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**THE RELATIONSHIP BETWEEN GOVERNMENT SIZE  
AND ECONOMIC GROWTH: EVIDENCE FROM A  
PANEL DATA ANALYSIS**

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**The Relationship between Government Size and Economic Growth:  
Evidence from a Panel Data Analysis**

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**Abstract**

Using a panel data analysis, the relationship between government size and economic growth is investigated for the 1994-2001 period. The results show that relatively small sizes of government are detrimental to economic growth, while medium sized government affects it positively.

**JEL Classification:** E62, O40

**Key words:** government size, economic growth, panel data, new European Union members and candidates

## **I. Introduction**

The size of the government is expected to affect the economic growth of a country through the impacts of taxation, expenditure and the budget balance on several economic issues such as the efficiency of resource allocation and the rate of factor accumulation (Dar and AmirKhalkhali, 2002). Government size may impact economic growth negatively due to government inefficiencies, excess burden of taxation, distortion of the incentives systems and interventions to free markets (Barro, 1991; Bajo-Rubio, 2000); it may also have positive effects due to beneficial externalities, the development of a legal, administrative and economic infrastructure and interventions to offset market failures (Ghali, 1998; Anaman, 2004). The literature on the relationship between government size and economic growth seems to point to a negative effect of the former on the latter (Guseh, 1997; Dalagamas, 2000).

It is a fact that, the government sector absorbs a relatively important share of society's economic resources and therefore affects economic growth in many developing countries. According to Wagner's Law (1892), the scope of government usually increases with the level of income because government has to maintain its administrative and protective functions, its attempts to ensure the proper operation of market forces and provision of social and cultural goods.

The purpose of this paper is to provide additional empirical evidence on the issue by a panel data analysis, which includes the ten new European Union member countries and the four left out candidates for the European Union. Section two describes the model and the data, section three reports the results and finally section four concludes.

## II. The model and the data

The empirical model used in this study is adapted from Anaman (2004) and is derived from the neoclassical production function with two factors of production, capital ( $K$ ) and labor ( $L$ ) such that:

$$Y = A \cdot f(K, L) \quad (1)$$

where  $A$  is the coefficient measuring the total factor productivity. Equation (1) can be expressed in growth rates as follows:

$$y = a + E_k \cdot k + E_l \cdot l \quad (2)$$

where the lower case letters denote the growth rates of the relevant variables and  $E_k$  and  $E_l$  are the partial elasticities of output with respect to capital and labor, respectively<sup>1</sup>.

The growth model in equation (2) can be modified as to include the government size and other relevant variables in the model. As Anaman (2004) does<sup>2</sup>, we assume a Cobb-Douglas functional form and rewrite the equation as:

$$Y = \exp\left(\alpha_0 + \alpha_1 \frac{G^2}{2} + \alpha_2 \frac{G^3}{3} + \alpha_3 \frac{G^4}{4}\right) \cdot (EX)^{\alpha_4} \cdot (K)^{\alpha_5} \cdot (L)^{\alpha_6} \quad (3)$$

where “exp” denotes the exponential operator,  $G$  represents the government size as the share of government expenditures in GDP,  $EX$  refers to the total value of exports and  $K$  is capital and  $L$  is labor force. When the natural logarithm of equation (3) is taken and differentiated, the final model to be estimated is obtained as:

$$y = \alpha_{0t} + \alpha_{1t} G_t + \alpha_{2t} G_t^2 + \alpha_{3t} G_t^3 + \alpha_{4t} (ex)_t + \alpha_{5t} (k)_t + \alpha_{6t} (l)_t + \varepsilon_t \quad (4)$$

where the lower letters refer to the growth rates of the variable,  $t$  denotes time and  $\varepsilon$  denotes the error term. The variables  $G$ ,  $G^2$  and  $G^3$  are included into the equation in order to test the

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<sup>1</sup> Anaman (2004) writes equation (2) as  $y = a + s_k \cdot k + s_l \cdot l$  and  $s_k$  and  $s_l$  are described as the shares of capital and labor inputs of total inputs.

<sup>2</sup> Equation (3) in Anaman (2004) erroneously places  $\beta_0$  ( $\alpha_0$  in this paper) outside the exponential operator.

effect of different government sizes on economic growth. Anaman (2004), using these three government size variables, finds that relatively small sizes of government is detrimental for growth, while medium size governments increase growth and a larger government size again hampers economic growth.

The analysis is done for fourteen countries of Bulgaria, Croatia, Romania, Turkey, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Malta, Slovakia and Slovenia. The first four of these countries are candidates for the European Union membership and the following ten countries are the newly accepted European Union members. To our knowledge, there is no study that takes these countries separately as a panel study group. Mostly the studies are done for OECD countries or only rich countries (among others see Ghali, 1998; and Dar and AmirKhalkhali, 2002). The data on the variables are obtained from IFS (International Financial Statistics of IMF) and covers the period 1994-2001.

### **III. Empirical Results**

When the government expenditure data for the thirteen selected countries are analyzed, it can be seen that the average government sizes as percentage of GDP range from 26 % to 47 %. In this sense, our data can be divided in three parts of low (26-33%; Lithuania, Latvia, Estonia, C. Republic, Turkey, Romania), medium (34-40%; Slovakia, Cyprus, Poland, Bulgaria, Slovenia) and high (41-47%; Malta, Hungary, Croatia) government sizes<sup>3</sup> and our empirical model is designed to detect any possible effects of these different government sizes on economic growth.

