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Patterns in the composition of public expenditures in CEE countries

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Abstract

The aim of this study is to investigate, from both theoretical and empirical points of view, the composition of public expenditures in Central and Eastern European Countries, and its impact on economic growth. Even if the problem of optimal public expenditures structure was largely debated in literature, especially from a neoclassical perspective, only a few studies have addressed the optimal composition of public expenditure in European developing countries. The findings could be valuable for policy makers, especially when one looks at arbitrary cuts in public expenditures adopted in most of these countries in recent years, as a response to the financial crisis and public debt and deficit crisis. Neither economic theory nor empirical evidence provides clear answers to the question of how the composition of public expenditures affects economic growth. Using regression analysis for data over 1995-2012 for a group of CEE countries, we estimate the correlation between the two types of public expenditures (current and capital) and economic growth. We investigate, using the Armey's model, the optimal levels of current and capital public expenditures which help maximizing economic growth. Comparing to neoclassical model, our estimations show non-optimal composition of public expenditures for the analyzed countries.

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Keywords: Productive and unproductive public expenditures; Economic growth; CEE Countries

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1. Introduction

The composition of public expenditures and its impact on a country's economic performance is a subject less debated in the literature, but of great importance for decision makers. Its importance has increased in recent years, as many governments have tried to fight against the economic crisis by increasing the allocations of financial resources for capital expenditures and by reducing current public expenditures.

According to data provided by Eurostat (2013), for a group of CEE countries (Bulgaria, Hungary, Romania, Poland, Estonia, Latvia, Lithuania, Czech Republic, Slovakia, Slovenia), public expenditures on social benefits, capital transfers, other current transfers and subsidies represent the largest category of government expenditures, equivalent to an average of 19.4% of GDP in 2012, while public capital expenditures represent in average only 3.7% of GDP. The choices between those two types of public expenditures should be more rationale, based on a thorough analysis of all costs and benefits and their contribution to economic growth, and should not be taken only according to the so-called superstition, widely spread especially among politicians, that current expenditures are negative and only capital expenditures matters for economic growth (Polak, 1989).

The aim of our paper is to investigate the relationship between capital and current public expenditures and economic growth, for the group of CEE countries. The conclusions of our research could prove to be useful for decision-making in the allocation of public financial resources.Section 2 of our study provides a survey of economic literature on this issue, while the next sections (section 3 and section 4) present an overview of the composition of public expenditures - descriptive statistics and also of the applied empirical methodology, the data used and a discussion of the results obtained. Section 5 contains the concluding remarks.

2. Literature review

Since the beginning of the 1990s, numerous studies have investigated the impact of public spending on economic growth, from both theoretical and empirical perspectives. The results differ a lot in respect to the sign and the intensity of the correlation between public spending and economic growth.

A seminal work on the impact of public spending on economic growth is Barro's endogenous growth model with productive government spending modelled as an externality (Barro, 1990). Based on the findings for a panel of 76 countries, with data covering 1960 to 1985, his study suggested a possible relationship between the share of government spending to GDP and the growth rate of real per capita GDP. In a later study (Barro, 1991), he examined 98 countries for the 1970-1985 period and reported a negative relationship between the output growth rate and the share of government consumption expenditure. He also found a positive but statistically insignificant relationship between public investment and the output growth rate. Two years later, Easterly and Rebelo (1993), studying a sample composed of 100 countries, estimated an important role for capital expenditures, especially transportation and communications on economic growth.

On the other hand, Devarajan et al. (1996), using data from 43 developing countries over 20 years, found a positive relationship between current government expenditure and economic growth, but a negative relationship between capital expenditure and per-capita growth. Their work suggested that 'expenditures which are normally considered productive could become unproductive if there is an excessive amount of them', and capital spending in developing countries may have squeezed current spending at the margin.

Contradictory results may be partly explained by the discretionary nature of capital spending, which is higher in developing countries. Therefore, it is quite likely that countries that have allocated funds towards capital spending and away from current spending have often done so for reasons other than productivity considerations, and this is where the role of corruption assumes importance. Researchers have further focused either on the composition of government spending, with the basic distinction between public consumption and public investment (Barro, 1991; Turnovsky and Fisher, 1995; Devarajan et al., 1996; Chen, 2006), either on specific functional categories of expenditure, such as infrastructure (Turnovsky, 1996; Judd, 1999), education

(Glomm, 1997; Fisher and Keuschnigg, 2002), or health (Bloom et al., 2001). Among different categories of public expenditures, it seems that investment in infrastructures and R&D may have the greater positive impact on economic growth. For example, the International Monetary Fund (2005) report shows that empirical research tends to confirm a positive correlation between public expenditure and growth capital. In recent years, most studies focused mainly on measuring the intensity of the correlation between capital public spending and economic growth. The results of these studies are somewhat different, some identifying a strong correlation, while others showing weaker correlation between public investment and capital growth. For example, the study of Romp and de Haan (2007) support the idea of an impact on growth capital expenditures substantially lower than the effects mentioned by Aschauer (2000) and some heterogeneity, meaning that the effects differ across countries, the level of regions or sectors.

