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THE ANALYSIS OF PRODUCTIVITY AND PROFITABILITY IN THE CEE REGION: FOCUS ON THE PRIVATE AND PUBLIC SECTOR

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Abstract

This paper presents a comparative analysis of productivity and profitability of companies of the private and public sector from selected countries of Central and Eastern Europe (CEE). The research is based on the data of productivity and profitability from "Cranet" project. The results of analysis indicate a statistically significant difference in the level of productivity and profitability between these two sectors, so that private sector has significantly higher level of productivity and profitability than the public sector companies. Analysis according to the individual countries also points to a significantly higher level of productivity and profitability in the private sector, except in Slovenia where the public sector companies have a better level only of productivity compared to the private sector.

Keywords: productivity, profitability, private sector, public sector, CEE region, CRANET

1. INTRODUCTION

Market competition is characterized by the competition on the supply side between organizations from the private and public sector. The main goal of an enterprise from the private sector is a long-term business success and profit, i.e. earnings for

shareholders. On the other hand, public sector enterprises are characterized by two purposes of business: the provision of general public interest and achieving the commercial objectives of the business, i.e. economic benefits. Commercial business goal of the public sector came to the fore in the second half of the twentieth century,

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when private capital entered in the field of business of enterprises in the public sector, and when the same products and services of general public interest were provided by private and state-owned organizations (Khan, 2006). In the long-term, companies of every sector can be successful only if they achieve efficient and effective business, which is measured by the ratio of output and input and by the level of achievement of set business goals (Andrašić, 2012).

Today, market competition between companies from the private and public sector raises the question which companies achieve better business performances, and whether the private sector accounts more efficient usage of resources, and thus better business performances in comparison with the public sector? One of the main reasons for privatization programs in countries of Europe was the belief that the private enterprises are doing business in a more efficient way than public sector enterprises. This belief was confirmed by numerous empirical studies. According to the survey of Megginson et al. (1994), the average profitability, as an indicator of business performances in enterprises after privatization, was increased from 8.6% to 12.6%. The research results of the World Bank (1995) also indicated that the performances of business enterprises in the private sector are higher than in the public sector enterprises. Kikeri and I ellis (2002) concluded that privatization in competitive markets has a positive impact on the improvement of the performances of enterprises in economies that are not in transition. Furthermore, Boubakri and Cosset (1998) also came to the conclusion that the private sector is more efficient than the public sector.

In addition to researches that confirmed

that the private sector operates more efficiently, there are researches on the opposite side of view. In fact, research by Ernst et al. (1999), Majumdar (1998) and Saygili and Taymaz (2001) indicated that there is no significant difference in the performances of the public and private sector, or even that the public sector is more efficient than the private sector.

The subject of this paper will be the analysis of performances of business enterprises from the private and public sector in countries of the Central and Eastern Europe. Performances of enterprises were measured through the assessment of profitability and productivity. Profitability indicates the earning power and business success achieved during the period (Kimmel et al., 2009) while productivity, as the ratio of the quality and quantity of produced effects or services, on the one hand, and investment on the other hand, points to the achievement of the highest performances at the lowest possible cost of resources (Anderson et al., 2005). The main objective of this paper is to examine whether there is a significant difference in the level of productivity and profitability between companies from the private and public sectors.

2. RESEARCH METHODOLOGY AND HYPOTHESES DEVELOPMENT

For the purpose of this research authors used data from Cranet project (www.cranet.org). Cranet represents the international research network established in 1989 under the patronate of the Cranfield School of Management, UK. The main purpose of the Cranet research is to collect comparative data on the international level

Table 1. The sample of enterprises according sector and state

State	Private sector		Public sector		Total
	Number of enterprises	%	Number of enterprises	%	
Slovakia	180	94.74%	10	5.26%	190
Hungary	92	81.42%	21	18.58%	113
Slovenia	129	80.12%	32	19.88%	161
Serbia	32	74.42%	11	25.58%	43
Bulgaria	144	84.71%	26	15.29%	170
Total	577	85.23%	100	14.77%	677

Source: Authors' calculation based on Cranet data

on the practices of human resource management in more than 40 countries of the world, by using standardized questionnaire. Data are collected every four years (Brewster et al., 2011). The research of the business performances is based on data collected in countries of the CEE region: Slovakia, Bulgaria, Hungary, Slovenia, and Serbia, with total of 677 enterprises divided in two groups according the ownership: enterprises from the private and public sector. Table 1 presents sample details.

