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The Local Governments Efficiency in the EU Countries: Evaluation by Using the Data Envelopment Analysis

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ABSTRACT

The purpose of the article is to evaluate the efficiency of local governments of EU countries. The subject of research is the view on local governments in the European dimension, while emphasising the management system and the efficiency of local governments. The article aims to assess the efficiency of allocated expenditures of local governments in EU countries from the perspectives of government effectiveness and the perception of corruption, and to assess changes of efficiency between the periods 2012/2015 and 2015/2018. To evaluate the efficiency of local governments, Data Envelopment Analysis was applied on the sample of the 27 EU countries in the years 2012, 2015, 2018. On average, the EU countries achieve higher score of efficiency in the local governments in terms of the government effectiveness (Model 1) when comparing the efficiency score from the point of the perception of corruption (Model 2). In connection to the aim, two research questions have been verified. The results show, based on the Malmquist index, that in the majority of the EU countries in 2012/2015, there prevailed a growth of the total productivity in the local governments (in relation to the government effectiveness and the perception of corruption), which was especially impacted by a growth of the technical efficiency (Model 1), and innovation activities and management change (Model 2). The achieved findings provide valuable information for the creators of the local public policies in the individual countries.

INTRODUCTION

Most countries indicate one overarching threat to the local democracy in Europe today, that is, the financial crisis, which significantly decreased the level of available financial resources for self-governments, while the structure of responsibilities remains the same or even increases (Nemec and de Vries, 2015; Kuhlmann and Wayenberg, 2016). Territorial reforms have a significant positive impact on functional performance local and regional governments. The issue of local governments is also examined from the perspective of efficiency and effectiveness of local governments (Voorn et al., 2017; Vidoli and Fusco, 2018; Balaguer-Coll et al. 2019) or of local governments efficiency and provision of specific services (Kyriacou and Roca-Sagales, 2019; Bel, et al., 2021).

The subject of this research is a view on local governments in the European dimension, while emphasising the management system from the point of the local governments efficiency for the sample of 27 EU countries. The submitted article aims to assess the efficiency of allocated expenditures of local governments in EU countries from the perspectives of government effectiveness and the perception of corruption, and to assess changes of efficiency between the periods 20012/2015 and 2015/2018. In relation to the aim of the paper, two research questions (RQs) are verified with regard to the 27 EU countries:

RQ1: Is the growth of total productivity of local governments in EU countries (from the perspective of government effectiveness) between the periods 2012/2015 and 2015/2018 affected mainly by the growth in technical efficiency?

RQ2: Is the growth in total productivity of local governments in the EU countries (from the perspective of corruption) between the periods 2012/2015 and 2015/2018 affected mainly by innovation and management of local governments?

1. LITERATURE REVIEW

Local and regional governments are examined in a broader and a narrower context in relation to a number of current issues (Nemec and De Vries, 2015; Kuhlmann and Wayenberg, 2016). The researches evaluate the structure and the range of the sub-national governments' competencies in the European dimension, and the trends and the significance of the local governments reform tendencies (Pawlowska and Radzik, 2008; Ebinger et al. 2019). Ebinger et al. (2019) examine territorial reforms in Europe. Their results confirm the existence of the positive effect of local and regional governments. Several studies draw attention to the significance of financial sustainability of local governments. This financial potential is closely related to the provision of public services and is a precondition for their development. Pawlowska and Radzik (2008) focus on approaches for the evaluation of local governments. The authors present models of local governments that are mainly based on the principles of technology, bureaucracy, and transformation. Other authors Moldogaziev and Liu (2020) examined the relations and forms of management, including personal management and/or corruption-related questions on the level of the sub-national governments.

According to Arora a Chong (2018); Caldas et al. (2020) the quality and character of a local government are determined by a multiplicity of factors (national and local traditions, economic resource controls). Arora and Chong (2018) devise recommendations for the increase in quality in relation to government accountability and found that in order to increase government efficiency, low-income countries should pay more attention to monitoring corruption. Kyriacou and Roca-Sagales (2019), in relation to the evaluation of the local governments and the government effectiveness examined a link between fiscal decentralization and public service provision according to the expenditure functions.