Most of the above mentioned studies analyze the impact of the composition of public expenditures using the functional structure of expenditure. Our study focuses on analyzing the relationships between economic types of public spending, current and capital, and economic growth for the CEE countries. In contemporary economies, governments spend a large share from their budget on goods and services which are likely to affect consumers' utility in a way similar to private consumption. From a certain budget, allocation between capital and current spending creates a trade-off which is, in many countries, at the forefront of the public debate and policy discussions. However, this trade-off received less attention in academic literature. The only two notable papers of which we are aware of explicitly focusing on this trade-off between productive government spending and utility from public consumption are Barro (1990) and Turnovsky and Fisher (1995).

3. Descriptive statistics on the composition of public expenditures

According to their economic structure, public expenditures are divided in operating costs, which includes intermediate consumption, compensation of employees and taxes paid on production; public money transfers to the benefit of households and businesses; interests paid to reimburse the debt burden and capital investments.

Table 1. The share of public social benefits, capital transfers, other current transfers and subsidies in total government expenditures for selected CEE countries during 1995-2012 (%)

Time/Countries	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovenia	Slovakia	Estonia	Latvia	Lithuania
1995	:	62,56	48,52	43,14	44,05	55,92	49,34	31,31	40,99	46,87
1996	:	53,40	43,75	47,80	43,91	48,46	50,71	32,68	45,24	51,93
1997	40,27	57,32	41,89	42,87	42,16	49,22	48,21	33,66	43,01	58,84
1998	47,04	59,25	44,96	43,63	41,35	50,37	49,07	36,45	50,17	41,78
1999	45,04	59,98	43,73	46,67	36,51	48,72	55,16	36,25	52,12	42,29
2000	45,13	57,13	43,20	47,14	34,32	48,63	56,92	37,77	46,64	45,35
2001	53,11	60,65	43,12	47,60	36,15	49,06	49,20	37,22	43,90	44,74
2002	48,36	58,57	43,65	46,52	38,24	48,47	50,58	35,03	43,63	39,98
2003	44,01	52,66	42,35	47,32	38,82	48,93	46,77	36,71	36,06	38,54
2004	46,37	54,79	42,65	47,46	45,48	48,98	48,86	38,01	35,48	37,72
2005	42,80	57,91	42,86	47,06	41,35	47,82	54,18	36,66	35,87	38,02
2006	44,83	55,85	43,60	46,34	40,98	47,51	54,92	38,28	35,87	36,16
2007	45,52	53,62	44,40	43,84	36,81	46,83	54,40	37,55	29,77	38,53
2008	43,86	54,53	44,95	43,44	35,86	46,95	58,80	38,42	31,18	39,48
2009	45,82	54,78	44,63	43,87	37,98	48,42	59,70	41,87	41,29	45,91
2010	48,32	56,33	45,03	42,90	43,28	50,16	58,38	45,22	43,38	44,74
2011	47,99	57,70	47,24	42,99	44,79	51,30	59,75	44,32	39,22	45,11
2012	48,99	58,46	45,85	43,90	44,45	50,69	60,57	40,23	35,65	44,30

Source: Authors' calculations, according to data provided by Eurostat (2013)

According to data from Table 1, provided by Eurostat (2013), for the selected CEE countries, public expenditures on social benefits, capital transfers, other current transfers and subsidies represent the largest category of government expenditures, equivalent to an average of 47.31 of total government expenditures and 19.4% of GDP in 2012. High weights were recorded in 2012 in Slovakia (60.57% of total public expenditures, 22.7% of GDP), Czech Republic (58.46% of total public expenditures and 26.1% of GDP), Slovenia (24.8% of GDP and 50.69% of total expenditures) and lowest in Latvia (13% of GDP and 35.65% of total expenditures), Estonia (16.3% of GDP and 40.23% of total expenditures), Lithuania (16% of GDP and 44.30% of total expenditures) and Romania (16.3% of GDP and 44.45% of total expenditures).