Based on data collected on the productivity and profitability of the company, a comparative analysis of the productivity and profitability between companies from the private and public sectors in countries of CEE was performed. In accordance with the research goal of the paper, and theoretical views presented in the introduction part, authors developed two hypotheses that were the subject of detailed testing:

H_1 : *There is statistically significant difference in the level of productivity between enterprises form the private and public sector in countries from the CEE region.*

H_2 : *There is statistically significant difference in the level of profitability between*

enterprises form the private and public sector in countries from the CEE region.

In the continuation of the paper there are presented the results of the analysis of productivity and profitability of enterprises from the private and public sector in CEE countries.

3. RESEARCH ANALYSIS

The comparative analysis of productivity in private and public sector in CEE is based on:

- Analysis of productivity between enterprises from the private and public sector in the CEE region based on aggregate data;
- Detailed analysis of productivity between enterprises from the private and public sector at the country level;
- Testing the significance of differences in the level of productivity between enterprises from the private and public sector.

The results of the aggregate analysis of productivity between enterprises from the private and public sector in the CEE region are presented in table 2.

The results suggest that private sector companies have in total, higher level of productivity (3.60), as compared to the

Table 2. Descriptive statistics for productivity of the enterprises from the private and public sector in the CEE region

Indicator	Sector	Number of enterprises	Average productivity	Std. Deviation	Std. Error
Productivity	Private	577	3.60	0.771	0.032
	Public	100	3.41	0.900	0.090

Source: Authors' calculation based on Cranet data

Table 3. The results of the Student's *t*-test on the productivity of the enterprises from the private and public sector in the CEE region

Indicator	<i>t</i>	df	Sig. (<i>p</i>)	Diff. Mean	Dif. Std. Err.
Productivity	2.233	675	0.026	0.191	0.086

Source: Authors' calculation based on Cranet data

public sector enterprises (3.41). To investigate whether differences in the level of productivity among enterprises of the private and public sectors are statistically significant, authors conducted a statistical method of Student's *t*-test, which tested the differences between means in the productivity of two large independent samples. For the implementation of the Student's *t*-test authors used statistical program IBM SPSS Statistics, Version 20 (Field, 2009). After entering and processing data using the statistical program, the following results were obtained.

Since the value of the Student's *t*-test is

2.233, which is higher than the limit value of 1.96, and the value of sig. (*p*) is 0.026 lower than 0.05, hypothesis H_1 is accepted. Namely, the difference between productivity of enterprises from the private and public sector is statistically significant, so we can conclude that enterprises from the private sector have significantly higher level of productivity than enterprises from the public sector.

Table 4 presents the results of measurement of productivity in the private and public sector of each country from the sample.

Private sector companies achieve

Table 4. Descriptive statistics for productivity of the enterprises from the private and public sector in countries of the CEE region

State	Sector	Productivity	Std. Deviation	Std. Error
Slovakia	Private	3.62	0.778	0.058
	Public	3.00	0.667	0.211
	Total	3.59	0.783	0.057
Hungary	Private	3.58	0.855	0.089
	Public	3.05	1.117	0.244
	Total	3.48	0.927	0.087
Slovenia	Private	3.57	0.716	0.063
	Public	3.81	0.780	0.138
	Total	3.61	0.734	0.058
Serbia	Private	3.59	0.798	0.141
	Public	3.36	1.027	0.310
	Total	3.53	0.855	0.130
Bulgaria	Private	3.63	0.756	0.063
	Public	3.38	0.697	0.137
	Total	3.59	0.750	0.058

Source: Authors' calculation based on Cranet data

productivity at a relatively uniform level observed in the countries of Central and Eastern Europe, which ranges from an average grade of 3.57 in Slovenia to 3.63 in Bulgaria. On the other hand, differences in the level of productivity of public sector enterprises is significant, and ranged from 3.00 in Slovakia to 3.81 in Slovenia.

