectives in its strategic development which solution transfers the system to a new level of image and organizational development.

The innovative character of WSSE characterizes the change of the priorities in the dynamics of years [5, 9]. For example, in the 90's the priorities were technological regimes, the development of automated management system, partial reorganization. Five years later the managers' attention was paid to the issue of non-payment, development of consumers' service, legal support, and sanitation of networks. Since 2000, the urgent issues have been the tariff

policy, resource and energy saving, technical re-equipment. In this period the agenda involved breaking large reorganization projects (leasing, concession), reduction of losses and environmental safety. In the future, these will be full technical re-equipment, continuation of adapting to market conditions, improvement of water and service quality, change of management mechanisms and implementation of innovation projects.

4. Conclusion

Summarizing the research let us define its most characteristic results.

First, both the object and the environment require the use of the system methodology for assessment, analysis, forecast and design of future conditions and strategic development models. The basis of the system approach is the attitude to WSSE from different prospects, i.e. as the object of environmental safety, management, participation in the regional economy, energy consumption, etc.

Second, the most urgency is acquired by the dual task: the analysis of losses, damages and overuse and the increase of energy efficiency and environmental safety in WSSE. Detailed answers are necessary made on the scientific basis and with a high probability to the following questions: What do we lose? Where do we lose and Who/what is specifically damaged? What is the scale of the damage? as well as What are the consequences of the damage?

The urgency of solving this issue is due not only to its economic importance but to the fact that losses reduce the level of environmental security of the system, give rise to chain reactions of deformation and reduction of the potential, distort the information field of economic space in the region, cause situations of social tension in the society.

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The Relationship between the Development of Sports Infrastructure and Future Spending Flexibility in Municipal Budgets

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Abstract

The research project Impala in the Czech Republic [1, 2] has shown that the development of all local sports infrastructure which is legislatively assigned to regions and municipalities is carried out spontaneously as a result of the fact that there are not yet any prescriptive or regulatory mechanisms for its conceptual and systematic implementation. The aim of this paper is to present current trends in the development of municipal sports infrastructure. For the analysis of financial flows in support of the development of sport a constructivist methodology has been created that makes it possible to monitor the development of the "institutional" and "non-institutional" support for sport. If the municipalities allocate institutional support of higher than 70% ($I_I > 0.7$), this leads to the fixation of higher operating costs in the budget, which in periods of tight budgets leads to burdensome expenditure with regressive effects on the development and financing of sport.

Keywords: Institutional support; budgetary implications; municipal sport; grants; municipalities

JEL Classification: D61, D62, H71, H75, I38

1. Introduction

According to a study carried out by the auditing firm KPMG [3], the Czech Republic ranks among the countries in the EU with the lowest level of support for sports from public sources when expressed as a percentage of GDP. Nevertheless almost four fifths of this support [4] is provided at the municipal level (regions, cities and municipalities). For this reason, how these institutions use their resources and what the current trend is in supporting sport on the municipal level is very important in promoting sport in the Czech Republic.

The international research project Impala was carried out in the Czech Republic. This project dealt with “established practices” in the field of implementation of municipal sports infrastructure, focusing on the identification, implementation and dissemination of best practices in planning, financing, construction and management of local infrastructure for leisure-time physical activity. The aim of the project was to assess national policies, legislation, mechanisms, regulation and development of local infrastructure for leisure-time physical activity (project Impala). The results of this survey showed, among other things, that all local sports infrastructure implementation, which is legislatively assigned to regions and municipalities, was carried out spontaneously, and, at the same time, no regulatory or normative mechanisms existed for their conceptual and systematic implementation [5]. The consequences of these "practices" are manifested in the random development of sports infrastructure, which has not only economic but also the externality effects [6].

2. Material and Methods

Based on analysis of the budgets of the selected cities (cities A-D) a common methodology for classification of financial flows was established to monitor the development of "institutional" and "non-institutional" support for sport [7]. Institutional and non-institutional support in this case study is defined as follows:

2.1 Institutional support of sport

This is the main stream in the development of sports infrastructure and offers *stable cash flows* (costs of operation, maintenance, renovation and new investments, etc.) directed towards entities *owned by municipalities* (C_{IS}). Institutional support includes:

- Physical education at schools (set by law).
- Sports facilities (athletic stadiums swimming pools, ice arenas etc.).
- Physical recreation (water parks, playgrounds, recreation areas, bike paths, etc.).

For this purpose, cities (usually those of more than 30 thousand inhabitants) have established specific organizations that bring together the sports facilities of the city. Physical education in schools in the Czech Republic is funded through the budgets of schools and money invested in the operation of school sports facilities is not currently accounted for separately and is not included in the financial flows of these case studies.

2.2 Non - institutional support of sport

Non-institutional support consists of expenditures to support sport (C_{NO}), which are not designated for facilities owned by municipalities and comprises two types of sports funding: expenditures for support through grants (C_{NOG}) and non-grant policy (C_{NOP}):

- Support through grants is characterized by pre-established *principles and rules of the grant competition* and is designed to effectively provide for current needs, fluctuations in demand and to supplement the offering of specialized sporting events. It may be conceived of separately, or it can be treated as a follow-up to "complement" existing institutional support for sport and physical education. Grant support is therefore based on the objectives of an established concept for the development of sport and physical education, is not a one-time act,
- Non-grant policy - this is the allocation of funds from municipal budgets *without firm criteria* at the discretion of the competent decision-making bodies. This is often mistakenly referred to as grant aid and, to a considerable extent, such decisions are based on contentious opinions, beliefs, and political or partisan positions (which are always present). Funding decisions are not made on the basis of parametric methods but rather on the basis of "custom" (automatic support for certain sports and clubs), or on the basis of political considerations.

In accordance with the terminology thus established, the following indices were evaluated:

I_I (index of institutional support) = C_{IS} / (C_{IS} + C_{NO})
I_{NO} (index of non-institutional support) = C_{NO} / (C_{IS} + C_{NO})
I_{NGP} (index of non-grant policy) = C_{NOP} / C_{NO}

The level of fixed costs in the budgets of selected cities for the operation of sports infrastructure was calculated from these indices. The cities included: Olomouc (A), Mladá Boleslav (B), Český Těšín (C) and Němčice nad Hanou (D).

The data selected for the analysis of the actual use of funds in the case study was compiled from the primary internal sources of municipal institutions, from the official websites of the cities and thanks to the help of the staff of municipal authorities. Systematic budget data sorting according to the established methodology was problematic for workers in these institutions, so the primary and secondary data, especially in the area of grants, was re-evaluated and sorted.

3. Results and Discussion

The case study analyzed two cities that granted access to their primary databases and allowed researchers to consult with them about the details of their spending on sport. General characteristics of the cities analyzed (2011):

- Olomouc (A): statutory city; 101.0 thousand inhabitants, annual budget approximately 2.2 billion CZK (88.3 million €),
- Mladá Boleslav (B): statutory city; 44.3 thousand inhabitants, annual budget approximately 1.0 billion CZK (38.5 million €) [8],
- Český Těšín (C): city; 25.2 thousand inhabitants, annual budget approximately 634.2 milion CZK (25.4 milion €) [9],
- Němčice nad Hanou (D): municipality; 2.1 thousand inhabitants, annual budget approximately 101.2 million CZK(4.0 milion €) [10].

The results of the analysis are divided into three categories:

- The level and percentage portion of expenditure on sport from the municipal budget for the period 2009-2011.
- The structure of the distribution of these funds between institutional and non-institutional support for sport, the calculation of the index of institutional and non-institutional support and the grant policy index.
- The causes and consequences of favoring institutional support for the development of sport.

3.1 The amount and percentage of expenditure on sport on the expense side of the budgets of cities in the period (2009 - 2011)

Table 1 presents the total expenditures (operating and investment) from the city budget for the financing of sport in each city. While city A has a relatively stable share of support from the sports budget to the sum of 4.2 to 6.6 % of the total expenditure budget ($I_{SP\%}$ = 4.2 to 6.6 %), city B has an $I_{SP\%}$: 3.6 to 13.6 % share, city C: 7.4 to 16.0 % and city D: 1.3 to 6.5 % (see Table 1). The very different level of spending to promote sport in each city is the result of one-time capital expenditure on sports infrastructure. Over the years covered, each city implemented at least one major investment project to expand their sports infrastructure regardless of the development budget.

Table 1. Share of expenditure on sport on the expense side of city budgets - cities A, B, C and D

(in thousands of CZK)	2009	2010	2011
City A - total budget	2 047 444	2 077 227	2 206 369
- of which: $I_{SP\%}$ (share of expenditure on sport in the budget of city A in %)	4.5	4.2	6.6
City B - total budget	1 039 949	1 125 190	962 209
- of which: $I_{SP\%}$	13.0	3.6	13.6
City C - total budget	512 673	738 568	634 180
- of which: $I_{SP\%}$	7.4	12.1	16.0
City D - total budget	81 863	94 937	101 170
- of which: $I_{SP\%}$	2.7	6.5	1.3

Source: Authors

3.2 Structure of expenditure divided according to institutional and non-institutional support for sport and calculated index of institutional vs. non-institutional support and index of grant policy institutional support of sport

Table 2, which follows, documents the details of expenditure on sport in the breakdown of the proportion of institutional and non-institutional aid in total expenditure on

sport and the share of non-institutional grant policy for the support of sport. The data in the table leads to the following findings:

- Cities A, C and D rely on the institutional form of support, in which (including PPP projects) more than 70% of their expenditure on sport is concentrated (I_I = 0.72 – 0.97).
- In all of the cities (cities A, C and D) which allocate a low level of non-institutional support (I_{NO}) a high level of funding is allocate through grants (I_{NGP} > 0.50), that is to say they decide about the allocation of grants (through nonparametric methods).
- Town B has balanced levels of institutional and non-institutional support for sport (I_I = 0,35 – 0.65 a I_{NO} = 0.37 – 0.65), at the same time the proportion of non-grant policy for significant grant support is minimal (I_{NGP} < 0.01).

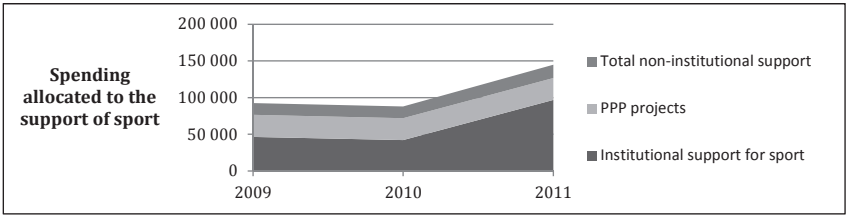
Table 2. Average shares of institutional (I_I)and non-institutional support (I_{NO}) in the total support for sport and the share of non-grant policy (I_{NGP}) in non-institutional support for sport in selected cities

Indicator	City A	City B	City C	City D
I_I	0.81 – 0.87	0.35 – 0.64	0.92 – 0.97	0.72 – 0.95
I_{NO}	0.13 – 0.17	0.37 – 0.65	0.03 – 0.08	0.05 – 0.28
I_{NGP}	0.50 – 0.63	0.00 – 0.01	0.88 – 0.92	(0.35) – 1.00

Source: Authors

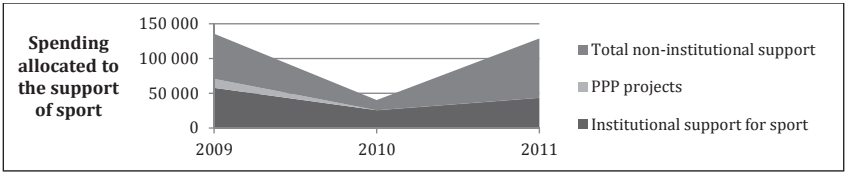
The expenditure pattern in the basic distribution of institutional and non-institutional support in 2009-2011 for each city is more precisely characterized in Figures 1 to 4. From these, the current trend of prioritizing the financing of sports facilities which are the property of the municipalities is evident. Non-institutional support is mostly (except in the case of city B) insignificant, and its relative share is shrinking.

Figure 1. Total spending allocated to the support of sports activities in Olomouc



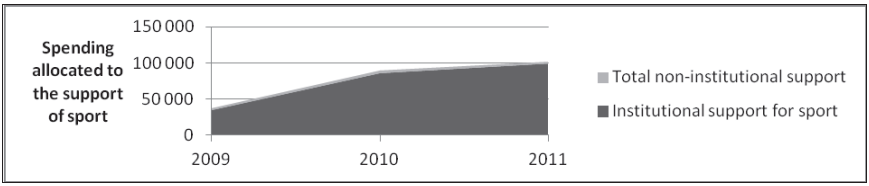
Source: Authors

Figure 2. Total spending allocated to the support of sports activities in Mladá Boleslav



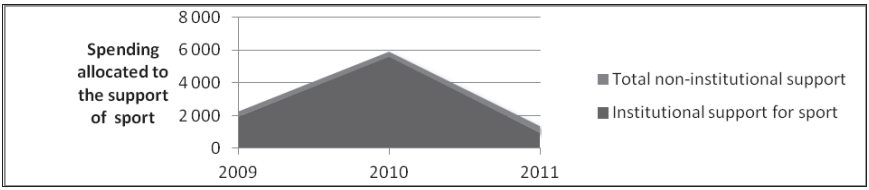
Source: Authors

Figure 3. Total spending allocated to the support of sports activities in Český Těšín



Source: Authors

Figure 4. Total spending allocated to the support of sports activities in Němčice nad Hanou



Source: Authors

3.3 Causes for and consequences of favoring institutional support for the development of sport

Due to the high proportion of non-institutional support ($I_{NO} > 0.3$) city B has the highest level of spending flexibility, it is both able to flexibly respond to current needs by means of new grant programs, as well as to respond to possible spending reductions by immediately limiting grant programs (see year 2010).

Towns A, C and D provide non-institutional support for sport only as an addition to general support (I_{NO} = 0.03 to 0.28) of their total expenditure on sport. It is significant that, considering the low level of non-institutional support, all these cities have a significantly higher proportion of non-grant policy ($I_{NGP} > 0.5$), or rather decisions about the ways these funds are used to promote sport does not include parametric rules significantly more than in city B, where this share is less than 1.3% (I_{NGP} = 0.01). For all cities analyzed (except for city D due to the repair of sports facilities) the operational costs of maintaining sports infrastructure are continuously rising, which reflects the preferred form of investment in this area.

4. Conclusion

After the completion of critical investments in its technical infrastructure, the sports infrastructure of cities continues to expand, and as a result its importance in terms of its regressive effect on the budget constantly increases. Cities prefer alternative varieties of support for sports services through sports services which belong to the city itself (institutionalization), because this option is administratively and organizationally easier for municipalities, eliminating the demanding processing and evaluation of an annual grant agenda. If the municipalities show an index of institutional support of $I_I > 0,7$, this results in a fixation of higher operating costs in the budget, which is seen in periods of tight budgets as burdensome ("mandatory") expenditures with regressive effects on the budget and subsequently on the development and financing of sport .

The analysis of selected cities shows that support for the development of sport through grant (criterial) competitions in the CEE countries does not have a sufficient tradition, is applied to a minimum degree and is replaced by grant policy. This, however, is often associated with clientelism and corruption, because the grant competition in this sense is not conceived of on the basis of predetermined indicators and evaluated on the basis of cost-benefit analysis [11] –

grants are awarded on the basis of a purely formal competition. The institutional development of sports infrastructure projects is often subsidized by the EU, and their structural impact on the budgets of public institutions thus often goes unrecognized.

Acknowledgements

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Comparing Competition and Regulated Monopoly in a Railway Market: An Agent-Based Modeling Approach

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Abstract

This paper introduces an agent-based model of a passenger railway line. The model is used for comparing the welfare of the railway market under unregulated duopoly and monopoly with maximum-price regulation. In the model, the railway operators gradually adjust passenger fares and eliminate train departures until the market reaches steady state. The paper analyses the steady-state data generated using two sets of parameter values. It finds that for most maximum-price levels, including the price that would be chosen by an unregulated monopoly, the total welfare in the monopolistic market is significantly lower compared to the duopoly market. However, there are some levels of maximum price which produce similar or even higher welfare than the duopoly market. The paper suggests that if correctly implemented, a simple maximum-price regulation may generate welfare outcomes comparable to competition.

Keywords: Open access; regulation; railway; welfare

JEL Classification: L11, L92, C63

1. Introduction

The main component of the European railway reform is the separation of infrastructure and transport services, which opens the possibility of competition in the market. Two common competitive regimes are open access and franchising. Under open access, more train companies may operate in the market. While open access is an option in the markets which are not under public obligation (approximately 10% of European markets), it is used significantly less frequently. Under franchising, the market with specified terms of service is usually auctioned to a single operator. Franchising is used particularly for subsidized markets, but it can be implemented also in profitable routes. [4]

The goal of the paper is to discuss the welfare effects of monopoly with specified maximum permitted fare (franchising) as compared to an unregulated duopoly (open access). For this purpose, the paper introduces an agent-based model of a railway line. The construction of the model is similar to the model presented in [2] and [3]. The model contains one or two operators each with more trains departing every day. In sequential steps, the firms adjust prices and departure times of their trains until they reach steady state. Finally, the steady-state outcomes are used for comparing the monopolistic and duopolistic market structures.

Even though the agent technology is used in transport logistics, especially in scheduling, dispatching, optimization of train coupling and sharing systems, or allocation of railroad tracks (see [1] for a survey), the presented model uses a specific market-based approach which determines not only the optimal timetable, but also prices and welfare outcomes. Moreover, the paper addresses the topic of regulation of a monopolistic railway operator. There are several empirical studies dealing with the problem of franchising regulation (see [5] or [6]). But to our knowledge, there are no papers using agent-based simulation for comparing the welfare under competition and franchise contract with the maximum price regulation.

The paper has the following structure. Section 2 introduces the agent-based model of a passenger railway line. Section 3 presents the data generated by the model and the empirical methodology. Section 4 shows the results of the analysis. And Section 5 concludes.

2. Material and Methods

2.1 Model

This section presents an agent-based model of a passenger railway line. The model is implemented in the modeling environment Netlogo 5.0.1. In the model, agents behave according to specific rules in a given order. In this section, I describe the model in the same order used in the simulations. In each simulation, the model is first initialized and then runs for T periods.

In the initialization phase, the model creates the landscape, passengers and sets initial train departure times. The landscape is a horizontal line of 240 patches (in Netlogo, a patch is a square field whose side can be used as a measure of distance). The line represents 24 hours at a railway station in the departure city. As the total length of the line is 240 patches, a patch represents 6 minutes.

In the landscape, the model locates 1,000 passengers which may differ in two respects. First, in their reservation price p_r which is the maximum price they are willing to pay for a train ticket to the destination city. The reservation price of a passenger is drawn from a uniform distribution between the minimum and maximum reservation price. Second, they differ in their location on the horizontal line. The location represents the time at which passengers arrive at the station in the departure city, or alternatively the arrival time that would suit them best. For instance, a passenger located at 125 arrives, or would like to arrive at the station at 12.30 p.m. In order to approximate a realistic time pattern, I draw the location of a half of passengers from normal distribution with the mean of 70 and standard deviation of 30 (morning rush hours) and of another half of passengers with the mean of 160 and standard deviation of 30 (evening rush hours). If the drawn location is higher than 240 or lower than 0, the passenger is placed randomly between 0 and 240.

Suppose that there are either one or two train operators in the market. During the initialization, the model creates as many train departures as possible, sets the initial fare to 0, and determines the departure times. Let us assume the smallest technologically feasible difference between the departure times of trains is 10 minutes (for instance because all the trains on the connection depart from the same platform). Hence, the model creates 144 trains departing every 10 minutes from 0.00 to 23.50 if there is only one operator. In a duopoly, operator A has 72 trains leaving every 20 minutes from 0.00 to 23.40 and operator B 72 trains departing every 20 minutes from 0.10 to 23.50.

After the initialization phase, the model evolves in periods. Each period has three or four phases: 1) passengers choose their departure times, 2) the operators calculate profits or losses of the individual trains, 3) in certain periods, the operators may eliminate one train, and 4) the operators adjust prices.

1) Choice of a train – The variables relevant for the optimal choice of passenger j are her reservation price p_{rj}, the price of train i at time t p_{it}, the waiting time in hours h_{ijt} and the per hour weighting cost $w > 0$. Passenger j chooses the train with the lowest $p_{it} + wh_{ijt}$ if $p_{rj} > p_{it} + wh_{ijt}$ and no train otherwise. The choice of no train means that the passenger uses a different mode of transport (bus, airplane, car), or that she does not travel at all. Therefore her reservation price is likely to depend on the availability of alternative transport modes and her preference for train transport.
2) Profit calculation – The profit of train i in period t equals to $\pi_{it} = p_{it}q_{it} - F$, where q_{it} is the number of passengers on the train and F are fixed and quasi-fixed costs.
3) Exit – In certain periods, called *exit periods*, each operator considers eliminating the train with the lowest profit. If the profit of the operator without the train is higher than with the train given the prices of all other trains, the train is eliminated. Otherwise, the train remains in operation. If the exit of the least profitable train does not increase the operator's profit, it closes the second least profitable train in the next exit period. This continues until the operator considers closing each of less profitable half of all its trains. Then again, it starts from the least profitable train.

4) Adjusting prices – The prices of each train may increase or decrease by $\varepsilon > 0$, or remain constant. There are two possible pricing strategies: uniform and local pricing. In this paper, I assume that firms use uniform pricing, which means that all trains of one operator charge the same price. Hence in period t, each operator chooses the price $p_{it} + \varepsilon$, $p_{it} - \varepsilon$ or p_{it} that maximizes its profit (given the price of the other operator if there are two operators in the market).

Each simulation lasts for T periods and has two phases: For the first T_A periods, firms adjust prices given no trains exit the market. Then for the remaining T_C periods, firms consider eliminating trains and at the same time adjust prices. The exit period is every c^{th} period in the second phase. If there is only one train operator, it considers eliminating a train every c^{th} period. If there are two operators, operators may eliminate one train every c^{th} period in turns. That is, each operator can change its timetable every $2c^{th}$ period. The second phase has to be long enough so that the actual prices and the timetable are relatively stable in the last T_E periods. However, the variables may vary slightly even in these periods, or some variables may evolve in cycles. Therefore, the model reports averages of the key variables over the last T_E periods.

2.2 Data and methodology

In this section, I describe the data generated by the model and discuss the empirical strategy used for analyzing the data. The data is generated using the function Behavior space in Netlogo 5.0.1. I consider data generated in two scenarios with the following common parameter values: The fixed cost is $F = 1000$, the waiting cost $w = 100$, pricing step $\varepsilon = 2$, and the exit period occurs every $c = 4$ periods. The total number of periods in each run is $T = 1{,}000$. The price is adjusted for the first $T_A = 200$ periods and the variables are measured for the last $T_E = 100$ periods. In scenario 1, the reservation price ranges from 100 to 200 and in scenario 2, the reservation price ranges from 100 to 400.

In each scenario, I compare the setting with two firms to the setting with 1 firm using maximum prices $p_c = \{10, 20, 30, \ldots, p_m\}$, where the price p_m is higher than the price that would be chosen by an unregulated monopoly. For each setting, I run 10 random initializations of the model with random seeds 1 to 10 using random-seed function in Netlogo 5.0.1.

Each simulation generates the following variables:

- Quantity Q is the number of passengers who bought a ticket (called *customers*) averaged over the last $T_E = 100$ periods.
- Price P is the average price paid by customers averaged over the last $T_E = 100$ periods.
- Number of trains M is the total number of trains departing from the railway station averaged over the last $T_E = 100$ periods.
- The waiting cost C is the sum of the weighting costs of customers averaged over the last $T_E = 100$ periods.
- Total profit Π is the sum of the profits of individual trains π_{it} averaged over the last $T_E = 100$ periods.
- Consumers' surplus CS is sum of individual surpluses of customers calculated as $p_{rj} - p_{it} - wh_{ijt}$ averaged over the last $T_E = 100$ periods.
- Total welfare W is the sum of total profit Π and consumers' surplus CS.

Each monopoly parameterization is compared to a situation in which the price is found by the duopoly market in the following way. I run the following simple OLS regression:

$$X = \alpha_0 + \alpha_1 NO\_FIRMS, \qquad (1)$$

where X may be one of the variables presented in the previous paragraph and *NO_FIRMS* is a dummy variable that is equal to 0 if there are two firms in the market, and to 1 in the case of monopoly. In the following subsection, I report coefficients α_1 and heteroskedasticity-consistent standard errors (hc1 in R). These numbers show the direction and size of the effect and indicate whether the effect is statistically significant.

3. Results and Discussion

This section compares the welfare effects of a monopoly with price regulation and two-firm competition using the data described in the previous section. The data is analyzed in the software environment R. The Table 1 compares the situation under regulated monopoly and duopoly in scenario 1 with the reservation price ranging from 100 to 200. The second row shows the means and standard errors of the total welfare W, number of firms M, number of customers Q, and the waiting cost C. The rest of the table presents the change in number of trains ΔM, number of customers ΔQ, total waiting costs ΔC, and total welfare ΔW due to the shift from duopoly to monopoly in scenario 1. The rows show different maximum prices p_c. While the mean of the average price P under duopoly is 80, the price charged by an unregulated monopoly is approximately 99. Therefore the maximum price is always binding except for the situation with the maximum price $p_c = 100$.

In the first column, we can see that the total welfare is statistically significantly lower for all maximum prices except for p_c = 60, 70, and 80. The change in total welfare can be decomposed in three parts. First, total welfare is higher due to the lower number of trains (i.e. due to the lower total fixed costs) under regulated monopoly – the change in the number of trains ΔM is significantly negative and increasing in the maximum price p_c. Second, since the train departures are less frequent, the waiting costs are so high for some passengers that they stop using trains. Table 1 shows that the change in the number of customers ΔQ is significantly negative for all relevant prices. With increasing maximum price p_c, ΔQ first increases thanks to the increasing number of trains, and then decreases because of the increasing train fares. Each lost customer reduces the total welfare in the market by her reservation price which ranges from 100 to 200. And finally, the lower number of departures increases the total waiting cost of the remaining customers. The change in waiting cost ΔC is significantly positive and decreasing in p_c because of the increasing number of trains M.

Table 1. The effect of monopoly with regulated price – scenario 1

Duopoly	**mean W (s.e.)**	**mean M (s.e.)**	**mean Q (s.e.)**	**mean C (s.e.)**
	95.337 (2.378)	35.8 (2.25)	950 (23.5)	13,054 (1,034)
Maximum price	**ΔW (s.e.)**	**ΔM (s.e.)**	**ΔQ (s.e.)**	**ΔC (s.e.)**
$p_c = 10$	-38,768 (2,720))	-31.3 (0.76)	-274 (30.1)	33,004 (588)
$p_c = 20$	-21,278 (1,152)	-28.9 (0.73)	-124 (12.3)	33,004 (588)
$p_c = 30$	-9,703 (1,210)	-26.7 (0.73)	-61 (9.4)	27,935 (742)
$p_c = 40$	-6,607 (1,308)	-25.6 (0.74)	-55 (9.0)	24,117 (545)
$p_c = 50$	-2,931 (922)	-24.0 (0.74)	-55 (9.0)	20,040 (534)
$p_c = 60$	-1,516 (1,156)	-22.7 (0.81)	-65 (10.7)	16,089 (575)
$p_c = 70$	101 (1,179)	-20.3 (0.91)	-70 (10.9)	11,719 (487)
$p_c = 80$	400 (902)	-17.8 (0.88)	-82 (9.3)	7,661 (483)
$p_c = 90$	-2,237 (932)	-15.5 (0.83)	-116 (8.9)	4,182 (395)
$p_c = 100$	-7,616 (1,112)	-14.5 (0.81)	-172 (9.7)	1,861 (361)

Source: Author

Table 2 compares the market situations under duopoly and regulated monopoly in scenario 2 in which the reservation prices range from 100 to 400. Table 2 has the same structure as Table 1. The first row presents means and standard errors of total welfare W, number of trains M, total sales Q, and waiting costs C under duopoly. Compared to scenario 1, higher reservation prices lead to significantly higher total welfare, number of consumers, and waiting costs. The remaining rows show coefficients and standard errors of regression equation (1). In Table 2, I present only a part of the relevant range of prices. For the maximum prices p_c = {10, 20, 30, …, 170}, the changes in total welfare ΔW, the number of firms ΔM and customers ΔQ are significantly negative and increasing in the maximum price p_c. The change in the waiting cost ΔC is significantly positive and decreasing in p_c. The table presents more interesting price range from p_c = 180 to 300. The signs and trends of the coefficients are similar to scenario 1. What is important, the change in total welfare is significantly negative or not statistically significant for all maximum prices p_c with one exception. The change in total welfare is significantly positive for the maximum price p_c = 260.

Table 2. The effect of monopoly with regulated price – scenario 2

Duopoly	**mean W (s.e.)**	**mean M (s.e.)**	**mean Q (s.e.)**	**mean C (s.e.)**
	297,550 (2,982)	33.7 (0.08)	996 (4.7)	17,870 (1,550)
Maximum price	**ΔW (s.e.)**	**ΔM (s.e.)**	**ΔQ (s.e.)**	**ΔC (s.e.)**
p_c = 180	–11,138 (1,576)	–23.0 (0.99)	–4.25 (1.81)	32,784 (1,498)
p_c = 190	–8,404 (1,945)	–22.3 (1.00)	–4.95 (2.09)	29,128 (1,718)
p_c = 200	–6,560 (1,545)	–21.8 (0.98)	–7.05 (1.81)	26,099 (1,374)
p_c = 210	–5,160 (1,473)	–20.9 (0.96)	–6.05 (2.15)	24,176 (1,066)
p_c = 220	–4,060 (1,493)	–20.1 (0.99)	–7.25 (2.15)	21,893 (1,248)
p_c = 230	–1,408 (1,131)	–18.3 (1.00)	–11.2 (1.82)	16,174 (940)
p_c = 240	–389 (1,413)	–16.7 (1.00)	–14.1 (3.25)	12,683 (688)
p_c = 250	1,522 (1,176)	–14.6 (0.97)	–13.3 (2.52)	8,916 (583)
p_c = 260	2,550 (1,001)	–10.9 (1.10)	–12.2 (1.81)	4,575 (646)
p_c = 270	–114 (1,029)	–7.9 (1.09)	–21.5 (2.68)	1,347 (539)
p_c = 280	–3,606 (1,258)	–3.8 (1.08)	–28.5 (3.02)	–1,387 (546)
p_c = 290	–8,093 (1,375)	–0.62 (1.50)	–38.5 (2.56)	–3,214 (670)
p_c = 300	–9,237 (1,626)	–0.52 (1.39)	–42.3 (3.83)	–3,338 (696)

Source: Author

In both scenarios, the market situation under the maximum price that generates the highest total welfare under monopoly is characterized by a lower number of trains compared to the duopoly market. This increases total welfare because the total fixed costs are lower compared to the competitive situation. On the other hand, it leads to higher waiting costs and lower number of customers in the market.

4. Conclusion

The goal of the paper is to compare welfare outcomes under regulated monopoly and duopoly. In the model, operators adjust their prices and timetables in order to maximize profits. The findings therefore apply especially to unsubsidized markets and long-distance services, where net-cost contracts are preferred and the timetabling might be done by the operator. Using the model, the paper generates data for two different parameter combinations. The data suggest that for most levels of the maximum price, including the price of unregulated monopoly, total welfare under regulated monopoly will be significantly lower compared to the welfare under duopoly. At the same time, the data suggest that for a relatively narrow range of maximum prices, total welfare under monopoly may be comparable, or even higher than the welfare under competition. In this range of maximum prices, the number of train connections and the number of passengers using the monopolistic railway service is lower compared to the duopolistic market. Therefore, the paper suggests open-access policy might be preferable to competitive franchising with price regulation thanks to the effect of competition on the frequency of service, especially if the policy objective is not only to maximize welfare but also to increase the market share of railway passenger transport.

There are many opportunities for further research in this area. In order to get more reliable results, it would be useful to run simulations for more sets of parameter values. Furthermore, it would be beneficial to test the sensitivity of the results to changes in model assumptions. Most importantly, it would be interesting to test whether the findings of the model hold if the timetable is found using an entry algorithm instead of the exit algorithm used here. Furthermore, the paper presents only one of many possible application of the model. Most importantly, the model can be used for testing different types of monopoly regulations, or for evaluating specific franchise contracts.

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Economic Activity and Traffic Accessibility of the Vysocina Region Municipalities – Multi-Criteria Comparison

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Abstract

Economic activity is usually observed on the country or region level and it is measured using various indicators. Traffic accessibility is obviously not included but it can be the key factor for the development of the given area, for the employment and unemployment or for the higher number of enterprises. It is influenced by various factors like number of kilometers of roads, highways and railroads and also by travel times and number of public transportation lines or distance from the district center or from the center of the region. This article describes the analyses of selected municipalities in the Vysocina Region from the economic activity and traffic accessibility point of view using multi-criteria evaluation of alternatives methods. These methods can be used to find the order of the given alternatives according to the selected criteria and its weights. In this article we try to compare municipalities to find the problematic places in Vysocina Region and also to compare the situation of the municipalities according to the economic activity and traffic accessibility.

Keywords: Vysocina Region; economic activity; traffic accessibility; multi-criteria evaluation of alternatives

JEL Classification: C44, C67

1. Introduction

Vysocina Region is one of the 14th regions of the Czech Republic. It is situated in the center of the Czech Republic between Bohemia and Moravia. This region belongs to the agricultural and industrial ones but also to the poorer ones with lower wages. On the other hand it still has clean environment and it is not endangered by pollution. The number of inhabitants is about half a million – in this sense the region is third smallest among the Czech regions. 10% of inhabitants live in the region city Jihlava.

Comparion of regions is usually based on the economic factors like income of region, common expenditures (mainly transferred grants and subsidies, capital expenditures and expenditures of regional assembly, unemployment rate, ratio of economic activity, average wage, average age or the number of free workplaces. In this comparison Vysocina belongs to the worse regions (10th place) [9]. But if we would like to compare the municipalities we face the problem with the non-availability of data. We face the same problem with the measurement of traffic accessibility. The studies of traffic accessibility concentrate usually on the small area and they are created under the support of grants as the process of data collection is long and expensive. A big study of the accessibility of the employers in the district Bruntal (Czech Republic) was made under the grant of the Grant Agency of the Czech Republic [7]. Authors analyzed the situation of 302 municipalities on the basis of the public and private transport accessibility, time and kilometers distance from the main employers. For the comparison they used network and statistical analysis. One study using DEA model for evaluation of traffic and transportation system was made in China [15]. This study uses fixed assets investment and quantity of employee as inputs and passengers' volume, passengers' transportation volume, freights volume and freight turnover volume as outputs to evaluate the development of traffic and transportation in China's 31 province.

For comparison of regions or municipalities it is possible to use various kinds of techniques and methods such as multi-criteria evaluation of alternatives, statistical methods, econometric models or DEA models. DEA models are widely used in comparison of countries, regions or districts from various points of view. Except of our analysis mentioned above [9],

[10], Melecky and Stanickova [10] compared evaluated the performance of the four Visegrad countries and their NUTS 2 regions. Friebel and Friebelova [6] measured life quality in 14 Southwest Czech districts (LAU 1) by DEA using 4 inputs and 1 output. These articles are aimed at the measurement of competitiveness by economic and social characteristics or measuring of the life quality. Multi-criteria (or multi-objective) evaluation is also widely used as there are lots of methods for the comparison to find the order of the alternatives, to find the best alternative or to divide the alternatives into groups with good and bad ones. The methodology that can be used when comparing the municipalities is mentioned on the web [1]. Constantin et al [1] also mentions how to use the multi-criteria analysis to compare the municipalities from their property point of view.

In our analysis we decided to compare selected areas from the economic activity and traffic accessibility point of view. These two areas made two parts of the Ishikawa diagram of the potential territory development [12]. It is possible to compare 5 districts or all 704 municipalities in Vysocina Region. In the first case it is too little alternatives, in the second one there is a problem with data. So the ideal solution is to compare municipalities with extended competence called in Czech ORP (15 in Vysocina Region). These municipalities lie between the NUTS IV (LAU 1) – districts (5 in Vysocina region), and NUTS V (LAU 2) – municipalities (704 in Vysocina region). Figure 1 shows the Vysocina region and the ORPs.

Figure 1. Vysocina region and 15 areas with municipalities with extended competences

Source: [12]

In this first phase we have decided for the data envelopment analysis (DEA) not only to compare the selected areas but also to find which one is efficient [10]. In the next part, in this article, we try to compare the municipalities using multi-criteria evaluation of alternatives methods.