Table 2. Shares of public expenditures categories (according to their economic structure) in total public expenditures for CEE countries in 2012 (%)

Indicators/ Countries	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovenia	Slovakia	Estonia	Latvia	Lithuania
Intermediate consumption	16,14	12,86	15,65	13,21	16,21	14,07	11,54	18,21	18,51	14,32
Compensation of employees	24,81	16,46	20,42	22,82	21,48	25,69	18,74	26,65	24,85	26,62
Subsidies	2,40	4,52	2,59	0,88	1,03	2,72	3,71	2,55	2,21	0,88
Social benefits	37,77	44,86	36,31	38,67	34,81	40,27	49,67	32,35	28,31	38,24
Gross fixed capital formation	9,12	6,95	6,28	10,94	12,69	5,99	5,10	13,85	10,73	10,67
Interest, payable	2,4	3,3	8,8	6,7	4,9	4,3	4,9	0,4	3,7	5,3
Capital transfers, payable	1,99	7,10	3,72	1,60	3,76	2,21	2,18	2,12	2,39	0,78
Other current transfers, receivable	6,8	2,0	3,2	2,8	4,9	5,5	5,0	3,2	2,7	4,4

Source: Authors' calculations, according to data provided by Eurostat (2013)

The redistribution of income in the form of social benefits and transfers in cash or in kind was the most important category of expenditures, representing in average 38.13% of total public expenditures and 15.6% of GDP in 2012. Almost half of total expenditures was allocated to social benefits in Slovakia (49.67% of total public expenditures and 18.6% of GDP), Czech Republic (44.86% of total public expenditures and 20% of GDP), Slovenia (19.7% of GDP and 40.27% of total expenditures) and lower in Latvia (10.3% of GDP and 28.31% of total expenditures), Estonia (13.1% of GDP and 32.35% of total expenditures) and Romania (12.7% of GDP and 34.81% of total expenditures). The share of subsidies in total expenditures was a modest one during 1995-2012 in all countries, with significant declines in Slovakia, from 9.72% of total expenditure in 1995 to 3.71% in 2012 and also in Romania, from 10.08% of total expenditures in 1995, to 1.03% of total expenditures in 2012.

The next largest category was operating costs and especially compensation of employees, which accounted on average for selected CEE countries 22.86% of total expenditures and 9.3% of GDP in 2012. High shares were recorded in 2012 in Estonia (26.65% of total public expenditures and 10.8% of GDP), Lithuania (26.62% of total public expenditures and 9.6% of GDP), and lower in Slovakia (18.74% of total public expenditures and 7% of GDP) and Czech Republic (16.46% of total public expenditures and 7.3% of GDP).

Public spending on capital investment represented in average 3.7% of GDP and 9.23% of total expenditures in 2012. The governments of Estonia (13.85% of total expenditures and 5.6% of GDP), Romania (12.69% of

total expenditures and 4.6% of GDP) and Poland (10.94% of total expenditures and 4.6% of GDP) spent more than the average, while Slovakia (5.10% of total expenditures and 1.9% of GDP) was below the average.

The last category is the one of interest payments on borrowing and rent paid by government, which represented in average 4.5% of total expenditures and 1.9% of GDP in 2012, higher in Hungary (8.8% of total public expenditures and 4.3% of GDP) and limited in Estonia (0.4% of total public expenditures and 0.2% of GDP) and Bulgaria (2.4% of total public expenditures and 0.9% of GDP).

4. Methodology

The empirical analysis uses annual data on 10 CEE countries (selected according to data availability on Eurostat) from 1995 through 2012 in order to examine the link between government expenditures (current and capital public spending) and economic growth.

The model developed some links between the shares of government expenditures and the real GDP growth, testing whether the share allocated to different components of government expenditures is associated with a higher growth rate. The explanatory variables are: the share of current public expenditures in total government expenditures, the share of capital public expenditures in total government expenditures and the share of total public expenditures in GDP, while de dependent variable is the real GDP growth rate. Similar to Devarajan et al. (1996, p.10), we have included the share of total public expenditures in GDP as a control variable for level effects of financing government expenditures (which is a function of the level) on growth.

