

THE INFLUENCE OF PUBLIC AND PRIVATE SECTOR INVESTMENT ON ECONOMIC GROWTH IN THE EUROPEAN UNION

Florin Teodor Boldeanu Ph. D Student
Lucian Blaga University
Doctoral Studies
Sibiu, Romania
Mădălin Sebastian Ion Ph. D Student
Lucian Blaga University
Doctoral Studies
Sibiu, Romania

Abstract: : The objective of this working paper is to investigate the correlation between private and public sector investment and economic growth in the European Union. The analysis will be made between 1996 and 2012. This was a time of big changes for the European community, by the large number of states that were integrated and also by the turbulent times after the start of the economic crisis in 2008. A better understanding of the influences on economic growth by the public and private sectors will help policy makers in the EU to allocate more efficiently the financial resources. Our research will follow two major paths. One will be concentrated on the impact of the variables at national level and another will try to understand the effects of public and private sectors at regional level. The result of the analysis ought to show the bigger impact of the private sector on growth compared with the influence of public investment.

JEL classification: C23, H11, H50, H76

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1. INTRODUCTION

The theme proposed for the scientific research aims at analyzing how the private and public sector have influenced economic growth in the European Union (EU 28) from 1996 to 2012.

The relationship between government investment and economic development is a widely researched topic. These types of subjects were intended to determine the positive or negative factors that would modify the variation in GDP and a resizing of public investment to facilitate economic progress. Scientific studies that have targeted public sector are important for policy makers from different countries. By analyzing the impact of public expenditure on economic growth they can more effectively allocate budgetary expenditure.

The role of the private sector on economic growth is a less researched topic in the literature. Often, in the articles that analyze the public sector authors introduce variables to quantify the private component (gross capital formation, public investment, FDI, exports, and so forth). Thus, it was intended to determine the influence of the private sector through the measurement of a small group of explanatory variables.

Economic growth and most importantly the factors that determine long-term development are gaining more and more importance nowadays. By knowing very well all the components that influence growth in a country or in a regional cluster we can influence the size of domestic working labor force, the technological progress (the accumulation of knowledge) and in the end the productivity of states.

In our article we want to determine a wider set of variables (factors) from both the private sector and also the public sector that can influence economic growth for the countries in the European Union. Europe is now struggling with the effects of the economic crisis, long term debt and aging population. Omar Mahmoud Abu-Eideh (July 2014) listed some important factors that stimulate growth based on past research. From our point of view, from the nine factors that he named in his article, 6 of them can have an important influence on sustainable development. Investment, especially in “human capital formation” is a key determinant for the increase of GDP. With a state in which the population is better educated and has more skills, the productivity can grow in the long run. Higher education can lead to the next factor that influences growth, mainly innovation and expenditure in research and development. Superior technologies and know-how can foster a greater productivity of the state, especially for the private sector.

The state policies and the macroeconomic environment is also an important factor of growth or the opposite, it can cause negative impact on the economy. Tax burden, fiscal policies, governmental deficit and inflation control are all variables that can help the macroeconomic indicators in a country if the political system is stable.

Also, a big debate rests on the importance of trade openness for economic growth. Some researchers suggest that it can create competitive advantages, transfer technological know-how, increase scale economies. A large part of the economic literature found that open trade fosters economic growth. Ynikkaya (2003), Bagli (2014) suggest that for developing countries the restriction of trade is a better policy in generating economic growth.

Foreign Direct Investment, like openness, can help the development of the economy, if it generates technological transfers and managerial know-how to the recipient state. This can be a two edge sword. If the country that receives FDI relies too much on it and if FDI suddenly cannot be accessed anymore for no apparent reason, that country can immediately be in a financial crisis (Xuan-Vink Vo, 2010).

As well as Omar Mahmoud Abu-Eideh (2014), we stress the importance of socio-political factors in shaping economic growth. Political stability and absence of violence/terrorism, the rule of law, the control of corruption, voice and accountability, government effectiveness, regulatory Quality and others can influence directly or indirectly the economy.

In recent years, there is also a big emphasis on the impact of demographic factors on economic growth especially taking into account the globalization impact (migration, relocation of industries, etc.).