2. Material and Methods

According to the MCA (Multi-Criteria Analysis) [1], we have to go through these steps:

- Identifying the problem to be addressed
- Identifying the alternatives
- Identifying the criteria
- Scoring the alternatives in relation to the criteria
- Weighting the Scores According to the Weights Assigned to the Criteria
- Evaluating the Alternatives
- Ranking the Alternatives and Making a Recommendation

The first 5 steps belong to the phase of problem definition, the 6th and 7th steps are connected with the selected methods. Before we start the analysis we have to select the alternatives (municipalities with extended competences called ORP), the criteria and its weights.

In the Vysocina Region there are 15 ORP's to compare. As our analysis is aimed at the comparison from the economic activity and traffic accessibility point of view we have first specified the economic criteria and afterwards the criteria for the traffic accessibility description. For the method selection the aim for the comparison is crucial. If we need the order of the alternatives we can choose only among the methods that provide this. The importance of the criteria can be described by the criteria order or by criteria weights. To be able to change it slightly or to have the same values we prefer the weights. The methods that use criteria weights usually count utility function (WSA, AHP), distance from the best alternative (TOPSIS) or preferences (ELECTRE, PROMETHEE) [4]. The last category methods do not always achieve the order of alternatives and can be sensitive on dominated alternatives (those that cannot be on the first place). That is why we have used two methods from the previous two categories – TOPSIS and WSA - for the final order of the ORPs.

2.1 Alternatives and Criteria

According to the previous sections we compare 15 ORPs. First part of the comparison is aimed at the economic activity, the next part at the traffic accessibility.

As we have mentioned above the usual economic criteria like GDP or income and expenditures of the ORPs are not available. That is why we have to select other criteria that also describe somehow the economic activity of the ORP. To avoid the problems with different sizes of ORPs we prefer the relative types of criteria. The economic activity is influenced by the number of inhabitants in the age group 15-64, by the number of economic active inhabitants and also by the number of businesses and organizations (economic subjects) where people can work. The employment and unemployment rate are significant criteria for the comparison too. It is necessary that the selected criteria are not highly correlated as it can change the criteria weights (the correlation coefficient should be lower than 0.8). The selected criteria and their type - that means if we prefer higher values (max) or lower values (min) – are those:

E1: number of inhabitants 15-64 years old / number of inhabitants (max)
E2: number of economic active inhabitants / number of inhabitants (max)
E3: unemployment rate (min)
E4: number of employed / number of inhabitants 15-64 years old (max)
E5: number of economic subjects with less than 50 employees / 1000 of inhabitants (max)
E6: number of economic subjects with more than 50 and less than 250 employees / 1000 of inhabitants (max)
E7: number of economic subjects with more than 250 employees / 1000 of inhabitants (max)

In the Table 1 you can see all alternatives, criteria and data taken from the Czech Statistical office (year 2011). For the calculation we suppose the weights of the criteria to be the same as we think all of them are equally important. As the criterions E3 and E4 are highly negatively correlated it influences the weights (like we have the same information twice) and so we use only E3 criterion (but you will see that the impact is not so big).

The second part of our analysis is the comparison of the ORPs via traffic accessibility. This factor is given by the number and length of roads, number of bus or trains lines and the average travel times and also by the type of the means of transport people use and the ability and willingness to travel to work. Some of these characteristics are not available for the ORPs (number and lengths of roads), some will be available after our research via questionnaires by the end of this year. So in this article we compare ORPs only by following criteria:

T1: Number of lines to Jihlava from the ORP / 1000 of economic active inhabitants (max)
T2: Number of lines to the centre of ORP / 1000 of economic active inhabitants (max)
T3: Average travelling time to the centre of ORP in minutes (min)
T4: Average distance of municipalities to the centre of ORP in kms (min)

The travelling time and distances are not correlated. We use only these criteria as the ORP's centres (sometimes district towns) are more preferred for a working place than the

region town Jihlava but the number of lines from the ORP's centre can be also important. Special case is Jihlava itself where for T1 the urban mass transportation lines were included. Table 2 shows the relevant data, the weights here are supposed to be the same too.

Table 1. Alternatives, economic activity criteria and data

ORP	Crit.E1	Crit.E2	Crit.E3	Crit.E4	Crit.E5	Crit.E6	Crit.E7
Bystrice nad Pernstejnem	0,6817	0,4911	12,24	0,5976	84,92	0,5537	0,0503
Havlickuv Brod	0,6844	0,4955	8,57	0,6476	95,58	0,9655	0,2124
Humpolec	0,6687	0,4720	7,41	0,6498	97,38	1,5567	0,1730
Chotebor	0,6765	0,4921	9,43	0,6313	96,38	1,1899	0,1831
Jihlava	0,6951	0,5114	8,79	0,6535	92,28	1,3687	0,2451
Moravske Budejovice	0,6864	0,4911	13,88	0,5791	91,36	1,1848	0,1269
Namest nad Oslavou	0,6888	0,4724	14,10	0,5901	87,34	0,6600	0,0000
Nove Mesto na Morave	0,6790	0,4751	10,92	0,6200	90,82	0,7893	0,1052
Pacov	0,6648	0,5217	6,03	0,6394	89,79	1,3325	0,1025
Pelhrimov	0,6828	0,5185	6,18	0,6640	111,19	1,5397	0,2008
Svetla nad Sazavou	0,7010	0,5170	9,85	0,6251	93,69	1,1408	0,1488
Telc	0,6754	0,5044	11,27	0,6057	104,25	1,0739	0,0767
Trebic	0,6955	0,5157	13,10	0,6184	96,93	1,0346	0,1209
Velke Mezirici	0,6914	0,4697	11,51	0,6340	96,77	1,3593	0,1416
Zdar nad Sazavou	0,6861	0,5029	8,39	0,6538	97,66	1,1153	0,2091

Source: Authors, [14]

Table 2. Alternatives, travel accessibility criteria and data

ORP	Crit.T1	Crit.T2	Crit.T3	Crit.T4
Bystrice nad Pernstejnem	0,2050	1,4350	23	9
Havlickuv Brod	1,4420	0,4677	22	13
Humpolec	2,1986	1,2214	19	9
Chotebor	0,3720	0,9300	19	9
Jihlava	0,9985	0,2996	24	17
Moravske Budejovice	1,2064	1,2925	23	8
Namest nad Oslavou	2,0183	1,7079	18	8
Nove Mesto na Morave	0,2215	1,2184	22	10
Pacov	0,3929	2,3576	20	6
Pelhrimov	0,7746	0,5595	22	13
Svetla nad Sazavou	0,1919	0,9594	18	8
Telc	5,4745	1,5207	19	8
Trebic	0,9380	0,3908	28	15
Velke Mezirici	1,1456	0,8441	26	8
Zdar nad Sazavou	0,9702	0,5544	22	14

Source: Authors, [14]

2.2 Multi-criteria Evaluation of Alternatives

Multi-criteria evaluation of alternatives belongs to the category of discrete multi-criteria decision making models where all the alternatives ($a_1, a_2, \ldots, a_p$) and criteria ($f_1, f_2, \ldots, f_k$) are known. To solve this kind of model it is necessary to know the preferences of the decision maker that can be described by weights. We may find a lot of different methods – see [1], [4], [5], the two that we use are WSA and TOPSIS (reasons are described above).

WSA (Weighted Sum Approach)

One particular example of utility maximization methods is called WSA and it is based on assumptions of linearity and maximization of all the partial utility functions [4]. Therefore the

minimizing criteria need to be transformed into maximizing criteria. Then the decision matrix **Y** = (y_{ij}) is transformed into a normalized decision matrix **R** = (r_{ij}), in which all the elements use the same units of measurement:

$$r_{ij} = \frac{y_{ij} - D_j}{H_j - D_j}, \quad r_{ij} \in \langle 0;1 \rangle, \quad \forall\, i = 1, \ldots, p, \quad j = 1, \ldots, k, \qquad (1)$$

where r_{ij} denotes normalized value for the *i*-th alternative and *j*-th criterion, D_j – basal value, the worst possible value an alternative acquires in the *j*-th criterion, and H_j – ideal value, the best possible value an alternative acquires in the *j*-th criterion. Obviously, r_{ij} = 0 for the basal alternative, and r_{ij} = 1 for the ideal alternative.

The next step consists in calculation of the utility that can be cumulated from each alternative using the formula:

$$u(a_i) = \sum_{j=1}^{k} v_j \cdot r_{ij}, \quad \forall\, i = 1, \ldots, p, \qquad (2)$$

where v_j denotes corresponding element from the weight vector and r_{ij} denotes normalized value gained from previous step. Obviously, the alternative with the highest value of utility is considered compromise. In addition, WSA makes it possible to arrange all the alternatives with respect to their utility values.

TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution)

The output provided by TOPSIS is a complete arrangement of possible alternatives with respect to the distance to both the ideal and the basal alternatives incorporating relative weights of criterion importance. The required input information includes decision matrix **Y** and weight vector **v**. In addition, in the same way as in the WSA an assumption of maximization of all the criteria is true (otherwise it is necessary to make an appropriate transformation). This decision-making approach can be summarized in the following steps (detailed description of steps and notation in [4]):

- normalize the decision matrix according to Euclidean metric:

$$r_{ij} = \frac{y_{ij}}{\sqrt{\sum_{i=1}^{p} y_{ij}^2}}, \quad \forall\, i = 1, \ldots, p, \quad j = 1, \ldots, k, \qquad (3)$$

- calculate the weighted decision matrix **W** = (w_{ij}) = $v_j \cdot r_{ij}$, and from the weighted decision matrix **W** identify vectors of the hypothetical ideal **H** and basal **D** alternatives over each criterion
- measure the Euclidean distance of every alternative to the ideal and to the basal alternatives over each attribute:

$$d_i^+ = \sqrt{\sum_{j=1}^{n} (w_{ij} - H_j)^2} \quad and \quad d_i^- = \sqrt{\sum_{j=1}^{n} (w_{ij} - D_j)^2}, \quad \forall\, i = 1, \ldots, p, \qquad (4)$$

- for all alternatives determine the relative ratio of its distance to the basal alternative:

$$c_i = \frac{d_i^-}{d_i^+ + d_i^-}, \quad \forall\, i = 1, \ldots, p, \qquad (5)$$

- rank order alternatives by maximizing ratio c_i .

3. Results and Discussion

The first part of our analysis takes into account the comparison of the economic activity of the ORPs. We have used two methods – TOPSIS and WSA – as the final evaluation for each alternative lies between 0 and 1 and so we are able also to form clusters with similar results. Table 3 shows the ranking of all ORPs by both methods and also one possible distribution into clusters for each method (both without E4 criterion but with this criterion the TOPSIS order is

the same, the WSA slightly different). The winner of the analysis is the ORP Pelhrimov which has the high employment rate, high number of economic subjects in the category with less than 50 employees and also with more than 50 and less than 250 employees. The unemployment rate is the second lowest among other ORPs. The second place is not the same – TOPSIS method evaluated Humpolec to be the second ORP, WSA Jihlava. The result of WSA is influenced mainly by the criterion E2 where the percentage of economic active inhabitants from the productive age group is 47% for Humpolec and 51% for Jihlava – but according to the WSA rules after normalization of this criteria (transfer to the scale 0-1) Humpolec has only 0.04 but Jihlava 0.8. TOPSIS method rates better the variability of each criterion that is why we prefer the results of this method. Humpolec is on the second place primarily because of the highest number of economic subjects with less than 50 employees, relatively low unemployment rate but also because of the fact that in other criteria has better values than average. It can be caused by good location – in the centre of Czech Republic near the highway D1 that connects two biggest Czech towns Prague and Brno. Jihlava is on the third place as it has the highest number of economic subjects with more than 50 and less than 250 employees and also with more than 250 employees. Jihlava itself is the region city and that is why it is a place with more possibilities to work. When we think about the clusters Humpolec has similar conditions as Jihlava, Zdar nad Sazavou and Havlickuv Brod while Pelhrimov is better than these ORPs. Except of Humpolec all the other places are district towns. The last district town is Trebic which is nearly the worst one. It has nearly the same percentage of inhabitants of productive age and also the same percentage of economic active persons as Jihlava and it is better in number of economic subjects with less than 50 employees than Jihlava but it has very high unemployment rate and low numbers of higher economic subjects. It means that there are no possibilities to work and so people starts to carry businesses on their own.

At the end of the table and worse than Trebic there are two ORPs – Bystrice nad Pernstejnem and Namest nad Oslavou. Both are very far from region town Jihlava and on the border of the Vysocina Region with the South-Moravian Region. Both have very high unemployment rate, lower percentage of employed in productive age group and very small number of economic businesses with more than 50 employees (Namest has no company with more than 250 employees). So these are the places that should be supported and subsidized.

Table 3. Results for the economic activity comparison

Alternative	TOPSIS ranking	TOPSIS results	TOPSIS clusters	WSA ranking	WSA results	WSA clusters
Pelhrimov	1	0,88805	1	1	0,86990	1
Humpolec	2	0,77563	2	8	0,52685	4
Jihlava	3	0,76452	2	2	0,73161	2
Zdar nad Sazavou	4	0,73328	2	4	0,63874	3
Havlickuv Brod	5	0,70049	2	5	0,56763	3
Pacov	6	0,66800	3	6	0,56334	3
Chotebor	7	0,64647	3	9	0,52504	4
Svetla nad Sazavou	8	0,56388	4	3	0,66042	3
Velke Mezirici	9	0,48437	5	10	0,48129	5
Nove Mesto na Morave	10	0,38861	6	13	0,29648	7
Telc	11	0,36401	6	11	0,47970	5
Moravske Budejovice	12	0,34617	6	12	0,40460	6
Trebic	13	0,34405	6	7	0,54775	4
Bystrice nad Pernstejnem	14	0,20141	7	14	0,21902	7
Namest nad Oslavou	15	0,03937	8	15	0,15217	8

Source: Authors

The next part of the analysis is concentrated on the traffic accessibility of the ORPs. Because of the lack of data we have tried the comparison with only 4 criteria. The results (Table 4) show that it is not enough and it will be necessary to add some more. The negative effect can be seen on the district towns that are all on the bottom (Havlickuv Brod, Pelhrimov, Zdar nad Sazavou, Jihlava, Trebic). It is because of the fact we do not have data about the lines inside the towns and about the number of people travelling to work by different means of transport. The

area of these ORPs is higher and so the travelling time to the ORP centre is higher too. Passing over these facts Trebic is still the worst one.

But from the results we cannot say that the traffic accessibility like this has the impact on the economic activity. It is visible on the order of Namest nad Oslavou, the poorest place with economic activity but here we have it on the second place. There are enough lines to Jihlava or Namest nad Oslavou itself and the travelling time is not so high in comparison with other ORPs (this ORP area is one of the smallest). The best ORP in this category is Telc, UNESCO monument. Thanks to this fact there are more lines going to this place – but it does not influence much the economic activity of the ORP (11th place). Only Humpolec is on the top of both results. It is caused by the closeness to the D1 highway that influences traffic accessibility and economic activity too. For the better analysis the criteria about the number of highways and road going through the ORP's area should be added as well as the percentage of the people travelling to work inside the ORP or outside (and outside the region).

Table 4. Results for the traffic accessibility comparison

Alternative	TOPSIS ranking	TOPSIS results	TOPSIS clusters	WSA ranking	WSA results	WSA clusters
Telc	1	0,82422	1	1	0,82788	1
Namest nad Oslavou	2	0,54704	2	2	0,71205	2
Humpolec	3	0,50683	2	4	0,61378	3
Pacov	4	0,47238	2	3	0,70951	2
Moravske Budejovice	5	0,39487	3	6	0,49818	4
Svetla nad Sazavou	6	0,38092	3	5	0,53470	4
Chotebor	7	0,36164	3	7	0,49193	4
Bystrice nad Pernstejnem	8	0,33802	4	8	0,44537	5
Velke Mezirici	9	0,32520	4	10	0,36583	5
Nove Mesto na Morave	10	0,31926	4	9	0,42212	5
Havlickuv Brod	11	0,29485	4	11	0,32050	6
Pelhrimov	12	0,25258	5	12	0,30006	6
Zdar nad Sazavou	13	0,25132	5	13	0,28598	6
Jihlava	14	0,17288	6	14	0,13818	7
Trebic	15	0,12368	6	15	0,09185	7

Source: Authors

4. Conclusion

Vysocina Region is one of the smallest regions in the Czech Republic and one of the poorest ones. According to the economic activity of its ORPs we can say that the ORPs with bigger towns (especially with district towns) or those lying near the D1 highway are the better ones. This fact correspond with frequent idea that the bigger the town is the higher number of jobs offers and also that the existence of highways near town attracts infrastructure development. The smaller ORPs on the border of this region with no big businesses have higher unemployment rate and so its economic activity is worse. The traffic accessibility comparison shows that it is necessary to add more criteria to have better results. From the current results we cannot say that the better traffic accessibility has positive impact on the economic activity. As nowadays we carry out the survey of the conditions connected with travelling to work we hope we obtain the missing data to have the analysis more predicative.

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Technical Efficiency of Selected Private Hospitals in Slovakia

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Abstract

Paper used Data Envelopment Analysis to study technical efficiency of selected private hospitals in Slovak republic. Datasets consisting of data coming from four private health care facilities entered analysis. Input variables included in analysis were the number of doctors, number of nurses, number of other personnel and material costs. Output variables were number of treatment days, occupancy of beds and number of patients. We found that upon Data Envelopment Analysis, most common problem seems to be overstaffing of particular private hospitals in Slovakia. We also observe necessity of the material costs reduction in health care facilities.

Keywords: DEA; technical efficiency; private hospital; health care

JEL Classification: I10, I19

1. Introduction

Wide debate about setup of the health care market is nowadays present in societies. Transformation of health care market in central Europe seems to be inevitable, because of necessity of its´ efficiency. Lack of financial resources has led to fact that medical interventions and medicaments have become partly charged, health insurance has been more and more assured by private institutions and hospitals have become stock companies. State hospitals are largely in debt. On the other hand, private hospitals are able to create profit. State owned hospitals are mainly in debt because of fact that they cover technologically and medically challenging problems. By contrast, private hospitals are able to adapt and modify its supply to market needs.

Efficiency of healthcare facilities is a crucial factor that can lead a healthcare system to economic efficiency. In this paper we look closer on technical efficiency of chosen private hospitals in Slovak republic using Data Envelopment Analysis (DEA). DEA is one of the mostly used methods to assess the technical efficiency of enterprises. Its basic idea consists in enveloping positions of the monitored entities with line called efficiency frontier. All entities not present at this line are considered as inefficient. This method does work under the condition that at least two entities must be compared and at least one of them is always effective. It lies on the efficiency frontier. Others may be inefficient and inefficiency is then measured as the distance from the efficiency frontier. DEA is widely used to assess the technical efficiency of services providing enterprises [7]. DEA includes several types of models, the most used models are:

- DEA BCC (Banker, Charnes, Cooper) [3] - assumes that the studied units, also called DMU - Decision Making Units (DMU), have variable returns to scale. Also efficiency frontier has convex or concave shape.
- DEA CCR (Charnes, Cooper, Rhodes) [5] - DMU monitored in accordance with this model have constant returns to scale. All efficient DMU therefore lie on a straight line.
- Additive DEA model - previous models can be further divided into input and output models. Input models change just inputs and outputs are unchanged, in order to achieve efficiency, output models works vice versa. Additive model combines the input and

output models and therefore, calculate how to change specific inputs and outputs simultaneously.

Non-parametric DEA models were used separately to evaluate the efficiency of hospitals in many European countries, for example in Finland [10], Portugal [1], Spain [21], Germany [11], Austria [12], Ukraine [18], but also in Czech Republic [8].

Literature shows that the efficiency of hospitals is perceived by authors diversely and has been studied from different perspectives. Schiavone [20] performed DEA analysis on data coming from Italian public hospitals over the period 2000-2004. He showed that competitiveness between health care providers led to higher levels of efficiency. Kazley and Ozcan [13] used DEA to study impact of electronic medical record on hospital efficiency. They found no evidence of efficiency shift caused by implementation of electronic medical record. Kittelsen and Magnussen [14] found on dataset from Norwegian health care market evidence of strong economies for surgical and medical services and intermediate for inpatient and outpatient production. Prior and Solà [19] found using DEA that majority of hospitals in Catalonia may improve their efficiency and reduce their costs by diversification to the output-mix offered. Clement et al. [6] in cross country study using DEA found out that lower technical efficiency is associated with poorer risk-adjusted quality outcomes in the study hospitals. Zavras et al. [22] showed that health care centers with higher technological infrastructure exhibit higher efficiency and centers which cover populations from 10000 to 50000 are the most efficient. Asmild el al. [2] using DEA point out that different hospitals may have different optimal sizes, or different efficient modes of operation, depending on the location, the population they serve, and the policies their respective provincial governments wish to implement. Dlouhý et al. [8] run analysis on dataset of Czech hospitals and propose improvements to given hospital based on DEA. Linna et al. [15] point out differences in the average hospital efficiency between Finland, Norway and Sweden. Here Finland is the most efficient country in term of average hospital efficiency. For more background information, see O'Neill et al. [17].

Regarding the monitoring of hospitals´ efficiency in Slovak republic, there is to our knowledge only one study of this kind [9] which examined technical efficiency of inpatient sections in Slovak hospitals. The study evaluated sixty Slovak hospitals based on 2005 data and followed as the input - number of doctors, nurses and the average number of beds and as the output - number of completed hospitalizations and days of treatment using the DEA. Measurement of medical facility efficiency is also discussed in the study of Boďa and Roháčová [4], who investigated the number of beds per one medical position and average length of stay to the number of hospitalized and deceased per one medical position, while efficiency was examined and evaluated at the district level in 2009, using the model of DEA. Based on the above mentioned, it can be concluded that in the Slovak Republic, the issue of evaluating the efficiency of hospitals or other medical facilities is rather scarce.

2. Material and Methods

In our research, we assessed the technical efficiency of the monitored entities using the CCR and BCC models, though we focused only on the input models, because the output variables are hard to regulate by hospitals. Therefore, we carried out also analysis by the additive model. We summarized the outputs of the analysis in the Table 2.

Researched subjects were four private Slovak hospitals. We decided to do not mix public and private hospitals mainly because of fact that DEA is highly sensitive to selection of input and output variables and number of variables [16]. Also, when comparing private and public hospitals, assessment of the efficiency could be distorted as a result of another type of management. To protect sensitive data, the hospitals were not named. For purposes of analysis, we entitled them Hospital A, Hospital B, Hospital C, Hospital D. Researched hospitals provided data for five years in the period of 2007 to 2011. To calculate the dynamic development of efficiency we used the way that each Decision Making Unit (DMU) in each year is treated as an individual DMU.

To evaluate the efficiency using the DEA method it is necessary to choose the input and output variables. Based on the examination of foreign and domestic literature, *we used as an input variables number of doctors, number of nurses, number of other personnel and material costs, while number of treatment days, occupancy of beds and number of patients were used as an output variables.*

Number of doctors, number of nurses and number of other personnel are labor inputs that reflect the absolute number of employees in a particular hospital in a given year. Material costs represent total costs used for all necessary medical and non-medical material in a given year in Euro. Inputs can include other variables, such as number of beds. This variable is, however, very difficult to adjust by hospital, since in most cases the number of beds is regulated by health insurance companies. The output variable number of days of treatment represents the total number of days of hospitalization in year. Variable bed occupancy represents the percentage of occupied beds to the total number of contracted beds in the hospital in a given year. The variable number of patients shows the number of patients for all hospital patients each year. Values of examined input and output variables are shown in the Table 1.

Table 1. Variables

Hospital / Year	Input Variables				Output Variables		
	Number of Doctors	Number of Nurses	Number of other Personnel	Material Costs in €	Number of Days of Treatment	Bed Occupancy in %	Number of Patients
A_{2007}	155	313	458	4 526 887	108 772	80,51	16 131
A_{2008}	160	318	457	4 470 690	103 208	77,85	15 959
A_{2009}	164	319	451	4 531 724	101 857	75,88	16 796
A_{2010}	166	321	449	4 642 493	94 746	72,35	16 697
A_{2011}	166	322	452	4 920 414	88 469	71,77	15 921
B_{2007}	44	136	183	1 542 787	58 106	75,40	9 500
B_{2008}	48	145	184	1 546 894	57 808	75,40	9 328
B_{2009}	52	147	184	1 720 280	57 282	75,40	10 014
B_{2010}	52	147	185	1 840 869	56 326	74,70	10 132
B_{2011}	55	143	182	1 785 050	49 436	69,60	9 908
C_{2007}	73	267	304	2 056 040	98 584	61,70	12 354
C_{2008}	73	274	327	2 659 433	100 383	62,00	12 872
C_{2009}	69	250	263	2 767 076	99 395	62,20	12 327
C_{2010}	66	254	253	2 898 101	98 620	62,10	12 193
C_{2011}	80	238	203	3 305 538	89 283	66,30	11 663
D_{2007}	70	208	248	1 853 000	83 388	75,9	10 874
D_{2008}	74	224	297	2 385 000	87 004	77	11 930
D_{2009}	82	230	304	2 705 000	95 231	74,9	13 614
D_{2010}	87	228	333	2 862 000	96 819	77,7	14 243
D_{2011}	82	219	265	2 698 000	89 332	77,8	12 491

Source: Authors

3. Results and Discussion

Cooper et al. [7] argues that each DMU efficient by the CCR model is effective also by the BCC model, but the reverse implication is not true. This was also confirmed in our case. This fact results from a concave / convex shape of the efficiency frontier. Each DMU is then easier to get on the efficiency frontier. According to the CCR model, none DMU (hospitals) was technically

efficient during the entire five years period. Hospital B and C were technically inefficient only in 2008. Hospital D was technically effective only in 2007. The worst results had hospital A, where the rate of technical inefficiency was worst during all five years and it has been worsened during the whole period.

Table 2. Data Envelopment Analysis

DMU	Input CCR efficiency	Input BCC efficiency
A_{2007}	0,81337	1
A_{2008}	0,75963	0,93217
A_{2009}	0,75376	1
A_{2010}	0,74464	0,9938
A_{2011}	0,70783	0,9073
B_{2007}	1	1
B_{2008}	0,99735	0,99735
B_{2009}	1	1
B_{2010}	1	1
B_{2011}	1	1
C_{2007}	1	1
C_{2008}	0,97103	1
C_{2009}	1	1
C_{2010}	1	1
C_{2011}	1	1
D_{2007}	1	1
D_{2008}	0,92542	1
D_{2009}	0,9746	1
D_{2010}	0,9939	1
D_{2011}	0,98635	1

Source: Authors

According to the BCC model, in 2007 and 2009, Hospital A was technically effective and the level of technical efficiency was better in the remaining years much more than in the case of CCR model. The Hospital B according to BCC model was technically inefficient in 2008. All remaining observed hospitals were effective in every year according to BCC.

For the results of our research it is important to know the specific recommendations of each model. To assess the need for changes in the values of the inputs there are two approaches. The first one is based on the assumption that it is possible to change the value of only one of the inputs, and other inputs remain unchanged and DMU becomes technically efficient. The second approach points to the fact that technical efficiency can be achieved by changing the individual inputs simultaneously. Table 3 shows the required change of inputs by CCR.

If we use the approach ceteris paribus, then the most needed change consist of lowering the number of doctors and nurses in Hospital A. In 2007, it was necessary to reduce the number of doctors by 46,86% and in 2011 by about 55,58%. The percentage reductions need for nurses was not as needful as doctors; it ranged around 19% to 30%. Hospitals B and C needed to reduce number of nurses and doctors much less. Hospital D in 2008 needed to reduce the number of doctors and nurses by about 8%. The need for reductions of nurses fell to 1,36% in 2011, but the need to reduce the number of physicians has increased to 20,55%. The largest percentage of reduction in terms of number of personnel and material costs had to be done also in Hospital A. The percentage reduction need for other personnel was from 2007 to 2011 about 25% to 32%. In the case of material costs, these figures ranged from 36,2% to 47,45%. Hospital B was in these

two indicators (other personnel and material costs) almost perfectly fine, but Hospital C had slightly higher percentage of necessity to change the number of other personnel in 2008. In the last observed year, Hospital D was quite good in terms of the number of other personnel, but Hospital D needed to either reduce material costs by 10,19% or number of doctors by 20,55%.

Table 3. Required change of inputs by CCR

CCR								
	Ceteris Paribus				Simultaneous change			
DMU	Number of Doctors	Number of Nurses	Number of Other Personnel	Material Costs	Number of Doctors	Number of Nurses	Number of Other Personnel	Material Costs
A_{2007}	-46,86%	-18,66%	-25,20%	-36,20%	-28,20%	0,00%	-6,54%	-17,54%
A_{2008}	-51,15%	-24,04%	-28,87%	-38,71%	-27,12%	0,00%	-4,84%	-14,67%
A_{2009}	-52,57%	-24,62%	-28,26%	-39,81%	-27,94%	0,00%	-3,64%	-15,19%
A_{2010}	-53,41%	-25,54%	-28,37%	-41,59%	-27,88%	0,00%	-2,83%	-16,06%
A_{2011}	-55,58%	-29,22%	-32,15%	-47,45%	-26,36%	0,00%	-2,93%	-18,24%
B_{2008}	-8,33%	-6,21%	-0,54%	-0,27%	0,00%	-5,94%	-0,28%	0,00%
C_{2008}	-2,90%	-4,56%	-13,17%	-2,90%	-8,07%	-1,67%	-10,28%	0,00%
D_{2008}	-8,33%	-7,46%	-9,14%	-7,46%	0,00%	0,00%	-1,69%	0,00%
D_{2009}	-12,61%	-2,54%	-2,54%	-6,18%	0,00%	0,00%	0,00%	-3,64%
D_{2010}	-15,73%	-0,61%	-8,43%	-10,18%	0,00%	0,00%	-7,82%	-9,57%
D_{2011}	-20,55%	-1,36%	-1,36%	-10,19%	0,00%	0,00%	0,00%	-8,83%

Source: Authors

If we want to achieve technical efficiency by combined reduction of inputs, then Hospital A did not have to change the number of nurses in any year of research. Optimal combination of input reduction was for example a reduction of doctors by 26,36%, reduction of number of other personnel by 2,93% and the reduction of material costs by 18,24% in 2011. Values were also similar for other years. Model recommended in 2008 to reduce the number of nurses in Hospital B by almost 6% and the number of other personnel by 0,28%. For Hospital C the recommendation for 2008 was to reduce the number of doctors by about 8%, to reduce the number of nurses by 1,67% and to reduce the number other personnel by 10,28%. In 2008, Hospital D should reduce the number of other personnel by nearly 2% and in 2009, by nearly 4% of material costs. In 2010, it was necessary to reduce the number of other personnel by almost 8%, while material costs by almost 10%. In the final observed year it was needed to reduce material costs by nearly 9%.

Table 4 depicts the option where only one input is about to change. If we want to change the value of only one input, the most significant reductions was needed in Hospital A. Hospital needed to lower the number of doctors by 15,29%, or material costs by 17,69%, in 2011. Hospital B needed to reduce number of doctors by more than 8%. The need to reduce number of nurses in 2011 was also high. To achieve technical efficiency it was necessary to reduce the number of nurses by 9,27% in Hospital A. Hospital D needed to reduce number of nurses by 6,21%, in 2008. In 2011, there was necessity of changes in Hospital A which concerned other personnel and material costs. Hospital B contrary did not needed any changes.

In case when we want to achieve technical efficiency by combined reduction of inputs, we can mention only the increased need to reduce number of doctors in Hospital B by 8,07% in 2008, and necessity of reduction of material costs in Hospital A by about 8,5% in 2011.

Table 4. Required change of inputs by CCR

	BCC							
	Ceteris Paribus				Simultaneous change			
DMU	Number of Doctors	Number of Nurses	Number of Other Personnel	Material Costs	Number of Doctors	Number of Nurses	Number of Other Personnel	Material Costs
A_{2008}	-10,61%	-6,84%	-6,78%	-7,20%	-3,82%	0,00%	0,00%	-0,41%
A_{2010}	-2,18%	-1,11%	-0,62%	-2,90%	-1,56%	0,00%	0,00%	-2,28%
A_{2011}	-15,29%	-9,27%	-9,27%	-17,69%	-6,02%	0,00%	0,00%	-8,42%
B_{2008}	-8,33%	-6,21%	-0,54%	-0,27%	-8,07%	-5,94%	-0,28%	0,00%

Source: Authors

4. Conclusion

Proposed analysis can bring actions to amend the processes of hospitals in the future by historical data and to look at it as the analysis of trends. The unsatisfactory results of Hospital A may result from its status. It's a hospital that is slightly specialized and provides health care at the higher level than other hospitals researched. We assume that in order to maintain its high standards of health care services, it requires for its operation higher amount of inputs. Some of the models recommended too extreme reduction of inputs. This reduction could cause the inability of hospitals to provide health care. We are inclined therefore to models that reflect the simultaneous change of input factors. Hospitals should streamline the purchase and use of materials needed for its functioning. It is necessary to find cheaper, but equally high quality suppliers, in order to avoid deterioration of the quality of health care. Here, electronic auctions become to be standard in term of procurement.

Authors are conscious about necessity to confront public and private hospitals in future and to set up benchmark for each type of hospitals.

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The Public Policy and the Business Environment

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Abstract

This study assesses the importance of the public policy in helping businesses by creating relevant motivating environment for them. To understand entrepreneurship, to support and stimulate it properly, public policy aim is to create a dynamic environment, which ensures that people can start new ventures and subsequently develop these ventures to become high-growth businesses. To promote business environment is quite complex. Cohesive and pervasive approach used in presented study derives from social qualitative research and includes broad spectrum of elements that interconnects public with private sector and spans all aspects of entrepreneurs´ needs. Based on empirical study, in-depth semi-structured interviews among the entrepreneurs, the article finds out how businesses perceive their surrounding environment, especially how do they perceive public policy influence in that respect. Our attention was drawn to sample firms, though the business environment seemed comparatively disadvantaged, it allows businesses to act. We detect increasing attention devoted to business environment in the public sector in the course of time.

Keywords: Public sector; public policy; business support; business environment

JEL Classification: P35, R11

1. Introduction

The public policy is complex and faces serious demanding goals. Public policy options depend on many factors, like the strength of role of the government. Many areas of public policy affect businesses – regulatory policies, system of laws, regulatory measures, courses of action, funding priorities, trade policies, labor market policies, regional development policies, social policies, education policies, and even gender policies.

Czech state government has set objectives as a strategic priority with concrete policy measures and targets. An increasing amount of attention is being paid to areas of the entrepreneurship policy framework, support of education system and women and innovative entrepreneurs support.

Every day, policymakers at the state and local levels make decisions that have implications for the livelihoods of businesses. Businesses are generally viewed as an engine of technological progress and economic growth. Hence, the paper focuses on one single impact aspect of public policy - the business environment.

1.1. Objective

To examine the nature and specific expression forms of relation between public policy and enterprise are necessary in order to reveal how these views may affect or enhance public policy practice and theories. The intention is to analyze empirical ties and to demonstrate it by empirical study. By conceptualizing different approaches the critical approach has been generated. Deep research in this area is necessary because of its impact on the economic development of regions and public sector knowledge management. [3]

Entrepreneur and his business should be the focal point of research within the public sector. The challenge is to understand the needs of entrepreneurs. The company is a point where social and economic processes are meeting. Hence there comes an urgent need to address this issue in the framework of public sector. [4]

The purpose of this paper is to assess the importance of the public sector and the public policy in helping businesses by creating relevant environment for them. Intention is to find out whether entrepreneurs are supported and motivated enough to start new business and subsequently develop these to become high-growth businesses. Promotion of business environment is quite complex we need to know how businesses themselves perceive public policy.

1.2. Definitions and theoretical background

Entrepreneurship is a system that includes businesses (entrepreneurs), institutions, public sector actions and the desired public policy outcomes. Desired outcome of public policy is increased level of business activity. [1] Role of state government is to foster stimulating conditions to enable businesses to be successful in their efforts. In order to do this, the system of public policy must logically focus on all parts of the individual entrepreneurial process from awareness of the entrepreneurship option to early stage survival and growth of an emerging company. Apart from the work of the European Union and the Organization for Economic Cooperation and Development, few researchers have focused on the topic of public policy to promote business and create relevant environment for them.

In the contemporary science there is a secondary role that is given to the micro-level, and to the importance of the personality of the entrepreneur and his business. Our objections are divided into theoretical and methodological.

From the methodological point of view, the question is how to determine conclusively the role and importance of the public policy on behavior and economic competitiveness of the enterprise. It is either the one having a decisive primacy and fatal impact on the business or the business is subordinated to public policy. [5] To differentiate and resolve this we need to take both the business sciences and public sector sciences into consideration.