The issue of local governments is also examined from the perspective of effectiveness, efficiency, and financial sustainability. Narbon-Perpina and De Witte (2018a, 2018b) analysed the literature dealing with research into efficiency of local governments carried out between 1990 through 2016. The authors assessed the methods and indicators used in different countries to measure the efficiency in the context of local governments. Geys and Moesen (2009) emphasize that various approaches coexist to measure the (technical) efficiency, and it is important to assess whether, and to what extent, the approach taken

affects the outcome of efficiency local governments. Other authors Vidoli and Fusco (2018) state that in the public economics literature expenditure needs, allocative efficiency and spatial dependence of local governments costs have been widely analysed separately implying bias estimations of the expenditure needs at the local level. The authors Wollmann (2018); Porcceli and Vidoli (2020) evaluate the cooperation between the private and the public sector, focusing mainly on expenditure needs of local governments Camps (2018) discusses the extension of public service activity in the local subsystem; whether public service provisions must necessarily be the exclusive domain of public bodies, identified with direct management, or if participation by a private entity, characterised as indirect management.

The current issue of local governments in the European dimension pertains to effective management and reduction of corruption. These questions examined (Montes and Paschoal, 2016; Liu et al., 2017). Research by Linhartova and Volejnikova (2015) into this area confirms that economic performance of the individual countries affects the rate of corruption. The authors show that advanced countries apply more effective solutions to the impact of corruption of local governments. Results from other of studies a show that countries with higher government effectiveness have a lower rate of corruption and vice versa (Alfano et al., 2019; Slijepcevic and Rajh, 2020).

2. MATERIALS AND METHODS

2.1 Data

The subject of the analysis is a sample of 27 EU countries. All data used in the paper are obtained from Eurostat - Government finance statistic, General government expenditure by COFOG that includes 10 main functions: Corruption Perceptions Index and from the World Bank Worldwide Governance Indicators – Government effectiveness. The data were collected during the specified years: 2012, 2015 and 2018 for all analysed variables.

In the evaluation of efficiency, we want to propose two models to evaluate the efficiency of local governments according to produced output. Table 1 and 2 provides an overview of the selected variables (Inputs and outputs) in models 1 and 2.

Table 1. Input variables in DEA models

Type	*Model*	*Input - Local government expenditure by function (COFOG)*	*Units*	*Data source*
Input	Model 1/ Model 2	General public services (EXGPS)	Percentage of GDP	Eurostat
	Model 1/ Model 2	Public order and safety (EXPOS)	Percentage of GDP	Eurostat
	Model 1/ Model 2	Economic affairs (EXEA)	Percentage of GDP	Eurostat
	Model 1 /Model 2	Housing and community amenities (EXHCA)	Percentage of GDP	Eurostat
	Model 1 /Model 2	Health (EXHE)	Percentage of GDP	Eurostat
	Model 1 / Model 2	Recreation, culture, and religion (EXRCR)	Percentage of GDP	Eurostat
	Model 1 / Model 2	Education (EXEDU)	Percentage of GDP	Eurostat
	Model 1 / Model 2	Social protection (EXSP)	Percentage of GDP	Eurostat

Source: Authors according to Eurostat (2020)

Table 2. Output variables in DEA models

Type	*Model*	*Output*	*Units*	*Data source*
Output	Model 1	Government effectiveness (GE)	Index	World bank
	Model 2	Corruption Perceptions Index (CPI)	Index	Eurostat

Source: Authors according to Eurostat (2020); World Bank (2020)

Before the application of DEA model, it is necessary to verify some conditions. The primary is the verification of correlations between variables. The set of outputs is incomplete if the input is not correlated with any output. We further assume that the high correlation between outputs is a sign that some of the outputs may be excluded from the analysis. At the beginning of the analysis, we compiled a correlation matrix between the variables in the specified years of the analysed period. Cohen's methodology based on Pearson correlation coefficients was used to determine the level of correlation (Cohen, 2013).

