

# SUBSTITUTION EFFECT OF PUBLIC SUPPORT PROGRAMS AT LOCAL LEVEL\*

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## Abstract

The paper evaluates the principle of additionality in public support programs at local level. In the evaluation of public support policies a key question is whether the policy has made a difference over what would have otherwise occurred. This could be measured by different ways as output, behavioral or input additionality. In this paper we analyze the impact of public support programs on input additionality as the extent to which the subsidy is reflected in increased expenditures by supported subjects through the measurement of substitution effect. We studied public investment subsidies in the case of education support in Slovakia. We identified the substitution effect in 10% of the analyzed municipalities. There are several differences in outcomes.

An important factor is the size of the city as larger municipalities reduce their other activities when obtaining the support. We also showed that less developed regions have a lower tendency to misuse the support programs. The more developed regions and cities reduce their own spending on a given priority when obtaining the support.

**Keywords:** support programs, additionality, substitution effect, structural funds, municipalities.

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\* Acknowledgment: This research was supported by VEGA (Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic) under the contract No. 1/0093/12 titled Efficiency of EU Regional Policy in the Slovak Republic.

## 1. Introduction

European Union member states which accessed in 2004 and 2007 have been granted large amounts of financial support through EU structural funds. They were considered as lagging behind regions of the EU. This has allowed them to obtain a strong support for regional and local development. This new international level of regional support greatly exceeded existing public expenditures at the local level. Even though EU structural funds are intended to enhance the growth of the least developed regions within the EU, high amounts of additional resources can create wrong incentives for public finance allocations.

Local communities, including local governments, should adapt and plan their expenditures in line with EU structural funds priorities. Therefore we focus our research on the interaction between local municipalities and structural funds priorities. We specifically focus on the negative incentives EU support creates at the local level, namely the substitution effect. We measure the inefficiency level of the EU funds allocation in the public sector in Slovakia. We try to quantify the level of the substitution inefficiency based on the example of the Regional Operational Program targeted on support of school infrastructure in primary education.

Slovak municipalities are responsible for primary education in their districts. The costs for education are paid from the state transfers based on the number of pupils in a particular school. These transfers are supposed to cover both the personnel costs as well as the investments into the infrastructure. In most of the cases the schools are deprived, paying low wages and having only little money for investments.

The aim of this study is to focus mainly on the substitution effect in relation to the financing of the selected priorities by local municipalities. We identify the extent of the substitution effect and then characteristics of the municipalities which most likely replace their own resources by the EU funds.

Previous research on the efficiency of this assistance focused mainly on the analysis of aid to the private sector. Considerably less attention has been paid to the relation of the public support especially at lower levels of the public sector. This article is therefore focused on exploring the substitution effect, pointing to the problems of inefficiencies that may occur in supporting the public sector at the local level.

In the next section we offer literature review that emphasizes the theoretical foundations of the substitution effect. Then we elaborate on the data description as well as on methodology. The suggested type of methodology was until now used mainly to analyze the public support of the private sector. However, it will also help us to identify whether the funding priorities of the EU actually translate into higher volumes of support for the development priorities at the local level. Finally, we formulate some policy recommendations to EU funds design for the public sector.

## 2. Theoretical framework of the research

The EU support for lagging regions comes from the effort to stimulate their growth which is expected to result in economic and social convergence of these regions. To achieve this, the proper application of this support is extremely important. There-

fore, the distribution of EU funds is bind by several principles (Reg. 1083/2006) which should ensure the proper allocation of money. Two of them are important in our research. The first principle is concentration meaning that EU funds should be allocated to the areas which need it. The second of them is additionality, which should ensure that EU funds are complementary to national and local resources rather than supplementary.