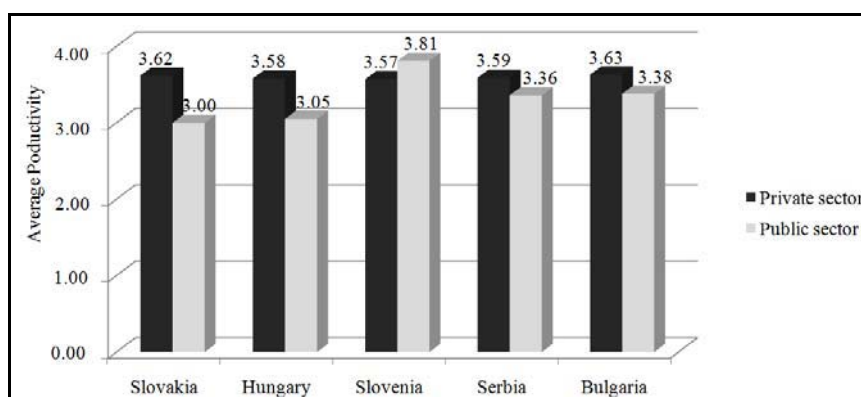
A detailed analysis of productivity between the private and public sectors in individual countries shows that the private sector has higher level of productivity in Slovakia, Hungary, Serbia and Bulgaria (Figure 1). The biggest gap in the level of productivity is present in Slovakia, where private sector companies achieve an average productivity of 3.62, while public sector enterprises have an average rating of productivity of 3.00. For enterprises in Slovenia there is a situation where public sector enterprises have a better assessment of the productivity (3.81), in contrast to private sector companies (3.57).

The second comparative analysis, of profitability in private and public sector in CEE, is based on:

- Analysis of profitability between enterprises from the private and public sector in the CEE region based on aggregate data;
- Detailed analysis of profitability between enterprises from the private and public sector at the country level;
- Testing the significance of differences in the level of profitability between enterprises from the private and public sector.

The results of the aggregate analysis of profitability between enterprises from the private and public sector in the CEE region are presented in table 5.

The results suggest that private sector companies have in total, higher level of profitability (3.37), as compared to the public sector enterprises where level of profitability is 2.96. To investigate whether differences in the level of profitability



Source: Authors' calculation based on Cranet data

Figure 1. Average productivity of the private and public sector in the CEE region

Table 5. Descriptive statistics for profitability of the enterprises from the private and public sector in the CEE region

Indicator	Sector	Number of enterprises	Average profitability	Std. Deviation	Std. Error
Profitability	Private	577	3.37	0.859	0.036
	Public	100	2.96	1.004	0.100

Source: Authors' calculation based on Cranet data

among enterprises of the private and public sectors are statistically significant, authors conducted a statistical method of Student's t-test, which tested the differences between means in the profitability of two large independent samples. For the implementation of the Student's t-test authors used statistical program IBM SPSS Statistics. After entering and processing data using the statistical program, the following results were obtained.

Since the value of the Student's t-test is 4.303, which is higher than the limit value of 1.96, and the value of sig. (p) is 0.000 lower than 0.05, hypothesis H_2 is accepted. Namely, there is statistically significant difference between profitability of enterprises from the private and public sector is, so we can conclude that enterprises from the private sector have significantly higher level of profitability than enterprises from

the public sector.

The next table presents the results of measurement of profitability in the private and public sector of each country from the sample.