According to the results of correlation analysis, in the Model 1 and Model 2 the low correlation between outputs and inputs could be seen (max 0.420; 0.561). We can therefore assume that all our inputs are necessary in the analysis as they affect our output. When analysing the inputs in Model 1, and in Model 2, the low or medium correlation (max 0.766) can be seen between them which signalise that all of inputs are necessary. Therefore, we decided not to exclude any of the specified variables.
The topic of local public administration is quite limited in the available statistical databases. Many indicators of public administrators fail to meet the requirements for robustness and for the use in the sub-national government sector.

2.2 Methods

The Data Envelopment Analysis (DEA) is used to measure the efficiency of local governments. We use a non-parametric method for the analysis, which uses data on several inputs and outputs when evaluating efficiency. We apply the standard output-oriented model, under the assumption of variable returns to scale (BCC model – Banker et al., 1984). In our paper the Decision-Making Units (DMU) are countries located in the European Union. We analyse *n* countries (DMU_j, $j = 1,\dots,n$), where each uses *m* inputs (x_{ij}, $i = 1,\dots,m$) and produces s outputs (y_{rj}, $r=1,\dots,s$). The output-oriented BCC model can be written in the following form:

Maximise
$$\varphi_q + \varepsilon\left(\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_r^+\right) \tag{1}$$

Subject to
$$\sum_{j=1}^{n} y_{rj}\lambda_j - s_r^+ = \varphi_q y_{rq} \quad r = 1,\dots,s$$
$$\sum_{j=1}^{n} x_{ij}\lambda_j + s_i^- = x_{iq} \quad i = 1,\dots,m$$
$$\sum_{j=1}^{n} \lambda_j = 1$$
$$\lambda_j \geq 0 \quad j = 1,\dots,n$$
$$s_i^- \geq 0 \quad i = 1,\dots,m$$
$$s_r^+ \geq 0 \quad r = 1,\dots,s$$

Where ε is constant, *q* denotes evaluated DMU_q, y_q is the output of DMU_q, x_q is the input of DMU_q, s^+ are slack variables for outputs and s^- are slack variables for inputs, and λ_j is the weight.

To analyse the reasons for changes in efficiency between two periods we apply the methodology of Malmquist index (MI). The value of MI can be calculated as the component of "catch-up" effect (C_q) and "frontier shift" effect (F_q). The catch-up effect represents efficiency change, while frontier shift effect represents innovation or technological change. Färe and Grosskopf (1992) presented the following formula for calculation of the MI:

$$MI(\boldsymbol{x}^{t+1}, \boldsymbol{y}^{t+1}, \boldsymbol{x}^{t}, \boldsymbol{y}^{t}) = C_q \times F_q \tag{2}$$

$$MI(x^{t+1}, y^{t+1}, x^t, y^t) = \frac{D_q^{t+1}(x^{t+1}, y^{t+1})}{D_q^t(x^t, y^t)} \times \left[\frac{D_q^t(x^{t+1}, y^{t+1})}{D_q^{t+1}(x^{t+1}, y^{t+1})} \times \frac{D_q^t(x^t, y^t)}{D_q^{t+1}(x^t, y^t)} \right]^{1/2} \quad (3)$$

The value of catch-up effect, frontier-shift effect or Malmquist index higher than one indicates the progress, while value equal to one signalises status quo, and a value below one signalises a regress between two periods from the point of view of analysed variable (catch-up effect, frontier-shift effect or Malmquist index) (Cooper, 2007).