The additionality principle is defined from both macro and micro level perspectives. The macro level is defined by the European Commission that sets limits to EU expenditures which are related to the public expenditures of the government (Reg. 1260/1999, Reg. 1083/2006). At the micro (local) level, additionality principle means that the recipient should use the additional funds as the extra resources and should not substitute it with its own resources. Both, macro and micro levels are difficult to control and measure. According to Georghiou (1994) the additionality principle can be defined according to three dimensions: input additionality, output additionality and behavioral additionality. The first analyzes whether the additional funds/aid received by targeted subjects increases their expenditure on the target activity. The second aims at gauging the output which would not have been achieved without the policy intervention. Finally, behavioral additionality deals with the changes in terms of the internal allocation of funds and operative decisions of the targeted institution after the policy inception. The principle of additionality can be measured in many ways; the most common are measuring deadweight, displacement, substitution effect and leakage (BIS, 2009).

Output additionality is very often measured by the deadweight effect. This effect represents the proportion of total outputs/outcomes that would have been secured anyway without the intervention in question (BIS, 2009). In the case of projects under the Structural Funds, these are projects that would not be implemented in whole or in part without the support from the EU. The results of studies by different authors (Wren, 2005; Lenihan and Hart, 2006; Tokila and Haapanen, 2010; Sipikal, 2010; Sipikal, Pizar and Labudova, 2013) vary considerably. The obtained values range from 20% (Wren, 2005) to 73.5% (Lenihan and Hart, 2006). This indicates a large potential for the inefficiency of support. All studies are methodically based on interviews with businesses that received support, which can significantly distort the measured value.

Input additionality is usually measured by the substitution effect, the main interest of this paper. This effect arises as inefficiency when beneficiaries of the EU funds reduce their own resources on the given priority and replace them with the external resources, such as the EU funds. The measurement of the substitution effect examines whether the expenditures on a given priority spent by the beneficiaries have changed after receiving support from the EU funds. Substitution effect is an undesired outcome of the public support schemes. Considering the long term effects of the EU support programs, sources replacement is perceived as deteriorating the behavior of public entities. The reason is that once public entities substitute their own resources with EU money, in the long run they would have to invest even more if financial support

will be ceased. Another reason is that with the substitution in public sector the EU investments schemes lose their importance and therefore end up as useless investments with no multiplicative effect in the lagging behind regions.

As stated in Barca report:

*'The task of place-based development policies is not to compensate for the failure of some places to raise enough revenue from their own sources to finance their development. If this were the purpose, an EU-level regional equalization fund could be set up, as is common practice in many countries. Instead, the task of such policies is to trigger a change in the behavior of private actors in regions where either an efficiency or a social exclusion trap exists. The simple transfer of funds cannot get close to doing this and might even worsen problems by creating a dependency culture'* (Barca, 2009, p. 39).

The problem is that there is no standard methodology on how to evaluate the effective implementation of the principles which ensure the correct implementation of EU funds. In the case of additionality, this is also reported by Del Bo *et al.* (2011) - it is concluded that even though additionality as a criterion is controlled by the national authorities and the European Commission, 'there is no standard methodology and the information provided is very heterogeneous in terms of quality and usefulness' (p. 6).

The Cohesion policy of the EU is one of the most developed systems of international support to the less developed regions. Mutual interaction between local, national and transnational forms of support should be guided by several fundamental principles (Council Regulation no. 1083/2006), including the principle of additionality. In order to ensure a genuine economic impact, contributions from Structural Funds should not replace public expenditure by Member States under the terms of this Regulation. As a general rule, the level of the expenditure of recipient shall be at least equal to the amount of average annual expenditure in real terms attained during the previous programming period (Council Regulation no. 1083/2006, p. 24).