A key element of the endogenous approach is the effort to change the atmosphere in the region, to form environment properly, to motivate entrepreneurs, to strengthen their confidence, an effort to arouse positive expectations, create a partnership with public sector. This effort should start to strengthen mechanisms of public sector positive feedback. [10] [11]

Study held by Vrije Universiteit, Amsterdam examines company's perception in relation to its environment – state, taxation system, insurance system, competitors, suppliers, human resources, etc. Vaessen identifies ties existing inside environment, whereas environment influences businesses and at the same time businesses respond to environmental forces, both obstacles and opportunities. Sociological qualitative method of study allows identifying main characteristics of the business environment. [12]

Original theory is in decline and gradually there come new theories in order to take their place. In response to these opinions new approaches have developed behavioral theory which is able to overcome gaps in existing public sector theories. [6]

We can follow the research trend accentuating endogenous approach. Such a direction draws attention to the entrepreneur, his actions and decisions, which in turn affect the atmosphere in the business environment, enhance business confidence and leads to economic growth.

A general feature of current public sector theories is a deflection from the concept of exogenous development towards the endogenous development [2]. New approaches emphasize the role and quality of the human factor, his communication skills, decision-making and innovative thinking. Researching marginal phenomena in their particulars and perception of their volume opens us new perspectives in public sector policies and in its exploration. Public policy gives incentives to support businesses and these have subsequently demonstrated ability to react on public policy applied. Policy makers and scientists can learn from this rising phenomena.

2. Material and Methods

2.1 Research problem statement

To understand their effects on small businesses, it is necessary to understand the relationship between public policy and business and the way businesses evaluate it. This allows us to understand whether policymakers across all levels consider the impact their decisions on a range of business activity issues are likely to have.

In the process of discovering the role of public sector, there remain unanswered questions. What is the importance of public sector in creation of the environment in which the company operates? Which processes take place in interaction between businesses and its environment and are they impacted by existing legislation and public government policy?

We consider the public policy regulatory system that businesses are facing within the entire environment. We need to identify structural and functional characteristics of the businesses being concerned with behavioral aspects of the company and the public sector. Increasing complexity and differentiation of decision-making processes in companies make it necessary to include in theoretical concepts organization patterns.

From the methodological point of view, the question is how to determine conclusively the role and importance of the company environment on behavior and economic competitiveness of the enterprise.

2.2 Method

Research is based on qualitative research method. Qualitative research is the process of searching for the essence, based on different methodological traditions, exploring the social or human problem. Researcher creates a complex, holistic picture, analyzes the different types of texts, informing about the views of the respondents. For qualitative research it is typical that hypotheses are generated only during the research, trying to understand a new problem.

The reason for choosing qualitative examination method is that this area is quite complex. It involves the collection and analysis of qualitative data. The main intention of the method held was an in-depth insight that has been applied. It was an empirical study of 54 enterprises. The task was to explain how businesses perceive public policy aiming towards them. This required explorative approach.

2.3 Collection and analysis of data, anonymity and confidentiality

The procedure of empirical data collection: respondents were recorded and then the text has been transcribed literally. 200 pages of text have been obtained. The research has been carried out during the past 5 years, mapping 30 years of the development of individual enterprises. The empirical study surveyed 54 companies.

Data were obtained by interviews with managers or owners of businesses. Interviews were designed to map area of public sector and local government, public policy approach was emphasized. Interviews aimed at entrepreneur relationships towards public sector, dynamics and causal mechanisms of relations.

There were an informal semi-structured dialogs. Set was the framework of interview, questions aimed to the company surrounding environment. The aim was to crystallize the situation which demonstrates relation between public sector and enterprise. What kind of decisions do entrepreneurs take in relation to public sector? How are they manifested externally? What do they think is the situation in the local governance? What are the problems forming business environment? How was it perceived by the company management, and what is the response back to the public sector?

The interview searched for external links and moments particularly affecting relations between company and public sector. Questions were aimed to identify the idea of starting a business (where, when, why), they developed gradually as a manger described the development of business activities.

To achieve confidentiality there have been removed all names and there has been given the identification codes, then companies were numbered (01, 02, 03…54).

In order to get statistically representative sample, the number of SMEs in the Czech Republic and in Pardubice region was found out and SMEs were selected and divided by the sector. Investigated companies are in the Pardubice region, the examined companies sample corresponds by its number, industry and structure to NACE classification (Tab. 1).

Table 1. SME structure according to NACE classification in Pardubice region

Code	Section	SME number in Pardubice region	In %	Corresponding SME number	SME involved in empirical study
A	Agriculture, forestry and fishing	46	4,07 %	2	2
B	Mining and quarrying	0	0,01 %	0	0
C	Manufacturing	284	24,88 %	13	16
D	Electricity, gas, steam and air conditioning supply	10	0,84 %	0	1
E	Water supply; sewerage; waste management and remediation activities	5	0,42 %	0	0
F	Construction	199	17,48 %	9	10
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	300	26,28 %	14	15
H	Transporting and storage	29	2,58 %	1	1
I	Accommodation and food service activities	49	4,27 %	2	2
J	Information and communication	23	2,05 %	1	1
K	Financial and insurance activities	10	0,86 %	0	0
L	Real estate activities	7	0,59 %	0	0
M	Professional, scientific and technical activities	93	8,17 %	4	5
N	Administrative and support service activities	29	2,51 %	1	1
O	Public administration and defense; compulsory social security	6	0,53 %	0	0
P	Education	15	1,29 %	1	0
Q	Health and social work activities	13	1,12 %	1	0
R	Arts, entertainment and recreation	9	0,75 %	0	0
S	Other services activities	15	1,29 %	1	0
T	Activities of households as employers; producing activities of households for own use	0	0 %	0	0
U	Activities of extraterritorial organizations	0	0,01 %	0	0
Total		114 072	100 %	54	54

Source: Author based on Czech statistical office

All collected text has been organized. Gained empirical study text has been analyzed, selected by sentences and their meaning and integrated and then it has been grouped properly. Subsequently, the data were processed and strongest relations of dependence were identified and analyzed.

Three hypotheses were designed to represent pervasive statements and to be appropriate in relation to recent theoretical outcomes:

A: Local government creates sufficient stimulation to support our business

B: We have obtained financial support to fund our business

C: Existing legislation and standards mean no serious obstacles to our business.

The text confirms or refutes identified hypotheses. Statements were grouped accordingly to hypotheses A, B, C. In the case the meaning of the text was positive; it has been assigned value of 1. In case the meaning of the text was negative, it has been assigned a value of 0. (Tab. 2)

Table 2. Prevalence of positive public policy perception

	Number of companies	in %
A: Local (public) government creates sufficient stimulation to support our business	26	48
B: We have obtained financial support to fund our business	15	28
C: Existing legislation and standards means no serious obstacles to our business	32	59

Source: Author

3. Outcome of Empirical Research and Discussion

Obtained study text is a rich source of data showing in-depth picture of the analyzed problem. In order not to go beyond the relevance of the theme, we have condensed and focused on following outcomes. By processing there have been found and described the strongest dependencies: 26 companies (entrepreneurs) out of 54 total (48 %) states, that local government creates sufficient stimulation to support their business. 15 companies (entrepreneurs) out of total 54 (28 %) states, that they have received financial support to fund their business. 32 companies (entrepreneurs) out of total 54 (60 %) states, that the existing legislation and standards means no serious obstacles to their business. (Tab. 2)

In the Pardubice region the local government level authorities have mostly surveillance function. Funding level is generally state level, like Ministry of Industry and Trade, Ministry of Labor and Social Affairs, Ministry of Regional development, etc. On the government level there are policy measures to promote entrepreneurship.

Entrepreneurs have expressed positive perception of existing Czech-Point network, cooperation with Chamber of Commerce, promotions including radio and newspaper webcasting, television programs and campaigns, entrepreneurs´ awards, publication success stories in magazines, subsiding events, conferences, fairs, policy forums, helping community organization, sponsoring events that profile businesses and provide start-up information.

Research has confirmed awareness of entrepreneurs of non-profit agencies. CzechInvest as the investment and business development agency contributes to attract foreign investment and to develop Czech companies, provides services and development programs. The government faces challenges in evaluating the impact of policies geared towards showing higher levels of business activities. The main priority of this body is a reduction in the administrative burden of businesses.

Types of measures can be sorted as follows:

- Public policy - opportunities: Entry barriers deregulation, technology transfer, access to foreign markets, procurement regulation,

- Public policy - capital: Loans, venture capitals,
- Public policy - abilities: Education, infrastructure (public and private)
- Public policy – incentives: Income taxes, Social security, administrative burden, labor market regulation, bankruptcy regulation, motivation.

Research has showed critical aspects of public sector influencing businesses and creating relevant business environment, which should for instance encourage people to consider starting business as an option. It is not surprising due to complexity of trying to understand precisely how to influence business environment. Public policy to promote entrepreneurship is complex, it will likely have some difficulty determining role in these areas. Many areas of government policy affect businesses by regulatory policy, social policy, trade policy, labor policy, regional development policy. As local government applies more surveillance function, government should adopt more horizontal structures for developing and implementing an integrated policy approach. The mix of policy options will depend on a number of factors. [1]

Businesses are obviously constrained by environment impacted by public policy. We detect increasing attention devoted to business environment in the public sector in the course of time. Dependencies between public sector and businesses are often reciprocal and sometimes indirect.

Some negative feedback and obstacles to businesses has been expressed, in order to be complete, they are stated below:

- I am owner of a funeral service and must own at least one vehicle and two burial transport coffins or transport bags more than equals the average daily need, at least 2 vehicles and 4 transport coffins or transport bags. The state seems to have the same demands on vehicle reliability of my funeral services as for ambulance services.
- When we were in a boom we faced shortage of drivers, we could benefit from the free movement of labor within the EU and hire a driver from Slovakia. Foreign drivers must apply for a Czech driving license, because the Czech driving license is linked to the digital tachograph, which tracks the driving time and rest periods for drivers. But they must have a residence in the Czech Republic for more than 185 days per year.
- We are engaged in construction and we often manipulate with the soil. Waste Act does not apply to excavated soil that meets pollution limits. There is absence of regulations. We must dispose excavated soil, which can be any environmentally clean, as waste. I have to pay extra waste fee.
- The law requires me as entrepreneur to keep records of quality inspections that took place on my premises. Doing duplication of authorities' evidence seems to me absurd.
- I paid notary fee depending on the type of my company. Establishment or cancellation of the legal form of the company must be done by a notary. Method of calculating the remuneration of the notary is particularly absurd. The total paid amount depends not on the number of pages or actual time spent on this work, but on total registered capital. Company with higher capital therefore pays more, although the text is absolutely identical.
- Fluctuation at workers´ positions is quite high. I am obliged to notify every vacant job including its characteristics within ten days to the job center. And immediately I must also notify when the position is occupied again.
- I went abroad to visit a fair but the Trade Act indicates, that I am obliged to notify 3 days in advance my intention to Licensing Office and not doing this I am practically breaking the law. Given the absurdity of this obligation is not so surprising that this obligation is not respected.

4. Conclusion

In this article, we have considered the existence of one aspect of public policy aiming at businesses while creating a kind of "business environment" for them. Perception about what Public Policy towards Business Environment should have been derives either from the theoretical, conceptual frameworks or from findings of research on the experiences and needs of businesses. [7]

In relation to public policy, what can be learned from the counterfactual businesses in the examined sample? They have proofed an ability to exist in environment of state regulation system and to maintain their competitiveness. Regional policy has been aimed to improve input conditions to companies.

In attempting to discover and evaluate the business environment, our attention was drawn to sample firms. Though the business environment could seem comparatively disadvantaged, firms´ stock of assets, (experience, skills, knowledge, adaptability, finance…) allows management and owners of the business to act.

A route suggested for attempting to support businesses rests on this pillar: business conditions deserve careful attention from policy-makers. The presence of facilities would ensure that it is in accordance with idea expressed by Blažek [2] about endogenous development promotion. He poses that a strategy of endogenous development must also embrace a strategy aimed at the elimination of obstacles existing in the business environment. Meeting several requirements for relevant factor conditions in a policy region is more important than developing one particular to its optimum. Many policy measures can be designed to realize extra-regional expansion of locally bound businesses.

Presented study is in accordance with Vaenessen "reactive company". There exist environmental conditions to which businesses respond or by which they are affected. This can be point of departure for the future studies of how businesses react in order to reach economic growth. The results provide grounds for the strong link between firm and environment and for greater emphasis on the ways in which businesses may counteract environmental conditions. [12]

The government and administrative structures must be developed as multi-level systems transmitting powers between local, regional, sub-national, national and supranational levels. The existing (government) institutions need to be gradually reorganized. The new structure of public sector has to stimulate new forms and instruments of public policy, which ensures to combine endogenous and exogenous forms. [8] [9]

The policy that is aiming at stimulating the regional level of entrepreneurship needs patience and a long-term orientation. These issues should be the main starting points for a policy that would like to stimulate new businesses formation. Future research should focus on at least two questions. First, what kind of measures would be appropriate for stimulating a business environment? Second, what type of public policy would be suited for improvement of business environment? To promote potential for businesses, governments should support and increase a country's ability to compete on knowledge, new ideas, and the ability to adapt and find new solutions for problems.

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The Efficiency of Contracting-out Local Public Services

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Abstract

Under contracting arrangements, a government retains responsibility for providing a service, but hires private firms to produce and deliver it. The theory of contracting suggests that, provided certain conditions are met, contracting out has the potential to improve efficiency without sacrificing quality, compared to direct supply by public organizations. In developed countries, contracting out can sometimes improve the performance of the public sector. In countries making the transition from socialism to market-based economies, the situation is much more complicated.
The study examines the experience with contracting out among municipalities with focus on the Slovak conditions. Despite some methodological problems, the data suggests that externalization of production (i.e., contracting out) generally delivers neither improved efficiency nor quality compared with internalized production (direct provision of public goods and services by governments). Although the data overall supports the case for internalization, it also reveals examples of effective contracting, thereby indicating the potential value of contracting if it is properly implemented. The possible policy responses to the current situation are also offered.

Keywords: Contracting; efficiency; local public services; Slovakia

JEL Classification: H49

1. Introduction

Contracting out public services is a market-type solution to alleged problems of inefficiency in the public sector. Under this arrangement, which is most commonly found at the local government level, government retains responsibility for provision of the service, but hires private firms to produce the service [1]. Contracting can also be defined as a binding agreement in which a public institution pays a private firm or non-profit organization to provide a specific level and quality of public service. Citizens as customers, through their taxes or user fees, pay the government, which in turn pays the contractor. According to Savas [2], since the provision function is retained by the government, contracting represents a conservative approach to increasing the role of the private sector.

Contracting out stems from the "organizational decision to make or buy a good or service" [3]. Modern public organizations are expected to decide whether to produce goods and services internally or to contract them out. The guiding principle behind the choice is to increase efficiency, while maintaining or increasing the quality of delivery of a public service [4-5].

The potential beneficial impacts of contracting are connected mainly with increasing individual choice, and improving cost-effectiveness, quality and equity ([6-8] and many others). Such potential has not been fully confirmed by hard data, however, and many empirical studies (e.g. [9]) cannot even confirm the effect of the mode of production on costs, which has been the main positive argument for contracting. Moreover some authors stress the barriers to effective contracting as well as the negative impacts connected with the use of competition and contracting ([6], [8], [10-11] and many others). Lowery [12], for example, discusses three types of quasi-market failure, two of which (market formation failure and preference error) are closely connected with contracting out. Market formation failure results from a lack of competition, often due to the small number of potential suppliers for many public services. If privatization merely substitutes a private monopoly for a public one, then savings will likely disappear after the initial contract. Preference error failure is connected with limited information, and one of its dimensions (principal-agent theory) is discussed below.

According to Prager [3] the general rule of public sector organization is to "internalize operations to the point where the costs of further expansion are perceived to be greater than the costs of acquiring the components or services in the market" [3]. In addition, production should be internalized when there is a need for close control of the production process.

The theoretical basis for assessing the potential of contracting out in developed countries comes from both management sciences and the new institutional economics [13]. The latter views governmental decision makers as self-interest seeking individuals, working in an environment in which information asymmetry, bounded rationality and opportunism leads to problems of transaction costs and agency costs.

In the following text we briefly introduce two core theoretical concepts important for evaluating the potential of contracting out: principal-agent theory [14-18] and the theory of transaction costs [3], [19-20].

1.1 Principal-agent theory and contracting

Establishing and maintaining a legal contractual relationship between principal and agent is connected with many problems and risks. According to Shetterly [21], this process occurs in three phases: pre-solicitation, contractor selection and contract management. All of these phases may be connected with classic "principal-agent" problem situation in which the relevant characteristics and actions of agents are not directly observable by principals. Arrow [14] notes two subsets of the principal-agent problem: "moral hazard or the problem of hidden action and adverse selection or the problem of hidden information."

Moral hazard can occur in contracting because the behavior of the private partner is imperfectly controlled. When behavior is imperfectly controlled, it creates a situation where either shirking in performance of duties or inappropriate actions by the private partner adversely impacts the goals of the public partner.

In the adverse selection problem, the private firm has some information that is not shared with the public sector organization and uses that information to make decisions that affect the public organization. The public organization, however, cannot check to see if the information is serving the public interest. For example, consider a public sector organization that wants to hire the best private partner. The private firms bidding for the contract know more about their own qualifications than the public sector organization ever will, and this information asymmetry may render impossible a full ex ante evaluation of the private offers. Bailey [6] examines the effects of such public services contracting problems.

According to More, "The principal must weave these interrelated components into a contractual framework that, in mitigating the informational asymmetries and structuring rewards, prompts the agent to behave as the principal himself would under whatever conditions might prevail" [17].

1.2 Transaction costs and contracting

The transaction costs associated with contracting out and the relationship of these costs to benefits derived from external delivery are essential elements of the contracting relationship. When contracting for services, governments incur contracting costs which are implicitly or explicitly part of the make or buy decision. The transaction costs of contracting are of two types: "those associated with the contract formation stage and those associated with the contract performance stage" [20].

Changing service delivery from public production to contracting out involves changes to both production and management systems, all of which entail transaction costs. These changes require establishing new performance criteria, constructing monitoring systems, changing job responsibilities, and reducing the number of public employees. Activities such as crafting requests for proposals, establishing systems and protocols for reviewing proposals and selecting vendors, crafting contracts, negotiating with vendors, and installing contract monitoring systems must be undertaken before the internal delivery system can be taken off-line. These transaction costs are important to the make or buy decision. Different services have different levels of

transaction cost factors, in part determined by asset specificity and ease of measurement explained by the transaction cost theory noted above.

1.3 Research goals

To summarize, we may argue that the relevant literature suggests that if and only if the contracting is properly implemented, it may (but need not) improve cost-effectiveness and quality of provision of public services. The goal of this paper is the attempt to measure efficiency of contracting in Slovakia on the sample of municipalities by multicriteria analysis – the MBVI method, used to construct composite efficiency scores. Based on our findings, we formulate conclusions and research implications.

2. Material and Methods

This paper is the part of our long term research concerning the processes and results of contracting in our conditions (about ten samples starting from 2000). In most of our previous papers we used economy (costs) criterion to evaluate results from contracting. For the purposes of this paper we undertook specific targeted research on the situation in 2010. The representative research sample covers 139 out of almost 2900 Slovak municipalities across different size categories (such split is expected to help to obtain more detailed picture and does not impact representativeness of results). We focused on a core sample of local public services - maintenance of local communications, maintenance of public lighting technical infrastructure, management of cemeteries, waste collection and waste disposal, and management of public parks and green areas.

Compared to the simple costs analysis in our previous samples (Table 4), in this study we also used the method of best values of indicators (MBVI) for the evaluation of efficiency.

We have chosen three indicators of evaluation as efficiency benchmarks in our analysis (similarly to many existing studies, mentioned above and also to follow methodology used in our previous research):

1. The costs of service delivery per inhabitant (we assume that all municipalities follow the same service standard).
2. The unit costs of service delivery (Table 1).
3. The quality of service.

Table 1. Unit cost indicators for selected local public services

Service	Calculation unit
Waste	1 metric tonne of waste
Public lighting	1 light point
Communications	1 km of communications
Public green areas	1 m^2 of public green areas
Cemeteries	1 grave place

Source: Authors

For local public services we have to acknowledge that measuring the quality of a service is generally much more difficult than measuring the quality of a good. Service quality may be identified in terms of performance characteristics, but their assessment may require subjective judgments. It can be measured through user satisfaction, but this is subjective because individual opinions on what constitutes a high standard of service quality may vary from one user to another.

To cope with this problem as well as possible we follow the research methodology of several existing studies in this area [22]. The citizens' satisfaction with local public services is the measure of local public services quality in these studies. Data on service quality were provided by the users, the citizens of different municipalities, through a questionnaire. The

samples are non-representative (total 1410 persons interviewed), so we accept that our summary data are partly preliminary. Citizens evaluated local public service quality using the following scale:

Absolutely satisfied	100 %
Satisfied	80 %
More satisfied than unsatisfied	60 %
More unsatisfied than satisfied	40 %
Unsatisfied	20 %
Absolutely unsatisfied	0 %

To calculate MBVI we assigned weights (vj) to the indicators (Table 2). To set the weights we used Saaty`s method [23] with inputs from a panel of ten experts on contracting in both countries.

Table 2. Weights (vj) for used indicators

Indicator	vj %
Unit costs of service delivery per inhabitant	30
Unit costs of service delivery per service outcome	30
Quality of service	40
Σ	100

Source: Authors

2.1 Research results

The basic research results for our sample are very similar to previous findings (see for example [24]) and findings of other authors in our conditions [25-28]. Table 3 indicates the scale of contracting out. Larger municipalities contract more frequently and it is again confirmed that the most frequently contracted service is waste management.

Table 3. Percentage of contracted out local public services

Service	Number of inhabitants						Non-weighted average
	less than 999	1000 - 4999	5000 - 9999	10000 – 19999	20000 - 49999	more than 50000	
Waste	93.94	79.00	52.94	45.45	71.43	100.00	73.79
Public lighting	48.48	55.00	56.25	27.27	71.43	83.33	56.96
Communications	42.42	68.00	31.25	18.18	57.14	66.67	47.28
Public green	6.06	4.00	12.50	36.36	64.29	83.33	34.42
Cemeteries	0.00	5.00	25.00	54.55	7.69	50.00	23.71
Average	38.18	42.20	35.59	36.36	54.40	76.67	

Source: Authors

Table 4 provides summary data on the efficiency of contracting out (efficiency is measured as the ratio of the cost of outsourced services to the cost of internal delivery, expressed as an index number). As in previous studies there is no clear, common picture for either the selected services or the municipal size categories.

Table 4. Efficiency of contracting, internal form = 100%

Service	Size categories by number of inhabitants						Non-weigted average
	Less than 999	1000 - 4999	5000 - 9999	10000 - 19999	20000 - 49999	more than 50000	
	Costs of service delivery per inhabitant						
Waste	43.43	54.41	82.29	113.89	129.33	266.61	114.99
Public lighting	105.58	162.18	97.81	60.93	69.76	156.11	108.73
Communications	133.53	35.15	27.29	25.92	58.49	25.70	51.01
Public green	268.18	79.58	23.59	108.26	89.68	124.94	115.71
Cemeteries	(-)	381.74	105.37	37.06	143.33	47.16	142.93
Average	137.68	142.61	67.27	69.21	98.12	124.10	
	Unit costs of service delivery						
Waste	31.19	198.44	63.14	3.91	204.26	(-)	100.19
Public lighting	92.81	90.21	49.30	64.59	103.94	133.63	89.08
Communications	228.60	79.99	425.43	233.87	459.64	200.62	271.36
Public green	186.08	0.51	1.20	41.46	143.19	162.01	89.08
Cemeteries	(-)	11.07	83.93	413.19	1.18	110.84	124.04
Average	134.67	76.04	124.60	151.40	182.44	151.78	

Source: Authors

Table 5 presents the results of the quality assessment/comparison of contracting-out and internal delivery arrangements for the selected municipalities. Table 6 provides the final calculation of the total efficiency of selected modes of delivery of local public services in analyzed municipalities using the MBVI method for three selected indicators (maximum = 100 points). In 15 cases internal delivery looks to be the better solution and in 10 cases it is contracting-out. Overall average results favor internal delivery, except for the public lighting.

Table 5. Quality of delivered services – citizen satisfaction in %

Service	Service delivery alternative	Number of inhabitants						Non-weighted average
		less than 999	1000 - 4999	5000 - 9999	10000 - 19999	20000 - 49999	more than 50000	
Waste	internal	66.00	74.00	67.00	63.00	72.00	0.00	57.00
	contract	68.55	71.00	59.00	77.00	66.00	71.00	68.76
Public lighting	internal	63.29	65.65	72.00	56.00	67.00	70.00	65.66
	contract	69.94	71.80	59.00	68.00	70.00	76.00	69.12
Communications	internal	64.84	49.56	50.00	51.00	50.00	50.00	52.57
	contract	49.74	48.56	54.00	40.00	47.00	40.00	46.55
Public green	internal	62.97	63.37	66.00	79.00	61.00	90.00	70.39
	contract	68.50	52.00	62.00	53.00	62.00	57.00	59.08
Cemeteries	internal	67.78	71.41	67.00	75.00	71.00	75.00	71.20
	contract	(-)	62.66	71.00	61.00	67.00	65.00	65.33

Source: Authors

Table 6. Eficiency of contracting - multidimensional evaluation

Service	Service delivery alternative	Number of inhabitants						Non-weighted average
		less than 999	1000 - 4999	5000 - 9999	10000 - 19999	20000 - 49999	more than 50000	
Waste	internal	100.00	96.73	100.00	100.00	74.55	(-)	94.26
	contract	60.90	100.00	87.83	66.33	100.00	(-)	83.01
Public lighting	internal	100.00	94.51	100.00	100.00	100.00	84.33	96.47
	contract	95.56	100.00	90.68	71.60	90.24	100.00	91.35
Communications	internal	52.80	100.00	100.00	95.40	84.67	99.03	88.65
	contract	100.00	75.15	97.63	100.00	100.00	100.00	95.46
Public green	internal	69.55	100.00	100.00	100.00	94.48	67.86	88.65
	contract	100.00	68.98	48.62	97.51	100.00	100.00	85.85
Cemeteries	internal	(-)	99.50	100.00	86.04	100.00	100.00	97.11
	contract	(-)	100.00	94.37	100.00	79.34	91.73	93.09

Source: Authors

3. Results and Discussion

The data collected by all previous studies [29-32] and also the data from this project support following statements:

- Contracting out in transitional conditions delivers less positive outcomes compared to the expectations in the existing literature, which assumes standard market and social conditions.
- The direct supply by public organizations in transitional countries may in many cases be more efficient and of higher quality compared to outsourcing.

However, we need to be aware of several methodological problems connected with our research. There are too many extreme values in our tables with findings in this given sample – the same problem has been visible for older samples. We decided not to exclude extreme values, because they do not change our results – all our samples show that the only appropriate conclusions would be that the results of contracting between municipalities vary and depend not so much on the organizational form of delivery, but on other factors, especially the quality of decision-making and contract management on the level of public organizations. We already continue our research to obtain more comprehensive and representative information on this.

Concerning the reliability of the data, and the reliability of the research methods, we are also aware about several problems. One important issue is the limited reliability of data collected from municipalities. Their cost monitoring is not sophisticated. They do not use accrual accounting and so cannot know the real cost of service delivery. With internal service delivery, the reported service costs only cover direct costs and so are likely to be too low. In fact there is no full cost accounting at the local self-government level in Slovakia, and this devalues the cost data on internal service delivery. A second data problem is the fact that some of the selected municipalities use a mix of internal and external production for service delivery. In such cases we asked for data about the dominant delivery form.

The methodological reliability issue is that the results could be sensitive to used benchmarks (but we did not have better choice) and the assumed weights. Concerning weights we have confidence in the experience of the expert panel, and the data from tables clearly indicate that different weights would not change the result that, on average, internal production is cheaper and delivers comparable quality.

4. Conclusion

The theory of contracting suggests that contracting out has the potential to improve efficiency as long as certain conditions are met. Because several socio-economic preconditions for successful contracting are insufficiently mature in transitional countries, contracting delivers less positive outcomes and internalization may be a desirable decision.

The core part of our paper tests the above conjectures using concrete data from Slovakia. The data base is formed from a new survey for 2010, supplemented by earlier data collected by the authors.

Simple cost comparisons for older samples and multidimensional analysis for the new sample, processed by the method of best values of indicators, deliver similar pictures. Contracting out is a very common solution in municipal practice, for example dominating practice for waste management services in both countries. However, the efficiency of contracting measured by three indicators (per capita costs, unit costs and quality) is limited – or better to say, there is no evidence that contracting improves local public service delivery as the rule.

The final part of our paper identifies the key factors responsible for the empirical findings. It is visible that a lot needs to be done in the area. Most important possible policy responses include increased competition and transparency, the implementation of regular testing of all current arrangements for public service delivery, the introduction of accrual and full cost accounting into the public sector, improved control, and effective training of public servants in modern public management methods.

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Socioeconomic Attributes of Social Services

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Abstract

Social services, their form and frequency of use in society are a phenomenon whose significance is beyond all doubt in the present day. This phenomenon attracts the attention of economists, doctors, sociologists, social workers, family members and a number of other actors encountering the objective need to care for their fellow citizens who – for various reasons and to varying degrees – cannot do so themselves. This article is based on the results of theoretical research work and its aim is to draw attention to the social and economic aspects influencing the effectiveness of the social services. It also seeks to map the links between the various ostensibly discrete concepts that make up the mosaic of determinants of the social services' effective financing and provision.

Keywords: Social services; health services; non-profit sector

JEL Classification: I310, H800, H00

1. Introduction

The focus of the paper's attention, i.e. the social services, will be scrutinised from their microeconomic characteristics and macroeconomic performance. This perspective encompasses the economic approach, i.e. the question of the costs of the social services and their effectiveness. Economic calculation and the properties of the social services upon exchange are key components of this approach. However, in the context of the national economy the social contexts of the question of the accessibility of social services in the population and the broader results of consumption of social services in the form of increased welfare, wellness and well-being are also important. That accords with the need for a positive perception of old and disabled citizens in society [1].

The analysis is also based on the idea that the accessibility and quality of the social services is important from the point of view of humanity and the dignity of life in modern society. Consumption of social services is not just a superior option, it is – in many cases – a general ethical imperative. Currently, when there is a pressure to reduce a number of areas of life to simple economics, this ethical and humane aspect of the provision and consumption of social services needs to be strengthened substantially. Selective calculations of costs and returns must therefore be complemented by monitoring of the actual social situation of those who are dependent on the social services. That can be done in the form of proven subjective satisfaction with the state and standard of the provision of social services, combined with an objective assessment of these people's medical and social situation.

2. Material and Methods

This paper is not seeking to provide an exhaustive or encyclopaedic overview of current theoretical knowledge, at the same time it utilizes theoretical analysis of the social services as a socioeconomic goods. During the research the theoretical heuristics of these findings were filtered primarily in terms of their significance for analysis of the specifics of social care as a subgroup of the social services. The results of the theoretical analysis could also help understand the causes for a number of more general problems in the Czech social services sector. This is also consistent with the author's research area that has been rooted in theoretical analysis of social services and social policy concepts – in this sense this paper can be seen as a continuing

development and contribution of this knowledge. That applies to economic findings, where the article utilises a number of published socioeconomic analyses and models (most notably [2-4]), but also to the social policy view of the problems of social services, where the article is based on the definition of social policy in the broader sense as activities designed to bring about the desired working of social systems [5-8].[1]

3. Results and Discussion

In a market economy, the social services are an economic (precious) good with a non-zero production price. They can be classified in terms of the economic criterion at consumption [10]. As they do not satisfy the characteristics of pure public goods (non-excludability from consumption, non-reducibility), they can be economically classified among "mixed" public goods, provided they are provided in the defined quality. One typical phenomenon with mixed public goods is the "overload effect", which occurs when growth in the number of users of the mixed collective good is accompanied from a particular moment by a change in the quality of the good. This also happens in social services (one example may be care in homes for seniors, where growth in the number of clients may mean a fall in quality for each of them). Some forms of social service provision of can also be classified among private goods, most notably individualised transactions offered by private profit-making providers and "tailor-made" for individual clients who pay for them with their own money.

It is a methodologically useful approach to classify goods in terms of the institutional criterion, as Bénard did when he classified them from the point of view of their financing as non-market, impure market and market [2].

Table 1. General classification of goods in terms of the institutional criteria

Category of goods	Existence of market negotiation and market prices	Discriminatory state intervention
Market goods	yes	no
Impure market goods	yes	yes
Non-market goods	no	yes

Source: [2]

This classification makes it possible to differentiate the character of a good in terms of financing (allocation), whereby a good is understood by Bénard as market if there is a market price resulting from the interaction of supply and demand in a competitive market and private financing; in the opposite case it is non-market.

In practice, individual social services can be ranked in all three categories in terms of the institutional criterion, but it depends on the given country's specific conditions. The services of public-owned and publicly funded old people's homes may be an example of a non-market good. Here there is no market negotiation and the state fixes the price on the basis of a costs calculation. One example of an impure market service may be a caring service, whose funding in the Czech Republic is tied to a contribution towards the care (currently at four different levels based on the degree of disability). Here the client demands a social service and a private entity supplies it – there is some form of negotiation here, but its price and also accessibility are influenced by the state (through institutional regulation or specific subsidising). Lastly, social services provided outside the state-regulated and supported system of social services, i.e. on a purely private basis, may be an example of market services.

In this context one should mention the basic classification of expenditure on social services – private expenditure (based on an individual's decision) and public expenditure (based on public choice). It is obvious that the two types of expenditure display radically different characteristics. Seeing that imprecise definitions of these two concepts are commonplace, even

[1] Research behind this paper served also as a theoretical background for empirical analysis of social services in the Czech republic [9].

repeatedly cropping up in research results (e.g. funds paid through public health insurance are treated as the capital of public health insurance companies and some citizens even regard them as "their money"), we consider it necessary to define these terms at least in rough outlines.

Private expenditure is dependent on the individual responsibility and the individual's approach to his social situation. Without doubt, though, it is also dependent on the individual's disposable means, i.e. the limitations of his budget. From the individual point of view, one property of private spending on social services is that at the time of consumption of a social service the individual typically is not generating the means to finance it. Indirect financing mechanisms, such as the finances of other entities (e.g. the financing of social services in the context of solidarity within the family) or the spreading of financing over time, are therefore used to resolve these situations.

At the same time, private expenditure presupposes a specific person who is able to decide, continually, regularly and rationally, on the basis of his own rational economic deliberation. The methodological anchoring of private investments (expenditure) in the individual's decision-making is so strong that it serves as the foundation for the entire economic allocation and its mechanisms of effectiveness based on individual preferences.

Private expenditure enables individual to decide autonomously, but – and this needs to be stressed – only within the limitations of his budget. The rationally acting individual has to respect this limitation even when there is a justified need for social services. That is one of the reasons for the existence public expenditure.

In social policy, public expenditure is part of the concept of the welfare state [11] and is based on the principles and procedures of public economics. The fundamental question in connection with public expenditure is whether the state itself provides the social services or whether it guarantees the accessibility of social services for the population through the allocation of public funds mandated by the legislative rules for the use of such funds. In the concept of public spending social services are, in model terms, provided free of charge at the point of service.

Public expenditure primarily requires the existence of a policy of social services that will reflect society's priorities on the basis of the democratic process and civil society. According to public funding concepts, the individual/citizen should, instead of making his own rational decisions, opt to engage and participate in these policies so that they faithfully reflect social preferences, whose character at any given time is defined and determined by democratic consensus. Social institutions and the policymaking process [6] are thus equally crucial to the performance of public expenditure as the determination of the individual's priorities is for private expenditure – with the understanding that public spending accents a non-discriminatory approach to policymaking allowing every citizen to participate.

Public spending on social services is differentiated according to the specific system of financing. Typically, however, they are tied to the magnitude of public budgets, which is expressed as a ratio to gross domestic product. We may regard this budgetary restriction as a limit that has to be respected at a pan-societal level, because not even volume of public funds is unlimited. That may be a risk, because savings drives can reduce this expenditure below an adequate level; theoretically, however, sufficient funds also may be spent without any link to their effective use.

Both forms of expenditure and the means of financing (private, public) have advantages and disadvantages. It is clear that an inclination to one or the other type of financing is also a question of political and ideological preferences, but there are also economic analysis approaches that objectivise the different financing mechanisms in connection with the method and mechanism by which funds are spent. The resulting variant is thus typically a tree of the priorities we hold when designing the system and our preferences as regards the target state.