We apply model under the assumption of variable returns to scale and output-oriented model as we suppose that the financial resources provided by local governments are given, and we would like to analyse which is the optimal level of outputs produced by the given financial resources. We want to find out the maximal level of outputs which should be produced at a given level of local government expenditures in each country. We could only evaluate efficiency in the given sample of countries under the applied criteria (inputs and outputs), that it is necessary to properly define. In more detail (Banker et al., 1984).

3. RESULTS AND DISCUSSION

In the EU countries, the efficiency of the local governments is evaluated (in two Models) in 2012, 2015 and 2018. We realise the analysis of efficiency changes of the local governments between years 2012/2015 and 2015/2018.

3.1 The Evaluation of the Local Governments Efficiency in EU Countries

Estimated efficiencies of local governments in Model 1 (from the government effectiveness point of view) and Model 2 (from the corruption point of view) for the years 2012, 2015 and 2018 are expressed in Table 3. We can see that in Model 1, Denmark, Ireland, Luxembourg, Malta, Netherland, and Finland reached efficiency at 1, during the analysed years. Therefore, we can consider these countries as efficient in the use of local government expenditure from the point of view of government effectiveness during the analysed years. In the case of Germany, Estonia, Cyprus and Sweden, the efficiency was equal to one during the two years, only in one year was lower. We can see that countries like Belgium, Spain, France, Austria, and Portugal were above the average through the almost all analysed years. Below the average could be seen countries like Bulgaria, Croatia, Czechia, Greece, Hungary, Italy, Poland, Romania, Slovakia, and Slovenia. As the last efficient in the use of local government expenditure from the point of view of government effectiveness can be considered Romania in all years.

In Model 2, Denmark, Ireland, Cyprus Luxembourg, Malta, Finland, and Sweden reached efficiency at 1, during all analysed years. Therefore, we can consider these countries as efficient in the use of local government expenditure from the point of view of corruption during all analysed years. In the case of Belgium, Germany, Estonia, and Netherland, the efficiency was equal to one during the two analysed years, only in one year was lower. We can see that countries like France and Austria were above the average through the almost whole analysed period. Below the average could be seen countries like Bulgaria, Croatia, Czechia, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Slovakia, and Slovenia. As the last efficient in the use of local government expenditure from the point of view of corruption can be considered Romania in 2012 and Bulgaria in 2015 and 2018.

Table 3. The efficiency of local governments in Model 1 and Model 2

	Model 1			*Model 2*		
Country/Year	*2012*	*2015*	*2018*	*2012*	*2015*	*2018*
Belgium	1.0000	0.9642	0.9293	1.0000	0.9319	1.0000
Bulgaria	0.6649	0.6589	0.6719	0.5845	0.5059	0.5361

Czechia	0.8109	0.8635	0.8175	0.6047	0.6574	0.7262
Denmark	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Germany	1.0000	1.0000	0.9945	1.0000	0.9906	1.0000
Estonia	0.8866	1.0000	1.0000	0.9697	1.0000	1.0000
Ireland	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Greece	0.7370	0.8276	0.8363	0.6123	0.7616	0.7965
Spain	0.9358	0.9418	0.8976	0.9958	0.7837	0.8184
France	0.9214	0.9409	0.9575	0.8788	0.8227	0.8867
Croatia	0.7583	0.7689	0.7275	0.5633	0.6281	0.5986
Italy	0.7218	0.7494	0.7584	0.5914	0.5616	0.7123
Cyprus	1.0000	1.0000	0.9886	1.0000	1.0000	1.0000
Latvia	0.8027	0.9016	0.8496	0.6272	0.6857	0.7388
Lithuania	0.8291	0.9244	0.8737	0.8137	0.7465	0.7700
Luxembourg	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Hungary	0.8005	0.8666	0.8770	0.8333	0.8121	0.7419
Malta	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Netherlands	1.0000	1.0000	1.0000	1.0000	0.9965	1.0000
Austria	1.0000	0.9830	0.9937	0.9437	0.9379	1.0000
Poland	0.7512	0.7876	0.7812	0.7063	0.7350	0.7303
Portugal	0.8719	0.9333	0.9306	0.8168	0.7897	0.8312
Romania	0.4756	0.5521	0.4525	0.5568	0.5534	0.5803
Slovenia	0.8592	0.8396	0.8812	0.7843	0.7399	0.7565
Slovakia	0.8017	0.8327	0.8230	0.6227	0.6606	0.6667
Finland	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Sweden	1.0000	1.0000	0.9820	1.0000	1.0000	1.0000
Average	0.8751	0.9013	0.8898	0.8335	0.8259	0.8478
Max	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Min	0.4756	0.5521	0.4525	0.5568	0.5059	0.5361
St Dev	0.1352	0.1183	0.1303	0.1769	0.1656	0.1558