This is a system that ensures that substitution does not occur. In practice, it is automatically achieved by co-financing EU programs by the state budget of the supported country. However, not all member countries fulfill this principle (Reg. 1083/2006). There is no obligation for co-financing at the local level, even though local levels also contribute to the financing of the projects (in our research case co-financing is 5%). In addition, certain exceptions to this system are allowed. This amounts to a basic problem in the evaluation of additionality. It is not possible to determine objectively what the base of national funding would have been in the absence of EU funding and thus to state definitively that the member state has substituted EU funds entirely for the funds that it would otherwise have spent in an area (David, Geuna and Steinmueller, 1995). Exceptions in additionality principle represent at the same time one of the main strengths and shortcomings of the current system of verification of additionality. From one side, the exceptions allow the system to be flexible and to take the specific characteristics of each country into account in the enforcement of additionality (CSIL, 2010). However, from the other side, it may be possible to identify cases in which sub-

stitution is removing funds from areas funded by the EU and to infer from this that concerns about additionality are appropriate. Despite of the need for the additionality principle at the local level, there is no obligation for this additionality in the support system.

### **2.1. Substitution effect**

The measurement of the substitution effect was the subject of several studies. The ways how the authors approached this research vary from qualitative, with estimation and description of mechanisms how it is created, to quantitative approach with real data gathering, the approach we are trying to implement in this paper as well. In the study of BIS (2009), for instance, the authors summarized different evaluation studies in Great Britain and identified that the substitution effect arose from different supporting schemes to the business sector. Even though data on the substitution effect did not allow the authors to provide a detailed inspection of the extent of the substitution according to the areas, it was identified as one of the smallest inefficiencies. They conclude that from the three examined areas - Business development & competitiveness, Regeneration through physical infrastructure and People and skills - the last one reported the highest substitution effect, 4.4 %. The study of Potluka *et al.* (2010) about the substitution effect in public programs in Slovakia concludes that the business sector tends to replace its own resources with the public ones if available. Authors demonstrate it based on the example of Slovak beneficiaries from the business sector (e.g. tourism) and claim, although without exact data available, that there are many examples of purposely weak indicators of profitability concerning a certain project in order to receive EU support. The reason is that EU support seeks projects that are unprofitable in the financial sense but profitable for the society as such. This criterion therefore creates an incentive to provide data about financial unprofitability of the intended project even though it is possible that the project would be profitable even without the support.

In terms of regional concentration of assistance, studies also came to different results. Bergström (2000) identified no statistically significant difference between supporting the companies of the lagging behind regions and supporting the companies outside these regions. Tokila and Haapanen (2010), on the contrary, came to the opposite conclusion.

For example, Luukkonen (2000), Czarnitzki and Licht (2006), Hewitt-Dundas and Roper (2010) focused specifically on the substitution effect in the area of R&D support. They have noted the positive impact of the support that stimulates additional private investment in R&D. This might be because of the specificity of the R&D sector which provides very costly research projects feasible only with additional support. Therefore the substitution effect is not much observed in the R&D sector.

Previous research on the efficiency of this assistance focused mainly on the efficiency of aid to the private sector. Considerably less attention is paid to the relation of public support to the lower level public sector. The discussed problems are insuf-

efficient control mechanisms of quality of the implemented project and also the insufficient control of the efficiency and adequacy of money spent. The problem is that there is no explicit mechanism to ensure that the local level recipients spend money efficiently. Also, there is no control mechanism to ensure that they contribute to the financing of the projects themselves instead of substituting own resources by the EU funds. There is an extensive debate about whether and how the international support has influenced the domestic policy priorities of municipalities. In some cases, structural funds influence the spending priorities; in other, they just add finance volume to existing ones (Mairate, 2006).

Several research studies show that the local government is not completely benevolent and welfare-maximizing, but is instead influenced by special interest groups or other political factors, the additional public funds may be diverted, irrespective of their growth potential. The political aspect dominates the presence of interest groups in the allocation of additional public funds, since municipalities ruled by the same party that is in charge of the higher level of government are more successful in attracting grants and funds. In this setting, the role of institutional quality and the set of limits and controls on the use of additional public funds gains relevance and importance (Kemmerling and Bodenstern, 2006; Kemmerling and Stephan, 2002). This article is currently focused on exploring the principle of additionality in this type of settings, pointing to the problems and inefficiencies that may occur in supporting the public sector at the local level.