It is obvious that casting doubt on one or the other type of expenditure is an easy business if we focus on the disadvantages that are rooted in them. Whenever private financing runs up against social exclusion of low-income population groups or market failure or when public financing does not respect individuals' priorities we can say that one or the other type is bad. And the problem is, understandably, that although both approaches may be justified to

some degree, their implementation is fundamentally differentiated as far as the specific instruments used are concerned. The declared goals of the social services tend to be the same whether they are privately or publicly funded, but the proposed instruments are incompatible or compatible only with difficulty.

One fundamental difference between private and public expenditure is the mechanism for defining the quality of the financed service. The allocation of private funds is conditional on both participating parties' willingness to effect the transaction. That is why its character and quality is determined by the intersection of supply and demand. There is no general standard whose criteria should be satisfied by the transaction. Although that makes possible high-quality services provided that the demanding party demands it and the supplier is willing and able to supply such a service, it also makes possible a poor quality of services if, for example, both parties accept it at the price of low cost. In the consumption of social services that may come into conflict the professional standards. For that reason there are typically statutory terms prescribing the minimum attributes of such transactions. By contrast, public expenditure is capable of specifying and financing a certain public minimum standard. Its quality is thus determined by the public interest.

The division of expenditure into public and private does not mean that the two should be separate in practice. Of course they should be separate in accounting and substantive terms. It should be clear what is covered by public funds and to what standard, what the citizen co-finances privately and what standard applies for those who decide not to contribute private funding. But it is becoming increasingly evident that the goal can only be reached by a combination of the two types of financing. The following section will look at the implications this has for the financing and organization of the system.

From the economic point of view, social services providers can be classified into four categories and can also draw on various sources of financing. That is shown in Table 2.

Table 2. Relationships between the financing and provision of social services

Financing method/Provider	Public	Volunteer	Private	Informal
Tax – public funds	Hierarchic structures, internal quasi-market	Services bought by the state – external quasi-market		Subsidies/support to carers
Voluntary solidarity		Charitable support to volunteers	Payment of care for clients	
Employers		Support for volunteer organisations		Support for people caring for relatives
Private	Payments for public services	Payments for the services of volunteers	Market exchange	
Individual non-cash help	Voluntary work in the public sector	Volunteers taking part in care		Help from the family, friends, neighbours

Source: Author based on [5]

The table reveals a number of links to the analysis of the economic nature of the social services themself. Let us now focus on those links that are the most relevant from the point of view of economic analysis.

First, there is the interaction between public providers and public funds, which functions on the principle of hierarchic structures. That paves the way for motivational and monitoring strategies based on an organisational/command mechanism, but these have one fundamental drawback, especially as regards individuals' decision-making: they do not function autonomously, particularly with regard to economic rationality. It therefore cannot be assumed that people will follow these strategies of their own volition or that they will behave according to these strategies if some existential pressure is placed on them. These strategies presuppose two basic links – to a knowledge of the logic and mechanisms of the system's working and to the participating entities' value systems and motivational preferences.

In the case of the organisational/command mechanism, effectiveness is thus achieved by defining and subsequently monitoring goals and rules. An external entity is necessary to define these rules and subsequently monitor whether the practical exercise of a particular activity genuinely corresponds to them. It is also a good idea to define certain indicators that can be used to monitor, perhaps indirectly, the quality and costliness of the performed activities. As the character of services is not primarily determined by an individual's demand, accessibility and quality standards have to be defined.

However, economic theory and experiences with centrally planned economies reveal these approaches' general limitations. For that reason, principles of cooperation, plurality, competition and quasi-competition in the public sector are being increasingly asserted in contemporary public economics; in certain cases, these principles can provide effectiveness better than directive allocation and central planning. The distribution of funds to non-profit entities is also the subject of analysis. Optimisation thus becomes a question primarily of the effective use of a defined quantity of public funds. Preserving public funding for certain goods and services and simultaneously improving the effectiveness of allocations in the public sector with the help of the latest findings of public economics is part of the subtext of these allocation schemes. One outcome is that the allocation of public funds in the first row of the table is shifted towards other providers that will be able to use them more effectively than the state and its organisations.

Second, there is market exchange, i.e. the interaction of private funds between the supply and demand sides. In the market mechanism, it is competition that controls whether a certain entity is behaving rationally in economic terms. In other words, the activity of one entity acts as a control as to whether another entity is ineffective in its activity. In this context microeconomic theory provides a detailed apparatus for analysing benefit, price fixing and rational use of production factors and also describes various deformations in the competition environment cause this mechanism of the indirect control of the rationality of allocation to fail (e.g. monopolies, various oligopolies etc.). The price system works as an information system for participating entities [12].

What is more, this type of motivation is capable of overcoming, for example, racial [13] or social [14] prejudice, which is a highly useful property in the social services. It is thus possible – besides ethical motivation stemming from humanism and altruism – to increase motivation for the regular provision of social services based on contractual freedom and individual decision-making, accompanied bz adequate regulation of behaviour and position of the actors in the whole system.

Analysis of goods in the field of social services has already led to the deduction that each of the said types of interaction has its disadvantages. For that reason, we find in practice a broad range of combinations of social services financing and providers, especially if legislation has put in place an level playing-field for their providers. These can be classified into the boxes of the above table.

We have already shown that the economic and social specifics of the social services mean that providing them on a market basis, i.e. as the outcome of the intersection of market supply and demand, is only one of the alternatives. The typology of social services financing and providers therefore implies the plural nature of this sector.

It is clear, though, that both private for-profit providers and public "hierarchical" providers of social services may suffer from "typical disadvantages", meaning that they do not cover all needs in the field of social services, and do not do so because of the economic characteristics of the way they function. That is one of the reasons for the establishment and existence of the so-called third (civic, non-profit) sector [15], which seeks to fulfil the goals of "social economics". Its aim is to address social problems and achieve social goals by ensuring that a wider range of actors, including non-profit organisations, pay an active role. Definitions of social economics in the relevant literature vary [16], mainly where it regards which organisations are included in it and which are not. The provision of social services indubitably ranks among the goals of social economics, however.

4. Conclusion

Based on theoretical analysis, important characteristics of social services as socioeconomic goods were discussed. They include the classification according to the type of transaction and the presence of government intervention, the role of public and private resources, possible combinations of providers and financing and also showing the room for the non-profit approach.

In this sense, the results of the paper are purely theoretical and they brought to readers and conference participants a picture of what is behind social services as a socioeconomic category.

The typology shows the possibilities and the limits within which we operate in the financing of social services and their institutional organization. Such a concept analysis is safe in that it allows to consider the properties and characteristics of the different institutional forms, but not the question of the extent to which social services to provide and what should be the proportion of funding. This is a permanent issue for social policy actors in the country, as these variables cannot be determined ex ante. They can only consider trends and priorities and to generate projections based on them, or directly make a consensus. It is not true that this consensus can be in social services automatically generated only by the invisible hand of the market, as consumer sovereignty is hampered by a number of the objective factors that make it impossible to sole application of the liberal model and the realization of mutually beneficial market exchange equivalent.

An important issue is the problem of the effectiveness of the provision and funding of social services. Here we move from one pole, which is an objective assessment of care needs an external actor and the corresponding subsidies from public budgets to the second pole, which is a subjective assessment of their needs and the corresponding allocation of private resources. Both systems must "meet" with the appropriate range of social services and these links are circular. There is of course the question of the overall efficiency of the system, i.e. at what level will the social services be available in the national economy and if that will be perceived as a positive and efficient. In this respect, there is a risk of marginalization of the sector under fiscal pressure, such as when an economic crisis.

As for the "real" (empirical) implications of the paper for Czech social system, a link can be made to current publication [9], which has been recently prepared at the University of Finance and Administration and its partner institutions and focuses on financing and costs of social services in the Czech republic, as well as models of social services that could be utilized for this purpose. Their character is beyond the scope of this paper.

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Vouchers as an Alternative of How to Support Sport at Municipality Level

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Abstract

Support for sport at the municipal level has a long tradition, especially in Europe. Youth involvement in sport is usually an important aspect of grant policies. Several questions arise in connection with this topic, including those concerned with how to allocate public resources more efficiently and how to increase youth participation in sport. We want to analyse vouchers as a tool for increasing transparency and efficiency as well as the involvement of youth and their parents in sport policy at the local level.
Vouchers typically transfer purchasing power to the client. Using sport vouchers as a tool for allocating public resources is still quite rare, though some attempts with sport vouchers were made in Australia and the UK and there are examples of sport vouchers use in the Czech Republic.
The aim of the paper is to discuss vouchers as an alternative or additional method of sport support at the municipality level and to identify strengths and weaknesses of this method. The paper stems from the previous work of the author. The methods used were literature review and analysis of three Czech municipalities which implement the voucher system.

Keywords: Sport; voucher; transparency; grant; voucher system

JEL Classification: H76, L31, L83

1. Introduction

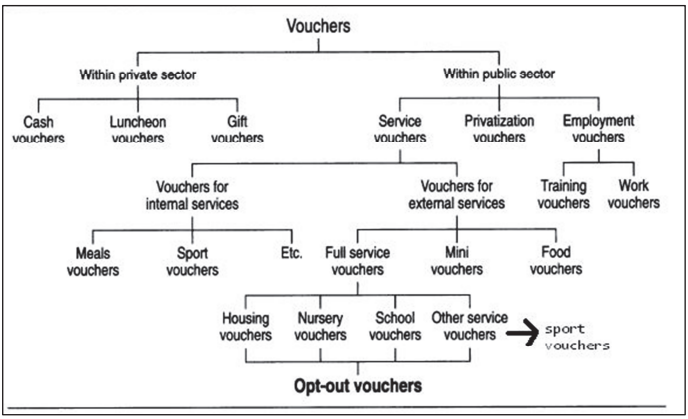
Support of sport from public budgets has a long tradition at the municipal level, especially in Europe. Youth involvement in sport is usually one of the important aspects of grant policies [1, 2, 3]. Thus, questions like "how to allocate public resources more efficiently" or "how to increase youth participation in sport" and many others arise. Many papers have been written about grant policy principles and effectiveness or advantages and disadvantages of grant policies, but only a few have taken vouchers into consideration. We want to analyze vouchers as a tool for increasing transparency and efficiency as well as the involvement of youth and their parents in sport policy at the local level. This discussion is based not only on theoretical reasoning but also on an analysis of empirical evidence, provided by several Czech municipalities which have started experiments with vouchers as a tool for allocating financial support for sport clubs.

The application of vouchers as a tool/method for public resource allocation was originally introduced in the education system. One of the earliest suggestions for government use of vouchers, made by Milton Friedman in 1962, was as a way to fund education, without excessive government intervention in the market [4]. Valkama & Bailey [5] gather the following approaches to vouchers from existing literature: A voucher has been defined as (1)a token that may be exchanged for goods or services; (2) a paper given instead of money, (3) a document that controls and/or separates expenditures by authorizing and/or recording them separately, and (4) a state benefit tied to a specific defined purchase, the financing of which comes from a source other than where the actual purchase takes place. Cave [6]states that"Voucher systems of distribution are defined as regimes in which individuals receive (pay for or are allocated) entitlements to a good or service which they may 'cash in' at some specified set of suppliers, which then redeem them for cash or the equivalent from a funding body. He also points out that the goal of a voucher in the case of public services "is not to facilitate market exchange but to redistribute income or guide consumption".

Vouchers were tested not only for education [7, 8, 9], but also for housing [10, 11], the distribution of health care services [12, 13, 14] or social services [15]. However, usage of vouchers in sport is still quite rare [16].Hence the aim of this paper is to discuss sport vouchers as an alternative or additional method of financial support at the municipality level and to identify strengths and weaknesses of this method.

The first problem and question is "how to categorize the sport vouchers distributed by local authorities and intended as support for sport clubs into common vouchers taxation?" General taxation of vouchers is provided by Valkama, Bailey[5].Although they identify also sport vouchers (see Picture 1), these are identified in a different context (as a motivation tool for public service employees). Sport vouchers as a tool for allocation of public resources can fall into the category of service vouchers as vouchers for external services (as "other service vouchers", see black arrow).

Figure 1. Categorization of vouchers



Source: [5], modified by author

2. Material and Methods

This paper use interesting Czech cases to demonstrate the gap within the sport vouchers theory. The theoretical part summarizes the main findings and along with an analysis of practice we formulate the main strengths and weaknesses of the voucher system. For the analysis of municipalities which implement the voucher system, data available publicly on websites and results of interviews with officials responsible for voucher management in each municipality – conducted during spring 2013– were used. Author's experiences with grants system are also one of analytical source.

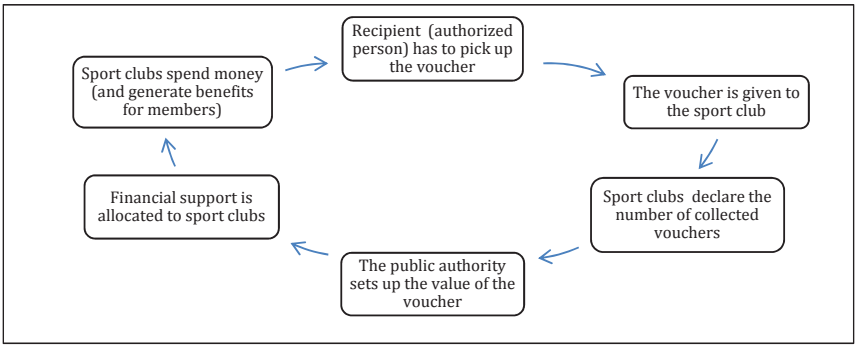
3. Results and discussion

As mentioned above, sport vouchers are still quite rare. At the regional level, two Australian regions, Northern Territory and Queensland, introduced sport vouchers for youth (see [17, 18]). There is also one municipality in the UK [19],East Renfrewshire, where the council launched a pilot outreach program. Youngsters can pick up a free voucher book enabling them to take part in activities on offer in two sport centers. The aim was to encourage those aged between five and eighteen to take part in sports activities. However, this opportunity was only offered during summer holidays [19].

In the Czech Republic, three municipalities (Hodonín, Opava, Poděbrady) have introduced sport vouchers (and Prostějov considered it as a proposal only). Opava and Poděbrady have a one-year experience, while Hodonín has 3 years of experience. All cities use a similar pattern with small modifications (see [20]).

Using vouchers as a tool for allocation of public financial resources to sport clubs creates a necessity to establish a relatively simple and understandable system. The system has to be clear and transparent at least in the part where active involvement of target groups (i.e. the recipients of vouchers) is expected. The following diagram (Picture 2) represents simple cycles of sport voucher application which was noticed in the municipalities mentioned above.

Figure 2.The process of a voucher scheme



Source: Author

The first phase, not mentioned in the scheme, is that the municipality has to set up the sport policy, including the sport voucher policy. The decisions about these policies usually involve considering the following questions: (1)Who is eligible for a voucher? The recipient can be determined by age, address, or other criteria. (2) Which organizations can accept the vouchers, e.g. only non-profit organizations focused on sport, only organizations previously registered at the municipality, or any organization? (3) What other conditions are there for picking up a voucher and giving it to the sport club? (4) What are the conditions for sport clubs when they ask for money based on collected vouchers (e.g. a list of members, deadlines, approved costs etc.)? Decisions about these rules are made by a public authority – generally the municipality body. However, it seems that gaining the support of street-level bureaucracy during the introduction of sport vouchers is extremely important(this is probably important for any other public policy since Lipsky 1980 [21]), as administrative workers are often the ones responsible for technical details. It seems that the effort as well as support of the head of the economic department was crucial in the case of the first municipality which started to use sport vouchers.

Based on previous analysis we gathered advantages and disadvantages of sport vouchers for selected groups involved in the process (see Table 1). We assume that each group may influence the real effect of vouchers on society or municipality (based on the level of support and consequent involvement in the process). The idea is that the sum of new obstacles (disadvantages) should be the same or lower for all groups, or the sum of new benefits (advantages) should be higher than the sum of disadvantages. Based on the interviews, it seems that after initial scepticism of groups the support for sport vouchers is increasing.

Table 1. Advantages and disadvantages of vouchers in sport

	Advantages (benefits)	Disadvantages (costs)
Recipients	▪ Motivation to continue or start with sport ▪ Freedom of consumer choice ▪ Indirect involvement in public affairs	▪ Time (and cost) for collecting the voucher from the local municipality
Sport clubs /organization	▪ Increasing interest in services granted by the voucher ▪ Guaranteed support not dependent on a political decision-making process	▪ Administrative stress ▪ Economic costs of administration ▪ The risk that no public resources would be gained if no vouchers from members were gathered ▪ Vouchers are set to a fixed amount of money, hence cost differences among sports are not taken into consideration ▪ The value of the voucher can be floating (derived from the number of collected vouchers), and thus the sum of money can be unpredictable
State / local municipality	▪ Establish a transparent system based on inhabitants' revealed preferences instead of on a political decision ▪ Absence of the necessity to formulate a clear sport grant policy – consumer choice determines allocation	*Direct economic cost:* ▪ Costs of distribution of vouchers ▪ Increasing of administrative stress especially if vouchers are used in combination with the previous system *Other impacts* ▪ Vouchers cannot be used in investment decisions

Source: [16]

As we need to identify the strengths and weaknesses of vouchers for sport, we have to analyze available cases of implementation and identify key variables which affect the efficiency of the voucher system. A comparison of main differences among the analyzed cities is presented in Table 2.

Table 2. Main differences among voucher systems in analyzed municipalities (2012)

City	Determination of the value of a voucher	Expenditure per one recipient in CZK (2012)	Target group	Number of parts	Number of supported recipients (2012)
Hodonín	Floating (ex post)	2118	Age 6-18	2	875 (2009)
Opava	Floating (ex post)	1000	Age 6-19	2	966
Poděbrady	Floating (ex post)	youth 900; senior citizens 300	No age limit	3	NA
Prostějov (proposal)	Fixed (ex ante)	–	Age 6-19	2	–

Source: [16]

For the year 2013,Hodonín made some inventive changes. They set up two different values of the vouchers based on two categories (competitive sport, non-competitive sport). There also some new restrictions on the use of money received in exchange for the collected vouchers (see [22]).Participation in the voucher system grants the right to ask for standard grants (1) support for coaches (2) special grants. The new rules seem to be clear; however, the situation can be more unpredictable for sport clubs – it will be difficult to anticipate the income based on gathered vouchers.

3.1 Variables affecting the voucher system

To answer questions like (1) "What affects the voucher system and when could it be useful for other municipalities?" or (2) "When could the voucher system be a priori better than a standard grant policy?", we have to determine the variables which affect the system functions and consequently the outcomes. To identify these variables we use the previous research Czech cases [16, 20]; discussion with officials in municipalities and partly author's own experiences with grants system (both as decision maker and sport club representative). We determined 5 variables.

The first and most complex variable is the *mechanism of how the value of a voucher is determined and the predictability of next-year value*. One non-realized proposal expected a fixed value of the voucher (Prostějov [23]), but all already implemented voucher systems derived the value of the voucher "ex post", based on the amount of disposable resources and the number of collected vouchers. Hence all sport clubs have to face some level of uncertainty. The total amount dedicated to sport is known, but the number of vouchers picked up is unknown (and not exactly predictable), as is the number of vouchers which will be given to sport clubs.

Hodonín [22] introduces (for the year 2013) two different values of vouchers based on two categories (competitive sport, non-competitive sport). The value of a voucher for competitive sports is twice as high as for non-competitive ones. A voucher declared as belonging to the competitive sport category has to correspond with the evidence of the sport club (i.e. the given child has to be a member of a sport club and participate in competitions). This new rule supports competitive activities and consequently makes the system more unpredictable (nobody knows how many "competitive" vouchers will be collected by sport clubs). A possible solution is obvious – to set a fixed value of vouchers. This solution is clear for recipients and sport clubs, but presents an obstacle for the municipality. Municipalities prepare their annual budget and dedicate a certain amount of money to support sport. In the case of a fixed value of vouchers, we can assume that not all vouchers will be picked up – hence unwanted savings in budgets would appear. On the other hand, the rest of the budget (savings induced by unused vouchers) can be spent through traditional grant systems or provided as a direct subsidy to schools or municipal companies operating sport facilities. A fixed value shifts uncertainty from sport clubs to the municipality.

The uncertainty induced by ex post value setting can be identified as a disadvantage of the voucher system. If the club cannot predict the value, then it cannot count on this value although it is able to estimate the number of collected vouchers. Hence, the money gained through the voucher system can be considered as a "lottery" and maybe this money will not be spent effectively. One of the variables which limit the prediction is the return rate (the percentage of vouchers collected by sport clubs from eligible recipients). Crompton [24] has shown that the return rate grows by approximately 6% per year (not proportionally spread), at least during the first 6 years. The return rate starts at 16% and ends up at 53% after six years. Only Hodonín has more than one year of experience and their results confirm the tendency to a 6% annual growth of the return rate.

The second important variable is the *degree of clarity of voucher rules*. Rules determined by a public authority can be simple or complicated, for example, the voucher can be picked up by the recipient only on specific dates at the municipality office or the voucher can be downloaded and printed from the internet and a validity check is done by the officials ex post (when the voucher is claimed by the sport club). Another example can be connected with the number of obligations for sport clubs, such as how many documents they need or how many administrative steps have to be taken before they receive money. Finally, the stability of rules in time is also an important factor – significant changes in the system announced annually will bring uncertainty and make the system less transparent, which will probably decrease support of advocacy groups for the vouchers.

Another important variable in the voucher system is the *level of 'cost' freedom* for sport clubs. In other words, how freely they can spend the money gained from the voucher system.

Rules of standard grants provision usually contain a list of approved expenditures including the rule that all money has to be spent before the end of the accounting year.

We can identify two theoretical stances: (1) there should not be any restrictions, the money would be spent on anything which is in accordance with the mission of the sport club (including salaries for trainers). Moreover, there should not be a time restriction, i.e. money can be spent anytime regardless of the end of accounting year. The obligation to spend all money in a given time period usually creates problems for sport clubs which need support at the beginning of the accounting year (before grants are allocated). (2) The rules limiting "cost freedom" enforce the desired effects, i.e. support of the youth sport. The extreme version of the voucher system could be defined as the obligation to decrease the level of membership fees according to the value of the voucher. This argument could be useful in the situation when we want to attract more youth to sport and want to avoid or decrease any social obstacles (as would be the case in low income families).

Two cities (see [22, 25]) determined the spectrum of approved costs as: material cost including energies and services, promotion, investment, events for youth, entry fees etc. The salaries for employees are forbidden. One city [26] did not declare an explicit list of approved costs, but they reserve the right to audit the club's accounts.

Next important value is the role of *recipients' domicile*. This rule also influences the predictability of the value of a voucher. Each of the analyzed cities chose a slightly different approach (See Table 3). The impact of this problem can be noticed in the predictability of the sum of vouchers which can be picked up and consequently of the return rate. The second important factor is that under some circumstances there is a space for possible cooperation among municipalities as in the case of Hodonín. This means that a non-resident may use a voucher, but its value is decreased and can be compensated directly to sport clubs from the budget of the other municipality.

Table 3. Approach to resident and non-resident members of sport clubs

City	Approach
Hodonín	Primarily dedicated to recipients with the domicile in the city, but members of sport clubs from different municipalities may also use the vouchers. The value of the voucher for non-residents is decreased to 1/3 and the municipality where the non-resident has a domicile may provide the rest of the amount for the sport club.
Opava	The voucher may be used by a registered member of a sport club. The role of the domicile is not emphasized.
Poděbrady	The voucher is for residents but youth who are members of local sport clubs and at the same time visit nursery school, primary, or secondary school may also use the vouchers.

Sources: [22,25,26]

The final very important variable that was identified is propagation and public discussion of the idea of sport vouchers during introduction and implementation of the voucher system. Based on experience of analyzed municipalities we can expect a cautious attitude to sport vouchers and low support from recipients as well as from sport clubs at the beginning. But it seems that the support of and the satisfaction with the system is increasing in time. Recipients, officials, as well as sport clubs are becoming familiar with the system. However, the voucher system should not be significantly changed from year to year or the transparency benefit disappears.

3.2 General strengths and weaknesses of a voucher system

The obvious advantages and disadvantages of using sport vouchers were shown in Table 1; however, based on literature review as well as discussions with officials and sport clubs in these municipalities, we compiled a list of general strengths and weaknesses of vouchers. In cases of some weaknesses we also listed a counterargument.

General weaknesses of vouchers

- Allocation of financial resources is based only on the number of members. (a) Sport events or sport clubs with a low number of members have limited access to resources although they may provide services which are valuable. Theoretically, we can find examples like events for handicapped athletes. (b) Different sports have different spectrums of costs and more competitive sports may have higher costs that non-competitive ones. (Counterargument – these cases can be solved through special grants.)
- More "persuasive" sport clubs can gain more vouchers even though the real number of their members is lower. We have to assume that not all children in the municipality are members of sport clubs, hence there are "free vouchers" in the system (and possible fictitious members of sport clubs). If the sport club persuades families (or children) who have free vouchers to give those vouchers to them, they receive more money than the sum that corresponds with the real number of members. We also have to take into consideration the possibility of immoral persuasive techniques (such as pressure on kids, blackmailing, higher member fees if the voucher is not given to the club, etc.). (Counterargument – this is a kind of competition and the fact that a more active/persuasive subject gains more vouchers is not a problem. The holders of the vouchers have to decide which of the suggested sports is more valuable for them and will give the voucher to a selected sport club.)
- The problem with "locality" and the role of recipients' domicile. What should municipality do in the case of non-resident children visiting local sport clubs (should they receive vouchers too?) or in the case when resident kids are visiting non-local sport clubs (should they be compensated?). This problem arises in the case of big cities divided into parts with their own municipality bodies (and decision-making about local grants).
- Difficult prediction of the value of the voucher. (Counterargument – the situation is the same in the standard grant provision system, i.e. till the decision about the money is made, the sport club has to wait).
- Too lenient or too strict limits for approved costs as well as time limits for spending money gained from the vouchers. The problem of cost freedom was mentioned above. It seems that some level of control is desirable, but strong limits cut down the benefits of the voucher system when compared with standard grants.

General strengths of vouchers

- Transfer of purchasing power. Typical argument since introduction of vouchers in education. Vouchers in sport may stimulate inhabitants (eligible recipients) to make the decision and support their favorite sport club. The process of allocation also involves the moment of activation, hence the recipient may become more interested in the system of sport support in their municipality. This activation of inhabitants may induce positive effects on all local policies. Potůček [27] considers breaking the link between voters and politicians as one of most important failures of representative democracy. Similarly, there are other studies emphasizes the role of accounting rules for the policy outcome [28,29]
- Transparency. The process of money allocation is clear and transparent to all participants in the system including sport clubs, inhabitants, and any other advocacy group. The standard grant provision is based on a financial request and the decision about allocation (approving of the requested amount, decreasing the requested amount or a rejection of the request). The process of evaluation of grant requests is often perceived as non-transparent [20].
- Motivation and promoting sport as a leisure-time activity. There is a possibility that vouchers can be perceived as a chance to make membership in sport clubs cheaper than it would be without them. Vouchers can motivate recipients to start doing a sport, to try new opportunities. The impact of vouchers on motivation will be strongly affected by the rules of the system and the behavior of sport clubs.

4. Conclusions

Based on the analysis performed above, we can suggest some recommendations. However, the list of recommendations cannot be considered as definitely complete. More research, theoretical as well as empirical, has to be done before the final recommendation.

- Use only one value of voucher or set two separate budgets for two different values of vouchers (i.e. non-competitive, competitive).
- Declare long term support for sport through vouchers as an annual percentage of municipality budget of a valorized amount of money (to make the system more predictable for clubs and fix the problem with the "lottery" situation).
- Promote the idea of participation in financial support allocation (picking up the voucher) among inhabitants.
- Keep or implement no time restrictions for spending the money gained from vouchers. This will solve the problem with the "uncovered" periods of the year.

We discussed vouchers as an alternative method of financial support of sport at the municipal level. We identified main strengths and weaknesses of this method. Vouchers can bring benefits to municipalities, but their usage has some limitations. Not surprisingly, we concluded that the idea of vouchers has great potential, but the method of its implementation is crucial for total outcomes.

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Non-governmental Non-profit Organisations: (Non-)Measurability of Economic Characteristics

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Abstract

The paper contributes to the discussion about the measurability of the economic characteristics of nonprofit organisations and other entities established for purposes other than the pursuit of profit. The text analyses the most widely used definitions of the nonprofit sector, examining reflections of these specifications in economic statistics and characteristics, particularly in the approach adopted by the Government Council for Nongovernmental Nonprofit Organisations (GCNGO-NPO), its concept of "nongovernmental nonprofit organisations". The paper indicates significant weaknesses of the GCNGO-NPO's concept and provides arguments against its wider use. Alternatives are presented for a more accurate approach to the definition of the nonprofit sector.

Keywords: Nonprofit organisations; nonprofit sector; economic indicators; economic statistics

JEL Classification: H4, H8

1. Introduction

The nonprofit sector is an important part of society. Its existence has an economic dimension, which is the focus of interest of this paper. This paper aims to discover the possibilities for expressing the economic characteristics of nongovernmental nonprofit organisations (NGO-NPOs) as defined by the government, or more precisely by the GCNGO-NPO.

We consider the economic dimension of the nonprofit sector to be very important, although the roles and functions of NGO-NPOs cannot certainly be degraded to the merely economic or financial level. Nevertheless, economic performance, the share in the employment rate, the involvement of volunteers, and the share in the gross domestic product (GDP) are important for economists, and certainly also for public policy makers [1].

In democratic societies, the roles and functions performed by nonprofit sector organisations are perceived as reasons for the existence of these entities and for their support from public sources [2]. One relevant public policy consists of creating a favourable environment for the activities of these entities, both in the legal setting and in the financial support provided for these organisations from public sources. This paper focuses mainly on nongovernmental nonprofit organisations (NGO-NPOs); however, we also analyse other approaches applied in the Czech Republic for comparison and to obtain a consolidated picture.

The following approaches/definitions are examined in the paper:

1. Nonprofit organisations (NPOs, also described as civil society organisations) as defined by the structural-operational definition by Salamon and Anheier [3]. The definition sets non-distribution of profits, institutionalisation, and private law as the basis, and self-governance and volunteerism as the characteristic features that an organisation must comply with.
2. Nongovernmental nonprofit organisations (NGO-NPOs). The Czech public administration uses a narrowed definition. The concept of NGO-NPOs was introduced into the Czech terminology by the GCNGO-NPO as part of defining the Czech government's subsidy policy towards NGO-NPOs [4]. This is a narrower definition of organisations of the private nonprofit sector, containing only selected legal forms covered by the private nonprofit sector.
3. Nonprofit institutions serving households (NPISHs) and nonprofit institutions (NI) [5]. The concept of nonprofit institutions serving households has been used by the

CSO in the national accounting of the Czech Republic for long time, as it is one of the institutional sectors. There are nonprofit organisations in other institutional sectors, and the CSO presents data for all nonprofit institutions in the Czech Republic within the SANI.

The aim of this paper is to discover the economic characteristics that are assigned to organisations defined as NGO-NPOs and to indicate the weaknesses or shortcomings of the approach favoured by the GCNGO-NPO. The paper clearly shows that this approach does not actually enable an accurate assessment of the economic characteristics of NGO-NPOs.

2. Material and Methods

The relevant applied method for this paper was desktop research, in which secondary data sources were analysed, put into perspective, and mutually compared, and conclusions were subsequently derived. We used data for the reference year 2010. For the purposes of this article, we used the following statistical data sources:

2.1 Annual National Accounts [6] and the Satellite Account of Nonprofit Institutions [7].

The national accounts and their extensions, "satellite accounts", are descriptive statistical macroeconomic models reflecting the relationships between entities in the economic territory of the respective state and the relationships between the national economy and other countries [8]. These models describe the economy as a kind of living organism in which the most varied movements of goods and services, transactions of distribution and redistribution of incomes, and financial transactions are ongoing.

The annual national accounts (ANA) monitor only nonprofit organisations falling within the institutional sector S.15 - Nonprofit Institutions Serving Households (also referred to as S.15 or NPISHs [9]). Because data for nonprofit institutions in the Czech Republic are not comprehensive, the Czech Statistical Office (CSO) also created the Satellite Account of Nonprofit Institutions (SANI). SANI is a complement to and extension of the national accounts. It is a descriptive statistical macroeconomic model showing data on nonprofit institutions in the country, i.e. the whole private nonprofit sector. SANI enables tracking of nonprofit institutions according to their sectoral and institutional classifications. The benefit of these data is their capacity to provide highly reliable information about the size and economic value of the nonprofit sector in the Czech Republic. This statistical data source is also very good in terms of other characteristics such as coherence, completeness, accuracy, availability, comparability, timeliness, and topicality.

2.2 Analysis of Public Source Funding Provided to NGO-NPOs [10] and the ÚFIS Database [11].

This is an analysis of GCNGO-NPO presenting statistical information on the amount of all subsidies granted to nongovernmental nonprofit organisations from the state budget, budgets of higher territorial self-governing units, budgets of lower territorial self-governing units, and state funds. The main source of data for the municipal budgets and state funds is the ÚFIS presentation system. This database provides access to selected data concerning the accounting and financial information of the state including the accounts and financial statements of all the centrally and locally managed public sector organisations and chapters of the state budget and budgets of territorial self-governing units, specifically data since 2010. All centrally and locally managed organisations of the public sector are obliged by law to provide data to this database. The database is quite complete and the possibility of remote access to the database allows for data stored from statements to be summarized according to defined parameters. However, the database contains some processing errors that cannot be eliminated by its users or even administrators.

There are various theoretical definitions of private nonprofit sector organisations, such as the structural-operational definition [3], the definition based on the system of national accounts

[8], definitions within SNA [5], various functional definitions [3], specifications within the Pestoff welfare triangle [12], and the definition by means of a legal theory [13]. Most of the definitions are negative definitions, formed as authors attempt to perceive the private nonprofit sector alongside the public sector, the profit sector, and the household sector, or to assign definitional attributes to the private nonprofit sector. Other terms are used in addition to private nonprofit sector, such as voluntary, civil, independent, nongovernmental, or third sector [14]. The term selection depends on the discipline by which the phenomenon is analysed and the characteristics that are the most important for the respective author, and such terms are sometimes used simply to achieve any definition of the sector other than a negative one. Other non-theoretical concepts of nongovernmental nonprofit organisations are used in the Czech legislation (where these organisations are perceived as making no profit) and in the political sphere (where these organisations are perceived as nongovernmental organisations). The information capacity of various data sources with respect to individual definitions is connected with these concepts.

3. Results and Discussion

3.1 The structural-operational definition

This approach is well known [15] and it would be superfluous to extensively comment on it in this paper. This definition is frequently used, in line with its original purpose, which was to create a definition that would allow a broad international comparison of nonprofit entities. The structural-operational definition can be applied to a wide range of organisations and also adapted to a specific national context. However, it is not an unequivocal definition, and problems may arise in attempting to include or exclude some organisations under this definition. This posed a significant challenge for this paper because the inclusion/exclusion of some organisations might have had a considerable impact on the research results.

3.2 The NGO-NPO approach

An organisation can be defined as NGO-NPO only pursuant to Government Resolution No. 223 of 30 March 1998 [4]. These include civic associations, which means the associations themselves and their organisational units. The GCNGO-NPO implicitly excludes commercial and labour unions from being civic associations, not including them under the NGO-NPO term. Foundations and endowment funds, public-benefit corporations, and facilities established by churches and religious organisations for specific charitable or humanitarian purposes are considered to be NGO-NPOs. The GCNGO-NPO does not consider churches, religious organisations, or monastic bodies to be NGO-NPOs, but accepts their facilities established for specific charitable or humanitarian purposes.

The concept of defining NGO-NPOs is then limited only by the listing of legal forms and the statements of GCNGO-NPO. No political statements, methodology regulations, government resolutions, or documents drawn up by the GCNGO-NPO with respect to the state subsidy policy of the Czech Republic towards NGO-NPOs explain the concept defining the organisations that fall within the NGO-NPO definition and the reason for including them under the definition. According to Mr. Müller, a member of the GCNGO-NPO, "The GCNGO-NPO respects the criteria of the structural-operational definition; however, this does not cover all private nonprofit organisations but only selected types of legal entities complying with this definition ... Another unwritten aspect of the GCNGO-NPO's approach towards the nonprofit sector is the transformation of the political system. The GCNGO-NPO focuses on such forms of nonprofit organisations that are associated with activities that had no permitted legal form before 1989" [16].

This approach to the definition was subsequently applied in follow-up resolutions of the Government of the Czech Republic and its strategic and conceptual documents as well as in quantifying subsidy transfers from public budgets.