Source: Authors calculations

3.2 The Evaluation of the Local Governments Efficiency Changes in the EU Countries

To analyse the reasons for changes in efficiency, the Malmquist index was used. We analyse the reasons for changes between specified years 2012, 2015 and 2018. The decomposition of the Malmquist index (MI) into the catch-up effect (CU) and frontier-shift effect (FS) between the years 2012/2015 and 2015/2018 in Model 1 is displayed in Table 4. The results of the MI indicate that the overall productivity from the point of view of government effectiveness increased by 2.21% between the years 2012 and 2015. This progress was positively influenced by an increase in technical efficiency by 5.06% and negatively influenced with a decrease in innovation activity by 2.22%. We can say that in seventeen countries, a growth of overall productivity from the point of view of government effectiveness was observed, where the highest progress was observed in the case of Denmark. This significant progress was influenced by the significant increase in technical efficiency by 21.18%. We can also see ten countries with a decrease in overall productivity. When we want to analyse changes in overall productivity between the years 2015 and 2018, we can see a decrease by 1.6%, which was influenced by the decrease in efficiency by 0.49% as well as due to a decrease in innovation activity by 1.1%. We can see that only eight countries recorded progress in the overall productivity from the point of view of government effectiveness. The highest progress can be seen in the case of Slovenia, influenced by a significant increase in technical efficiency by 9.12%.

Table 4. Decomposition of the Malmquist index in the Local Governments Efficiency by Country (Model 1)

	Changes in 2012→2015			*Changes in 2015→2018*		
Country	*CU*	*FS*	*MI*	*CU*	*FS*	*MI*
Belgium	0.9448	1.0214	0.9650	0.9899	0.9582	0.9485
Bulgaria	0.9730	1.0076	0.9804	1.0711	0.9709	1.0400
Czechia	0.9960	1.0494	1.0453	1.0053	0.9640	0.9691
Denmark	1.2118	0.9671	1.1720	0.8699	0.9641	0.8387
Germany	0.9969	1.0045	1.0014	0.9926	1.0020	0.9945
Estonia	1.1681	0.9047	1.0568	1.0366	1.0044	1.0412
Ireland	1.0000	1.0003	1.0003	1.0000	0.9896	0.9896
Greece	1.3568	0.7422	1.0071	1.0000	1.0000	1.0000
Spain	1.0614	0.9718	1.0315	0.9110	1.0520	0.9583
France	0.9948	1.0144	1.0091	1.0112	0.9948	1.0059
Croatia	0.9973	1.0070	1.0043	0.9824	0.9779	0.9606
Italy	0.9839	1.0821	1.0647	1.0061	0.9726	0.9785
Cyprus	1.0000	0.9601	0.9601	1.0000	0.9845	0.9845
Latvia	1.1324	0.9934	1.1249	0.9686	0.9843	0.9534
Lithuania	1.1127	1.0130	1.1272	0.9638	0.9790	0.9436
Luxembourg	1.0024	0.9675	0.9698	1.0180	0.9880	1.0058
Hungary	1.2493	0.8010	1.0007	1.0000	1.0000	1.0000
Malta	1.0000	0.9436	0.9436	1.0000	1.0000	1.0000
Netherlands	1.0201	0.9933	1.0132	0.9704	1.0196	0.9895
Austria	0.9897	0.9985	0.9883	0.9950	1.0032	0.9982
Poland	1.0284	1.0072	1.0358	1.0225	0.9830	1.0051
Portugal	1.0763	0.9554	1.0283	1.0036	1.0011	1.0048
Romania	1.1607	0.9993	1.1599	0.8709	0.9681	0.8431
Slovenia	0.9540	1.0112	0.9647	1.0912	0.9791	1.0685
Slovakia	0.9998	0.9981	0.9979	1.0514	0.9500	0.9988
Finland	0.9540	1.0022	0.9561	1.0477	1.0079	1.0560
Sweden	1.0023	0.9854	0.9877	0.9874	1.0046	0.9920
Average	1.0506	0.9778	1.0221	0.9951	0.9890	0.9840
Max	1.3568	1.0821	1.1720	1.0912	1.0520	1.0685
Min	0.9448	0.7422	0.9436	0.8699	0.9500	0.8387
St Dev	0.1017	0.0686	0.0612	0.0501	0.0213	0.0512

