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The efficiency of exercising self-government bodies' competencies in the building sector in the Slovak Republic: a study of selected regions

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Abstract: The significance of resolving the effective functioning of competency performance in the construction sector stems primarily from the impact on the efficiency and quality of the competencies exercised. Currently, municipalities in the Slovak Republic exercise the delegated competencies of spatial planning and building regulations, either individually or jointly on a contractual basis. The paper's primary goal is to evaluate the performance of municipal competencies in building/construction sector in selected regions of the Slovak Republic (Nitra and Košice region) from a quantitative point of view from 2014 to 2019. We used in our research mainly quantitative analysis of efficiency - two basic output-oriented DEA models, namely the CCR model and the BCC model. The current model in building sector has shown that joint building authorities are, on average, less efficient than single municipality building authorities, and this applies to both the overall efficiency indicator and the scale efficiency indicator. However, in terms of the net effect of the organizational form, single municipality building authorities are on average 13.4 percentage points more efficient than joint building authorities. Our research looks at the net effects of the new model in the construction sector.

Keywords: self-government; building order competence; efficiency

JEL Classification: H76; H83; R58

1. Introduction

The Slovak Republic is a relatively small state, which as of 31.12.2018 (Bačík, 2019) had 2927 municipalities. However, nearly 92% of them have a population of fewer than 3,000 people, which harms the efficiency of public services. (Moderné a úspešné Slovensko, 2020)

Act no. 416/2001 Coll. on the Transfer of Certain Competencies from State Administration to Municipalities and Higher Territorial Units was adopted. As a result, more than 300 competencies were transferred to self-governing units (Leško, 2015).

According to §117 of Act no. 50/1976, Coll. Building Act as amended, each municipality of the Slovak Republic is building authority.

In the case of building regulations competencies, the municipality is following the law. no. 50/1976 Coll. on Spatial Planning and Building Regulations (Building Act) as amended

by the Building Authority, while the Building Authority's activity is a delegated performance of state administration. Municipalities as self-governing units and district offices as part of state administration ensure competence in building sector in Slovakia. According to Act No. 416/2001 Coll. on the transfer of some competencies from state administration bodies to municipalities and local authorities, there was a transfer of competencies from the state to municipalities in building regulations. The significance of resolving the efficient functioning of competencies exercised by administrative bodies of self-government and state administration stems primarily from the impact on the efficiency and quality of competencies exercised by local governments and the apparent financial undersizing of transferred competence. The summary report on the results of the efficiency and effectiveness check in the exercise of powers by Slovak municipalities (NKÚ, SR, 2015) confirmed the financial underestimation of transferred competence in the area of building regulations (58% of the inspected municipalities paid extra for the exercise of competence in 2011-2013). Inter-municipal cooperation is one possible response of local governments to this situation. According to domestic authors such as Klimovský, Nižňanský, Slávik and Černěnko, the fragmentation of the territory has an inefficient effect on the performance of self-government and the associated financing of its competencies. Here, however, we meet the views of domestic experts on the problematic performance of delegated competencies in the construction sector to municipalities, as stated by Kováčová (2014): "the smaller the municipality, the greater the problems securing the transferred competencies". The principles of public administration are subject to two key requirements worldwide: efficiency and effectiveness. In terms of methodology and model tools and area coverage, a systematic examination of the efficiency and effectiveness of administrative bodies in the field of construction competencies in our conditions is still in its infancy. Change efforts are not always met with a positive response, not only from self-government or the state.

2. Methodology

We used two basic output-oriented DEA models in the fundamental analysis of building authority efficiency: the CCR DEA model (Charnes et al., 1978) and the BCC DEA model (Banker et al., 1984).

We estimated the measures of technical efficiency using the CCR DEA model, assuming constant returns to scale. This rate represents what is known as overall technical efficiency, which expresses the efficiency of the evaluated authorities in comparison to the most efficient authorities in the sample, regardless of size. On the other hand, the BCC DEA model estimates technical efficiency under variable returns to scale. This measure is known in the literature as pure technical efficiency or managerial efficiency because it expresses the efficiency of the evaluated authorities compared to the best authorities of a similar size class and thus does not account for inefficiencies caused by the office's inability to be of optimal size.

Comparisons of the efficiency of organizational forms of exercising building regulations competencies (joint building authorities vs independent building authorities) were carried out using a two-phase method proposed by O'Donnell et al. (2007)

This method compares the technical efficiency of decision-making units, classified into different groups, using the concept of a meta-frontier.

We calculated group efficiency rates and meta-efficiency rates using the CCR DEA model:

$$MTR^k = \frac{TE^M}{TE^k} \quad (1)$$

where: MTR = meta-technology rate; k = decision-making unit of the k-th group (organizational form - in our case the building authority).

Using regression analysis, we investigated the impact of various external factors on authority efficiency. We used the number of inhabitants living in the building authority's district as an explanatory variable to determine the optimal size of the building authority.