### **3. Research methodology**

#### **3.1. Data collection**

The support of education is considered by the EU as one of the cornerstones of the development of lagging behind regions. In Slovakia for the years 2007 - 2013 this support is financed, among others, from the Regional Operational Program (ROP) under Measure 1.1 Education infrastructure. The current research focuses on the municipalities supported from the structural funds of EU, aimed at education modernization in primary schools in Slovakia. The investigated projects were implemented in 2008 and 2009. Of the total number of 466 municipalities where the modernization of school infrastructure was implemented, we investigated 206 (Chi-square goodness-to-fit test in the Annex 1). We provided a survey among successful applicants in order to analyze the principle of additionality through the examination of substitution effect in the practical implementation of the measure. The result is a sample of 206 municipalities (44.2 % of all supported municipalities). The survey aimed at gathering data on capital expenditures on infrastructure of schools at local level (municipalities) before and after receiving the EU support. We examined the time period from 2006 to 2010. This period was chosen to allow a sufficient time frame to examine the behavior of the local municipalities before and after receiving the EU support.

### 3.2. Regression analysis

In respect of the external aid, various studies (Beugelsdijk and Eijfinger, 2005; Wren, 1996) indicate that support resources lead to substitution of own resources which indicates the existence of a substitution effect of the assistance. It can be assumed that the magnitude of the substitution effect is influenced by the various factors as reflected in the scientific literature (Gillespie *et al.*, 2001; Lenihan, 2004; Beugelsdijk and Eijfinger, 2005). These factors are tested in the analyses of the principle of additionality. International experiences suggest that this amount is affected mainly by the size of the supported entity (Atzeni and Carboni, 2006; Lenihan and Hart, 2006), territorial level (Atzeni and Carboni, 2006; Tokila and Haapanen, 2010) as well as the level of development of the investigated territory (Tokila and Haapanen, 2010). In order to obtain information about the behavior of the supported municipalities, we used a regression analysis where we pursue the modification of own capital expenditures on education (dependent variable) depending on the implementation (independent variable). Other independent variables are municipality size (population in 2009), the level of unemployment (in 2009) and the territory in which the municipality is located.

The unemployment rate was used as a proxy for the maturity of the city. The literature assumes that richer regions are more likely to substitute own resources. In poor cities insufficient own resources are expected to support the development and therefore the substitution effect does not occur.

However, there are no available data at the regional level (i.e. GDP), which would better reflect the status of developed region. The unemployment rate was used, since there is a strong relationship between the rate of unemployment and the maturity of a city (Tokila and Haapanen, 2010; Gillespie *et al.* 2001).

We will also consider whether the regional dimension also plays a role in this effect, we do not expect however that there should be a difference in the level of substitution effect between regions. Regarding the size of the city, we assume that larger cities have greater budgetary resources that allow greater transfers between different development priorities and therefore there is a greater potential risk of substitution.

**Table 1:** Description of variables

Variable	Response categories	Description
Treatment in year	Binary	1= there was a support from the EU in the given year; 0 = there was no support from the EU in the given year;
Inhabitants	Ordinal	Size categories according to the number of inhabitants of the given municipality in year 2009; 1 = 0 – 1000 inh., 2 = 1000 - 2000 inh., 3 = 2000 - 3000 inh., 4 = 3000 - 5000 inh., 5 = 5000 - 10 000 inh., 6 = 10 000 - 20 000 inh., 7 = 20 000 - 50 000 inh., 8 = over 50 000 inh.,
Unemployment	Ordinal	Unemployment categories according to the level of unemployment in LAU 2 level (districts in Slovakia) in 2009; 1 = 0 - 10%; 2 = 10 - 15 %; 3 = 15 - 20 %; 4 =over 20 %.
NUTS 2	Reference group	Dummy variables for eligible NUTS 3 regions in Slovakia (West Slovakia, Middle Slovakia, East Slovakia )