3.3 Closer to NIs and NPISHs

Institutions in the national accounts are grouped into sectors according to their economic behaviour. The definitions of the sectors are part of the international standards and the standards of the European System of Accounts issued in 1995 (ESA 95). Institutional sectors are divided according to whether they generate market or non-market, financial or non-financial products. A specific group are manufacturers with production generated for their own final consumption. An important rule here is the 50% cost limit expressing an economically significant price. When an institutional unit achieves an economically significant price, i.e. more than 50% of the operating costs of the organisation is financed from market activities, it is regarded as a market producer. Otherwise it is a non-market producer. Some nonprofit entities can cover their operating costs by their market production by more than 50%. Hence, the rule of the 50% cost threshold is insufficient for the statistical monitoring of nonprofit institutions. As a result, nonprofit institutions may occur in all institutional sectors, as shown in Table 1.

Table 1. Nonprofit institutions in the national accounting

Institutional sector	**The sector of non-financial corporations**	**The sector of financial institutions**	**The sector of government institutions**	**The household sector**	**The sector of nonprofit institutions serving households**
Institutional unit type	**S.11**	**S.12**	**S.13**	**S.14**	**S.15 (NPISHs)**
Businesses	C1	C2			
Government institutions			G		
Households				H	
Nonprofit institutions	N1	N2	N3	N4	N5

Source: [5]

As defined by SNA, nonprofit institutions are "legal or social entities created for the purpose of producing goods and services whose status does not permit them to be a source of income, profit, or other financial gain for the units that establish, control, or finance them" [9], through which they effectively meet the structural-operational definition by Salamon and Anheier (see above). In the practice of the CSO, this means that, when identifying nonprofit institutions, SANI has in view whether the terms and conditions of the structural-operational definition have been met, regardless of the institutional sector in which an economic entity operates. Therefore, SANI has the ability to quantify the size and the field of operation of the whole private nonprofit sector in the Czech Republic, and thus portray the role of organisations of the private nonprofit sector in the Czech society.

3.4 Economic characteristics of NGO-NPO, NIs and NPISHs

The typical characteristics of three individual approaches are now clear. Their mutual differences are best revealed in the following analysis of the possibilities for quantifying the nonprofit sector as defined by means of these approaches.

Table 2. Quantification of the number of units falling within the individual definitions of the nonprofit organisations in the Czech Republic by legal forms in 2010

Definitions of NPOs Name of the legal form	NGO-NPOs	NPISHs (NIs in S.15)	NIs	According to the structural-operational definition
Foundation	434	434	434	434
Endowment fund	1,129	1,129	1,129	1,129
Public benefit corporation	1,785	1,671	1,785	1,785
University (public)	x	x	26	26
Educational legal entity	x	159	159	159
Association (union, society, fellowship, club, etc., including trade unions)	62,530	66,259	66,527	66,527
Political party, political movement	x	134	134	134
Church legal entities	212	4,251	4,251	4,251
Organisational unit of an association	21,910	29,586	29,609	29,609
Professional organisation - chamber of commerce	x	20	20	20
Chamber (except professional chambers)	x	x	178	178
Interest association of legal entities	x	783	943	943
Hunting society	x	4,014	4,014	4,014
informal association under the Act on Association of Citizens	x	434	x	Cannot be quantified
Total	88,000	108,440	109,209	At least 109,209

Source: Authors based on [6], [7]

A practical example of the differences between the three individual approaches is illustrated in Table 2. In the case of associations (and this also applies for their organisational units), which are the most numerous legal form within the Czech nonprofit sector, the following can be stated:

1. Not all the associations are included in the institutional sector of S.15 Nonprofit Institutions Serving Households (i.e. 66.3 thousand units) and in the sectors of financial and non-financial corporations (i.e. a total of 66.5 thousand units)
2. The GCNGO-NPO does not include all civic associations into their concept of NGO-NPOs, but only the 62.5 thousand units that are not trade unions.

There are 88 thousand NGO-NPOs counted for 2010. Not all of these NGO-NPOs can be found in NPISHs. As the following table shows, although the difference in the number of NPISHs and NIs is only 1% of organisations, the difference in the production of NPISHs and NIs is 58%. These two definitions are therefore not interchangeable.

Table 3. The economic indicators of individual definitions of nonprofit organisations in the CR in 2010

Definition of NPOs Indicator	NGO-NPOs (Estimate)	NPISHs (From SANI)	NIs (From SANI)	According to the structural-operational definition	*Units*
The number of organisations	88.0	108.4	109.2	At least 109.2	*in thousands of organisations*
The number of full-time employees	28.2	47.9	97.1	At least 97.1	*in thousands of persons FTE*
Production	41.2	49.6	97.6	At least 97.6	*in billions of CZK*
Gross value added (GVA)	23.1	26.2	59.9	At least 59.9	*in billions of CZK*
Expenses	x	84.4	165.4	At least 165.4	*in billions of CZK*
Revenues	x	81.8	165.1	At least 165.1	*in billions of CZK*
Transfers from abroad	x	0.3	x	At least 0.3	*in billions of CZK*
Transfers from businesses	x	3.0	x	At least 3.0	*in billions of CZK*
Transfers from households incl. voluntary work	X	11.5	x	At least 11.5	*in billions of CZK*
Transfers from nonprofit organisations	x	x	x	x	*in billions of CZK*
Transfers from the public sector	x	16.3	x	At least 16.3	*in billions of CZK*
Subsidy transfers from public budgets and state funds	10.3	x	x	At least 10.3	*in billions of CZK*

Source: Authors based on [6], [7], [10]

If we adhere to the definitions of NGO-NPOs, we are able to identify only the number of entities and subsidies granted to NGO-NPOs from public budgets. To identify the number of entities, we need to have detailed information, so as not to include trade unions under civic associations and to only include church facilities established for specific charitable or humanitarian purposes and not ecclesiastical legal entities. We were able to identify these organisations on the basis of a complete set of selected legal forms. More information on the subsidies received from public budgets and state funds can be obtained from an annual study by the GCNGO-NPO. The data stated herein are representative of the subsidies provided to NGO-NPOs from the state budget and regional budgets, or from municipalities and state funds. There are limitations resulting from the data sources (ÚFIS) and the concept of NGO-NPOs as well as the possibilities to monitor it in the databases of the public administration and the budget.

The values concerning NGO-NPOs in some economic indicators can be estimated only indirectly on the basis of knowledge of the distribution of legal forms by industry and institutional sector and the distribution of these economic indicators by region, as in the case of production, employment rate and gross value added [7].

Another point of criticism of the specification of NGO-NPOs is its very essence, which, due to its political nature, is defined only on the basis of enumeration of several legal forms and their component parts, and is provided only in the Czech Government regulations without any further legislative support in private law or political defense of the policy. However, that the Czech legislation lacks any definition of the term NGO-NPO by means of a legal standard or another theoretical specification and does not specify which organisations fall under the term is marginal compared to the fact that the Czech legislation lacks any definition of the nondistribution constraint condition or the profit reinvestment condition as well as any system of control and sanctions for failing to comply with the nondistribution constraint condition.

The unmethodical approach to NGO-NPOs can also be seen in the GCNGO-NPO's rigidity and inability to respond to new incentives, based on the very definition of this policy on the basis of legal forms. The concept set for NGO-NPOs does not take into account the reality of origination of legal forms or the transformation of the existing legal forms of NGO-NPOs that are abundant in the Czech Republic. The situation after the adoption of Act No. 3/2002 Coll., on freedom of religious expression and the position of churches and religious societies, can serve as an example. Religious schools and school facilities established by churches and religious societies had previously been considered to be facilities established by churches for specific charitable or humanitarian purposes. New legal forms were created pursuant to the decision of the Ministry of Education and those religious schools and school facilities were forced to transform to new legal forms, such as high schools (611), elementary schools (612), and pre-schools (631). Since then, the GCNGO-NPO has not perceived these entities as NGO-NPOs although they had fallen under the definition of NGO-NPOs before 2002 and subsidies had been provided to them under the state subsidy policy.

The final comment regarding the definition of NGO-NPOs under GSP is related to an informal explanation provided by a long-term member of the GCNGO-NPO, Müller [16], who stated that "the GCNGO-NPO respects the criteria of structural-operational definition, dealing only with selected legal types that are associated with the activities that had no permitted legal form before 1989." However, according to the findings based on the analysis of subsidies obtained by nongovernmental nonprofit organisations from the state budget in 2008, considerable subsidies are obtained by organisations established before 1989 that only changed their legal character after 1989.

4. Conclusion

Our criticism of the definition of NGO-NPOs has several points. One point is that the definition of NGO-NPO is not reflected in the available statistical data for the needs of public administration and political decision making. Considering the quality of the data sources, only the following can be said of NGO-NPOs:

- simple quantification of the number of individual legal forms where trade unions can be excluded from civic associations and ecclesiastical legal entities can be limited only to church facilities established for specific charitable or humanitarian purposes;
- prediction of other economic indicators for NGO-NPOs such as GVA or employment;
- quantification of the incomes of NGO-NPOs from the state budget and regional budgets in the form of subsidies,
- quantification of incomes of NGO-NPOs, including all ecclesiastical legal entities (not only church facilities established for specific charitable or humanitarian purposes) and excluding foundations and endowment funds, in the form of subsidies from municipal budgets and other public sources;

A number of other indicators, such as the value of provided donations or transfers other than subsidies, cannot be easily quantified and it is even not possible to estimate their absolute volume.

The impossibility of quantifying the volume of financial sources assigned from public budgets for NGO-NPOs lies in the legislative failure to take account of NGO-NPOs – for example, this term is not included in the classification of the budget structure, the basic tool of the public administration for monitoring and evaluating public budgets.

Second point of our criticism of the definition of NGO-NPOs is its rigidity and inability to respond to new incentives, political, social and legislative changes.

We proved that this approach does not actually enable an accurate assessment of the economic characteristics of NGO-NPOs. That´s why we recommend to replace it by another one above mentioned approaches based on SANI.

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Application of Power-interest Matrix and Influence-attitude Matrix in Stakeholder Mapping of Universities

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Abstract

Stakeholder analysis is a very important tool of strategic management in these days. For understanding of the stakeholder community the stakeholder mapping that is a key part of stakeholder analysis is very useful. This article focuses on the stakeholder mapping of universities. There are lots of different tools for stakeholder mapping – different matrixes and grids, two, three or multidimensional maps, etc. In this paper authors demonstrate the possibility of stakeholder mapping on the example of selected university. For the stakeholder mapping of this university authors chose two matrixes – the power-interest matrix and influence-attitude matrix. Power-interest matrix helps to understand the stakeholder community and their influence on the university. The influence-attitude matrix divides the stakeholder community into groups of opponents and supporters of the university. On the basis of authors' research it is obvious that among the most important stakeholder groups there are lots of groups with high power to influence university as well as interest in university activities. Based on the authors' research we can state that there are several very important opponents of the university that must be take into account by managers of selected university.

Keywords: Stakeholder mapping; stakeholder; power-interest matrix; influence-attitude matrix

JEL Classification: I29, M39

1. Introduction

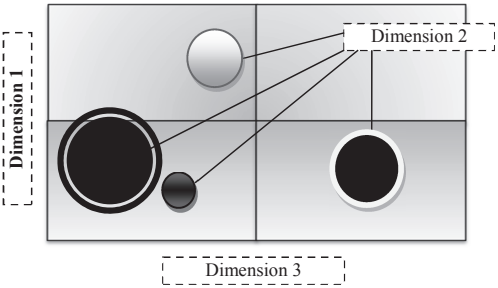
For all organizations, private as well as public, groups and individuals that can affect or are affected by their actions are very important. These groups and individuals are called stakeholders. Stakeholders are "*individuals or groups who depend on an organization to fulfil their own goals and on whom, in turn, the organization depends*" [1] and represent "*all parties who will be affected by or will affected the organization's strategy*" [2]. Because the knowledge and demands of stakeholders are still higher organizations have to react on these demands and use new methods for working and communication with all stakeholders [3]. For communication with stakeholders it is necessary to understand their needs well. All stakeholders have some interest concerning the organization and its actions and some power to be a benefit for the organisation or a threat. Understanding the stakeholder needs is crucial for understanding stakeholders and therefore understanding of lots of characteristics – e.g. interests, power and influence on an organization, etc. have become a subject of methods of stakeholder mapping [3] that is part of stakeholder analysis.

The stakeholder mapping is used as the support for stakeholder analysis and understanding the stakeholder community. The process of stakeholder mapping help managers to understand who the key stakeholders of the institution are, what aims and needs they have, what they are looking for in the connection with the organisation, etc. The aim of the stakeholder mapping is not only development of list of stakeholders and stakeholder groups, but also assessment of most important information about stakeholders and key stakeholders' characteristics, but also presentation (visualization) these characteristics and information in the understandable way with the aim to help managers with decision making processes [4]. Characteristics that are assessed during mapping are usually [4-6]:

- power, interest, influence, attitude, support, legitimacy.

On the literature search it is obvious that various types of stakeholder mapping techniques exist. For stakeholder mapping are used lots of different methods, maps, grids, matrixes and diagrams. Most common are two dimensional maps, and sometimes third dimension shown by size of the symbol representing stakeholder group or colour representing stakeholder group is added. Some approaches like Stakeholder Circle methodology use for stakeholder mapping multidimensional maps, too. Several authors develop special models. For example Mendelow uses model of environmental scanning. An example of traditional three dimensional stakeholder map is shown in the Figure 1.

Figure 1. Traditional three dimensional stakeholder map



Sources: [4]

In the last decade also universities started to use stakeholder analysis for understanding of their stakeholders [7]. But there are only few researches and authors devoted to the stakeholder analysis of universities –for example [8-11]. The authors usually focus on stakeholder identification and neither of them focuses especially on the stakeholder mapping. Therefore the aim of this article is the application of the stakeholder mapping in the market of the tertiary education. For the stakeholder mapping of selected university authors will use the power-interest matrix and problem-frame stakeholder map (influence-attitude matrix).

2. Material and Methods

As stated in the text above; this article focuses on the stakeholder mapping of universities by the mean of the power-interest matrix and influence-attitude matrix. First of all before starting with the stakeholder mapping it is necessary to develop a categorised list of all stakeholders and stakeholder groups representing the stakeholder community. Because of the fact that the final list of stakeholders is usually very large and must be reduced to an amount which is effective for stakeholder mapping, the stakeholder prioritisation follows after completion of the stakeholder list. For example Stakeholder Circle Methodology allows the use of only 15 most important stakeholder groups for visualization and stakeholder mapping.

There are several approaches to the prioritization of stakeholders. The stakeholders can be prioritised on the basis of the professional judgement [6], or on the basis of Stakeholder Index, or Stakeholder Interest Intensity Index [12]. The data for the stakeholder mapping are usually gathered by the mean of questionnaires and researches where respondents have to asses all dimensions and characteristics for stakeholder mapping. On the basis of this assessment it is possible to use appropriate methods for stakeholder mapping.

Data that are necessary for the stakeholder mapping described in this article were gathered through authors' research of the selected Czech public university. Hence the data concerning stakeholders are considered as very sensitive data, the selected university will be not named in this article. First of all it was necessary to prepare the categorised list of all

stakeholders and stakeholder groups representing the stakeholder community of the selected university. The final list of all stakeholder groups follows:

- Accreditation commission Czech Republic, alumni, local community, competitors, current students, grant organizations, employers, employees, government authorities, high schools, local authorities, management, marketing and public relations departments, media, Ministry of Education, Youth and Sports, parents, prospective students, sponsors, suppliers, transporters.

As the second step it will be necessary to carry out the stakeholder prioritisation. For the stakeholder mapping 10 most important stakeholder groups will be selected. The stakeholder prioritisation will be based on the professional judgement of respondent. After prioritization it will be necessary to analyse the stakeholder community in detail and asses all required characteristics for mapping. Stakeholder analysis help to understand better the nature of the stakeholder community and their power and influence that can be exerted on, to and within university [13].

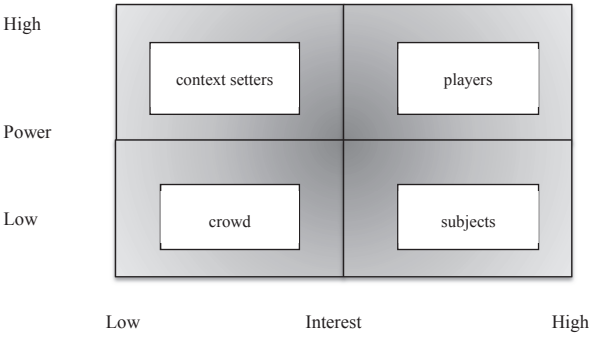
As stated in the text above, there are lots of different approaches to the stakeholder mapping. Author will use traditional matrixes and maps. Concretely as the mean of the stakeholder mapping author selected probably the most frequently used stakeholder mapping tool - power-interest matrix and problem-frame stakeholder map (influence-attitude matrix). Therefore the key characteristics of stakeholders that will be necessary to asses for construction of selected matrixes are following:

- level of interest,
- level of power (or influence),
- level of attitude.

Interest and power will be rated on a scale 1-9, where 1 represents low level of dimension, 5 medium level of dimension and 5 high level of dimension. Attitude has three main values – opposite (against), indifferent, support (for).

The power-interest grid represents two-by-two matrix with two dimensions – stakeholder's interest and stakeholder's power. This matrix typically help managers to determine which stakeholder's interests and which stakeholder's power have to be taken into account. By creating power-interest grid managers can develop better picture of stakeholder community and how they can affected the university.

Figure 2. Power-interest matrix (grid)



Source: [3, 14-15]

The stakeholder's power represents the ability and capacity of the stakeholder to influence and affect the university and its action. Influence can take various form for example the ability to provide resources, or ability to influence other others, etc. Stakeholder's interest is simply the interest in university activities in different forms (financial, political, etc.) (Bryson

2004). The whole matrix is divided into four quadrants representing four categories of stakeholders [14-15]:

- key players - group with significant power as well as high interest;
- subjects - stakeholders with high level of interest but only little power;
- context setters (or leaders) - a group with a high potential to assume the role of players in the future;
- crowd - stakeholders with little level of both – power and interest.

The power-interest map and understanding of position of key stakeholder groups in this map is basis for development of strategies concerning delivering of aims of university to stakeholders. The problem-frame stakeholder map (sometimes called influence-attitude matrix) is used for developing definitions of problems [14]. This map consists of two dimensions – influence and attitude and the construction is similar like power-interest matrix (for detail see Figure 1. Power-interest matrix (grid)). Based on this map stakeholders are divided into four groups - strong and weak opponents and strong and wear supporters [14-15]. It must be remembered that the position of stakeholders in all maps and matrixes is subject of change through changing of personal interest, growing power, changing attitude or developing new alliances among stakeholders. Therefore it is necessary to carry out the stakeholder mapping regularly.

The methodology used for stakeholder mapping in this article can be described in the following steps:

1. Identification of all stakeholders from the stakeholder community – developing of the categorised list.
2. Prioritization of the stakeholders – selection of the 10 most important stakeholder groups.
3. Analysis of stakeholder – assessing of interest, influence and power.
4. Stakeholder mapping:
    a. power-interest matrix,
    b. influence-attitude matrix.

This methodology can be used in further research for other public, as well as private universities and comparison of stakeholder maps of different universities.

3. Results and Discussion

This part summarizes results of the authors' research. According to the methodology that was described in the text above first of all it was necessary to carry out the identification of stakeholders and develop a list of stakeholders. The final list of the stakeholders that was identified by respondent corresponds with the list cited in the text above.

Respondent marked all identified stakeholder groups, but only remarked that transporters are not very important for the main activities but for support activities and services like school canteen are essential. At the second step respondent was asked to prioritize stakeholders based on his own professional judgement and further he assessed the dimensions for construction of both matrix – interest, power (influence), attitude. The stakeholder prioritisation can be seen in the Table 1.

Table 1. Prioritization of stakeholders

Stakeholder group	Priority
Prospective students	1
Current students	2
Media	3
Accreditation commission Czech Republic	4
Competitors	5
Employees	6
Ministry of Education, Youth and Sports	7
Management	8
Alumni	9
Grant organizations	10
Parents	11
Marketing and public relations departments	12
Sponsors	13
Government authorities	14
High schools	15
Local community	16
Local authorities	17
Suppliers	18
Employers	19
Transporters	20

Source: Authors

As can be seen from the Table 1 the most important groups involve all students (prospective, current and alumni). As the most important group for this university are considered prospective students and the second most important groups are current students. The third most important stakeholder group are media. Media have the power to influence other stakeholder groups and their opinion, as well as general public opinion. Therefore all institutions (not only universities) have to develop long-term and positive relationships with media to achieve their strategic goals.

Among the ten most important stakeholder groups are also Accreditation commission Czech Republic and Ministry of Education, Youth and Sports. These two institutions are essential for survival of the universities. As the fifth most important group are considered competitors. Because of the fact that the competition at the Czech market of tertiary education is growing (while in 2000 there were only 8 private universities operating at the Czech market of tertiary education, nowadays there are 44 private universities), competitors are really important stakeholder group for all kinds of universities. As well as competitors also employees and management of universities are important stakeholder groups because the provided services to students depend on these stakeholder groups. Grant organizations as an important source of the funds are considered as the tenth most important stakeholder group. Values of all necessary characteristics of both matrixes are summarized in the Table 2.

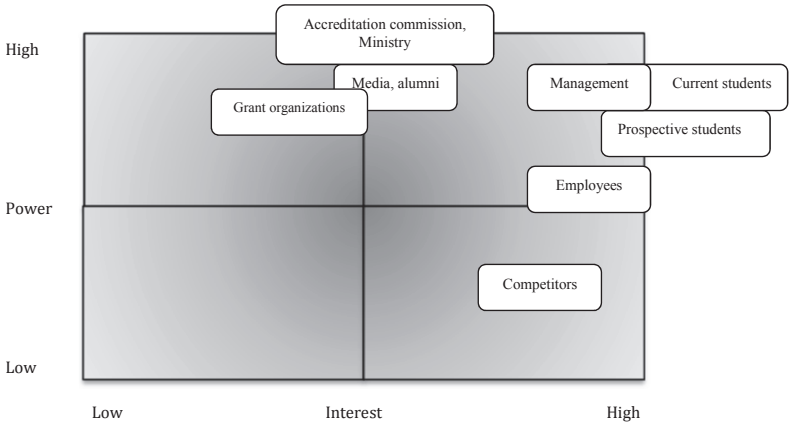
Table 2. Value of indicators for matrixes

Stakeholder group	Priority	Interest	Power (influence)	Attitude
Prospective students	1	9	7	Indifferent
Current students	2	9	8	Support
Media	3	5	8	Opposite
Accreditation commission Czech Republic	4	5	9	Opposite
Competitors	5	7	4	Opposite
Employees	6	8	6	Support
Ministry of Education, Youth and Sports	7	5	9	Indifferent
Management	8	8	8	Support
Alumni	9	5	8	Support
Grant organizations	10	4	8	Indifferent

Source: Authors

As can be seen from table 2 all stakeholder groups show high value of power except of competitors and the value of interest is highest for prospective and current students followed by employees and management. There are three opponents, four supporters and three indifferent stakeholder groups. Values of all characteristics were used for construction of corresponding matrixes.

Figure 3. Power-interest matrix

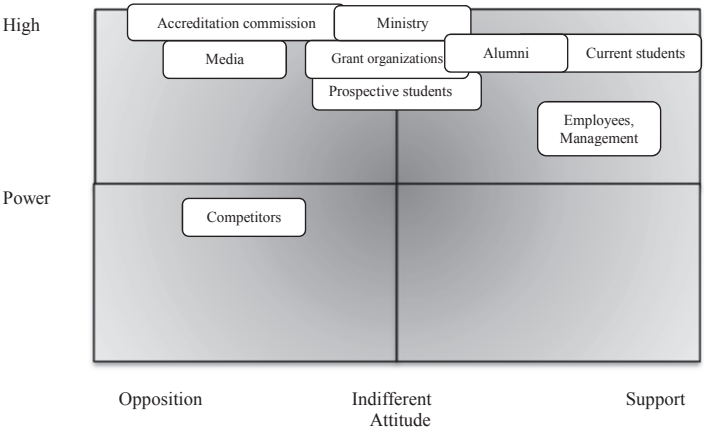


Source: Authors

Based on the power-interest grid we can state, that four of the tenth most important stakeholder groups represent so called key players that have a high capacity to influence selected university and its action and these groups are also in the activities of universities highly engaged. These four most important key players are current and prospective students, management and employees of universities. Other four stakeholder groups – Accreditation commission Czech Republic, Ministry of Education, Youth and Sports, media and alumni are located on the border between key players and context setters. All of these stakeholder groups have medium level of interest in university's activities but they dispose of high level of power to influence activities of selected respondents. One stakeholder group (grant organizations) represent pure context setter and it is necessary to keep them really satisfied, because they are a very important source of finance for universities. Competitors represent subjects with lower power but quite high interest in university actions. That is obvious because competitors need to

know all competing universities and prepare strategies to win their competitive fight concerning prospective students. None of the stakeholder groups represents crowed that should be devoted only minimum effort.

Figure 4. Power-attitude matrix (Source: Authors)



Source: Authors

The problem-frame stakeholder map (influence-attitude matrix) divides the stakeholder groups into groups according to their attitude to the organization. Strong opponents represent two stakeholder groups - Accreditation commission Czech Republic and media. This situation is not very favourable for this university because both of these stakeholder groups are essential for the survival of the university. Accreditation commission can affect the process of accreditation and granting of a new accreditation to this respondent. The evaluation of the Accreditation commission as a strong opponent clearly expresses negative relationships of the university with the Accreditation commission. There is the same problem with media. Media are very powerful. They have the power to influence public opinion. Therefore it is necessary to take consistently care of relationships with these two stakeholder groups and try to postpone them to the group of weak opponents as competitors or to the group of indifferent stakeholders. Indifferent stakeholders represent grant organizations, prospective students and Ministry of Education, Youth and Sports. All of these stakeholder groups have high level of power but they are indifferent to the activities of the university – they are neither opponents neither supporters. Strong supporters of the university are alumni, current students, employees and management. This fact shows that internal stakeholder groups are tilted in favour of the organization and this fact indicates good relationships within the organization. Current students and alumni are supporters of the organization, too, which indicating satisfaction with the university.

4. Conclusion

This paper deals with the possibilities of the application of the stakeholder mapping by the mean of the power-interest matrix and influence-attitude matrix in the stakeholder analysis of universities. Based on the authors' research ten most important stakeholder groups for mapping of the stakeholder community of selected university were identified - prospective students, current students, media, Accreditation commission Czech Republic, competitors, employees, Ministry of Education, Youth and Sports, management, alumni, grant organizations. Four of these ten stakeholder groups represent based on the power-interest matrix key players and the

university have to pay attention. Results of the power-attitude matrix are very important for this university because these results show that two powerful stakeholder groups are strong opponents of this university - Accreditation commission Czech Republic and media. Both of these stakeholders have the power to influence public opinion and the existence and survival of this university. It is necessary to focus on the improving relations with these groups. Grant organizations, prospective students and Ministry of Education, Youth and Sports represents indifferent groups. Also in this case it is necessary to support the relationships with these stakeholder groups with the aim to postpone these stakeholder groups to the group of weak supporters. The stakeholder mapping of this university shows very good relationships with internal stakeholders – management and employees; and with prospective students. But of course it is necessary to take care of these groups for keeping this situation. Because of the fact that all respondents are connected in some ways and have the power to influence others there are several recommendation for further research. First of all it is necessary to develop a map of the patterns of the possible influence that can occur among identified stakeholder groups. For detail analysis and support of management decision the stakeholder-issue relationship map and integrated stakeholder analysis map should be developed, too.

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Application Possibilities of the Stakeholder Circle Methodology in the Marketing Communication of Universities

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Abstract

Stakeholder analysis has become more and more popular during last years. The concept originally created for profit organizations has spread out to other sectors as well as non-profit organizations and tertiary education. This article focuses on the application possibilities of the Stakeholder Circle Methodology in the marketing communication of universities. The first step of the marketing communication strategy represents identification of the target audience. This step corresponds with the first and second step of the Stakeholder Circle Methodology – stakeholder identification and prioritization. This article focuses on the determination of the most important stakeholder groups of public and private universities, their prioritization based on the Stakeholder Circle Methodology and determination of the most urgent stakeholder groups based on the calculation of the Urgency. On the basis of the author's research that was carried out in the market of tertiary education in the Czech Republic the most important and the most urgent stakeholder groups of private and public universities will be identified and compared differences between answers of respondents from public and private universities.

Keywords: Urgency; Stakeholder Circle Methodology; university; stakeholder; prioritization

JEL Classification: I29, M39

1. Introduction

Universities, not only public, but of course also private universities have a very important role in the educational system in the Czech Republic in education and training for young people. Changing environment, negative demographic growth, decreasing number of children in the age of potential prospective students, growing competition and global financial and economic crisis caused that universities have to face a very strong competition in these days. Universities understand the necessity of using tools from business (especially management and marketing). Because of the growing competition in the Czech market of the tertiary education, all universities (public as well as private) have to start to use marketing communication tools because as stated Keller all marketers (and marketers in the sector of tertiary education are not an exception) must understand the necessity of marketing communication to the target groups and diversity of options of marketing communication and combination of marketing communication tools in marketing communications programs [1].

Marketing communication in the sector of tertiary education is used not only for targeting and attracting prospective students, but also for other groups and individuals in the universities' surrounding. Beforehand most of the universities focus only on their customers (perspective students), in the contemporary turbulent environment this orientation in the marketing communication was proved as insufficient [2]. Hence it is necessary to take into account also others individuals and groups from the surrounding that can affect or are affected by universities' activities and decisions. Therefore also universities started to adapted stakeholder approach [3]. These groups that can affect universities' actions are in literature called stakeholders. Stakeholders as well as stakeholder analysis has been gaining importance and the growing popularity of stakeholder identification, mapping and analysis reflects in decision-making processes and marketing [4]. Stakeholder analysis is nowadays more important than before because of the growing interconnected nature of the business environment. Stakeholder analysis is considered as very important tool for managers because stakeholder analysis and identification help organizations to fulfill mission of organization, create public value and meet

organizations' mandates [5]. And finally who are the stakeholders? Depending on usage of broader or narrow definition we distinguish mainly two fundamentally different views on the definition of stakeholders. The so called "claimant" definition was extended to the "influencer" definition of stakeholder [6]. The claimant definition of stakeholder is following – "any individual or group that maintains a stake in an organization, a claim, a right or an interest" [7]. The influencer definition is connected with the affects connected with stakeholders' and organizations' action. According to the influencer definition stakeholders are defined as "any group or individual who can affect or is affected by the achievement of an organization's purpose" [8].

First of all the stakeholder theory was designed to profit and commercially oriented organizations and entities. Major part of authors devoted to the stakeholder analysis of profit organizations – for example [8-10], etc. With changes in the environment the stakeholder theory and analysis found an important role in the application in the non-profit organizations' sector, too [11]. And nowadays we can find several authors devoted to the stakeholder analysis of non-profit organizations in different areas. For example [4], or Downing [12] focus on the stakeholder analysis in the health sector, papers of Bryson [5] focus on the non-profit organizations generally and several authors pay their attention to the application of the stakeholder theory in the tertiary education market – for example [3], [13-14], and many others. The results of researches from the tertiary education sector and identification of basic stakeholder groups of universities in these researches will be used as the starting point for author's research described in this article. There are lots of research papers concerning techniques of stakeholder identification, analysis and prioritization – for example [5-6], [15-16] and many others. For the author's research the Stakeholder Circle Methodology supported by the online software tool was chosen. The Stakeholder Circle Methodology is very closely connected with marketing communication models and strategies of effective marketing communication. The traditional concept of marketing communication strategy involve following steps [2], [17-18]:

- identification of target market, determination of communication objectives, design of communication, selecting of marketing communication channels, budgeting, decision on media mix, measuring of results and managing of integrated marketing communication.

According to Kotler and Keller the first step of marketing communication - identification of target groups (audience) is considered as a critical one [17], [19]. The Stakeholder Circle methodology consists of five key steps [20-21]:

- identification, prioritization, visualization, engagement and monitoring. First two steps - identification and prioritization of the stakeholder groups can be considered as the identification of key target markets (audience) within the meaning of the effective marketing communication strategy.

During identification of stakeholder groups it is necessary to focus on an assessment of what organization needs from all stakeholder groups and individuals and what stakeholder groups and individuals want from the organization. A key part of the first step of the stakeholder analysis is identification of stakeholders' requirements. Understanding stakeholders' expectation is important information for creating of communication with stakeholders. Identification of stakeholder requirements and wants and needs is necessary for creation of the message of marketing communication targeted to these stakeholder groups. The identification of stakeholder requirements corresponds with other step of marketing communication strategy – determination of communication objectives, because communication objectives have to be based on the requirements of target groups.

As stated above this article focuses mainly on the prioritization of the stakeholder groups - the second step of Stakeholder Circle Methodology. Therefore the major aim of this article can be summarized as follows: the aim of this article is to perform prioritization of stakeholder groups of public universities and identify key stakeholder groups (target audience for marketing communication) and classify them into the groups according to their Urgency that will be

calculated based on the Stakeholder Circle Methodology. Key stakeholder groups of public universities will be compared with key stakeholder groups of private universities.

2. Material and Methods

As stated in the text above; this article focuses on the stakeholder analysis on the basis of the Stakeholder Circle Methodology with the main focus on the prioritization and identification of the most urgent stakeholder groups and their classification into groups according to the calculated Urgency. First of all it is necessary to carry out the identification of the most important stakeholder groups that are subsequently prioritized. For the prioritization according to the second step of the Stakeholder Circle Methodology the following identified stakeholder groups from the previous author research will be used:

- Accreditation commission Czech Republic, alumni, communities, competitors, current students, donors, grant organizations, employers, faculties, departments, employees, government authorities, high schools, study referents at high schools, local authorities, management, marketing and public relations departments, media, Ministry of Education, Youth and Sports, parents and prospective students.

Further on the most important groups with the highest Urgency of the marketing communication activities will be identified. The Stakeholder Circle is not only a methodology for stakeholder management but also a software tool (that is available online). This software simplifies the whole analysis and help to guide through steps of the methodology and for data input. The Stakeholder Circle online software tool will be used for the analysis of the results of the author's research. The Stakeholder Circle software also uses multidimensional maps for visualization of the key stakeholder groups (possible usage for further research) and calculates all variables that are necessary for prioritization – Stakeholder Index and Urgency.

Data that are necessary for the second step of the Stakeholder Circle Methodology were gathered through author's research of the Czech public and private universities. The total research sample in the Czech market involves 72 private and public universities (28 public universities (included 2 state universities) and 44 private universities. The total return rate of online questionnaire was 54%. Respondents were mainly chiefs of marketing departments of universities or deans or rectors responsible for marketing communication activities.

Prioritisation in the Stakeholder Circle Methodology is based on three factors – Power, Proximity and Urgency. On the basis of these three factors Stakeholder Index is calculated (for detail see formula 1). The Stakeholder Circle Methodology uses the Stakeholder Index for arranging of the stakeholder groups in order of importance of each stakeholder group for organisation. Based on the Stakeholder Index the unique priority number is allocated to each stakeholder group.

$$Stakeholder Index = (\sum Power, \Pr oximity, Urgency) \quad (1)$$

Power can be defined as a relative power of the stakeholder group to terminate organisation's activities. Proximity answers the question if the stakeholder group is relatively remote from organisation's activities or closely associated with the organisation's activities. Both factors are rated on a scale of 1-4, where 1 represents low value and 4 high value of both factors [20]. In the Stakeholder Circle Methodology the Urgency is connected with two attributes: time sensitivity and criticality, therefore the final rating on a scale of 1-5 can be formulated as follows [22]:

- 1 – represents only little need for action outside regular communication,
- 2 – represents communication that is commonly planned and must be carried out within the medium term,
- 3 – represents communication that is commonly planned but must be carried out within short term,
- 4 – represents urgent action in the frame of regular communication,

- 5 – represents immediate action in communication.

The necessary input data for calculating of Urgency are Stakeholder Value and Stakeholder Action (for detail see formula 2).

$$Urgency = INT((StakeholderValue * StakeholderAction / 25) * 5) \quad (2)$$

Stakeholder Value is connected with the vested stake that stakeholder or stakeholder group has in the organisation. This stake can be in a form of emotional, personal or financial stake, or for example reputation of stakeholder. It represents how much can stakeholder lose or gain on the basis of the success of the organization's activity. Stakeholder Activity is connected with the fact what is the stakeholder willing undergo in his activity toward organisation. It answers the question – How far is the stakeholder prepared to go to achieve his outcomes?

Stakeholder Value and Stakeholder Action are rated on a scale of 1 to 5; where 1 means low Stakeholder Value or low Stakeholder Action and 5 high Stakeholder Value or high Stakeholder Action (for detail see Table 1).