We used data on the number of acts of building authorities and the amount of financial contribution to the performance of construction competencies of a sample of building authorities in the Nitra and Košice region from 2014 to 2019. These regions were piloted in our examination within the framework of the legislative changes in building sector being prepared by Slovak Republic. All analyses were carried out using the spreadsheet software program Microsoft Excel.

3. Analysis of the efficiency of building authorities

The first phase examines whether the size of building authorities (determined by populations served) affects their performance efficiency and whether there is a particular size class of building authorities that could be considered optimal in terms of served population.

Additionally, we assess the efficiency of current building authorities in terms of organizational structure. We compare the efficiency of so-called single municipality building authorities and joint building authorities to see if merging independent building authorities of municipalities into joint building authorities improves their performance.

Performance data from a sample of building authorities in the Nitra and Košice regions were used in the analyses. See basic characteristics. Table.1.

Table 1. Characteristics of building authorities

Descriptive statistics	NR	KE	NR&KE
Number of building authorities	36	69	105
Number of independent building authorities	10	43	53
Number of joint building authorities	26	26	52
Number of municipalities	353	392	745
Average number of municipalities at building authorities	9.8	5.7	7.1
Average number of municipalities per joint building authorities	13.2	13.4	13.3
Average population at building authorities	14,457	13,186	11,380
The average number of inhabitants per independent building authorities	5,116	2,593	3,069
Average population per joint building authorities	24,156	15,548	19,852

The basic characteristics shows that joint building authorities serve approximately 6 times the number of inhabitants and 13 times the number of municipalities than independent municipalities.

According to an analysis of current building authority efficiency, building authorities (further BA) serving up to 1,000 inhabitants have the best overall efficiency (0.505). On average, BA of this size have the highest efficiency (0.885), indicating that they are close to the optimal size (the most productive scale size class) at 88.5%. BA with 1,000-4,000 inhabitants achieve roughly the same high indicator of average scale efficiency. BA of the largest size class of 15,000-100,000 inhabitants achieve the best average values in terms of net (so-called managerial) efficiency.

We then focused on a more acceptable distribution of size groups when investigating the dependence of BA's efficiency on their size.

According to this analysis, BA achieves the highest average efficiency in a group of up to 500 inhabitants in terms of overall efficiency and scale efficiency. On the other hand, the previous analysis confirmed that the largest BA achieves the highest average pure, resp. managerial efficiency and it can be specified that these are authorities with more than 30,000 inhabitants.

A comprehensive evaluation of BA size groups with up to 500 inhabitants reveals that they achieve 62.8% performance of the most efficient BAs in the sample on average. Admittedly, their performance is hampered by managerial inefficiencies, but it is enhanced by the fact that they are 91.4% of the optimal size.

Only in the case of economies of scale did regression analysis confirm a statistically significant dependence of efficiency measures on the size of BA at the level of independent authorities. Moreover, this efficiency is negatively correlated with office size, accounting for up to 70% of its variability.

The size of BA has no statistically significant effect on overall efficiency and net efficiency. The size of the office explains only 2% of the variation in overall efficiency and 7-8% of the variation pure/managerial efficiency.

We paid particular attention to determining whether the organizational form of exercising construction-related competencies affects the efficiency of current joint BA and independent BA are considered special organizational forms by us. Joint BA serve 19,853 inhabitants on average, six times more than independent municipalities and nearly twice the average for all BA. The effect of economies of scale was assumed because of the size differences between joint and independent BA.

A basic comparison of efficiency rates for both organizational forms reveals that independent BA outperform joint BA by 4.6 percentage points (p.p.) on average. This difference, however, is statistically insignificant, most likely due to the large variability in size in both the subgroups of separate and joint BA.

When we compared pure efficiency, we came to the opposite conclusion. Joint BA outperform stand-alone BAs by 4.9 p.p. on average, indicating a more efficient workforce. Even in this case, however, the difference is not statistically significant.

We discovered a statistically significant difference in the distributions of scale efficiency measures. On average, separate BA appear to be 15.1 p.p. more efficient. This conclusion is consistent with previous analyses of the relationship between efficiency and size of BA, i. e. smaller independent BA are more scale efficient than large joint BA on average.

As shown by the results of the analyses presented above, the differences between joint and individual BA are due to both managerial inefficiencies and inefficiencies. If organizational forms represent specific competency technologies, the net effect of technology on efficiency can only be measured if both types of inefficiency are formally eliminated. We used a method based on the so-called meta-frontiers approach proposed by O'Donnell et al. (2007) to calculate the net effect, employing the meta-frontier indicator (MTR) to express the distance to the best performing technology.

A comparison of joint and independent BA as organizational forms revealed that independent BA are more efficient on average, by as much as 13.4 p.p. (see Table 2). There is a statistically significant difference.