### 3.3. Substitution effect identification

As it was suggested in the previous section, the substitution effect is not easy to measure. We have seen that many researches tried to identify it through respondents' estimations (BIS, 2009) or through meta-analysis of the projects and studies. In this paper we try to identify the substitution effect through quantitative analysis of data obtained in our own survey. In the survey we investigated whether EU funds recipients decreased their own resources once receiving EU funds. We propose a method how to identify this effect. Assume that amount of own resources on the given priority in the year, when EU support was received is  $\alpha_t$ . In the ordinary year, when support is not received, own resources are  $a_{t-1}$ . So we conclude that if  $a_{t-1} > \alpha_t$  we may expect that the substitution effect occurred. If  $i$  is the number of the observation based on the condition that  $a_{t-1} - \alpha_t > 0$ , the quantification of the effect is as follows:

$$\sum_{i=1}^N (\alpha_{it} - a_{i(t-1)})$$

We do not concentrate on the quantification of the impact independent variables have on the substitution effect, we rather search for the evidence and importance of those variables on it.

Therefore, for the purpose of the regression analysis we operate with a dummy variable defined as:

$$\text{If } \alpha_{t-1} > \alpha_t \text{ then SE}=1 \text{ and if } \alpha_{t-1} < \alpha_t \text{ then SE}=0.$$

This enables us to identify the factors which have an impact on the dependent variable but we do not have to deal with its quantification.

In our research, we aimed to investigate whether the substitution effect can be observed in school infrastructure projects in Slovakia. In addition, we focused on the factors that could influence the occurrence of the effect. In particular, we analyzed the potential impact of the size of the city and of the unemployment level.

## 4. Research results

Implementation of the Regional Operational Program started in January 2008 when the first call for grant applications for ROP municipalities was announced. In this call 1,009 applications were submitted representing more than double the amount of funds allocated to the whole measure 1.1. The high number of submitted applications points to the fact that the schools accepted the challenge with high expectations and were well prepared for it.

They got a unique opportunity to obtain 95% of the investment costs. They must co-finance with 5% from their own financial resources. The final number of approved applications was 450 which accounted for nearly 45% of the total number of applications received in the first round. These data show that the absorption capacity of the local level is much higher than expected. In the first call the demand of half of the applicants was not satisfied. Subsequently, other calls were announced. Until 2013,



782 applications were approved representing total eligible costs of approx. EUR 626 million of which a total of EUR 596 million represent non-returnable funds.

As suggested before, the current research focuses on the education support through the ROP measure 1.1 Education infrastructure approved until 2010 for primary schools in 466 municipalities, of which 206 are investigated in detail.

#### 4.1. Analysis of own capital expenditures on education

Information obtained through a questionnaire survey was related to the capital expenditures on education during the years 2006 to 2010. The following figure presents the evolution of total capital expenditures on education, own capital expenditures and EU supporting resources from the Measure 1.1 Education infrastructure in the surveyed 206 municipalities.