Table 1. Qualitative rating of Stakeholder Value and Stakeholder Action

Numeric value	Stakeholder Value	Stakeholder Action
1	Stakeholder has only limited or no stake in organization's activities	There is nearly no probability that stakeholder attempt to influence organization's activities
2	Stakeholder has only indirect stake in organization's activities	There is little potential that stakeholder attempt to influence organization's activities
3	Some medium direct stake in organization's activities	Stakeholder could be prepared to influence organization's activities
4	Organization's activities and their outcome are important for the stakeholder or his organization or business	High probability and significant effort to influence in organization's activities
5	Great stake (personal stake) in organization's activities	Very high personal effort to influence organization's activities (stakeholder will go any length to influence them)

Source: Stakeholder Circle Software online

The priorities will be assigned to the stakeholder groups on the basis of the Stakeholder Index. Based on the value of Urgency the most urgent stakeholder groups will be classified.

3. Results and Discussion

This part summarized results of the author's research. First of all respondents had to evaluate Stakeholder Value and Stakeholder Action on the scale of 1 to 5. The following table summarizes entry data (Stakeholder Value and Stakeholder Action) separately for public and private universities in the Czech market.

Table 2. Entry data for calculation of Urgency for public and private universities

Stakeholder group	Stakeholder Value		Stakeholder Action	
	Public	Private	Public	Private
Accreditation commission Czech Republic	3	3	4	4
Alumni	4	4	3	3
Communities	1	1	1	1
Competitors	1	4	2	5
Current students	4	5	5	5
Donors, grant organizations	4	4	3	2
Employers	1	1	2	2
Faculties, departments, employees	5	4	5	5
Government authorities	1	1	3	3
High schools, study referents at high schools	1	1	3	3
Local authorities	1	1	2	2
Management	2	2	3	3
Marketing and public relations departments	3	3	3	4
Media	3	3	5	5
Ministry of Education, Youth and Sports	2	2	4	3
Parents	4	4	1	2
Prospective students	4	5	5	5

Source: Author

As can be seen from Table 2 the highest Stakeholder Value for public universities has only faculties, departments and its employees and the second highest Stakeholder Valuehave alumni, current a prospective students, parents and donors and grant organizations. In the case of private universities the highest Stakeholder Value was assigned to prospective and current students, followed by faculties, departments, employees, alumni, donors, grant organisations and parents. Because high Stakeholder Value (or vested stake) means that stakeholder or stakeholder group can gain or lose much on the basis of success of universities' outcome; it is obvious that students (current, prospective or on the second place alumni) have the highest value of stakeholder action and stakeholder value and activities of universities are important for them. Their personal stake is mainly reputational. Prospective and current students are also stakeholder groups that will go any length to influence organization's activities – that means that they have the highest value of Stakeholder Action as well as media or faculties, departments, or employees. Because alumni have already graduated at universities, the value of Stakeholder Action is only 3; they could be prepared to influence organization's activities. Respondents also do not assume that parents will be willing to influence their activities.

Based on the results of author's research we can see (for detail see Table 2) that there are not significant differences between answers of private and public universities. The same values were assigned to the Accreditation commission Czech Republic, alumni, communities, employers, government and local authorities, high schools, management and media. In the case of competitors we can see that all factors were rated as much less important by public universities than public universities. In other cases there are only slight differences usually for one point. In the following table the resulting calculated value of Urgency and Stakeholder Index for public and private universities as well as Priority are summarized.

Table 3. Urgency, Stakeholder Index, Priority

Stakeholder group	Urgency		Stakeholder Index		Priority	
	Public	Private	Public	Private	Public	Private
Accreditation commission Czech Republic	3	3	45.78	45.78	5	5
Alumni	3	3	41.56	36,26	8	9
Communities	1	1	14.91	14.69	17	17
Competitors	1	1	20.14	41.01	14	7
Current students	4	4	46.14	56.77	4	2
Donors, grant organizations	3	3	35.52	35,52	10	10
Employers	1	1	19.40	19.40	15	15
Faculties, departments, employees	5	5	65.66	55.66	1	3
Government authorities	2	2	33.23	30.03	11	13
High schools, study referents at high schools	2	2	30.03	28.55	12	14
Local authorities	1	1	15.01	15.01	16	16
Management	2	2	40.65	44.68	9	6
Marketing and public relations departments	3	3	44.68	35.16	7	11
Media	4	4	53.57	48.56	2	4
Ministry of Education, Youth and Sports	3	3	44.15	40.29	6	8
Parents	2	2	25.64	31.13	13	12
Prospective students	4	4	51.27	57.65	3	1

Source: Author

As we can see from Table 3 the Urgency calculated for all stakeholder groups is the same in both cases – public as well as private universities. On the other hand in several cases there are differences between priorities of public and private universities. The same priority was assigned for Accreditation commission Czech Republic, communities, donors, grant organizations, employers and local authorities. The most important stakeholder group with priory 1 for private universities are prospective students and the second most important stakeholder group are *current students, as could be expected. For public universities the most important stakeholder group are faculties, departments and employees and the priority 2 based on the Stakeholder Circle Methodology was assigned to media. Media are considered as a very powerful stakeholder group since they dispose of the power to influence other stakeholders and public opinion.

The categorisation into the five groups based on the Urgency is summarized in the following table.

Table 4. Categorization of the stakeholder groups based on the Urgency

Numeric value	Verbal expression	Stakeholder groups	Time frame
1	Little need for action	Communities, competitors, employers, local authorities	More than 1 year
2	Commonly planned communication activities	Government authorities, high schools, study referents at high schools, parents	6 months – 1 year
3	Short term commonly planned activities	Accreditation commission Czech Republic, alumni, donors, grant organizations, marketing and public relations departments, Ministry of Education, Youth and Sports	3 – 6 months
4	Urgent action in the frame of regular communication	Current students, media, prospective students	1 -3 months
5	Immediate urgent action	Faculties, departments, employees	Weeks

Source: Author

Both public and private universities marked as the most urgent stakeholder group with the highest value of Urgency faculties, departments and employees. That means that the immediate action has to be performed toward to this stakeholder group. The second most urgent stakeholder groups (with the necessity of the urgent action in the frame of regular communication) are current and prospective students and media. On the other hand the lowest

Urgency was calculated for local authorities, communities, competitors and employers. But it is necessary to answer another question, what is immediate urgent action? What time frame we should assign to the short term or urgent action? According to the Kotler and Caslione the traditional planning for three or five years is not effective, even dangerous during turbulent times [23]. Therefore the other question for respondents was to evaluate time frame for all levels of Urgency. The time frame is summarized in the last column of table 4. The most urgent activities should be done in maximum weeks. Urgent activities in the frame of regular communication (Urgency 4) should be done in the time frame from one to maximum 3 months). The communication activities for stakeholder groups with Urgency 1 can be done in the time frame of one year or more.

4. Conclusion

The aim of this article was to perform the prioritization of stakeholder groups of public universities based on the Stakeholder Circle Methodology and comparison of the most important stakeholder groups of public and private universities. Results are summarized in the Table 5.

Table 5. The most important stakeholder groups according priorities

Priority	Public universities	Private universities
1	Faculties, departments, employees	Prospective students
2	Media	Current students
3	Prospective students	Faculties, departments, employees
4	Current students	Media
5	Accreditation commission Czech Republic	Accreditation commission Czech Republic

Source: Author

As stated in the Introduction, there are several research papers focusing on the stakeholders of universities and tertiary education sector generally – for example [3], [14]. All these authors involve in the most important stakeholder groups students, faculties, departments and its employees and government authorities that are in authors' research represented by the Accreditation commission Czech Republic. Based on the comparison with other authors, we can state that the most important stakeholder groups of universities are similar in the Czech Republic as well as abroad. The only difference can be seen in the case of community that is considered as one of the most important stakeholder groups abroad, but Czech respondents assigned to communities the lowest priority.

As the most urgent stakeholder group are considered faculties, departments and its employees. Several respondents remarked that the internal communication in their institution is weak. Because of the fact that tertiary education is a service which quality depends on the people as one of the "Ps" of the marketing mix of universities, it is necessary to pay appropriate attention to creation and support positive long-term relationships with all employees and departments by the mean of clear communication of the mission statement and the main goals of universities, etc. Current and prospective students represent universities' customers therefore there are the most important group for marketing communication. Because the aim of the marketing and marketing communication of universities is to satisfy the needs of their customers it is necessary to analyse their needs in detail and prepare appropriate marketing communication strategy not only for them but also for all the most important stakeholders that must receive special attention.

The Stakeholder Circle Methodology involves not only prioritization (that is in the spotlight of this article) but the fourth step is centered "on identifying engagement approaches tailored to the expectations and needs of individuals or groups" [20]. Therefore authors will use results presented in this paper for further research and application in marketing communication of universities. The main aim of the next step is to create marketing communication strategy tailored to the expectations and needs of key stakeholder groups. The main tools for the preparation of engagement strategy are Individual engagement index representing index of

engagement of individual stakeholder and Engagement index that represents average level of stakeholder community support.

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Municipal Solid Waste Management Attributes and its Efficiency

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Abstract

Paper presents results of qualitative part of a broader research conducted in the field of municipal solid waste management in South Moravian Region in the Czech Republic. Preliminary efficiencies of municipalities in solid waste management were calculated using Data Envelopment Analysis with data about solid waste generation, municipal population and relevant municipal expenditures. Interviews regarding municipal waste management attributes were conducted with relevant responsible municipal authorities from selected sample of municipalities. Acquired data were compared with results of calculated municipal efficiencies in a set of correlation analyses. Results from examined sample show that more efficient municipalities are likely to be smaller in terms of population, have less frequent solid waste collection, use landfills for solid waste treatment, and have lower amount of "separation nests". On the other hand, having larger share of people living in flats, and using incinerator for solid waste treatment is more common among less efficient municipalities. Presence of more competitive environment, public or private ownership of company providing municipal solid waste management, or the level of fee per capita for waste collection and treatment in examined sample does not seem to be connected with either higher or lower efficiency of municipalities in this field.

Keywords: Efficiency factors; municipal solid waste management; public service; DEA

JEL Classification: H40, H72

1. Introduction

Municipal solid waste management (MSWM) is undoubtedly one of the standard services provided by municipalities all around the world. It is a response to human consumption that creates waste. For instance Czech Waste Act (no. 185/2001 Coll.) defines waste as "*any movable thing that a person discards or intends to discard or is obliged to discard and that is specified in some of the waste categories [included in the Act]*". This definition basically says that waste is something unwanted, something that needs to be dealt with in order not to be present anymore. One way to deal with this is to individually take care of one's own waste. However, here we encounter problem of individual benefit from such activity which is usually perceived as much lower than the effort (i.e. cost). And where there is no sufficient incentive, there would most likely be no subsequent action. This solely not necessarily means that piling waste is a problem. However, larger quantities of untreated waste create among other health risks, which is not in interest of any municipality. And at this point theory of public goods comes into concern resulting in taking care of waste management as one of the services provided by municipality.

MSWM and its provision have been examined by many authors from various perspectives, although in this paper I focus primarily on studies from authors examining local conditions. Let me divide them into several by no means exhausting groups according to their area of focus.

First group of studies, [1], [2] and [3] focused on the ways of contracting public services in general and included also parts describing specifically MSWM. Studies described issues related with public procurement process with various case studies and analyses of collected data.

Second group of studies, [4] and [5], focused on efficiency of MSWM in terms of costs. Studies either examined actual MSWM expenditures, or proposed a methodology for efficiency evaluation, for instance method of "minimum value" [6], and then compared this theoretical value with real data in a subsequent case study [7]. Other studies from this group like [8] can be also utilized as a decision support tool for public sector in area of (not just) MSWM.

Third group of studies, [9] and [10] used mathematical tools in order to create a model of integrated waste management utilized later by the Ministry of Environment.

And finally fourth group, [11] and [12], examined effects of competitive environment on the final levels of municipal expenditure in the field of MSWM.

However, listed studies usually focused only on certain aspect and identified its connection with MSWM (or public service in general) efficiency. On the other hand, I chose to initially evaluate MSWM efficiency of selected sample of municipalities, and then examine presence of what attributes makes municipalities more or less efficient when concerning MSWM.

The goal of both this paper and related ongoing broader research is to identify what is present in more efficient municipalities while not present in less efficient ones and vice versa. Attributes that are present in both more and less efficient municipalities will be identified as well. Knowledge of which attributes are present in more (or alternatively less) efficient municipalities can be utilized by municipalities attempting to increase their MSWM efficiency by adopting identified attributes (or in opposite cases removing them), if such change is possible.

Efficiency in this paper is understood as productive efficiency defined by, for instance [13], as the efficiency of a unit's production, or how well is the production unit able to transform inputs into outputs concerning production possibility frontier. At first I calculate efficiencies of municipalities from available data. Then I look for factors influencing calculated efficiencies in selected sample, and finally verify findings in a larger sample of municipalities. This outline follows standard procedure of empirical research in social sciences with initial qualitative part followed by quantitative part with verifications of created hypotheses. Nevertheless, results presented in this paper reflect outcome of just initial qualitative part of the research.

2. Material and Methods

Research was conducted on the sample of municipalities from South Moravian Region in the Czech Republic. The first part consists of quantitative data analysis. Used data contained annual information about the amount of generated municipal solid waste in tons, related municipal expenditures in CZK and the size of the municipality (population). Examined period contains years 2009-2011. This part of research included majority of the municipalities from region – 591 in 2009, 599 in 2010 and 532 in 2011 out of total 673 municipalities. Some municipalities were omitted because of no available reported data. In handful of cases I also reduced the sample from municipalities reporting obviously incorrect data, (for instance when reported amount of waste or expenditure per capita was significantly low). Collected data were used in efficiency calculation using DEA method which is explained later.

Second part of the research consisted of contacting personnel responsible for MSWM in selected municipalities, retrieving information about MSWM attributes of municipalities, and conducting a qualitative research. Municipalities were chosen based on the municipality's type with preference of local administrative capitals. 46 municipalities have been contacted in total, including all municipalities with extended administrative powers and municipalities with authorized municipal office, plus approximately five randomly chosen municipalities from both top and bottom 5% according to their efficiency score (see next subchapter). This contacted sample represents more than half of total population in South Moravia Region.

After this selection a person responsible for MSWM from each municipality was contacted by e-mail and, if no reply occurred within few weeks, also by telephone call. After arranging an appointment, personal interview was conducted. Findings from this qualitative part of research will be later tested on larger sample of municipalities in broader ongoing research. This subsequent testing should either verify findings from initial sample or on the other hand reject them. Testing on a larger sample would produce more reliable results.

In upcoming stages of the research I will extend data series with information from years 2012 and on. Including years prior to 2009 is also possible, however, responsible people often either do not remember that precisely how the situation MSWM was several years ago, or have been assigned with MSWM agenda only in recent years, which lower reliability of findings.

To my current knowledge, there are only handful of studies in this area, for instance [14] and subsequent [15] examining data from 2000-2002. They examined efficiency of waste

generation in general. I, on the other hand, focus primarily on the efficiency of municipal expenditures. Due to this I decided to conduct a new research, where I attempt to identify what are the current factors affecting MSWM efficiency with main focus on the expenditure part of it. After the identification relevant factors (with utilizing results from previous studies), I will collect the relevant current data in order to evaluate current situation in this field.

Foreign studies focusing on MSWM efficiency using quantitative methods of efficiency evaluation are not very numerous as well. Their focus is usually only on certain specific aspect of MSWM with not comprehensive results on connection between municipal attributes and MSWM efficiency. For instance [16] identified theoretical gap between actual and targeted waste and pollution production in Japan, [17] examined difference between public or private management of MSWM in Spain with no significant difference in results, and [18] identified that inefficiency in MSWM in Australia is on one hand caused by high population density, while on the other hand in rural areas it was not possible to attain an optimal scale of operations.

2.1 Efficiency calculations

In the first part of research I calculated efficiencies of MSWM based on the publicly available data concerning MSWM. In order to calculate efficiency I used the method of Data Envelopment Analysis (DEA), which is commonly used in cases when multiple inputs or outputs exist. DEA is a nonparametric method of measuring the efficiency of a decision-making unit such as a firm or a public sector agency [13] and has been introduced by [19]. In this case for each evaluated unit DEA basically produces efficiency ratio in the form of % where 100% means the most efficient unit and 0% the least efficient one.

Used data consists of annual current expenditure on MSWM set as input 1, size of the municipality in terms of population set as output 1 (output served by given input) and annual amount of reported municipal solid waste set as output 2 (again output served by given input). Data was collected from public databases ARIS/ÚFIS (expenditures), Czech Statistics Office (population) and ISOH (reported municipal solid waste).

I used basic input oriented CCR model with constant returns to scale. Input orientation was selected in order to identify most cost-efficient units, while constant returns to scale removed problems arising large difference in municipality size.

Efficiency ratios have been calculated for years 2009-2011. Each municipality then received value representing the average efficiency ratio from examined years. This was done in order to deal with possible jumps or drops that might have occurred within examined period.

Acquired efficiency ratios were finally used in correlation analysis (Pearson correlation) as the first dataset, compared with datasets of results of qualitative part of the research.

2.2 Efficiency factors identification

Interviews were successfully conducted with 25 of 46 contacted municipalities. Interviews took place mostly at municipal offices, several times at the location of company providing MSWM, and in one case at the municipal landfill location. Interviews were conducted during September 2013. In majority cases only one municipal representative was present (as MSWM agenda is usually assigned to one person), occasionally superior employee assisted. Each interview took approximately 40-90 minutes, depending mainly on the size of the municipality. After initial presentation of the research goals, interview followed. Questions asked were focused on the provision of MSWM and other aspects and attributes related to MSWM. Although there was also initial list of "closed" type of questions, main part of interviews consisted of questions asking responsible people about factors affecting MSWM from their perspective. Interviewed people were encouraged to express their own opinion about the MSWM organization in their municipality, and mention anything they find relevant to MSMW efficiency.

Quantitative collected answers (amount of competition present, or frequency of waste collection) were used directly in correlation analysis with calculated efficiency ratios. Qualitative answers (type of solid waste treatment) were transformed into numerical form (for instance with type of waste treatment landfill=1, mixed=2, and incinerator=3) in order to make

correlation analysis with calculated efficiency ratios, which is standard procedure when conducting empirical research. In correlation analysis I used standard Pearson correlation.

3. Results and Discussion

In this part I present selected results of qualitative part of my research. I do not include all of the results as some of them require either further study or are insignificant.

1) The first noticed finding occurred during the efficiency calculation process. Presence of landfill within the municipality seems to be significantly related to MSWM efficiency. Within the sample of municipalities, landfill is present in 4 out of 10 most efficient ones, while there are approximately dozen landfills in the whole region. This finding is not surprising, as municipalities in such cases get usually much better prices on landfills, or they do not pay for solid waste treatment at all, which otherwise accounts for majority of costs related with MSWM.
2) Second finding was made between the size of the population and efficiency. Calculated correlation coefficient acquired value of -0.34 with r^2 of 0.11. Although not very significant, this shows certain trend towards higher efficiency in case of smaller municipalities. This is usually connected with the fact that in larger municipalities presence of blocks of flats is much common, which was often pointed out during interviews as factors causing MSWM to be more expensive.
3) This is connected with third finding between efficiency and portion of municipal population living in flats. Portions were acquired either during the interview with municipal authorities or estimated from the census data from public database. Correlation coefficient in this case acquired value of -0.50 with r^2 of 0.25, which shows noticeable trend of lower efficiency if more people live in flats. This is usually explained as a result of greater anonymity of people living in flats. In areas consisting of flats it is more typical to have lower levels of separation as well as presence of illegal landfills that result in higher municipal expenditure on MSWM.
4) Fourth observation was made between the type of ownership of the company contracted for providing MSWM and MSWM efficiency. Based on collected data, there seem to be no effect on efficiency whether there is municipal, public, private or combination of some of these ownerships in case of company responsible for MSW collection and treatment. Both correlation coefficient and r^2 are very close to zero with small trend towards better efficiency in case of provision by private companies. Acquired results are in accordance with [20] who performed large meta-analysis of studies dealing with cost comparison of public and private provision of public services with rather mixed results.
5) Fifth observation was made between the type of used waste treatment (landfill or incinerator) and MSWM efficiency. Correlation coefficient of 0.35 and r^2 of 0.11 suggests small trend towards higher efficiency in case of landfill treatment. This is not surprising as within the region there is much wider selection of landfills than incinerators, which results in more competitive environment in case of landfills. Several municipal representatives pointed out that the rates for waste treatment at incinerator are either equal or even a bit higher than at landfill. This, together with typically farther distance to the incinerator, creates no incentive for incineration preference, at least from economic perspective.
6) Sixth observation was made between the presence of competition and MSWM efficiency. Based on theory, if more competition is present, customer should be able to get better prices. Nevertheless, in this case there was no significant effect of wider competition presence on MSWM efficiency, as the correlation coefficient acquired insignificant value of -0.18 with r^2 of just 0.03. This observation is in accordance with [12], who performed spatial analysis of effects of competition presence to the level of expenditures per capita of MSWM and did not find any significant effects on expenditures in municipalities where more competition was present.

7) Seventh observation was made between the average area covered by one standing of containers for separated waste (usually called "separation nests") and municipal efficiency. Correlation coefficient in this case acquired value of 0.51 with r^2 value of 0.26, which says that municipalities with less "nests" are more efficient. Nevertheless, this is not surprising as several municipal representatives expressed opinion that separation of waste is good on one hand, as it reduces total amount of solid waste, but on the other hand results in higher MSWM costs.
8) Eighth observation was made between the frequency of solid waste collection and MSWM efficiency. Correlation coefficient here acquires relatively significant value of -0.60 with r^2 value of 0.36, which says that lower frequency of collection results in more efficient MSWM. This is not surprising as it is natural that with less frequency of collection there would be lower related costs. Nevertheless, it shows that if municipality decides whether to have higher or lower frequency of solid waste collections, it has significant impact on the resulting expenditures.
9) And the final ninth observation was made between the level of fee per capita for collecting and treating municipal solid waste and MSWM efficiency. Correlation coefficient here acquires value of -0.22 with r^2 value of 0.05, which, although not very significant, shows small trend towards better efficiency of municipalities with lower fee per capita. This is possibly caused by higher motivation for people not pay the fee while creating illegal dumps, which results in higher municipal expenditures. Nevertheless, as the coefficient is quite close to 0, it also says that the amount of fee per capita has actually very little effect on MSWM efficiency.

Related to the last observation, in study [15] was the presence of PAYT (pay-as-you-throw) charging scheme identified as a major factor of efficiency (although the paper was focused rather on waste generation than waste expenditure). However, none of the 25 interviewed municipalities had implemented PAYT in any way during the examined period, although one municipality did it later. Moreover, once I explained them the basics of PAYT, representatives were rather skeptical and predicted significant emergence of illegal dumps as a result. This was stressed especially in municipalities with larger portion of population living in flats, where there is much more anonymity and people are much less concerned about their neighbors. On the other hand, few representatives from smaller municipalities expressed a positive attitude towards PAYT, but added straightly that it was only due to the fact that, within their municipality, people know each other, and potential for illegal dumps was small anyways.

Another study [21] related to this observation has shown that variable charges encourage people to separate more. Same results were concluded also earlier in [22]. The reduction in municipal solid waste accompanied with increased portion of separated waste was also verified by a municipal representative in the only municipality from the interviewed sample where such scheme was later adopted. But there is a drawback to this, which are expenditures. I have to conclude that (although there might be significant reduction in the amount of municipal solid waste) expenditures and related efficiency of this particular municipality were rather worse that in case of comparable municipalities with no such charging scheme. Moreover, several municipal representatives expressed their opinion that in general it actually might be cheaper not to separate waste. But this leads to a different question whether the economic or environmental aspect of MSWM is more important, which is not among the goals of this paper.

Table 1. Selected municipal attributes and their relationship with MSWM efficiency

	Municipal characteristic	Relationship with MSWM efficiency
1	Presence of landfill within municipality	Landfill present in 4 of 10 most efficient municipalities
2	Size of the municipality (population)	Higher efficiency observed in smaller municipalities (corr. coeff. = -0.34)
3	Portion of municipal population living in flats	Higher efficiency observed if less people live in flats (corr. coeff. = -0.50)
4	Public or private ownership of waste collecting company	Little to no relationship to MSWM efficiency
5	Type of used solid waste treatment (landfill/incinerator)	Higher efficiency observed if landfill used for waste treatment (corr. coeff. = 0.35)
6	Presence of competitions in waste management area	Little to no relationship with MSWM efficiency
7	Average area covered by "separation nests"	Higher efficiency observed if more area covered by "separation nests" (corr. coeff. = -0.51)
8	Frequency of solid waste collection	Higher efficiency observed if less frequent solid waste collection (corr. coeff. = -0.60)
9	Level of fee per capita for MSW collection and treatment	Little to no relationship with MSWM efficiency

Source: Author

Presented results are limited to the examined sample, and their primary role is to serve as a base for further quantitative research, where the findings will be compared with data from large survey among municipalities from South Moravian Region in the Czech Republic in order to verify or reject results concerning the effect of identified factors on efficiency on MSWM.

4. Conclusion

Paper presents preliminary results of qualitative part of empirical research conducted in the field of MSWM efficiency. MSWM efficiency was calculated by DEA method using public data on MSW expenditures, generated MSW quantities and population sizes for municipalities from South Moravian Region in the Czech Republic, and subsequently efficient municipalities have been identified. Based on this efficiency evaluation a set of interviews was conducted with the selected group of municipalities from the initial sample concerning their MSWM attributes. Data collected during interviews were compared with MSWM efficiency ratios acquired by the municipalities in correlation analysis.

Observed attributes can be divided into 3 groups according to their relationship with calculated MSWM efficiency of analyzed sample. It has been identified that more efficient municipalities tend to be smaller, have less frequent solid waste collection, prefer landfills for solid waste treatment, and have lower amount of "separation nests". On the other hand larger municipalities with larger share of people living in flats and using incinerators over landfills for MSW treatment tend to be less efficient. Attributes such as more competitive environment, public or private ownership of company providing municipal solid waste management, or the level of fee per capita for waste collection and treatment show no significant relationship with calculated MSWM efficiency.

Presented research will continue further with analysis of acquired data in various econometric models, and conducting a quantitative research on all municipalities from South Moravian region in the Czech Republic with hypotheses based on initial part of the research.

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Tax Laws Affecting the Sustainability of NGOs in Slovakia

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Abstract

In the paper we review the tax laws affecting non-governmental organizations based on expert evaluation acquired by the Delphi method and on the analysis of relevant legislative acts. The most important element of the tax system which affects the operation of NGOs, in addition to the exemption of their core work from income tax, is the so-called tax assignation. The paper analyses the reasons for the introduction of such a mechanism, as well as the reasons for the changes during its 12 years of existence. The paper focuses on the possibility of corporations to assign a share of their income tax, since it is this possibility that has undergone major changes in recent years. The aim of this paper is to analyse the tax system affecting the sustainability of NGOs in Slovakia, the changes in tax assignation and their impact on the operation and sustainability of NGOs.

Keywords: Tax assignation;. 2% of Income tax; NGOs; income tax

JEL Classification: L31, L39, H24, H25, H61

1. Introduction

One of the principles of the financing of non-governmental organizations (NGOs) is tax exemption. This principle is applied in two directions: it either refers to the legal form or to the activities of an organization, irrespective of its legal form.

In terms of the aim of this paper we will focus on public funding to non-governmental organizations, especially on the form of indirect support where the state waives certain income and thus enables NGOs to "save" resources, e.g.:

- exemption from taxes (e.g. value added tax, customs fees, etc.),
- tax reductions for NGOs,
- tax reductions for companies/donors (who can deduct donations from their tax base) and other [12].

Basically, under indirect public support of NGOs we can understand the advantages of these organizations in the field of taxation as well as the tax advantage for individuals and corporations that support the NGOs through donations. Since NGOs must meet the non-distribution constraint principle (i.e. they can make a profit, but it is predetermined that this cannot be used to enrich the owners, members or employees, but must be fully reinvested in the operation of the NGOs to support their mission and purpose for which they were founded), Weisbrod [16] considers tax relief as some form of compensation for this restriction about the possibility of profit distribution. Other authors indicate other reasons for tax exemption [1,2, 9, 11], e.g. exemption in respect of the character of the activities provided by non-governmental organizations enables them to fund charitable or generally beneficial services for which they are founded (in the area of education, health, social care etc.).

The reasons for writing this paper are the changes in the exemption of NGOs from different types of taxes and the changes in the mechanism of assignation of the income tax as well as the outcome of primary research conducted in the dissertation "Self-financing strategy and sustainability of non-profit organizations". The outcome of the dissertation confirms the importance of the legal environment and namely the tax laws that affect the economy and management of all institutions in the country including NGOs.

As reported by The U.S. Agency for International Development (USAID) [3], which has been assessing the sustainability of non-governmental organizations in Central and Eastern Europe since 1997, the legal environment should support the needs of the non-profit sector,

allow the entry of new organizations, prevent political interference in NGOs, enact the conditions under which NGOs would be able to conduct entrepreneurial activities to ensure income and to enhance their stability. Among the monitored factors are: the difficulty of registering new organizations, laws governing the operation of the organizations, their taxation, access of NGOs to information, etc.

The importance of the legal environment and in particular the tax laws is not only confirmed by USAID but also by the results of the primary Delphi research, as presented later in this paper. We examine the tax laws that affect the operation and sustainability of NGOs, with emphasis on the law on income tax. The paper further provides an overview of changes in tax laws, particularly about tax assignation.

The aim of this paper is to analyse the tax system affecting the sustainability of NGOs in Slovakia, the changes in tax assignation and their impact on the operation and sustainability of NGOs.

2. Material and Methods

Material and methods were selected in order to fullfil the foresaid aim of this paper. We are aware that the problems with tax system and tax assignation are broader and include many other areas, e.g. the impact on public budgets or increased tax administration cost connected with transferring the share of tax assignation to the selected NGOs, but due to the limited scope of the paper we focus on the impact on the sustainability of NGOs, especially the financial sustainability that can be achieved by using the tax assignation system. The material consists of primary and secondary information on NGOs and the Slovak tax laws affecting the operation and sustainability of NGOs. As secondary data we use relevant legislative acts and output of research studies published in this area. Important source was NGO Sustainability Index published yearly by USAID (in 2011 the Index was renamed to CSO Sustainability Index - Civil Society Organization but subject of analysis, methodology and content remain the same, we will use the term NGO to correspond with the abbreviation in this article).

Primary data was obtained by the Delphi method; we addressed a group of experts on the non-profit sector and NGOs with a questionnaire. The expert group in the Delphi research was made up of experts from scientific, public and non-governmental spheres. As experts from the non-governmental sector we chose representatives from the so-called umbrella organisations and significant agents in this field who examine the issue from a practical point of view. We asked experts from all three spheres to assess the significance of various determinants that affect the sustainability of NGOs and assess the state of the six selected dimensions in Slovakia (dimensions were chosen according to USAID methodology). The expert group was created based on citation analysis (the most cited names in scientific publications) and purposeful selection (our own decision after consultation with another expert).

We asked 40 experts by electronic means of communication, 22 of whom responded to the questionnaire, 4 did not want to be involved in the research, 3 marked the option "other" where they stated they did not consider themselves to be experts in the field of NGOs. After the first round we addressed only 33 experts of whom 15 answered. The participation of experts in both rounds of research and their expertise are shown in Table 1 and Table 2.

Table 1. Number of participating experts in both rounds

	TOTAL	Public sphere	Non-governmental sphere	Scientific sphere	other
Round 1	22	6 27%	8 36%	5 23%	3 14%
Round 2	15	4 27%	5 33%	5 33%	1 7%

Source: Authors

Table 2. Level of expertise of participating experts in both rounds (own research, 2012)

Criteria of expertise	TOTAL		Public sphere		Non-governmental sphere		Scientific sphere	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Years of experience	4.5	4.6	5.5	5.5	5.2	5.5	4.4	3.9
Number of publications	6	7.2	4	6.6	7	8.6	9	7.7

Source: Authors

The experts evaluated the significance (importance) of the selected determinants (they had to assess on a scale from 1 to 5, where 1 means the most important determinant and 5 the least important determinant for the sustainability of Slovak NGOs), as well as the current state (condition) of Slovak NGOs in terms of sustainability in accordance with the USAID methodology (they assessed the level of the determinants in Slovakia on a scale from 1 to 5, where 1 means the most developed determinant and 5 the least developed determinant). The determinants were grouped into six dimensions corresponding to those in the Index (legal environment, organisational capacity, financial viability, service provision, infrastructure, public image). The experts also had the option to propose their own determinant.

Based on the responses in the first round we evaluated the importance of the determinants as ordinal variables using median and variance. We added other determinants stated by experts in the first round and after 1 month we again sent the questionnaire to the experts to confront their opinion with the majority of the group. Subsequently, experts could modify their opinions or could argue their original opinion. After the second round we conducted an overall evaluation, the changes of opinions resulted in the changes of values of median and variance (Table 3).

Table 3. Significance of the determinants influencing the NGO sustainability and their state in Slovakia

Determinants	Significance					
	Round 1		Round 2		Total significance of the determinant	
	median	variance	median	variance	Round 1	Round 2
Legal environment	*2,3*	*x*	*2,4*	*x*	*62%*	***60%***
Suitability of laws governing the operation of NGOs	1,5	0,45	2	0,42	70%	60%
Clarity of laws governing the operation of NGOs	2	0,62	2	0,49	60%	60%
Tax laws (allowances for NGOs)	2	0,53	**2**	0,53	60%	60%
Availability of legal advice for NGOs	3	0,6	3	0,46	40%	40%
Opportunities to apply for government / public contracts	3	0,55	3	0,43	40%	40%

Determinants	State in the SR			
	Round 1		Round 2	
	median	variance	median	variance
Legal environment	*3,4*	*x*	***3,4***	*x*
Suitability of laws governing the operation of NGOs	3	0,41	3	0,37
Clarity of laws governing the operation of NGOs	3	0,37	3	0,51

Tax laws (allowances for NGOs)	4	0,44	**4**	0,29
Availability of legal advice for NGOs	3	0,48	3	0,45
Opportunities to apply for government / public contracts	4	0,49	4	0,44

Source: Authors

Research by the Delphi method has brought not only the expert evaluation regarding the current state of sustainability of NGOs, but also the assessing of the significance of individual determinants and dimensions. The significance of the legal environment for the operation of NGOs reached the value of 60% after the second round. From other surveyed dimensions a higher ranking was achieved by only public image (67%) and organizational capacity and financial viability with identical value of 63% (for more information see the outcome of research in [13] and on enhancing financial viability with modern managerial tools see [15]).

We focused on determinants where the significance on NGO activities was identified as important but it was considered to be underdeveloped in the current conditions in Slovakia. From Table III it is clear that "tax laws" is such a determinant. For this determinant the difference between significance and current state was 2 points (besides the legal environment other dimensions were financial viability, service provision and public image, but these are not in the focus of this paper). Based on the analysis of the Index and our research results we confirmed the importance of the legal environment, particularly tax laws on the sustainability and operation of NGOs and therefore we select them as a subject of analysis.

3. Results and Discussion

All NGOs are taxpayers. Therefore they must, in accordance with regulations, deal with tax liability. They are, however, due to their nature or the nature of their activities either totally or at least partially or conditionally exempted from most taxes in the Slovak Republic.

Tax exemptions, as one of the tax benefits for NGOs, are mainly regulated in Act no. 595/2003 Statutes on Income Tax, as amended. An overview of income that is not subject to tax in NGOs or is exempted from taxes as well as income that is to the contrary a subject to taxation is shown in Table 4.

Table 4. Taxation of NGOs in Slovakia

Revenue from the perspective of income tax	Definition of the income
Income subject to tax (§ 12)	income from the activities that generate a profit for NGOs
	income from the activities that may lead to generating a profit
Income not subject to tax (§ 12)	income gained from the tax assignation
	income gained from donating or inheriting
Income exempted from tax (§ 13)	income from the activities for which the NGOs (taxpayers) were founded (activities stated in the statuses as a goal/purpose that will be provided by the NGOs in a form of selected services, e.g. education, social services, health care, etc.) or activities that are their core work (activities stated in the statuses that are performed to help to achieve the goal, the purpose for which NGOS were founded), except from income from business activities and income on which withholding tax is levied
	income from church collections, religious acts and allowances for registered churches and religious societies
	income from membership fees stated in statute or constituent documents received by civic associations including professional associations, trade unions, political parties and political movements
	income from grants provided by international treaties by which the Slovak Republic is bound

Income that is subject to withholding tax (§ 43)	interest, win or other income accrued on the deposit saving books or cash balances on current accounts
	income from assets in the mutual fund, income from shares obtained from the redemption (repayment), income from deposit certificates, income from bonds and treasury bills

Source: Author based on [5]

In the past NGOs had some more tax benefits, for example relief on property taxes, on VAT, on income tax and on road tax. Income from entrepreneurial activities was also exempted up to 300,000 SKK, over this amount the income was taxed (abolished in 2006). Amendments to the Act on Income Tax in the years 2001 – 2006 cancelled these tax benefits and the possibility of tax assignation to NGOs took effect.