Regression analysis

We used the method of least ordinary squares to estimate the following equation:

$$RGDP_t^i = (Current/TE)_t^i + (Capital/TE)_t^i + (TE/GDP)_t^i \quad (1),$$

where: $RGDP_t^i$-real GDP growth rate for country i at time t; $(Current/TE)_t^i$- the share of current public expenditures in total government expenditures for country i at time t; $(Capital/TE)_t^i$- the share of capital public expenditures in total government expenditures for country i at time t; $(TE/GDP)_t^i$- the share of total public expenditures in GDP for country i at time t.

Table 3 contains the estimates of the above equation. The statistical program used is Eviews 7.

Table 3.Estimation of growth model with disaggregated expenditures (according to their economic structure)

Dependent Variable: RGDP?	
Method: Pooled Least Squares	
Total pool (balanced) observations: 180	
White period standard errors & covariance (d.f. correction)	
Independent variable	**Coefficient**
Current/TE?	0.100720*
	(0.034594)
	[0.0041]
Capital/TE?	0.185511*
	(0.065974)
	[0.0055]
TE/GDP?	-0.155586**
	(0.060612)
	[0.0111]
R-squared	0.059187
Adjusted R-squared	0.048556
Mean dependent var	3.605638
S.D. dependent var	4.470919
Durbin-Watson stat	1.240685

Note: In () are standard deviations of coefficients; in [] are highlighted the associated probabilities; * - statistically significant to 1%; ** - statistically significant to 5%; Source: Authors' calculations in Eviews 7 according to Eurostat 2013

Table 3 provides the regression results for the disaggregated public spending variables. Looking at the adjusted R-Squared indicator, we can say that the model explains approximately 6 percent of the variations in real output, a result similar to that obtained by Devarajan et al. (1996, p.17), of 0.06. According to these results, current and capital public spending contributed to economic growth in different proportions during 1995-2012. The regression equation is the following:

$$RGDP=0.100720*Current/TE+0.185511*Capital/TE-0.155586*TE/GDP \quad (2)$$

According to equation 2, the relationship between the real GDP growth rate and the ratio of current expenditures is positive and statistically significant. A unit increase in this ratio increases the real GDP growth rate by 0.10 percentage points. Estimation of causality and intensity of this correlation between public current expenditures and GDP growth rate is able to provide a basis for rational decisions regarding the allocation of financial public resources. In CEE countries, in the recent period, decision makers have often chosen to cut current spending, such as wages or social transfers and to increase public capital investments, hoping to help the economic recovery.

The relationship between public capital expenditures and real GDP growth has also been identified as a positive and significant one, but the contribution to real GDP growth is by 0.18 percentage points, higher than the result obtained for public current expenditures. This result suggests that public capital expenditures have positive effects to CEE countries' physical capital and could complement private sector productivity.

Among the CEE countries, Estonia had, in average, the largest capital allocations during 1995-2012 (both as a percentage of total public expenditures and gross domestic product), followed by Romania. World Competitiveness Report (Schwab, K., 2013, p. 412) assigned a good value for the indicator „quality of infrastructure" for Estonia, of 5.4 weighted average for 2011-2012 (1-extremely underdeveloped, 7-extensive and efficient by international standards), and 2.8 average value for Romania. Romania ranked 132 in a sample of 144 countries and also had the last rank at European level and among the CEE countries. Czech Republic spent only 6.95% of total expenditures on public capital in 2012, but ranked 28, general infrastructure being assessed as efficient, with a value of 5.5 for 2011-2012.

Equation 2 shows a negative but statistically significant relationship between the GDP and the level effect of total government expenditures to GDP. This result suggests that an increasing amount of public expenditures seems to not contribute to GDP growth rate.

Our model results are based on panel data, with the assumption that there are no individual cross-sectional effects. It presents as limits the countries specific characteristics, such as cultural, political factors, which might influence the GDP growth rate, but are difficult to measure and have not been taken into account.

According to the new theory on economic growth, public expenditures policies may exercise significant influence on economic growth. On the basis of this theory, the independent factors, such as the level of public expenditures as a percentage of GDP, influence over economic growth rate, as a dependent variable. Taking into account these considerations, a specific objective of our study consisted in testing the applicability of Armey's model (Pevcin, 2004), for the group of selected CEE countries, for the period 1995-2012, in order to identify the optimal levels of current and capital public expenditures which help maximizing economic growth.