*Table 1 here*

Table 1 shows the estimation results of equation (4) with common coefficients, i.e. disregarding country specific effects for four different country groups of whole sample, low, medium and high government size group countries. The findings of Anaman (2004) in terms

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<sup>3</sup> The average government sizes of the selected countries for 1994-2001 are as follows: Lithuania 26,12; Latvia 27,20; Estonia 30,41; C. Rep. 31,09; Turkey 31,79; Romania 32,32; Slovakia 34,08; Cyprus 35,02; Poland 38,92; Bulgaria 39,85; Slovenia 39,39; Malta 41,17; Hungary 47,07; Croatia 47,96.

of government size variables are asserted for the whole sample, as well as the low and high size government groups. Small size of government increases growth, while medium sized government decreases economic growth and a large government size increases growth again. For the medium government size group countries, small and large sized government enhances economic growth but a medium government size decreases it. Among these, the effects of small and medium government sizes are statistically significant for the whole sample while all of the three government sizes are statistically significant for low government size countries but none of the government size variables are significant for the medium and large government size group countries. Export growth is found to affect economic growth positively and significantly every group except the ones in Panels B and D. Capital growth is also beneficial for economic growth and statistically significant for all, while labor growth is detrimental but insignificant for growth for the whole sample, small government size group and the high government size group whereas it is beneficial for growth for only medium size government group countries.

*Table 2 here*

Equation (4) is estimated also with fixed effects, to decompose the country specific effects from the analysis. Table 2 shows that while the government size variables loose their significance for the whole sample, the signs of the variables are identical to before except for the last one. The government size variables' effects remain the same for low, medium and high government size groups, all being statistically significant for the low and medium government size groups. Export growth and capital growth effects are exactly the same as in Table 1 in terms of signs and significance. Labor growth is found to hamper economic growth all groups, being significant for only the medium government size group countries.

#### **IV. Conclusion**

Panel data analysis of the effect of the size of government on economic growth on the ten new European Union countries and the four candidates for the European Union show that when all countries are taken together, relatively small sizes of government are detrimental to economic growth whereas medium sized government affects it positively. Economic growth increases with export and capital growth but decreases with labor growth. These results show some variation when the countries are divided into three subgroups in terms of their average government sizes.

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Table 1. Estimation results with common coefficients and White heteroskedasticity consistent standard errors and covariance

$\alpha_0$	$\alpha_1$	$\alpha_2$	$\alpha_3$	$\alpha_4$	$\alpha_5$	$\alpha_6$	$R^2$	$F$	$N$
<i>Panel A: Whole Sample</i>									
82,935 (2,359)**	-6,574 (-2,149)**	0,159 (1,878)***	-0,001 (-1,588)	0,382 (3,198)*	0,664 (5,474)*	-0,237 (-0,937)	0,86	106,79*	112
<i>Panel B: Low government size group</i>									
133,666 (2,790)*	-11,549 (-2,325)**	0,329 (2,019)**	-0,003 (-1,838)***	0,085 (0,834)	0,662 (6,769)*	-0,252 (-0,616)	0,85	39,658*	48
<i>Panel C: Medium government size group</i>									
-69,780 (-1,269)	7,041 (1,445)	-0,212 (-1,584)	0,002 (1,650)	0,595 (10,681)*	0,443 (4,476)*	0,035 (0,099)	0,97	185,58*	40
<i>Panel D: High government size group</i>									
2609,7116 (0,645)	-178,863 (-0,670)	4,039 (0,639)	-0,030 (-0,716)	0,501 (1,584)	0,876 (5,540)*	-0,169 (-0,350)	0,84	14,34*	24

\*, \*\*, \*\*\* indicate 10%, 5% and 1% significance respectively.

The numbers in parentheses are t-values. F indicates the F-statistics and N is the number of observations.

Table 2. Estimation results with fixed effects and White heteroskedasticity consistent standard errors and covariance

$\alpha_1$	$\alpha_2$	$\alpha_3$	$\alpha_4$	$\alpha_5$	$\alpha_6$	$R^2$	$F$	$N$
<i>Panel A: Whole Sample</i>								
-1,796 (-0,345)	0,016 (0,106)	0,0001 (0,092)	0,367 (3,117)*	0,684 (6,152)*	-0,429 (-1,182)	0,87	126,79*	112
<i>Panel B: Low government size group</i>								
-21,962 (-4,807)*	0,642 (4,452)*	-0,006 (-4,189)*	0,024 (0,333)	0,696 (10,445)*	-0,087 (-0,267)	0,88	53,59*	48
<i>Panel C: Medium government size group</i>								
23,098 (3,277)*	-0,680 (-3,501)*	0,006 (3,643)*	0,549 (11,035)*	0,559 (8,711)*	-1,221 (-2,834)*	0,98	290,25*	40
<i>Panel D: High government size group</i>								
-352,133 (-1,258)	7,858 (1,283)	-0,058 (-1,306)	0,283 (0,805)	0,973 (6,430)*	-0,062 (-0,109)	0,86	17,91*	24

\*, \*\*, \*\*\* indicate 10%, 5% and 1% significance respectively.

The numbers in parentheses are t-values. F indicates the F-statistics and N is the number of observations.