Source: Authors calculations

The decomposition of Malmquist index (MI) into the catch-up (CU) and frontier-shift (FS) effect within between years 2012/ 2015 and between 2015/2018 in Model 2 is displayed in Table 5. The results of the MI indicate that the overall productivity from the point of view of corruption increased by 6.46% between the years 2012 and 2015. This progress was positively influenced by an increase in technical efficiency by 2.44% and in innovation activity by 5.44%. We can say that almost of all countries obtained a growth of overall productivity from the point of view of corruption, where the highest progress can be seen in the case of Latvia and Denmark. This significant progress in both countries was influenced by the significant increase in technical efficiency by 42.43% (Latvia) and 22.68% (Denmark) respectively. On the other hand, there were only seven countries with a decrease in overall productivity. When we want to analyse changes in overall productivity of the local governments between the years 2015 and 2018, we can see a decrease of 2.07%, which was influenced by the decrease in innovation activity by 4.55%. We can see that only eight countries recorded progress in the overall productivity from the point of view of

control of corruption. The highest progress can be seen in the case of Italy, influenced by a significant increase in technical efficiency by 24.4%.

Table 5. Decomposition of the Malmquist index in the Local Governments Efficiency by Country (Model 2)

	Changes in 2012→2015			*Changes in 2015→2018*		
Country	*CU*	*FS*	*MI*	*CU*	*FS*	*MI*
Belgium	0.8936	1.1945	1.0674	1.1016	0.8757	0.9646
Bulgaria	0.8250	1.1239	0.9272	1.0597	0.9671	1.0248
Czechia	1.0827	1.0555	1.1429	1.1048	0.9532	1.0531
Denmark	1.2268	1.1471	1.4073	0.8769	0.8170	0.7164
Germany	0.9444	1.0601	1.0011	1.0292	0.9679	0.9961
Estonia	1.1883	0.9787	1.1630	1.0970	0.9872	1.0830
Ireland	1.0000	1.0426	1.0426	1.0000	0.9866	0.9866
Greece	1.6333	0.6817	1.1135	1.0000	1.0000	1.0000
Spain	0.8244	1.0808	0.8910	1.0506	0.9358	0.9831
France	0.9362	1.0531	0.9859	1.0791	0.9531	1.0286
Croatia	1.1130	1.0578	1.1773	0.9533	0.9666	0.9214
Italy	0.8528	1.2588	1.0735	1.2440	0.9500	1.1818
Cyprus	1.0000	0.9614	0.9614	1.0926	0.9409	1.0280
Latvia	1.4243	0.9891	1.4088	0.8863	0.9705	0.8601
Lithuania	0.9299	1.1500	1.0694	1.0274	0.9722	0.9989
Luxembourg	0.9739	1.0539	1.0263	0.9680	0.9207	0.8913
Hungary	1.2000	0.8025	0.9630	1.0000	1.0000	1.0000
Malta	1.0000	1.0000	1.0000	1.0000	0.9487	0.9487
Netherlands	0.9508	1.0633	1.0110	1.0113	0.9690	0.9799
Austria	0.9875	1.1045	1.0908	1.0513	0.9625	1.0119
Poland	1.0354	1.0514	1.0887	0.9926	0.9546	0.9476
Portugal	0.8157	1.1757	0.9589	1.0526	0.9501	1.0000
Romania	0.9939	1.0667	1.0602	1.0486	0.9593	1.0059
Slovenia	0.8792	1.1616	1.0213	0.9489	0.9693	0.9198
Slovakia	1.0762	1.0302	1.1087	0.9948	0.9592	0.9542
Finland	0.8785	1.1037	0.9696	1.0266	0.9597	0.9852
Sweden	0.9936	1.0198	1.0133	0.9976	0.9739	0.9716
Average	1.0244	1.0544	1.0646	1.0257	0.9545	0.9793
Max	1.6333	1.2588	1.4088	1.2440	1.0000	1.1818
Min	0.8157	0.6817	0.8910	0.8769	0.8170	0.7164
St Dev	0.1852	0.1147	0.1215	0.0727	0.0368	0.0806