The two equations according to Armey's model are:

$$RGDP_t^i=\alpha+\beta_1\times Current_{i,t}+\beta_2\times Current_{i,t}^2 \quad (3),$$

where: $RGDP_t^i$-real GDP growth rate for country i at time t; $Current_{i,t}$ - the share of current public expenditures in GDP for country i at time t.

$$RGDP_t^i=\alpha+\beta_1\times Capital_{i,t}+\beta_2\times Capital_{i,t}^2 \quad (4),$$

where: $RGDP_t^i$-real GDP growth rate for country i at time t; $Capital_{i,t}$ - the share of capital public expenditures in GDP for country i at time t.

It is expected that the linear terms, Current and also Capital, to carry a positive sign, showing the positive effects of public expenditures on economic growth, while for the square term $Current^2$ and also for $Capital^2$ the sign is expected to be negative, measuring the negative effects associated to the enlargement of public sector.

After differentiating the RGDP with respect to Current (for equation 3) and to Capital (for equation 4), can be found the level of government expenditures as a share of GDP:

$Current\ (Capital) = -\beta_1/2 \times \beta_2$ (5).

In table 4 are presented the results of testing the Armey's model.

Table 4. Results of testing the applicability of the Armey'model for 10 CEE countries

Dependent Variable: RGDP?			
Method: Pooled Least Squares			
Total pool observations: 180			
Independent Variables	Coefficient	Independent Variables	Coefficient
Current?	0.343999*	Capital?	1.930246*
	(0.074685)		(0.288926)
	[0.0000]		[0.0000]
Current^2?	-0.006355*	Capital?^{2}	-0.239175*
	(0.001763)		(0.066124)
	[0.0004]		[0.0004]
R-squared	0.052021	R-squared	0.018454
Adjusted R-squared	0.046696	Adjusted R-squared	0.012940
SE of regression	4.328275	SE of regression	4.475338
Durbin-Watson stat	1.203687	Durbin-Watson stat	1.221447

Note: In () are standard deviations of coefficients; in [] are highlighted the associated probabilities; * - statistically significant to 1%;
Source: own calculations in Eviews 7 according to Eurostat 2013

The result of testing the Armey's model suggests an optimum size of public current expenditures for the 10 CEE countries, including both developed and developing countries, of approximately:

$Current = 0.343999/(2*0.006355) = 27.06\%\ of\ the\ GDP$ (6),

by 10 percentage points less than the average level recorded by these public expenditures in the period 1995-2012, of 37% of the GDP, at which the maximum growth rate of GDP would have been:

$RGDP = 27.06*0.343999 - 27.06^2*0.006355 = 4.65\%/year$ (7).

The optimum level of public capital expenditures as a share in GDP, according to this model is:

$Capital = 1.930246/(2*0.239175) = 4.03\%\ of\ the\ GDP$ (8),

suggesting an increase by 0.53 percentage points than the average level recorded by these public expenditures in the period 1995-2012, of approximately 3.5% of the GDP, at which the maximum growth rate of GDP is:

$RGDP = 4.03*1.930246 - 4.03^2*0.239175 = 3.89\%/year$ (9).

Eurostat (2013) shows that the average GDP growth for the 10 CEE countries was 3.60% during 1995-2012, lower than the contribution of the optimum level of capital public expenditure, of 3.89%/year.

We think that during the period of economic and financial crisis, higher public expenditures directed to support productive investments in infrastructure, in human capital, can generate beneficial effects which could compensate the lack of private capital and contribute to economic growth.

Our model has certain limitations, with respect to the differences in public expenditure policies for each country considered, but also the differences relating the degree of socio-economic development. Also, the Armey's model takes into account only the share of government expenditures in GDP and ignores some factors with strong impact on GDP growth rate, such as foreign direct investments, which are a key pillar, but also government revenues.

5. Conclusions

This paper investigated the patterns in the composition of public expenditures for CEE countries and its impact on economic growth.

Using a regression model, we investigated if current and also capital public expenditures have a positive contribution to the GDP growth rate, taking into account their shares in total government expenditures. Our empirical results suggest that the capital component of public expenditures has a higher rate of return than the current one, in line with the economic theory, according to which public capital has a positive impact on the economic activity. Even though current expenditures are often considered unproductive and in the recent period decision makers often chose to cut current spending, such as wages or social transfers, our model finds a positive relationship of these expenditures with GDP. These results show that especially developing-country governments have not allocated the financial resources correctly, as current spending are also identified as being productive.

In order to identify the optimal levels of current and capital public expenditures which help maximizing economic growth, we applied the Armey's model for the CEE countries analyzed and our results confirm that for capital public expenditures the average optimum level should be higher than the average level recorded by these public expenditures in the period 1995-2012, while for current public expenditures the optimum level suggests a decrease.

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