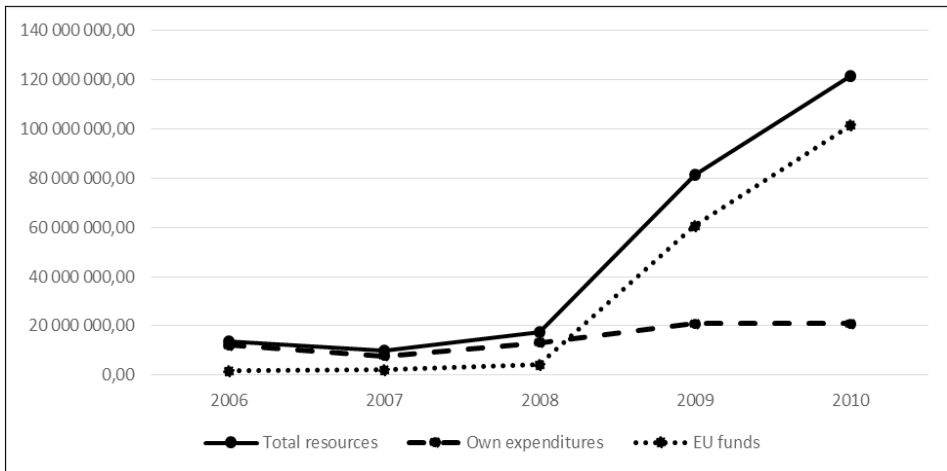


Figure 1: Capital expenditures on education in years 2006 - 2010 (EUR)

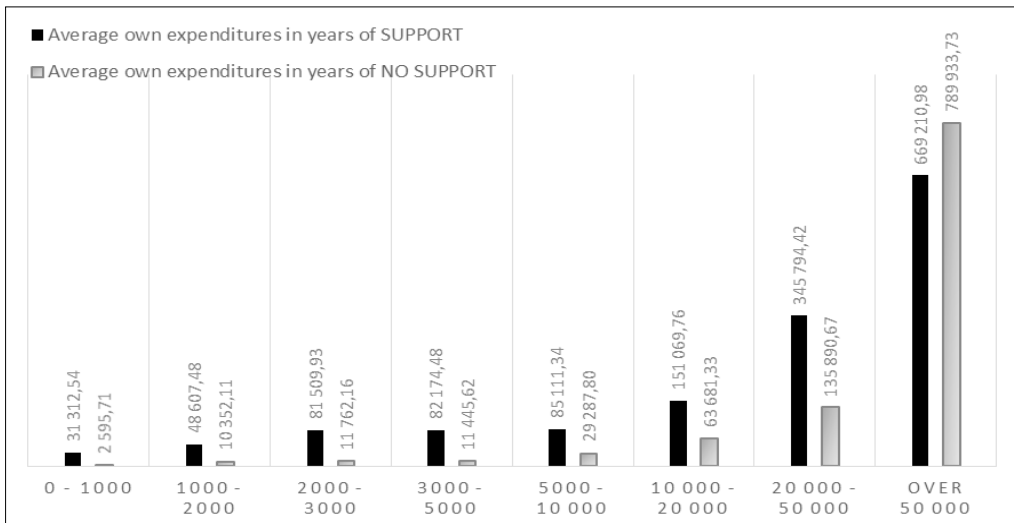
Source: Own calculations

Overall capital expenditures in the surveyed municipalities grew steadily with the support of ROP. Overall, an impact of the EU funds can be seen as there is a significant increase in spending since 2009 and also a large disparity between own and EU resources. The aid is not only complementary, but crucial for the development of the analyzed priority. As it regards own resources, we can observe only a slight increase between the years 2007 and 2010. It may not be applied to all the municipalities analyzed.

On the one hand, a general analysis of the expenditures does not point to inefficient behavior, as the own resources increased over time. On the other hand, detailed analysis identified inefficiencies through categorization of expenses according to size categories of municipalities (Figure 2). This behavior indicates the occurrence of substitution effect.

The examined data suggest that the expenditures in small municipalities multiplied enormously in the years of the support. In the smallest size category the average

expenditures on education were EUR 2,596 when no EU support was implemented. In the years when the aid was realized it was already EUR 31,313. The average resources per capita have risen from 3 Euros per 1 inhabitant in years when there was no support, to 41 Euros when a municipality was granted the EU fund.



**Figure 2:** Average own capital expenditures on education by municipality size (inhabitants) in period 2006 - 2010 (EUR)

**Source:** Own calculations

If we look at the largest towns in our sample, we can observe an opposite trend in the behavior of the average expenditures in the village as well as per capita. In this category, the average expenditures on education in the city were almost 790,000 Euros in the years when no support was implemented. In the years when the aid was realized it was only 700,000 Euros. The average resources per capita were 8 Euros per 1 inhabitant in years when there was no support, and 7 Euros in years when the support was implemented. These facts suggest that on the one hand the amount per capita in small villages increased in the years of support and on the other hand, decreased in large cities. This may suggest that large cities incline to decrease their own expenditures when external resources occur. This fact may indicate inefficient spending and a failure of the additionality principle fulfillment in the cities above 50 000 inhabitants.