3.1 Tax assignation

Tax assignation is a mechanism that allows individuals and corporations to assign for a selected NGO a percentage of the paid income tax. Tax assignation can be regarded as a mixed source: it has the characteristics of public funding (state foregoes part of the income tax, therefore a public resource) and private funding (free private choice of individuals or corporations who decide whether they assign a percentage to an NGO). In the event that they do not decide on any particular NGO, the entire amount of the paid income tax remains in the state budget. Tax assignation thus can be seen as a unique form of support which is at the crossroads between public funds and private funds.

The tax assignation in Slovakia has been developed thanks to an initiative of the NGOs themselves. The first impulse was at a conference in Stupava (1997) which brought together representatives of the non-profit sector. After the 1998 elections and the onset of a coalition led by Mikulas Dzurinda, the representative of the Committee of the Third Sector succeeded with the proposed amendments to the Income Tax and tax assignation. The main argument was a gradual withdrawal of foreign foundations that had previously supported the Slovak NGOs but now changed their support for NGOs in the less developed countries of Eastern Europe. Philanthropy was still underdeveloped in Slovakia and NGOs sought further sources of funding. Inspiration was found in implementing the tax assignation mechanism in Hungary. This way of fundraising appeared to be successful and the conditions were similar in these two countries. The mechanism was supposed to bring additional resources to the non-profit sector but also to help build relationships between NGOs and citizens – assignation of a percentage of income tax should represent some form of stimulation for corporations and individuals in their efforts to participate in a more significant way to finance public needs provided by the NGOs.

The mechanism of tax assignation has undergone several important changes since its introduction in 2001; we briefly summarize the genesis of the tax assignation.

Act no. 561/2001 Statutes on Income Tax amended the Act no. 366/1999 and one of the changes allowed taxpayers – individuals a free choice to assign 1% of their personal income tax to the public benefit services provided by defined NGOs which operate in the fields of education, health care, social services, physical education and sport, environment, culture and restoration of cultural monuments. The possibility of tax relief on the value of the donations for public purposes (up to 10% of the tax base for individuals and 2% of the tax base for corporations) was abolished by this amendment.

Another amendment took place in 2003 with the adoption of Act no. 595/2003 Statutes on Income Tax which changed the amount to 2% of the paid income tax and gave not only individuals but also corporations the possibility to assign this percentage of income tax. By allowing tax assignation to corporations Slovakia became unique in the world. Other amendments in this Act were related to specifications of recipients (to whom the 2% of income tax may be assigned) and to the obligations of the recipients, e.g. how the received resources may be used. A tax assignation recipient must be registered by a notary and the received resources must be used by the end of the next year and for the purpose resulting from their core work. If the recipient fails to fulfill these obligations, they have to return the received resources within 90 days to the state budget and at the same time they are subject to a breach of budgetary

discipline under a special regulation. A recipient, who receives more than 3,319.39 € from tax assignation in one year, is required to disclose the exact specification of the use of the received resources in Obchodný Vestník (Business Journal). The specification includes in particular the amount and purpose of use of the received resources and an auditor statement in specific conditions defined by special regulation. Based on this amendment, the Ministry of Finance estimated that funds from the tax assignation for NGOs should have been around 300 mil. SKK (approx. 10 mil. EUR). The estimation of the 1st Slovak Non-profit Service Centre doubled the sum, i.e. 600 mil. SKK (approx. 20 mil. EUR). There was certain shock when the total amount of tax assigned was 845,222,347 SKK (over 28 mil. EUR) [8]. The huge error in the estimation could have been a result of several factors: one of them was the expectation of government that taxpayers would be less trusting to the new mechanism and would not take part in the beginning in such a great number. Another factor was that NGOs took this opportunity and made many campaigns to increase the awareness about the possibility of dedicating the percentage from income tax.

Act no. 504/2009 Statutes on Income Tax came into effect on 1.1.2010 which amended the responsibilities of recipients, among others: a recipient, who was assigned more than € 33,000 in one calendar year, is within 30 days bound to open a special account which is to be used only for receiving and spending the funds from tax assignation; the recipient can use the received resources for advertising but only for the purposes defined in Act no. 504/2009 and for the purpose for which the NGO was established; the recipient can use the received resources for the purchase of movable and immovable property, if these are to be used for the core work of the NGO (the core work is certified by a notary at the registration for tax assignation). A major change in the Act was the reduction of the percentage from 2% to 0.5% from 2010. The main reasons for these changes were outlined in 2006 by Jan Počiatek (the Finance Minister at that time), who argued that the amount of 2% of corporate income tax was too high and was also threatening the very idea of the tax assignation which was to build relationships between NGOs and taxpayers. Another argument was that large companies set up their own foundation (form of NGO eligible to register for the tax assignation), to whom they assigned the 2% of their corporate tax. An example is the SPP foundation whose income from 2% of corporate tax was on average about € 3,375,590 [18]. The original proposal of Počiatek contained the abolition of assignation of the corporate income tax. After a protest of NGOs representatives (by implementing various campaigns for preserving the 2% of corporate income tax, as well as commenting on this proposal) a consensus was achieved in the form of a gradual reduction of the percentage of corporate income tax assignation from 2% to 0.5% during the years 2011 - 2019.

This amendment also seeks to ensure that large corporations take responsibility for supporting the NGOs established for public purposes from their own sources and not to only determine the allocation of the state budget revenues by tax assignation. The main aim of this amendment is thus to encourage corporate philanthropy. The state will assign an additional percentage of corporate income tax if a company provides a direct donation in that tax year as a corresponding percentage of the tax paid. The change in Act no. 504/2009 was also in the percentage of individuals for 2012. If an individual worked in 2012 as a volunteer for at least 40 hours and has confirmation of such, they could assign 3% of their income tax instead of 2%.

The overview of funds raised through the tax assignation for the period since the introduction of the mechanism is shown in Table 5. At the time of processing this paper information about number of individuals and corporations involved in tax assignation in year 2012 was not available.

Table 5. Income tax assignation from individuals and corporations in years 2002 - 2012

Year	Number of recipients	Number of participating individuals	Number of participating legal entities	Personal Income tax assignation (thousands €)	Corporate Income tax assignation (thousands €)	Total amount of Income tax assignation (thousands €)
2002	4 042	341 776	-	3 382	-	3 382
2003	3 398	286 164	-	3 222	-	3 222
2004	3 829	402 057	8 364	9 159	19 792	28 951
2005	5 746	418 241	14 063	10 371	20 525	30 896
2006	7 100	446 973	17 740	11 713	25 629	37 342
2007	7 662	408 277	21 632	12 819	29 306	42 125
2008	7 759	449 909	26 691	15 036	34 144	49 180
2009	9 098	503 253	30 078	17 684	37 496	55 180
2010	9 585	467 983	26 172	15 553	28 592	44 145
2011	10 049	475 843	25 427	16 526	25 444	41 970
2012	10 565	n/a	n/a	18 548	26 146	44 694

Source: Author based on theTax Directorate of the Slovak Republic

From Table 5 it is clear that the mechanism of tax assignation is very popular among NGOs, the number of NGOs registered has been growing since 2005 which corresponds to development and the growing number of NGOs in Slovakia (see more in [7]). The use of tax assignation is also confirmed by the results of the primary research in 2011 which focused on NGO funding, where 92% of respondents received funds through tax assignation [14]. The increasing number of NGOs registered for tax assignation only proves the impact of this indirect form of state support on NGOs. The impact is definitely positive; resources obtained through this tool basically can be used for everything connected with the core work, e.g. overhead and operating costs which is not always possible with funding from direct state support or special-purpose donations from private sector.

So far we have not mentioned it but another obvious reason for the abolition or reduction in the percentage of tax assignation mechanism was the government's effort to keep the full amount of the tax in the state budget instead of assigning any percentage among registered NGOs. This trend was associated with the economic crisis and efforts to sustain economic growth, which was reflected in several countries [10]. According to an estimate by the state the decrease in the percentage of corporate income tax assignation should have brought to the state budget about 6.7 million € in 2011 and about 7.3 million € in 2012 [6]. Table 5 shows that in 2011 the amount assigned by corporations dropped by 3.15 million €, which was less than half of the estimated amount that should have remained in the state budget. This fact is due to both a decrease in economic growth which reduced the state revenue from corporate income tax and compared to a decrease of 745 corporations that participated in tax assignation in 2010 (i.e. their income tax automatically became part of the state budget; the state did not consider any percentage that should be assigned to NGOs and Table 5 does not show this amount).

For 2012 we cannot currently determine the number of corporations involved in the mechanism of tax assignation but from the overall tax collection on corporate income tax the state transferred 26.1 million € for public purposes, i.e. the annual increase was 0.7 million € (2.8%). Compared to 2010 (before the amendment) the total amount of corporate income tax assigned declined by just 2.5 million. €, which is only about a third of the planned volume that had been supposed to stay in the state budget.

From the above mentioned it can be deduced that the amendment has not had such an effect as expected and that revenues to the state budget from corporate income tax that actually stayed in the budget and did not have to be transferred to the NGOs were not particularly high. The argument that corporations support mainly their own foundation (founded by the corporations themselves) is in contradiction to data from the Centre for Philanthropy which says that more than 2/3 of the 2% of the corporate income tax is assigned to NGOs that are not directly linked, established or controlled by these corporations. That the tax assignation is really

not an enrichment of corporations via their foundation can be proved by another fact that in 2011 among the top 200 largest recipients of the assignment were 16 corporate foundations which together received the amount of 7.6 million €. In the same year, however, the top 20 corporate foundations reallocated grants to a total amount of more than 9 million € [17].

4. Conclusion

The results presented in this paper are part of the primary research of the strategy of sustainability of NGOs conducted within the dissertation "Self-financing and sustainability strategy of non-profit organization." By presenting the results of the analysis we fulfill the aim of the paper which was to analyse the tax system affecting the sustainability of NGOs in Slovakia, the changes in tax assignation and their impact on the operation and sustainability of NGOs.

NGOs are favoured in many areas of the tax system of the Slovak Republic. One of the benefits is the tax exemption, the terms of which we stated in the paper. Another benefit is the possibility of obtaining funds from tax assignation. The benefit for NGOs might seems as a disadvantage for public budgets: it is a fact that the tax assignation is linked with higher tax administration costs which together with the percentage of the income tax transferred to the NGOs decrease the amount of resources in the public budgets. On the other hand, the tax assignation resources go to those NGOs who provide public services, so if there were no NGOs, the state would have to pay for those public services from public budgets. There are other researches proving that NGOs are more effective in the providing public services in the given circumstances (but this was not the object and the aim of this paper) and it could be a topic for another study to research the relation between the amount of funding of NGOs from tax assignation and the amount of services they can provide for the resources from tax assignation (i.e. the effectiveness of the use of the resources from tax assignation).

After 12 years of the existence of the tax assignation mechanism the NGOs have got used to it and the number of registered organizations as recipients has been increasing since 2005. Unlike the resources from direct state support (transfers from the state budget) which is usually restricted in the use, and difficult to gain, too (65% of direct state support goes to the long-term recipients, new NGOs who want to apply have a difficult position [4]), the indirect support in the form of tax assignation is open to every NGO, the final amount of resources gained through the mechanism depends on the effort of the NGO and these resources are not restricted in the use (beside exceptions mentions in the part 3.1), NGOs can spend them also on overhead and operating costs. Therefore, we think that NGOs prefer the indirect forms of support and any changes to the tax assignation mechanism are observed and commented on. It may seem that a certain solution regarding the situation in the tax laws is commenting on and lobbying all the laws affecting the operation and sustainability of NGOs. This could improve the NGO Sustainability Index evaluation of the legal environment as a whole from the current score of 2.8. On the other hand, in the legal environment there are also other determinants included, not only as tax laws, e.g. Labour Code and other components evaluated by the USAID according to their impact on the sustainability of NGOs.

To gain better conditions from the state in the form of tax laws is one of the ways to stabilize the income for NGOs from tax assignation. But it is a source that requires long-term effort and the results are very volatile - a change of government can bring other amendments to the tax laws which disregard the promises of the previous government towards the NGOs. Then there are the other possibilities of cooperation between NGOs and corporations (networking, company social responsibility, shared marketing) which help to build long-term partnerships between corporations and NGOs. In our opinion these partnerships are more effective than tax assignment. However, NGOs also have to make an effort if they want to be involved in the mechanism of tax assignation; they must comply with the administrative regulations (register for the tax assignation at a notary), and they have to promote themselves to persuade the corporations and individuals that may assign the 2% of their taxes, e.g. by proving their reputation, transparency and credibility. Registering as a recipient for the tax assignation might

be sort of "lesson" for NGOs to learn how to act in a transparent and credible way which is another positive aspect of this mechanism. We recommend NGOs to continue in their efforts to obtain funds from tax assignation as these activities contribute to building their sustainability.

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Migration and Unemployment: Case of Germany

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Abstract

The paper discusses the role of welfare systems on migration and contribution of immigrants to unemployment rates in Germany. With the use of European Labour Force Survey Data for 2010 and 2011, we estimate a series of logistic regressions in order to quantify the effect of immigration on unemployment. We conclude that most of the differences between unemployment rates of immigrants compared to natives in Germany can be explained by different characteristics (such as age, sex, education or type of job) of immigrants compared to natives. After controlling for such characteristics, the probability for an immigrant to be unemployed is only a fraction above that for a comparable native. Additionally, we make a separate analysis for immigrants from the EU only. Our results show that the effects are much smaller for the EU immigrants, and even insignificant after other observable characteristics have been accounted for.

Keywords: Migration; unemployment; welfare magnets; social tourism

JEL Classification: F22, J15, J61

1. Introduction

The European Union guarantees the Right to Free Movement to all of its citizens. This basic freedom, typical for formation of high level of integrity, projects into both European and national legislation of the member states. Whilst the right itself is quite unequivocal, it arouses extensive discussions when linked to impacts of immigration on the markets and public finances of the member states.

Migration has both positive and negative effects on the economy of the host country [1]. Therefore, on the one side, the member states are keen to promote immigration (of mostly skilled immigrants). On the other side, the potential burden of the immigrants, that do not integrate properly and depend on the welfare system of the host country, provokes national governments to take measures to control the immigration flows. Within the European Union, this is especially front burner with upcoming year 2014, which is the end of the transitional restrictions of 13 "old" member states for Bulgaria and Romania.

Researchers have been interested in migration motives for quite a long time. Rich empirical work with migration models has confirmed so-called traditional drivers of migration, such as higher wages and lower unemployment in the host country, shorter distance between home and host country and the same language used in both countries [e.g. 2, 3, 4]. Besides the traditional motives of migration, some researchers tested also the role of the welfare generosity of the host state on migration [e.g. 5, 6, 7]. This created the idea of so-called welfare magnets. The empirical research is quite unambiguous analyzing the traditional drivers of migration; however, the role of welfare generosity on migration is still fuzzy.

Following the idea of the Tiebout hypothesis [e.g. 8], theoretical ground for the relation between welfare generosity and migration exists. It articulates the idea that people are more likely to migrate to countries that provide a more generous social security system. In more developed countries with generous welfare system this simple idea causes often unreasonable fear that the social system will be misused by immigrants. This fear is followed by efforts to take measures in the social systems limiting its accessibility for immigrants [e.g. 9]. However, such measures are problematic. First, its compliance with the EU law is questionable and second, the initial fear driving such measures might be wrongheaded.

EU law contains a general principle of prohibition of unequal treatment based on the ground of nationality amongst all European citizens (meaning citizen of any EU member state). A deviation from this precept is only imaginable if public interests offer a reasonable justification. This could be considered in cases of limitations for the sake of public policy, public security and public health. However, aims and means have to be proportional. On a related note, the European Court of Justice already issued that solely financial worries are insufficient [10] and – even more – that there has to be a basic amount of solidarity between the different social security systems within the European Union [11]. Still, some member states seem to be threatened by a heavy financial burden if they open their social assistance schemes to every EU citizen that is looking for employment on their soil and are seeking for possibilities to limit the right to sojourn and the right to welfare benefits for economically inactive immigrants [9, 12]. Nowadays, they can make use of a piece of European secondary legislation (Directive 2004/38/EC), giving them the opportunity to expel needy and economically inactive foreigners and deny immigrating job seekers social assistance benefits. It is set on the fundamental idea that migrants should not become an "unreasonable burden" on the social assistance systems of the host member state (Recital 10 of Directive 2004/38/EC). Yet, if it proves that there is no valid data supporting the fear, this provision is at stake, since treating the in the aforementioned way generalized group of persons is not necessary, hence not proportional and would therefore violate the basic principle of primary law [13].

The welfare magnet – a country with generous social security system that attracts migrants – gained in this context a rather negative meaning, being occasionally misused for "social tourism". We are of the opinion that social tourism in terms of the European Union should refer to rather limited situation where an inactive person resides in the host member state to claim the social assistance with no intentions to seek for job and to contribute to the system in the future. Other inactive migrants should not be mistaken as social tourists. Social tourism must be considered only as part of whole concept of welfare magnets. Establishing the idea of welfare magnet on the contributory benefits (as many empirical models do, [e.g. 14, 15]) rather promote a concept of "workfare", appealing those who want to contribute to the system than being reliant on "welfare". What's more, after being employed in the host country, excluding the EU migrants from the social benefits of any kind should be out of question.

The empirical evidence on social tourism is very limited. In the study prepared in 2011, EU member states were asked to report on the problem of social tourism. Beside few sporadic examples, only Austria provided some statistics on increasing number of "Ausgleichszulage" (Austrian compensation allowance to secure a certain minimum income for domestic pensioners) recipients among migrants from other EU member states [16]. However, no commentary or comparison with natives followed the statistics, so it can hardly provide clear insight to the problem. More comprehensive study related to social tourism has been published recently by ICF GHK [17]. The study provides descriptive analysis of social security entitlements of non-active intra-EU migrants and provides important findings. Even though, the intra-EU migration has increased in general, non-active migrants are represented only by a very small share. According to the results of the study, the main motive for intra-EU migration is employment. The study concludes based on literature review and stakeholder consultations that there is little evidence to suggest existence of social tourism (benefit-related migration), as immigrants are not highly dependent on welfare than nationals. Five case studies introduce social benefits that are available to non-active migrants and could be therefore potentially misused. These case studies cover provision of the health care (in France and Spain), above mention Ausgleichszulage (in Austria), jobseekers allowances (in the UK) and benefit for disabled young persons (in Netherlands).

Latest empirical research [e.g. 1, 18] emphasizes overall positive impact of immigration on highly developed countries. Also, dependence of immigrants on the welfare system has not been proven to be significantly larger than dependence of natives [17, 19].

This paper adds to this discussion by partial analysis of the contribution of immigrants to unemployment rates in Germany. Looking at simple descriptive statistics, one witnesses a wide gap between the overall unemployment rates of migrants and natives. This might trap the

unwary and lead them to believe that, on average, a migrant is more prone to being unemployed than a *comparable* native. The catch here is that the mere descriptive statistics do in fact compare the incomparable. There exist notable differences in population characteristics between migrants and natives: migrants tend to (1) be younger, (2) have a higher proportion of women among them, (3) be less educated, (4) live in less densely populated areas, and (5) be employed in jobs that incline towards manual tasks requiring less qualification. All of these characteristics on themselves are associated with higher unemployment rates, even within the native population.

To see the real contribution of being a migrant to a person's unemployment probability, we use logistic regressions and control for the characteristics that divide the two groups. Our results suggest that a major part of the gap between unemployment rates of migrants and natives is in fact produced by different population characteristics.

Moreover, it is possible that in forming their opinions about the migrant/native differences, many people do not distinguish between migrants from the EU and those from outside the EU. This distinction, however, is crucial to the discussion of the within-EU social tourism. Therefore, we decided to run all our regressions in two alternative versions – (1) with all migrants included and (2) with only EU migrants retained in the data set – in order to show that if non-EU migrants are pooled with EU migrants, the adverse effect of being a migrant appears stronger.

2. Material and Methods

Below we briefly discuss the data set we worked with in our empiric study, the variables we included in our regressions, and the methods we used to obtain our results.

2.1 Data set

European Labour Force Survey (ELFS) data for Germany from years 2010 and 2011 were used in the analysis. After discarding respondents below 18 and above 65 years of age, the dataset contained data on 291,789 individuals in 2010 and 291,259 individuals in 2011. The survey design in Germany applies the so-called wave approach, meaning that each person is questioned repeatedly in several consecutive years; therefore, we analysed data from the two years separately, so that nobody gets included twice in a single regression.

2.2 Variables

The outcome variable in our regressions is the respondent's *employment/unemployment status*, coded as a dummy variable from the original ELFS variable on the working status, coded using the standard ILO definition.

The main independent variable was a dummy (*migrant*) that distinguished migrants from natives. Our data enable to work with different concepts of migrants and natives. Some authors already commented on the importance of a precise definition of a migrant [20]. In our study, we used the following distinction:

- migrant = one who both did not report being born in Germany and reported a foreign nationality;
- native = one who reported both Germany as the country of birth and German nationality.

The wording of the migrant definition might sound a bit strange, but suits well the German dataset, as the ELFS data for Germany do not disclose the country of birth for of importance for our comparison of immigrants from EU and from the rest of the world. In the analyses that are meant to work with EU migrants only, we dropped all migrants who reported a non-EU nationality; the resulting indicator variable is referred to as *migrant, EU only*).

Control variables included the following demographic characteristics: respondent's *age* (in years, linear and quadratic terms included in the regressions), gender (coded as a dummy *female*

indicator), *education* and *degree of urbanization* of the place of residence. The latter two variables both distinguish three categories, verbally described as *low*, *medium* and *high*; for a detailed information about the coding of these variables, see the ELFS User Guide [20], variables HATLEV1D and DEGURBA.

Finally, we controlled for an individual's *type of job*, classified into 10 categories according to the first ISCO digit. For the employed, this is the ISCO code of their main job, for the unemployed, this was the ISCO code of their last job (if applicable).

2.3 Methodology

A series of logistic regressions was run to estimate the effect of being a migrant on the unemployment probability (measured by a regression coefficient that will be referred to as β henceforth). For each year, three nested models were applied: (a) one without any control variables, (b) one with demographic controls only, and (c) one with a full set of controls, i.e. demographic controls and *type of job*. The model with no controls is akin to a naive comparison of migrants' and natives' gross unemployment rates, and is meant to provide a benchmark value of β.

The reason why we added control factors in two stages in models (b) and (c) (rather than using just one additional model with full controls) is the following data limitations of the *type of job* variable. Firstly, for the unemployed, previous job is only reported in the ELFS data for those being jobless for less than eight years, which brings about an unwanted censoring pattern. Secondly, there is a very high missing value rate (more than 50 per cent) in the *type of job* variable for the unemployed, i.e. in the data on previous jobs. (There are no missing values for the employed.)

Despite these problems, we still think it is worth considering the *type of job* variable, as it could be an important confounder of the *migrant* effect; migrants are known to often engage in manual, part-time or seasonal jobs, which exhibit the highest fluctuation. It is true that the pattern of missing values on *type of job* imposes a clear bias on the estimates of unemployment rates at any levels of the explanatory variables. In regressions, this means that the intercept (constant) is biased. However, the remaining coefficients (most notably, β), are not necessarily affected To see whether this is the case, we performed a simple check of the effect of the missing value pattern on the estimates: we ran all regressions that did *not* include the *type of job* variable on both a full (unrestricted) sample and a sample restricted to only those observations for which *type of job* was available.

The whole analysis was carried out twice: first with all migrants and then with EU migrants only.

3. Results and Discussion

In total, the analysis described in the previous section comprises twenty logistic regressions. Table 1 presents the results of five of them, namely the regressions using data from 2011 with all migrants included (both EU and non-EU). The dependent variable is the *unemployed status* indicator, meaning that a positive coefficient indicates than an increase in the respective independent variable is, on average, associated with a higher unemployment probability, ceteris paribus. (Table 2 shows how to interpret values of β, the coefficient on *migrant*, in terms of the estimated change in unemployment probability.) Key findings of the results from Table 1 are as follows:

- The differences in the estimated coefficients between the "full sample" and "restricted sample" versions of models (a) and (b) are reasonably small; β (*migrant* coefficient) diminishes by less than 15 % when the sample restriction is imposed, the coefficients on the remaining variables typically change by less than 20 %. This suggests that the potential bias due to the pattern of *type of job* missing values is not large, and therefore the coefficients estimated in (c) have an interpretational value.

- The coefficients on the demographic controls in (b) and (c) are significant and have the expected signs – unemployment probability falls with age (up until the individual's fifties), is lower for women, and diminishes with education.
- The impact of being a migrant on one's unemployment probability (measured by β) is positive and significant in all models, but there are substantial differences between the estimates in (a), (b) and (c): the estimate drops rapidly – approximately by a half – with each additional set of control variables. Especially for the stratum of population with high unemployment rates, the difference between $\beta = 0.8$ and $\beta = 0.2$ can produce quite different results in terms of the migrant/native gap in unemployment probabilities, see Table 2.

Table 3 summarizes the estimates of β and the sample sizes in all regressions with full (unrestricted) samples. The main findings are summarized below:

Table 1. Detailed logistic regression results for 2011, both full and restricted samples.

	(a) no controls		(b) demographic controls (DC)		(c) DC, job type
	full sample	restricted s.	full sample	restricted s.	full = restricted
migrant	0.835 **	0.713 **	0.421 **	0.372 **	0.199 **
	(0.028)	(0.048)	(0.032)	(0.054)	(0.054)
age			-0.061 **	-0.068 **	-0.072 **
			(0.006)	(0.009)	(0.009)
age^2/100			0.071 **	0.063 **	0.065 **
			(0.007)	(0.012)	(0.012)
female			-0.116 **	-0.194 **	-0.176 **
			(0.020)	(0.032)	(0.036)
Education					
- low			ref.	ref.	ref.
- medium			-0.870 **	-0.686 **	-0.425 **
			(0.025)	(0.042)	(0.045)
- high			-1.858 **	-1.618 **	-0.870 **
			(0.036)	(0.059)	(0.075)
degree of urbanization					
- high			ref.	ref.	ref.
- medium			-0.328 **	-0.256 **	-0.303 **
			(0.022)	(0.036)	(0.037)
- low			-0.101 **	-0.069	-0.166 **
			(0.028)	(0.045)	(0.046)
type of job	no	no	no	no	yes **
constant	-2.934 **	-3.951 **	-0.597 **	-1.318 **	-2.435 **
	(0.010)	(0.017)	(0.109)	(0.174)	(0.376)
N	213 700	204 123	213 449	204 123	204 123

Standard errors in parentheses; * $p < 0.01$, ** $p < 0.001$; ref. = reference category. Due to space limitations, we do not report coefficients on the nine *type of job* categories; we only indicate whether *type of job* is included among the controls (yes/no), and whether the set of dummies is jointly significant (significance stars for a LR test).

Source: Authors

Table 2. Interpretation of β.

unemployment prob. (%)	β			
	0.80	**0.40**	**0.20**	**0.10**
3	3.44	1.41	0.64	0.31
5	5.49	2.28	1.04	0.50
10	9.83	4.22	1.95	0.94
15	13.20	5.84	2.73	1.32
20	15.75	7.16	3.39	1.65

Table shows the difference in unemployment probabilities (in percentage points) for migrants and natives as predicted by the logistic regression model, by baseline unemployment probability and β, the coefficient on the *migrant* variable. For instance, if we look at the stratum of population with unemployment probability of 5 per cent, then $\beta = 0.8$ implies that the difference between migrants and natives is 5.49 %, meaning that migrants are app. twice as likely to be unemployed as natives, while for $\beta = 0.2$ the difference is only 1.04 %.

Source: Authors

- In both years and both types of the *migrant* variable (all migrants, EU migrants only), there is a similar effect of additional controls: the more control factors we account for, the smaller the estimate of β.
- As might be expected, the gap between migrants and natives is much smaller if one considers EU migrants only. Within the same year and with identical controls, the difference between the β estimate for all migrants and that for EU-only migrants ranges from 0.20 to 0.48. In fact, in the most saturated model, the *migrant, EU only* variable is insignificant in both years, and in 2011 the β estimate is almost precisely zero. In the model with demographic controls, *migrant, EU only* is insignificant in 2011.
- The gap between natives and migrants narrowed from 2010 to 2011. As of yet, we do not have any concrete explanation for this phenomenon; analysis involving more time periods needs to be carried out to provide information about the dynamics of the migrant effect. Nevertheless, we have a working hypothesis that the year 2010 was still heavily affected by the global financial crisis of 2007-2009, which was not a favourable situation to migrants.

Table 3. Estimates of β and sample sizes in all logistic regressions with unrestricted samples.

	no controls	**demographic controls (DC)**	**DC, job type**
year 2010			
migrant	0.867 **	0.501 **	0.329 **
	(0.027)	(0.030)	(0.049)
n	212 152	211 890	201 089
migrant, EU only	0.412 **	0.151 *	0.135
	(0.048)	(0.051)	(0.079)
n	203 482	203 248	193 553
year 2011			
migrant	0.835 **	0.421 **	0.199 **
	(0.028)	(0.032)	(0.054)
n	213 700	213 449	204 123
migrant, EU only	0.352 **	0.052	-0.003
	(0.051)	(0.054)	(0.087)
n	204 724	204 509	196 117

Standard errors in parentheses; * $p < 0.01$, ** $p < 0.001$.

Source: Authors

4. Conclusion

Based on the empiric analysis for Germany, we conclude that after accounting for the observable characteristics (such as age, sex, education or type of job) the probability that the migrant is employed is similar to that of the native. The effect is more obvious for the EU migrants compared to migrants in total. This finding does not support the idea of so-called social tourism and leads us to the conclusion that there is no observable misuse of the welfare system of unemployment benefits. Our findings are consistent with conclusions of recent empirical evidence [17] which is directed to the role of non-active intra-EU migrants.

On the top of the empirical research done within this paper, we highlight the importance of the EU law in the migration discussions. In the light of recent political deliberations – mostly to be found in Germany and the UK – one might want to put people in mind of the burden of proof for the justification for deviating from the principle of non-discrimination of all EU citizens. At least the prima facie evidence does not support any need for special rules that exclude European job seeking migrants from social assistance benefits in the host country.

In the bigger picture, all member states benefit from the freedom of movement which should be considered our "joint responsibility" [18].

To follow up, we plan to include other countries to the analysis and, based on detailed legal background, specify groups of migrants with different social security treatment.

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Effects of the Non-distribution Constraint on the Entrepreneurial Motivation of Non-profit Organizations

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Abstract

The entrepreneurial motivation of non-profit organizations is characterised by specific features derived from the non-commercial status of these organizations in society. While exploring the non-distribution constraint, which is a key structural feature of NPOs, in terms of entrepreneurial motivation, we concluded that the traditional understanding of the non-distribution constraint as an issue of trustworthiness was incomplete. The aim of this paper is to explain why the non-distribution constraint should be understood in a broader context and why it does not destroy entrepreneurial motivation. The theoretical approach, based on different explanations of this issue, is strengthened by relevant empirical findings from primary surveys conducted in the Czech Republic, Slovakia, and Austria. These findings help show that the entrepreneurial motivation of NPOs can be in compliance with the non-distribution constraint and enable a better understanding of the role of the non-distribution constraint in economic theory and praxis.

Key words: Non-profit Organizations;; non-distribution constraint; entrepreneurial motivation; commercialization

JEL Classification: L31, L33, B30

1. Introduction

Much has been written in the past twenty years about the attempts by NPOs to look beyond traditional funding sources and to initiate earned-income activities [1]. At the same time, there has been little data available to formally document the existence, character, and entrepreneurial motivations of these organizations. There is also a gap in the theory [2]. The only economic theory of NPOs to take explicit account of the role of the non-distribution constraint is Henry Hansmann's trustworthiness theory [3]. Hansmann's approach, however, is "incomplete in that it does not explain why the non-distribution constraint does not destroy the motivation to undertake any entrepreneurial activities at all" [4].

The literature review undertaken for this paper reveals the lack of a well-developed discussion of entrepreneurial motivation and how the motivation is affected by the non-distribution constraint. According to Salamon and Anheier [5] the non-distribution constraint is a key feature of NPOs. The trustworthiness theory argues that the non-distribution constraint weakens the incentives of non-profit entrepreneurs to maximize profit at the consumer's expense. In fact, the non-distribution constraint has "only a weak effect on entrepreneurial choice" [6] as shown by the model of entrepreneurial choice proposed by Glaeser and Shleifer [7]. Revisiting specific economic theories of NPOs (the public goods theory, the consumer control theory, the trustworthiness theory, and the supply side theory) is helpful for understanding why "individuals prefer to satisfy some of their consumption preferences through involvement in NPOs" [4] rather than through regular exchange transactions in the marketplace.

A lack of strong empirical support has led some economists to contest these theories. Although case studies of non-profit entrepreneurship abound [8], there are fewer quantitative studies that examine the circumstances behind the entrepreneurial motivations of NPOs. The existing evidence seems to suggest that NPOs do not have a priori motivations for entrepreneurship, but rather adopt these activities as "a coping strategy when financial circumstances threaten to limit the scope of their service provision" [9].

According to the resource dependency theory, non-profits use commercial income as a replacement for lost government grants and private revenue [10], [11], [12]. Drawing on this

theory, Eikenberry and Kluver [11] maintain that, when public and private supporters falter, one of the strategies NPOs pursue is the use of market approaches to generate revenue. Other non-profit literature favours the institutional theory [13 - 15]. This perspective suggests that an NPO's survival requires it to confirm to the institutional environment in which it exists [16].

The aim of the submitted paper is to explain why the non-distribution constraint should be understood in a broader context and why it does not destroy the entrepreneurial motivation of NPOs. The reason for choosing this subject is that despite its relevance, the theoretical background has not yet been sufficiently strengthened by empirical findings, so a study to address this complex issue is needed. This paper should at least partly address this need.

2. Material and Methods

We combine a theoretical and empirical approach to the examined issue. The theoretical approach includes an extensive number of research papers and studies concerning the different economic theories about NPOs that deal at least marginally with the non-distribution constraint.

The empirical approach presents primary data obtained through a structured questionnaire. The data acquired in the Czech Republic in spring 2013 are part of the findings of the Masaryk University project CZ.1.07/2.3.00/30.0009: "Employment of Newly Graduated Doctors of Science for Scientific Excellence". The data from Slovakia are the results of primary research conducted as part of the dissertations "Self-financing and the sustainability strategy of non-profit organizations" [17] and "Utilization of financial management in diversification of financial sources in non-profit sector organizations" [18]. The source data for Austria are the results of the project "Different sources of funding of non-profit organizations" [19] conducted by the NPO-Kompetenzzentrum WU Wien Research Centre.

NPOs can be classified in terms of the governmental founder or proprietor (non-profit state) and non-governmental organizations, i.e. NGOs (non-profit private). We focus on NGOs that are represented in the Czech Republic as follows: civic associations (46% of respondents); foundations (6% of respondents); foundation funds (2% of respondents); public benefit organizations (21% of respondents); and church or religious associations (25% of respondents). In the Czech Republic, the survey started in 2013 and has only just passed the pre-research phase (including pilot testing), so there are only answers from 67 of the 250 surveyed NGOs.

The four main types of organizational-legal forms in Slovakia are very similar [20]. We obtained data from 182 of the 670 surveyed NGOs in the following structure: civic associations (84% of respondents); foundations (3% of respondents); non-investment funds (2% of respondents); organizations providing public benefit services (9% of respondents); and others (2% of respondents).

In Austria (266 respondents), NGOs have the following legal forms: "Verein" (association), "Stiftung" (foundation), "gemeinnützige Kapitalgesellschaft" (public benefit organization), and "Genossenschaft" (cooperative). As in the Czech Republic and Slovakia, the most represented and therefore the dominant legal form is the association [19].

The NGO samples in the three selected countries are not comparable in terms of history and size; this was not the aim of our survey. We did not want to conduct compliance tests among the countries; instead, we analyse and interpret the obtained primary data in order to acquire empirical knowledge that allows us to formulate several solutions and recommendations for theory and practice in examining the role of the non-distribution constraint in the entrepreneurial motivation of NPOs.