Results of the analysis showed that enterprises in the private sector achieve profitability at a relatively uniform level, observed in the countries of Central and Eastern Europe, which ranges from an average grade of 3.17 in Hungary to 3.49 in Slovakia. On the other hand, differences in the level of profitability of public sector enterprises is significant, and ranged from 2.50 in Slovakia to 3.09 in Slovenia.

A detailed analysis of profitability between the private and public sectors in individual countries shows that in the all five countries the private sector has higher level of profitability than public (Figure 2). The biggest gap in the level of profitability

Table 6. The results of the Student's t-test on the profitability of the enterprises from the private and public sector in the CEE region

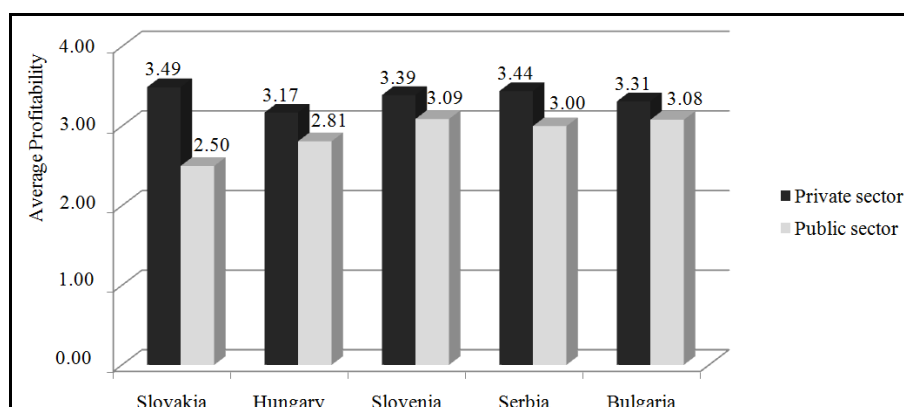
Indicator	t	df	Sig. (p)	Diff. Mean	Dif. Std. Err.
Profitability	4.303	675	0.000	0.411	0.095

Source: Authors' calculation based on Cranet data

Table 7. Descriptive statistics for profitability of the enterprises from the private and public sector in countries of the CEE region

State	Sector	Profitability	Std. Deviation	Std. Error
Slovakia	Private	3.49	0.868	0.065
	Public	2.50	0.707	0.224
	Total	3.44	0.887	0.064
Hungary	Private	3.17	0.990	0.103
	Public	2.81	1.209	0.264
	Total	3.11	1.038	0.098
Slovenia	Private	3.39	0.774	0.068
	Public	3.09	0.928	0.164
	Total	3.33	0.812	0.064
Serbia	Private	3.44	0.801	0.142
	Public	3.00	1.095	0.330
	Total	3.40	0.877	0.134
Bulgaria	Private	3.31	0.823	0.069
	Public	3.08	0.977	0.192
	Total	3.28	0.850	0.065

Source: Authors' calculation based on Cranet data



Source: Authors' calculation based on Cranet data

Figure 2. Average profitability of the private and public sector in the CEE region

between the private and public sector is present in Slovakia, where private sector companies achieve even 40% higher average profitability than public sector. In other countries enterprises from private sector achieve higher level of profitability from 7.5% to 12.8% in comparison with average profitability of enterprises from public sector.

4. DISCUSSION

The results of the analysis of productivity of enterprises from private and public sectors in countries of the CEE do not confirm the hypothesis H_1 , but the alternative hypothesis that there is statistically significant difference in the level of productivities between these two groups of enterprises. We can conclude that the private sector companies have significantly higher level of productivity as compared to the enterprises from the public sector. Higher productivity of the private sector is based on increasing jobs and reducing the number of employees. On the other hand, reducing the number of employees in public sector is sensitive issue because of the nature of public sector

(affordability of public products and services) and the strong influence of union of employees. Despite the level of productivity of private sector companies which are relatively uniform, higher standard deviation indicates to the greater differences in the level of productivity between public sector enterprises. Differences in the levels of productivity in companies from the public sector should be explained through the differences in the level of bureaucracy, centralization or decentralization of the budget, differences in the number of employees, the level of employees' expertise and functional knowledge, etc...