#### 4.2. Regression analysis

After identifying the differences in the spending behavior of individual municipalities during the years 2006 to 2010, we performed a regression analysis for identifying the factors which increase the probability of the substitution effect behavior. To study the effect of the EU funds allocation on the municipalities' expenditures we applied a linear regression model. This approach allows us to use binary variable as dependent variable in the model. We are interested in the sign of the coefficient and the statistical

significance of the results. The effect of the particular independent variables on the substitution effect would be only country specific and will not allow us to apply it generally.

In the linear regression model (Table 2), the dependent variable is represented by the binary variable of the substitution effect. The positive change of own capital spending on education before and after the years of the support is denoted 1, otherwise it is zero. For independent variables we chose the existence of support, size of municipality (population), unemployment in the district in which the municipality is located, and we have also examined whether the change in expenditures depends on the NUTS 2 regions where the municipality is located<sup>1</sup>.

**Table 2:** Regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5726,294	27316,316		,210	,834
Treatment in year	65962,373	11894,107	,146	5,546	,000
Inhabitants	5,220	,278	,508	18,746	,000
Unemployment	-870,376	1202,809	-,025	-,724	,469
ZS_NUTS3	31176,437	17983,606	,075	1,734	,083
SS_NUTS3	-3394,139	15980,177	-,007	-,212	,832

**Source:** Own calculations, SPSS

The results highlight two factors that are statistically significant - the existence of support in a given year and the population of the surveyed village. This means that the change of own capital expenditure on education is dependent on the funds from the EU as well as on the size of the surveyed municipalities.

The results of the regression showed the positive impact of the aid from the EU, which means that the support generally led to an increase in own capital expenditures on education in the sample of 206 municipalities. In the years when EU support was received, municipalities have increased their own spending on education with more than EUR 65,000. The results also apply positive dependence in the size of the municipality, which means that the larger the municipality is, the more its own capital expenditure on education increases. The independent variables in the model, such as unemployment and location, are statistically insignificant.

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1 Based on the regression, the model is statistically significant at  $p = 0.05$  significance level. The coefficient of determination is 0.535 with a relatively low R square 0.287. (a. Predictors: (Constant), Treatment in year, Inhabitants, Unemployment, SS\_NUTS3, ZS\_NUTS3. b. Dependent Variable: Own Capital Expenditures). The independent variables in the model, such as unemployment and NUTS 2 area are statistically insignificant.

### 4.3. The substitution effect

An individual analysis of the surveyed municipalities was conducted by calculating the substitution effect. Based on the analysis of a comparison between own expenditures in years with and without the EU support, undesired substitution of own resources was identified. From all the 206 municipalities the substitution effect occurred in 21 cases. This means that more than 10% of local governments tend to replace their own resources by EU funds. The cumulative amount of the substitution effect in 21 municipalities was EUR 2,250.428 thousands. For expressing this number as a percentage, it represents 1.3% of the total amount of aid from the EU. Foreign experience exerts a relatively higher result, for example BIS study indicates the substitution effect of 4.4% (BIS, 2009).

In the next section the surveyed municipalities are divided into eight categories by their population. According to the analysis it can be said that the substitution effect occurs in large cities.