Table 2. Net effect of the impact of different technologies on BA

Meta-technology ratio (MTR)	
Independent BA vs joint BA	
Result 1 - U-value	
The U-value is 287.5.	
Result 2 - Z-ratio	
The Z-Score is 6.98594. The p-value is < .00001. The result is significant at p < .05.	
Average MTR - all BA	0.878
Average MTR indicator - independent BA	**0.945**
Average MTR - joint BA	0.811
Difference	13.4 p.p.

4. Discussion

Currently, two models are used to carry out municipalities' delegated competencies in the area of building regulations: (1) at the municipal office if the competencies are exercised for residents of a single municipality; (2) at the joint BA if the competencies are exercised for several associated municipalities. The cooperation of municipalities led to the establishment of the joint BA according to Section 20a of Act No. 369/1990 Coll.

Several studies have found that joint exercise of competencies helps small municipalities compensate for their inability to perform them or increase their efficiency; such a method also leads to better self-government competencies (Bel, Fageda, Mur 2011, Fandel 2019 and others)

The purpose of this article is to examine the impact of the joint BA on the efficiency of service performance, using indicators of technical efficiency as an indicator of overall efficiency, scale efficiency as an indicator of the optimal scale size of the office for achieving maximum productivity, and the potential to improve efficiency from the perspective of the served population.

Our research compared joint and independent BA and discovered that independent BA are up to 13.4 p.p. more efficient. There is a statistically significant difference. However, this is the only result indicating that independent BA exercise their competencies more efficiently,

as small BA face significant challenges in exercising their building competencies due to a lack of financial, material, and technical resources. Nonetheless, the BA collaborate and establish joint BA, which lack legal personality and are formed haphazardly, as stated in the NKU's final report in 2015, and are also devoid of legal subjectivity. (Mederly et al., 2019) Our study also tested the hypothesis that large BA do not exercise building regulations competencies more efficiently than small BA. Only in the case of of scale efficiency did a regression analysis of the dependence of efficiency measureson the size of BA at the level of individual offices confirm a statistically significant dependence. This efficiency is negatively related to office size, with office size accounting for up to 70% of its variability in scale. The size of BA has no statistically significant effect on overall efficiency or pure efficiency.

The study concluded that, while the hypothesis of poorer efficiency of large BAs was confirmed in the cases of overall efficiency scale efficiency, it was not confirmed in the case of pure efficiency.

Our future research will also concentrate on structural changes in government administration. In the construction sector, the Government of the Slovak Republic intends to abolish BA as self-governing units in its program statement for the period 2020-2024. Simultaneously, it intends to strengthen the role of specialized district authorities as representatives of the state administration. This is an option that can lead to a more efficient exercise of competence in various ways. District offices are more uniform in size (in terms of population served). The Slovak Republic currently has 72 district offices, with an average of 75,200 inhabitants per office. The following are the prerequisites for legislative changes:

- Scope efficiency of district offices may occur.
- It will be easier to examine the effect of merging of BA by merger of efficiency on the basis of estimated size efficiencies.

Change efforts are not always met with a positive response, not only from self-government or the state. Nevertheless, the citizen is the clear beneficiary of the positive effects of reforms and streamlining. As a result, our future research will aim to analyze the net effects of the new model in the construction sector in the Nitra and Košice regions of the Slovak Republic using sophisticated methods of quantitative efficiency theory.

5. Conclusions

We conducted quantitative research to determine whether there are significant differences in the efficiency of competency exercises based on the organizational form of the building authority, the size of the building authority, and the legal framework governing competency exercises.

Since Slovak law allows municipalities to collaborate in the performance of a specific task or activity based on a contract (Section 20 of Act No. 369/1990 Coll.), and thus BA exercise their competence as independent BA or joint BA, we investigated whether the organizational forms of the authorities have a significant impact on the overall efficiency of the exercise of competencies as well as the scale efficiency.

Because the size of BA in Slovakia measured by population served varies, independent authorities of large cities can theoretically be much larger than the most prominent joint authorities. In comparison, the smallest joint authorities can be smaller than independent municipal authorities. The Slovak Republic's legislation does not specify the organizational structure or size of the BA.

Based on efficiency measures, we have found that independent BA have an overall efficiency by 4.6 p.p., better than joint BA. However, this result is not statistically significant due to the wide variation in the size of BA based on the number of inhabitants. In terms of scale efficiency, we discovered statistically significant differences in the performance of construction competence of joint and independent BA. Independent BA are 15.1% more efficient than joint BA on average.

A comparison of joint and independent BA as organizational forms revealed that the organizational form of independent BA is more efficient on average, by as much as 13.4 p.p. The difference is statistically significant. Or current research is continuing in building sector, being changed in structure of building authorities

Our research in the construction sector continues and looks at the net effects of the new model of BA performing their competencies, being prepared currently by the Slovak government.

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Conflict of interest: none

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