The results of the analysis of profitability between enterprises from the private and public sector in countries from the CEE region do not confirm the hypothesis H_2 also, but the alternative hypothesis that there is statistically significant difference in the level of profitability between these two groups of enterprises. According to the research results we can conclude that the enterprises from the public sector have significantly higher level of profitability as compared to the enterprises from the private sector. It was expected that the private sector has higher level of profitability than the

public sector because the fact that the main goal of establishment private sector enterprises is profit. On the other hand, for the most of the public sector enterprises the primary goal is provision of general public interest, while the profit is the secondary goal of business.

5. CONCLUSION

A comparative analysis of productivity and profitability, as indicators of business performances of enterprises from private and public sectors in countries of Central and Eastern Europe was based on aggregate and individual analysis at the level of each selected country. At the aggregate level, private sector enterprises, from selected countries of Central and Eastern Europe, achieved significantly higher level of productivity in relation to companies in the public sector. Analysis of productivity between two sectors at the level of individual countries showed that private sector companies in all countries also achieved a higher level of productivity as opposed to companies in the public sector, except Slovenia, where the situation was reversed.

Based on the aggregate profitability analysis it can be concluded that there is a statistically significant difference in the level of profitability between the public and private sector, so that enterprises in the private sector at the level of the whole region achieved significantly higher level of profitability compared to companies in the public sector. Profitability analysis at the level of each individual selected country of Central and Eastern Europe also indicated that private sector companies in all countries achieved higher levels of profitability compared to companies in the public sector.

Future improvements in public sector organizations regarding efficiency and effectiveness should be directed to the increase of the knowledge of employees, the decrease of the political (party) influence in management of public organizations, the optimizations of business processes inside public organizations, the strategic management approach to the most important public organizations, the benchmarking of the successful public sector management from countries which reached higher level of productivity and profitability, etc.

The position of the Republic of Serbia in relation to other selected countries in Central and Eastern Europe (Slovakia, Hungary, Slovenia and Bulgaria) in the line with the performances of business enterprises can be evaluated as very good. In fact, looking at the average grade of productivity for all companies (both private and public sector), our country is in fourth place among the top five ranked companies. The above positions ranked by productivity cannot be explained as unsatisfactory, since the differences in productivity levels between the above countries were relatively small, ranging from 3.48 in Hungary to 3.61 in Slovenia. If the rank of the Republic of Serbia according to degree of profitability is in the question, it occupies the second place in five countries of Central and Eastern Europe.

АНАЛИЗА ПРОДУКТИВНОСТИ И ПРОФИТАБИЛНОСТИ У ЦИЕ РЕГИОНУ: ФОКУС НА ПРИВАТНОМ И ЈАВНОМ СЕКТОРУ

Кристина Мијић, Дејан Јакшић и Немања Бербер

Извод

У раду је спроведена компаративна анализа продуктивности и профитабилности предузећа приватног и јавног сектора у одабраним земљама Централне и Источне Европе (ЦИЕ). Истраживање је базирано на подацима о оцени продуктивности и профитабилности из "Cranet" пројекта. Резултати истраживања указују на постојање статистички значајне разлике у нивоу продуктивности и профитабилности који остварују ова два сектора, односно да предузећа приватног сектора имају значајно виши ниво продуктивности и профитабилности у односу на предузећа из јавног сектора. Анализа по појединим земљама такође указује на значајно већи ниво продуктивности и профитабилности приватног сектора у односу на јавни сектор, осим у Словенији где јавни сектор бележи нешто бољи ниво продуктивности у односу на приватни сектор.

Кључне речи: продуктивност, профитабилност, приватни сектор, јавни сектор, ЦИЕ регион, "CRANET"

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