Source: Authors calculations

In case of verifying the research questions RQ1 and RQ2, it is advisable to stretch the 'technology' concept, in evaluating the efficiency development in a public sector, as a factor that determines the changes in the boundaries of production possibilities of a technology in a narrow sense (a real change of production possibilities), and a factor that includes the change of target, motivation and regulation (Førsund, 2015). In the local government sector, it may indicate for instance, the changes of aim, management and/or administration regulation.

It may be stated, based on the findings (Table 4), that the growth of the total productivity in the local governments from the government effectiveness point of view was especially impacted by the technical

efficiency, but also innovation activities and a new way of management during the years 2012/2015. Similarly, the growth of the total productivity in the local governments was connected with the growth of the technical efficiency in all of 8 countries during the years 2015/2018. These countries focused on more efficient use of the local government expenditures with regard to the results of the local government in the form of the government effectiveness. The research question RQ1, may be answered positively (YES).

The results (Table 5) indicate that the growth of the total productivity of the local governments from the corruption point of view was mainly impacted by innovation activities and a new way of management of the local governments during the years 2012/2015. However, in some countries, it was also impacted by the technical efficiency growth. On contrary, the total productivity growth in the EU countries during the years 2015/2018 was mainly impacted by the technical efficiency growth. These countries focused on more efficient use of the local government expenditures with regard to the results of the local public sector and the perception of corruption. Thus, the answer on the research question RQ2 is negative (NO).

CONCLUSIONS

The local governments in many advanced European economies are undergoing a period of reform that aims at enhancing their efficiency and effectiveness. The aim of this article was to evaluate the efficiency of the local government expenditures in relation to the government effectiveness and the perception of corruption for the sample of 27 EU countries. The Data Envelopment Analysis was used to evaluate the efficiency in the local governments in 2012, 2015, 2018 and to assess the development of the efficiency changes in the local governments in two periods, 2012/2015 and 2015/2018. In average, the efficiency results in the EU countries show higher efficiency of the local governments in relation to the government effectiveness in comparison to the efficiency of the local governments from the perception of corruption point of view. In a majority of the EU countries, there prevailed a growth of the total productivity in the local governments (in relation to the government effectiveness and also the perception of corruption) based on the evaluated changes of the efficiency during the years 2012/2015. On contrary, the total productivity growth in the local governments was only evident in eight EU countries (in the Model 1 and the Model 2) in 2015/2018. These findings reflect on the particularities of the local administration structures, the differences in the levels of the local public sector and the way of the local governments' management in the individual countries. The authors perceive the evaluation of the local governments' efficiency in the selected EU countries with regard to a typology that is connected with the role of the local public policies and the public services' provision as the topic for the next research.

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