3. Results and Discussion

Historically, the bottom-line focus on mission rather than money making has been the defining feature of NPOs [9]. Motivated by evidence indicating that the share of non-profit revenues from the entrepreneurial activities of NPOs is rising [12], [21], we tried to discover the

entrepreneurial motivation among non-profits when confronted with the non-distribution constraint.

3.1 Entrepreneurial motivation of NPOs

Over the last few decades, the increase in external environmental challenges faced by NPOs has attracted the attention of researchers. These researchers have argued that NPOs must adopt entrepreneurial postures in their operations [22-23]; adopt innovative practices [24-26], focus on outcomes targeted by government policy and pursue innovative ways of delivering superior value to the target market in order to capture competitive advantage [23]. Some researchers suggest the need for market orientation [27], to meet the increased competition. Others suggest 'marketization' or the adoption of business models.

Although the application of market principles to NPOs is hardly new, the concept has been embodied in diverse terminology [9]. Salamon [28] called it the "marketization of welfare"; Weisbrod [29] termed the increasing tendency of non-profits to develop new enterprises, charge fees, and produce goods for sale as the "commercialization" of the sector.

Commercialization is "a process in which NPOs are geared toward sales revenues rather than donations or government grants" [30]. There are two paths to commercialization [30]: it may occur as the result of the development of commercial activities to finance the production of mission-related output or as the result of a transformation of the relationship between the organization and its members from participation to consumption.

There are essentially two opposing opinions of the commercialization of NPOs. Opponents of commercialization [11], [31-33] generally agree that it is often driven by good social and financial intentions [34]. However, they also recognize that commercialization could involve tremendous complicity and controversy, stemming from the contradiction between the NPO moral adherence to social goals and the increasing engagement in profit seeking [30], [35].

By contrast, supporters of commercialization [36-37], [4] think that it is a promising way for NPOs to achieve self-sufficiency. Valentinov [38] stated that "many NPOs are located in hostile environments and face highly insecure prospects for survival. These prospects can be better understood, and hence more likely improved, if NPOs are viewed not as machines but as open systems" (the key idea behind this statement originates in Bertalanffy's general systems theory). The main insight is that the belief in the adverse consequences of non-profit commercialization is predicated on a mechanistic view of NPOs. In reality, "commercial activities provide a self-regulatory mechanism that enables, rather than hinders, NPOs to perform their missions in environments where the supply of critical resources is insecure" [38].

Undoubtedly, both sides have recognized the growing significance of the entrepreneurial activities of NPOs; however, it is still unknown how these activities affect NPO missions, funding streams, and service delivery. Empirical studies remain scarce because of the lack of data at the organizational level [34]. We want to find whether the entrepreneurial motivations of NPOs can be in compliance with the non-distribution constraint while providing insight into the examined issue. We also want to enable a better understanding of the role of the non-distribution constraint in economic theory and praxis.

3.2 The non-distribution constraint

In the "structural-operational" definition given by Salamon and Anheier [5], the non-distribution constraint is identified as a structural feature of NPOs. The non-distribution constraint allows NPOs to make profits but does not allow the distribution of the profit to managers or employees of the organization. "Whatever surplus a NPO generates ought to be put back into the quality of its products / services or ought to be used to finance the provision of services to needy parts of population" [6]. An NPO that earns a profit in any period may direct these resources in one of three ways: a) increase expenses so that the profit is used up in current operations, b) invest in fixed assets which presumably will be used in providing mission-oriented services, or c) retain the profits as a source of internal capital [39].

The classic account of the economic role of the non-distribution constraint is the trustworthiness theory of NPOs by Henry Hansmann [3]. This theory argues that NPOs appear more trustworthy than for-profit firms due to the non-distribution constraint. This approach has been traditionally criticized for exaggerating the significance of the non-distribution constraint and assuming that it is perfectly enforced [40-41]. The critical observations mentioned in the study presented by Valentinov [4] reveal that "the traditional understanding of the non-distribution constraint as a trustworthiness-enhancing device is incomplete". Valentinov shows that the non-distribution constraint is also a reflection of the directly utility-enhancing character of involvement in non-profit firms for their key stakeholders.

Recent studies have reaffirmed that the effect of the non-distribution constraint is conditioned by the effectiveness of its enforcement. Malani and Posner [42] showed that "eliminating the profit incentive to compromise quality does not eliminate other incentives to do so" [4], because the non-profit organizational form itself simply replaces one non-verifiable condition (the quality of the product or service) with another (altruism of the entrepreneur). Valentinov [4] showed that even ordinary for-profit entrepreneurship is importantly, if not primarily, motivated by non-monetary preferences, such as those for being one's own boss, having the opportunity to use certain skills and abilities, and pursuing one's own ideas and ideologies [43].

3.3 Empirical findings

Empirical research on this topic remains scarce because of the lack of relevant data [34]. Salamon [33] examined the extent to which the non-profit social service sector was commercialised, estimating that the income that NPOs received from entrepreneurial activities increased by more than 600% between 1977 and 1996 [37].

There have been attempts to provide empirical findings to illuminate the issue. One attempt was made in 2000, when the Pew Charitable Trusts commissioned two authors to survey the landscape of enterprise in the non-profit sector [1]. Respondents were asked to comment on whether they viewed their organizations as entrepreneurial, and if so, what entrepreneurial strategies they were using. They were also asked about their reasons for initiating business ventures. The research outcomes show that financial return is not the only entrepreneurial motivation in NPOs. Of the respondents operating business ventures, 39% said that their entrepreneurial activities also serve their constituents by providing employment, training, and therapeutic opportunities; 34% claim that the ventures generate positive community relations; and 23% say the ventures help to revitalize the neighbourhood and community [1].

Although limited in some ways, this paper contributes to the literature concerning the previous results by identifying some partial empirical findings from Austria, Slovakia, and the Czech Republic. The relevant primary results show that self-financing in entrepreneurial / commercial activities is not a "business" in the common market conception and could be in compliance with the non-distribution constraint.

Austria

Austrian NGOs have very strong state support; the most frequent source of funding is public sources, used by 91% of respondents participating in the survey [19]. This type of funding involves long-term contractual relationships which greatly influence the acquisition of new sources of funding, raising the question of how much effort NGOs have to make to keep these sources whilst obtaining new financial sources and fulfilling their missions. The need to fulfil the mission and keep the non-distribution constraint must be a priority when conducting any activity that brings in money for running NGOs [44].

A partial aspect of this issue also includes a fixed purpose for sources and accountability to the source provider. Compared with commercial activities, the highest effort must be made by NGOs when applying for EU funds, state funds, and contributions and donations from companies and individuals. The research results thus showed a clear desire of NGOs to gain a greater portion of funds through their own commercial activities [19]. It also confirms the importance of

self-financing, as it can offer the highest level of independence and freedom in the decision-making process.

The importance and benefit of self-financing are supported by the findings from the Austrian research on NGO funding that were focused on the freedom of use of financial sources. These findings showed that the highest purpose-fixed sources provide the least freedom to decide about the use of these sources in fulfilling the mission [44]. The highest influence of the source provider was observed in contractual support from the state and the EU (the source provider strictly controls the use of provided money). The lowest influence and control was in income from financial investments and renting assets, which are self-financing activities. We can conclude that self-financing has a positive effect on achieving the generally beneficial purposes for which NGOs were founded and can be in compliance with the non-distribution constraint.

Slovakia

The results were obtained in research about the funding of NGOs in Slovakia [19]. Self-financing is used by 87.4% of respondents. The distribution of sources within one organization indicates that the least-used sources are state/public contracts (only 2.2%). The NGOs have to search for other sources [45], and therefore private funding as represented by grants is at a higher rate, as are membership fees. On the other hand, self-financing within one organization is at 25.4% [20] which is higher than the amount stated in the "ideal" diversification of funding sources [18]. Although this type of financing is a quarter of the total sources of one NGO, it is still lower than the European average of 36.9% [46].

To evaluate the impact of self-financing on the non-distribution constraint of NGOs, we explored whether respondents considered commercial self-financing activities to detract attention from the mission and core work of the organization. Of the responding NGOs, 68% reported that no, self-financing is not such an activity; more than 21% of them said no, but had some objections to self-financing (e.g. NGOs should not develop business activities); some respondents (25%) were unable to decide, citing dependence on other factors e.g. the legal form of an NGO; less than 11% of organizations believe that self-financing is a commercial activity that distracts from the mission and core work of NGOs [47]. We conclude that NGOs must be able to distinguish between a commercial activity and an activity that requires a business-like way of thinking and to focus on self-financing in compliance with the mission and core work.

The Czech Republic

The data mapping the self-financing activities in the conditions of the Czech Republic were obtained in a pre-research project conducted during spring 2013. The data generally shows that self-financing is not just a recent trend. Most respondents (75 to 90% depending on the age of the organization) used some form of self-financing even in the early years of their existence. In general, 79% of the NGOs that took part in this pre-research raise funds through self-financing.

We asked the respondents to identify the problems (risks) connected with the self-financing of NGOs. They named business risks, the risk of conflict with the organization's mission, the risk of organizational and professional unpreparedness, and the risk of excessive dependence on only one financial source.

We were interested in the views of respondents on the issue of self-financing as a commercial activity. In general, most NGOs (approximately 75%) expressed the opinion that self-financing is not an activity that distracts from the main mission. This confirms Schober's assumption expressed in his study [19] devoted to the definition of "quasi-equity" (i.e. non-profit incomes vs. commercial incomes).

Respondents stated their inclination to use self-financing in the future (98% of respondents answered positively), confirming the importance and benefits of the entrepreneurial activities of NGOs. The results of this pre-research confirmed that even if the total volume of other financial sources, particularly public and private sources, is greater, the self-financing activities are an absolutely essential part of fund raising for most NGOs.

3.4 Discussion

The commercialization of NPOs is "a prominent theme in modern multidisciplinary studies" [38]. The economic determinants and effects of non-profit commercialization are the subject of wide-ranging literature, a significant segment of which raises critical concerns about the effects of commercialization on the ability of non-profits to fulfil their missions [38, 48]. Indeed, some critics have asserted that commercialization converts non-profits into for-profits-in-disguise [30], puts civil society at risk [11], results in mission deflection [32], and produces mission-market tensions [33].

Moeller and Valentinov [41] state, that "many NPOs are located in hostile environments and face highly insecure prospects for survival". These prospects can be better understood, and hence more likely improved, if NPOs are viewed not as machines but as open systems (Bertalanffy's general systems theory). The main insight that is thereby gained is that the criticism of adverse consequences of non-profit commercialization is predicated on a mechanistic view of NPOs. In reality though, commercial activities provide "a self-regulatory mechanism that enables, rather than hinders, NPOs to deliver their missions in an environment where the supply of critical resources is insecure" [38].

The traditional main financial goal of a profit-oriented company is to maximize the profit. As NPOs are not founded primarily for the purpose of making a profit, they pursue as their primary goal the achievement of a general benefit. This fundamentally changes their financial policy which usually gives priority to the pursuit of liquidity [44]. The financial sources that should be used and in what amounts to meet this task vary and are determined by the NPOs' strategic management decisions. We wanted to know whether the commercial activities of NPOs can be connected to the core work and do not have to be in conflict with the non-distribution constraint.

An extensive review of the non-profit literature and the empirical findings acquired through primary surveys led to the identification of a broad research problem which could not be solved in a limited conference proceeding. It should be further explicated into a series of specific research questions, while multiple qualitative case studies could be used to examine the research problem. The conclusion would form a basis for a monograph devoted to this topic.

4. Conclusion

The trend to NPO commercialization has increased significantly in recent years as more and more NPOs explore revenue generation opportunities. It is important to determine how to avoid any conflicts between the organization's commercial activities and its non-profit goals. While providing insights into understanding this phenomenon, most studies are descriptive and are unable to provide a comprehensive explanation that takes all influential factors into account.

The presented paper adds to the knowledge about the non-distribution constraint in terms of the entrepreneurial motivation of NPOs. Knowledge about how entrepreneurial activities could affect NPOs and the non-distribution constraint is equally important in theory and practice. The paper also provides relevant empirical data which supports the theoretical approach.

We proved Valentinov's assumptions that the trustworthiness theory by Hansmann is not logically complete. The trustworthiness theory also does not explain the economic role of the non-distribution constraint in NPOs that exist for reasons other than those considered by this theory. Furthermore, there are non-monetary motivations even in for-profit entrepreneurship. Were entrepreneurial motivations purely monetary, it would be naturally expected that the non-distribution constraint would destroy the entrepreneurial motivation. It does not; neither from a theoretical nor a practical point of view.

Apart from fulfilling the given scientific aim we want to suggest further topics and create a space for discussion in areas beyond the range of the specific issue within the paper. Do non-profit managers maximize utility because they cannot maximize profit due to the non-distribution constraint? Or do they seek to directly enhance their utility in the form of

involvement in the non-profit firms? Searching for answers to these questions and others may inspire further studies.

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Evaluation of Efficiency of Inpatient Care in Hospitals using Data Envelopment Analysis Model

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Abstract

The paper deals with evaluation of the technical efficiency of inpatient care in hospitals using Data Envelopment Analysis Model for selected 18 funded organizations of regions. The selection of 18 funded organizations of regions is based on the analysis of the development of hospitals and beds in the Czech Republic and of the development of selected performance organizations´parameters during the period 2003 - 2012. The aim of this paper is to assess the level of technical efficiency and possibilities of its increasing in selected funded organizations of regions providing inpatient care based on selected input and output parameters during the period 2010 - 2012. The evaluation of technical efficiency is based on the results of the input-oriented Data Envelopment Analysis model, which assumes the constant returns of scale. Three input parameters - number of beds, average length of treatment, cost per day of treatment and 2 output parameters - number of patients and bed occupancy in days were selected.

Keywords: Efficiency; Data Envelopment Analysis; inpatient care; funded organizations of regions

JEL Classification: C 44, C 67

1. Introduction

The efficiency of the inpatient care is a long-term and permanently discussed specialist subject. There is often a debate, in connection with this topic, about optimization or a health care reform and particularly about the necessity of reducing the number of beds, decreasing the average length of patients´hospitalization and also about expenses spent on hospitalization. The inpatient care efficiency depends significantlly on the set system of inpatient care financing which is in the Czech Republic specified via the settlement regulation that is announced annually by the Ministry of Health.

It is also necessary to mention that the methods of inpatient care settlement (or payment mechanism) have udergone various phases. It started with the introduction of payment for performances (the 1990s), which was followed by lump-sum settlements (since year 2007) and finally the gradual implementation of the classification system DRG was put in practice (since year 2007). It is the case of prospective settlement system because it enables both to the payer and to the health care provider to find out the amount of assets needed for patients in a specific diagnostic group [1,2,3].

The introduction of DRG system brings, according to specialists, a wide space for making the inpatient care effective both at the level of the system as a whole and especially at the level of independent health-service institutions. The central criterion in view, related to DRG system, is the length of hospitalization. For this reason the device leading to achieving the increase in effectiveness is determined by the attempt to shorten the length of hospitalization and thus to economize variable cost. The possibilities of shortening the hospitalization length are of various kinds, for example shortening the waiting time related to the particular medical examinations to a minimum and selecting such methods of treatment that will lead faster to achieving the required results [1].

The settlement changes have also an impact on the system of health-service institutions network, which provide inpatient care, including their legal form. In the Czech Republic the hospital facilities have a different legal form, such as an allowance organization (either state, regional or municipal organizations and/or a joint stock company and limited lability company).

This structure was changed considerably during the period 2003 – 2012 as is the case with regional allowance organizations; in year 2003 there were 81 allowance organizations providing inpatient care in hospitals while in year there were only 23 allowance organizations. The reason of nearly 72 % decrease in the number of regional allowance organizations was their transformation into a different legal form; commercial companies prevailed. Politically, those changes were justified by the economic requirements, in other words, by the necessity to increase the effectiveness of the hospital inpatient care and public finances.

The objective of this paper is to evaluate the standard of the technical efficiency and possibilities of its raising with the selected regional allowance organizations, which provide inpatient care according to specific input and output parameters during the years 2010 – 2012.

To reach the objective set in this paper, Data Envelopment Analysis model (DEA) will be applied both to efficiency evaluation and to the super efficiency of selected units - regional allowance organizatins providing the hospital inpatient care. The primary CCR DEA model oriented to inputs, which assumes constant returns to scale (CRS) was selected for this paper.

DEA model belongs to the verified methods based on the mathematical modelling and multiple criteria decision making, particularly in health services. [4] evaluates the efficiency of hospitals by means of DEA and Stochastic Frontier Analysis model (SFA). However, most authors prefer DEA model and its modifications, as is the case with [5]. Other authors [6] use DEA model for the hospital inpatient care evaluation from the technical efficiency point of view in relation to quality. Similarly [7, 8] prefer such indicators within the scope of DEA model, which give evidence about the sophisticated matter of the inpatient care and about its quality.

2. Material and Methods

2.1 Selected units, input and output parameters

For the evaluation of the technical efficiency of the hospital inpatient care by using the Data Envelopment Analysis model (DEA) all hospitals in the Czech Republic that had in years 2010 – 2012 a legal statute of the regional allowance organization (and also the units U) and provided urgent inpatient care, or subsequent/follow-up inpatient care were selected.

The efficiency calculation according to the input-oriented DEA model with constant returns to scale (CRS) was extended by the output-oriented DEA model calculation according to 3 selected inputs and 2 outputs (see below).

Five allowance organizations were not incorporated into the selection because they provide exclusively the subsequent/follow-up inpatient care. The scope of the inpatient care characteristic is regulated by the law number 372/2011 of Collection of Laws about the health services and terms of their provision as subsequently amended.

The number of U was 19 in years 2010 – 2011, in 2012 this number decreased to 18, the reason of the decrease of the number of U was the transformation of the Hospital with Outpatient Clinic in Nový Jičín, the allowance organization, to the joint stock company, which came into operation on January 1st 2012 (Hospital Nový Jičín, joint stock company). The specification by names of U is presented in the table below, e.g. Table 1.

The bed stock is in all the selected regional allowance organizations formed mostly by the urgent care beds, except Hospital Tišnov, allowance organization. Hospital Tišnov stated 45 urgent care beds and 48 subsequent / follow-up care beds and in years 2010 – 2011 – 50 urgent care beds and 48 subsequent/follow-up care beds.

The analysis according to DEA model required 3 input parameters and their selection took into consideration the selection made within the framework of the previous analyses of the hospital care efficiency by using DEA model, e.g. [9], [10], [11], [12], [13] and also the limited possibilities of comparable, available and verified data, which the Institute for Health Information and Statistics of the Czech Republic [14] administers (see Table 1):

- The number of beds
- The average time spent on treatment per day
- Cost spent on one day of treatment defined in Czech crowns

Two parameters were selected for measuring the output (see Table 2):

- Bed occupancy per day
- The number of hospitalized patients

Table 1. Input parameters according to selected units, in years 2010, 2011 and 2012, position as per December 31st.

	The number of beds			Average time spent on treatment per day			Cost per 1 day spent on treatment in CR		
U	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
Hospital Třinec	395	369	361	6,4	6	5,7	4 560	4 578	4 590
Hospital Frýdku-Místku	439	439	413	6,3	6,3	5,9	4 763	4 939	5 198
Hospital with Outpatient Clinic Karviná-Ráj	530	434	383	6,7	6,3	5,8	4 805	5 485	5 990
Hospital with Outpatient Clinic Havířov	458	424	434	7,6	7	6,8	4 350	4 365	4 573
Silesian hospital in Opava	534	526	502	6,1	6,1	5,4	4 541	4 818	5 349
Associated medical equipment Krnov	349	412	320	5,7	5,9	5,1	4 571	4 627	5 012
Hospital with Outpatient Clinic in Nový Jičín	412	320	x	5,9	5,5	x	4 285	4 785	x
Hospital Havlíčkův Brod	554	554	554	7	6,8	6,7	3 897	4 097	4 355
Hospital Jihlava	758	758	742	6,4	6	5,9	4 994	5 585	5 121
Hospital Pelhřimov	350	350	350	8	8	8	4 408	4 079	3 806
Hospital Třebíč	541	468	468	6,1	5,9	5,7	3 710	4 449	4 235
Hospital Nové Město na Moravě	452	429	429	5,3	5,2	5	4 163	5 032	5 015
Hospital Tišnov	98	98	93	12,5	12,9	13,8	2 070	2 081	2 061
Hospital Břeclav	491	441	441	6,3	6,1	5,8	3 662	4 119	4 247
Hospital TGM Hodonín	220	184	196	6,8	6,7	6,8	4 169	4 329	4 240
Hospital Kyjov	565	538	514	7,2	7	6,7	3 351	3 510	3 759
Hospital Vyškov	483	449	449	9,2	9,3	8,9	3 318	3 361	3 424
Hospital Znojmo	700	640	601	8,1	8,3	7,8	3 559	4 090	4 301
Hospital Ivančice	246	221	221	8,4	9,1	9,1	3 448	3 507	3 606

Source: Kardexes 2010, 2011 and 2012, IHIS Czech Republic

To achieve the high-quality results of the efficiency evaluation according to the DEA method, the selection of units, inputs and outputs was verified with basic assumptions, which apply to this model [see 5]:

- The number of units in view has to be high enough (higher than the result of the product of inputs and outputs);
- The proper choice of input and output parameters, that is in agreement with the general assumption of efficiency, which states that the effective unit is the unit, which maximizes its outputs along with the given level and combination of outputs, or by contrast, minimizes the utilization of outputs for the given level of outputs;
- No notable correlation between selected inputs and outputs is allowed (value 0.8 ought not to be exceeded).

The input parameters, which state directly the number or participation of the specialist staff (doctors, nurses) depending on the number of beds, that is, with respect to the qualitative potencial of the staff inputs, were not selected deliberately. The minimalization of the utilization of the inputs represented by doctors and nurses so that the higher efficiency was achieved, may, in fact, mean the low quality of the health care and overworked staff according to [5]. For this reason, cost per day of treatment defined in Czech crowns was placed in inputs.

Cost per day of treatment (C1DT) implies relative statement, which uses the data given in the annual statistical repor about the health-service facility economy and the formula (1), [15] is used to calculate these data, with L = inpatient health care cost; D= health transport cost; J = other health care cost; N= non-health performance cost; A= outpatient care cost; T= the number of days of treatment.

$$C1DT = L/1+(D+J+N))/(L+A)/T \qquad (1)$$

Table 2. Output parameters according to the selected units in years 2010, 2011 and 2012, the position effective to 31st December.

	Bed occupancy per day			The number of hospitalizations		
U	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
Hospital Třinec	281,6	275,4	286,8	17 425	17 444	18 120
Hospital Frýdku-Místku	276,6	275,7	271,6	19 427	19 108	19 441
Hospital with Outpatient Clinic Karviná-Ráj	258,4	258,7	248,6	19 886	18 953	17 604
Hospital with Outpatient Clinic Havířov	252,9	248	247,4	15 242	15 274	15 632
Silesian hospital in Opava	255,1	259,7	244,9	22 422	22 718	22 795
Associated medical equipment Krnov	283,3	229,3	224,2	20 015	14 077	14 124
Hospital with Outpatient Clinic in Nový Jičín	226,7	280,9	x	13 941	19 786	x
Hospital Havlíčkův Brod	270,2	268,4	258,6	21 418	21 876	21 383
Hospital Jihlava	222,9	206,6	221,6	26 403	26 224	27 787
Hospital Pelhřimov	258,5	255,8	254,6	11 326	11 184	11 117
Hospital Třebíč	220,6	242,8	250,8	19 689	19 397	20 433
Hospital Nové Město na Moravě	250,1	218,2	224,7	19 029	18 934	19 457
Hospital Tišnov	317,6	315,1	331,6	2 489	2 390	2 288
Hospital Břeclav	258,2	257,4	276,3	20 262	20 506	20 878
Hospital TGM Hodonín	281,7	281,5	311,7	9 140	9 061	9 056
Hospital Kyjov	261,7	257,6	261,3	20 503	20 328	19 999
Hospital Vyškov	292,9	294,9	307,3	15 383	15 023	15 475
Hospital Znojmo	274,4	245,7	272,6	23 819	19 896	21 049
Hospital Ivančice	283,9	287,1	287,9	8 242	7 216	6 960

Source: Kardexes 2010, 2011 and 2012, IHIS Czech Republic

2.2 Data Envelopment Analysis

Data Envelopment Analysis (DEA) is a method of the data envelopment analysis, specific model tool for the evaluation of efficiency, performance and productivity of homogeneous units. From the application point of view, DEA is considered to be a universal valuation tool, it means that it is possible to apply it to the production sector and also to the sector of services of both profit and non-profit type under the above-stated term of unit homogeneity.

The homogeneous production unit is then such a set of units, which deals with the production of identical or equivalent effects and which are indicated as outputs of this unit by [5]. This paper, which refers to the hospital facilities providing urgent or also subsequent/follow-up inpatient care.

DEA is used for evaluating the technical efficiency, always measuring the inputs and outputs of homogeneous production units. Considering the fact that various types of inputs and outputs may exist, DEA belongs to the methods of multiple criteria decision making.

The substance of DEA method lies in the division of objects, which depends on the size of the used up sources and on the amount of manufactured production or on different type od outputs. DEA compares the units considering the best units.

The starting point for DEA models is Farrel´s model for measuring the efficiency of units with one input and one output, which was extended by Charnes, Cooper and Rhodes to CCR (both input-oriented and output-oriented models) and by Banker, Charnes and Cooper to BCC (modified CCR extended by variable returns to scale).

CCR DEA maximizes the proportion of the unit being evaluated Uq, which is expresed as the portion of weighted inputs and wighted outputs with sticking to the terms, which mean that the proportions of the efficiency of all other terms are less than or equal one, i.e. z = 1. In this way we obtain for each unit by means of weights for inputs vi = 1, 2….m, the virval input and by means of weights for inputs ui = 1, 2 ….,r, the virtual output:

- virtual input = v1x1q + v2x2q +……+ vmxmq,

- virtual output = $u_1y_{1q} + u_2y_{2q} + \ldots.. + u_ry_{rq.}$

The model for unit Uq is via Charnes – Cooper transformation transferred from the problem of linear divided programming into the standard problem of programming, which look like (2). For non-effective units holds good that their rate of efficiency is less than one, i.e. z < 1.

To maximize $z = \sum_i^r u_i y_{iq}$, *(2)*

Under the terms $\sum_i^r u_i y_{ik} \leq \sum_j^m v_j x_{jk}$, $k = 1, 2, \ldots, n,$

$\sum_j^m v_j x_{jq} = 1,$

$u_i \geq \varepsilon$, $i = 1, 2, \ldots, r,$

$v_j \geq \varepsilon$, $j = 1, 2, \ldots, m.$

Furthermore the paper evaluates the level of super efficiency with selected units. The number of effective units depends on the relation between the number of selected units and the number of inputs and outputs and thus may achieve a high number of effective units. Therefore it is convenient to exclude these units out of the basic set, which as a result changes the original effective frontiers and the calculation of the rate of super efficiency. The rate of super efficiency is defined as a distance of inputs and outputs of evaluated units [5]. The model of super efficiency for costant returns to scale is expressed as follows (3):

To minimize θ_q ,

Under the terms $\sum_{j=1,\neq q}^{n} x_{ij}\lambda_j + s_i^- = \theta_q x_{iq}, \quad i = 1, 2, \ldots, m,$ *(3)*

$\sum_{j=1,\neq q}^{n} y_{ij}\lambda_j - s_i^+ = y_{iq}, \quad i = 1, 2, \ldots, r,$

$\lambda_j \geq 0, s_i^+ \geq 0, s_i^- \geq 0.$

3. Results and Discussion

The findings of the analysis of efficiency implemented via DEA model oriented to inputs and constant returns to scale in years 2010 – 2012 with 19 selected units are illustrated in Table 3.

Selected inputs and outputs are listed in Table 1 and 2 in the text above. Within the given input and output parameters, 9 units out of 19 were identified as effective (z = 1) for years 2010, for year 2011 it was also 9 units (out of 18). From the examined years point of view, 4 categories of results can be drawn (see Table 4). The constant efficiency was identified in all evaluated years with:

- 6 units (when in all years is z = 1) – Silesian hospital in Opava, Hospital Jihlava, Hospital Tišnov, Hospital Břeclav, Hospital TGM Hodonín and Hospital Kyjov.

Furthermore the fluctuating efficiency was identified, that is:

- In the improving period with 3 units – Hospital Třinec (2012), Hospital with Outpatient clinic in Nový Jičín (2011), Hospital Výškov (2012);
- In the period of deterioration with 4 units – Associated medical equipment Krnov, Hospital Havlíčkův Brod, Hospital Nové Město na Moravě a Hospital Znojmo.

Table 3. Resulting values of the efficiency index of units in years 2010 – 2012 by using DEA method (Input-Oriented)

	Input-Oriented		
U	Efficiency 2010	Efficiency 2011	Efficiency 2012
Hospital Třinec	0,94440	0,98688	1,00000
Hospital Frýdku-Místku	0,91486	0,91955	0,96532
Hospital with Outpatient Clinic Karviná-Ráj	0,85277	0,90914	0,92706
Hospital with Outpatient Clinic Havířov	0,79597	0,85118	0,79261
Silesian hospital in Opava	1,00000	1,00000	1,00000
Associated medical equipment Krnov	1,00000	0,91300	0,87953
Hospital with Outpatient Clinic in Nový Jičín	0,85523	1,00000	x
Hospital Havlíčkův Brod	0,96889	1,00000	0,94345
Hospital Jihlava	1,00000	1,00000	1,00000
Hospital Pelhřimov	0,79971	0,85497	0,82426
Hospital Třebíč	0,95162	0,93697	0,96519
Hospital Nové Město na Moravě	1,00000	1,00000	0,98037
Hospital Tišnov	1,00000	1,00000	1,00000
Hospital Břeclav	1,00000	1,00000	1,00000
Hospital TGM Hodonín	1,00000	1,00000	1,00000
Hospital Kyjov	1,00000	1,00000	1,00000
Hospital Vyškov	0,97151	0,99862	1,00000
Hospital Znojmo	1,00000	0,83995	0,91946
Hospital Ivančice	0,97048	0,96555	0,89476

Source: Authors

Table 4 illustrates the results of efficiency calculation in accordance with output-oriented DEA model with constant returns to scale. In case that the effictive unit equals one (z = 1) and the non-effective unit reaches the value greater than 1 (z > 1).

Table 4. Resulting values of the efficiency index of units in years 2010 – 2012 by using DEA method (Output - Oriented)

	Output-Oriented		
U	Efficiency 2010	Efficiency 2011	Efficiency 2012
Hospital Třinec	1,05887	1,01329	1,00000
Hospital Frýdku-Místku	1,09307	1,08749	1,03593
Hospital with Outpatient Clinic Karviná-Ráj	1,17265	1,09994	1,07868
Hospital with Outpatient Clinic Havířov	1,25634	1,17483	1,26166
Silesian hospital in Opava	1,00000	1,00000	1,00000
Associated medical equipment Krnov	1,16927	1,00000	1,13697
Hospital with Outpatient Clinic in Nový Jičín	1,00000	1,09529	x
Hospital Havlíčkův Brod	1,03211	1,00000	1,05993
Hospital Jihlava	1,00000	1,00000	1,00000
Hospital Pelhřimov	1,25045	1,16963	1,21321
Hospital Třebíč	1,05084	1,06727	1,03607
Hospital Nové Město na Moravě	1,00000	1,00000	1,02002
Hospital Tišnov	1,00000	1,00000	1,00000
Hospital Břeclav	1,00000	1,00000	1,00000
Hospital TGM Hodonín	1,00000	1,00000	1,00000
Hospital Kyjov	1,00000	1,00000	1,00000
Hospital Vyškov	1,02933	1,00138	1,00000
Hospital Znojmo	1,00000	1,19054	1,08759
Hospital Ivančice	1,03042	1,03568	1,11762

Within the set input and output parameters, 2 levels of constant inefficiency were identified in all monitored years: Inefficient with 4 units (in all years is z<1) – Hospital in Frýdek-Místek, Hospital with Outpatient clinic Karviný-Ráj, Hospital Třebíč and Hospital Ivančice; Notably inefficient with 2 units (notably inefficient when z < 0.9) – Hospital with Outpatient clinic Havířov, Hospital Pelhřimov.

Source: Authors

Table 5. Classification of resulting indexes of efficiency od units during the period 2010 – 2012

Category	*terms y*	*Number of units*
I. Constantly effective	*in all years is z = 1*	6
II. Effective in a fluctuating	*improving during the time, i.e 2010 or 2011 z <1, but in 2012 z = 1*	3
	2010 or 2011 is z=1 ,but in 2012 is z<1	4
III. Constantly ineffective	*in all years is z <1*	4
IV. Constantly notably ineffective	*in all years is z <0,9*	2

Source: Authors

Furthermore the so-called super effective was calculated via DEA model with effective unit, which is defined as a distance between inputs and outputs of evaluated units from new effective frontier, which enables further classification of effective units.

They were identified as super effective within the set of effective order between effective units. In all years Hospital Tišnov was excluded from the set of effective units, due to the reasons stated in Chapter 2.1.

The order (from the best to the worst) of effective units in monitored years is as follows:

- 2010: Hospital TGM Hodonín, Hospital Jihlava, Associated medical equipment Krnov, Hospital Znojmo, Hospital Výškov, Hospital Nové Město na Moravě, Hospital Kyjov and Hospital Břeclav;
- 2011: Hospital TGM Hodonín, Hospital Jihlava, Hospital Kyjov, Hospital with Outpatient clinic in Nový Jičín, Hospital in Břeclav, Silesian hospital in Opava, Hospital Havlíčkův Brod and Hospital Nové Město na Moravě;
- 2012: Hospital TGM Hodonín, Hospital Jihlava, Hospital Třinec, Hospital Kyjov, Hospital Břeclav, Silesian hospital in Opava and Hospital Vyškov.

The implemented efficiency evaluation via DEA model oriented to inputs and constant returns to scale in years 2010 – 2012 in selected units implies the recommendation to those, which belong to categories III and IV (see Table 5). These units ought to consider the possibilities of optimization or the reduction of particular input parameters. The reduction of the number of beds and average time of treatment ought to deal especially with Hospital with Outpatient clinic Havířov, Hospital Pelhřimov, but also Hospital in Frýdek-Místek and Hospital in Třebíč. Furthermore it is possible to recommend the reduction of cost spent on 1 day of treatment, that is first of all Hospital with Outpatient clinic Karviná-Ráj and Hospital Ivančice.

The obtained results of efficiency evaluation of selected units are necessary to consider within the framework of restrictions of selected input and output parameters and also within a specific structure (medical fields) of hospital care in particular units. More accurate evaluation of efficiency of units can be carried out within the framework of particular medical fields - surgery, internal department, gynecology, neurology and the like. Nevertheless, it is not possible to obtain comparable valid data with higher number of units in reasonable time.

4. Conclusion

It may be assumed from the trend of the number of the allowance organizations providing inpatient care in hospitals that this form of organization in health-service is programmatically supressed. At present (year 2013) the total number of regional allowance organizations in the Czech Republic is 23, which provide inpatient care in hospitals, out of which 18 provide urgent,

or even combined inpatient care (urgent and subsequent). These regional allowance organizations were the subject of the technical efficiency evaluation according to DEA model in this paper. What was evaluating especially was the efficiency focused on inputs – the bed number, average time of treatment stated in days and costs spent on 1 day of treatment.

Generally it can be stated that with 1/3 of allowance organizations having been evaluated, the technical inefficiency was identified, that is in all monitored years 2010 – 2012. However, the technical efficiency ether on a stable or fluctuating level with the majority of allowance organizations. Super effective was reached in Hospital TGM Hodonín, Hospital Jihlava, whose results can become the model for other allowance organizations and they can also be the subject of benchmarking.

An extra calculation for selected inputs and outputs in accordancewith output-oriented DEA model with constant returns to scale was aupplemeted to verify the results of super efficiency. It was confirmed by that calculation that Hospital TGM Hodonín and Hospital Jihlava are effective even from their outputs point of view – the bed occupancy per day and the number of hospotalizations, i.e. in relation with selected inputs.

In conclusion, it is necessary to underline that possibilities of DEA model as a tool for technical efficiency evaluation of inpatient care are relevant, but limited by the selection of input and output parameters and also by the availability of relevant data. Generally, the specification of the efficiency of units is quite complicated in health-services because economic arguments often stay in the background due to the assertion of higher objectives. These objectives are connected with the substance of health care when the result of production is nothing more sophisticated, more specific and more important than the health of man. The health care efficiency has to be therefore confronted with the legitimate patient´s expectations concerning the quality and availability of health care. For these reasons, the health care efficiency is necessary to consider and evaluate in context of the quality of provided health care, economic efficiency and equality concerning the access to health care.

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