**Table 3:** Substitution effect by size category

Size category (Inhabitants)	Number of municipalities	SE included	% of SE
0 - 1000	14	0	0,00%
1000 - 2000	59	3	5,08%
2000 - 3000	46	3	6,52%
3000 - 5000	21	0	0,00%
5000 - 10 000	27	4	14,81%
10 000 - 20 000	16	2	12,50%
20 000 - 50 000	17	4	23,53%
over 50 000	6	5	83,33%
Total	206	21	10,19%

**Source:** Own calculations

Out of the 21 municipalities where the substitution effect occurred, more than half (11) have more than 10,000 inhabitants (Table 3). It means that 86% of the substitution effect (EUR 1,935.883 thousands) occurred in the largest cities within the sample. Another important finding is that the analyzed sample contained 6 cities with population of more than 50,000 and in 5 of them the substitution effect was identified. On this basis, it can be stated that the substitution occurs more likely in larger cities.

The sample of 206 surveyed municipalities is further divided on the basis of the selected economic indicator - the unemployment rate in the district in which the municipality is located (Table 4). This analysis confirmed the previous findings that the substitution effect occurs in major cities where unemployment is the lowest. This means that out of 21 cases in eight municipalities unemployment was less than 10%.

**Table 4:** Substitution effect by unemployment rate

Unemployment rate	Number of municipalities	SE in	% of SE
0 - 10%	61	9	14,75%
10 - 15 %	77	9	11,69%
15 - 20 %	24	1	4,17%
over 20 %	44	2	4,55%

**Source:** Own calculations

## 5. Conclusions

We have tried to point out the principle of additionality and its real scope in terms of the substitution effect of school infrastructure support in Slovakia. The result is a confirmation that the additionality principle also applies at the local level, even if it is not regulated by legal regulations.

The investigation showed that there are differences in the substitution effect's occurrence, especially in terms of the size of the municipalities. The breach of the additionality principle is shown especially in the larger cities, which tend to replace funds previously invested in school infrastructure with funds gained from EU support programs. It was also shown that despite the large volume of the financial support from EU funds, the increase of their own financial resources by municipalities was relatively small compared to level of support. Part of this increase is made up by the investments that the cities were forced to pay for ineligible costs and thus are kept as own funds invested.

This analysis also showed that in underdeveloped regions the EU support becomes crucial and not complementary for development. This increased emphasis on the need for proper selection of priorities as well as an effort to avoid waste of resources. Therefore, it is always a continuous evaluation of financial resources importance that needs to be provided in the widest range of implemented priorities. As the results showed, the substitution effect occurs frequently when investing in more developed regions. For confirmation of these trends in other areas or countries should accede to even greater concentration of aid to underdeveloped regions than ever before. It would be appropriate to compare the results in within each priority in different countries of the European Union.

It was also confirmed that the substitution effect is a less problematic effect in the application of the principle of additionality than other effects. For example, dead-weight effect achieves more than 10-fold higher levels of inefficiency (Sipikal, Pisar and Labudova, 2013).

The principle of additionality is only one indicator of efficiency. In the case of school infrastructure, for example, the research showed that in the small municipalities there is no breach of additionality principle (but mainly because there was no previous support of school infrastructure at all). On the other hand, EU spending per student is much higher than in large cities and it indicates that improvement of

infrastructure in small cities is much more costly than achieving comparable effects in large cities. Here, it shows that 95% support from the EU and the state for co-financing of projects may lead to high interest for support, which could result in a commitment to getting it without a real need. In the future, policymakers should reconsider to reduce the present level of 95% of project's cost co-financing to some lower level to demand higher participation of the recipients. It could lead to lower demand/supply ratio for support programs and also increase the amount of funds spent by local municipalities on education.

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### Annex 1: Chi-Square Test - Frequencies

Size Category			
	Observed N	Expected N	Residual
1	12	17,7	-5,7
2	61	64,9	-3,9
3	46	47,8	-1,8
4	21	28,2	-7,2
5	27	20,0	7,0
6	16	11,5	4,5
7	17	12,4	4,6
8	6	3,5	2,5
Total	206		

Test Statistics	
	Size
Chi-Square	11,709 <sup>a</sup>
df	7
Asymp. Sig.	,111