The remainder of the article is organized as follows: Section 2 addresses the objective of the research. Section 3 presents the theoretical background of the study. Section 4 reports the methodology applied, Section 5 the analysis and Finally, Section 6 contains concluding remarks.

2. OBJECTIVES

This paper aims to determine three objectives; firstly, what components of public and private sector have a significant impact on GDP / capita in the European

Union in the period 1996-2012. After determining the relevant variables for economic growth, we will continue the analysis by finding significant or insignificant components. Thus, it is important to make a comparison with the research studies in this area to determine whether our finding align with the economic concepts already established. For example, in the public sector, many researchers like Barro (1991), Barro and Sala-i-Martin (1992), Devarajan et al (1996) believe that GDP growth is positively influenced by productive expenditure (general public services, defense, public order and safety, education, health, public services and development, housing, environment, transport and communications), negative influenced by unproductive expenditure (culture, recreation and religion, economic affairs and social protection). Also, in terms of the private sector, foreign direct investment, private investment, exports would positively influence economic growth. This point of view is affirmed by Reinhart and Mohsin (1989).

Another objective would be to determine the role that the state has at socio-political level by using the six indicators published by the World Bank (worldwide governance indicators). Thus, we will analyze whether the efficiency or inefficiency of government, corruption and political stability has a relevant influence on GDP.

Another research objective would be measuring structural influences at regional levels in the European Union. Eurostat provides data about the changing GDP / region and also provides information in the areas of education, transportation, communication, etc. The statistical data is not so vast like at the state level and the period of research is narrower.

From our point of view, an analysis at a smaller level is necessary because reducing the gap between the poor and developed regions would bring only benefits and would also lead to higher economic growth for the state as a whole. It is true that the developed regions such as London, Paris metropolitan area, Brussels, Hamburg, Bucharest have an advantage over the less developed areas, but it is appropriate to analyze the regional level in order for better allocation of resources and to facilitate economic development.

3. THEORETICAL BACKGROUND

Scientific research in the field has focused more on public sector analysis. Recent studies show that the structure is more important than the overall level of public spending them, giving decision makers a clearer picture to intervene effectively in the economy and to achieve long-term sustainable growth.

Braşoveanu et al. (2012) conducted an econometric test to capture the correlation between expenditure (% of GDP) and economic growth (real GDP growth rate and GDP / capita) in Romania during 1990-2011. The classification used by the authors divides public spending in three categories: productive spending (which stimulates growth), unproductive expenditure (that effect economic development) and other expenses.

After applying their econometric model the authors found that all categories of expenditure adversely affect economic growth. Real GDP growth rate falls by 0.45 percentage points for productive expenditures, with 1.57 percentage points for unproductive expenditure and 1.92 pp for other expenses.

B. Yu et al (2009) studied the impact of expenditure on the change of GDP in 44 developing countries in Asia, Africa and Latin America in the period from 1980 to

2004 (totaling 80% of the GDP of countries that in category). To determine the effects of public spending (agriculture, education, health, telecommunications, social security and defense) on growth, the authors used the generalized method of moments GMM.

They found a correlation between public spending and GDP growth, but each of the different categories of expenditure affects the dependent variable depending on the region. Thus, in Africa, human capital expenditure had a positive effect on economic development. In Asia, capital expenditures, agriculture and education have positive influence, while in Latin America it was found that no category of expenditure has promoted economic growth. This study demonstrates the importance of resizing the composition of public spending, increasing the most effective of them and reducing the less productive (such as those for defense).

Miyakoshi et al (2010) developed a detailed strategy to maximize economic growth in the period 1990-2008 for 50 developing countries in Asia, Eastern Europe, Middle East and Latin America. Using a vector of adjusting public expenditure the authors have determined the evolution of each category of expenditure that meets the condition of maximizing the growth rate of GDP. The problem of the multicollinearity was solved by the authors by omitting by choice one of the explanatory variables. By adjusting with 4% the total public expenditure consisted of an economic growth of over 5% in Eastern Europe and Latin America, 2% in Asian and 1% in the Middle East. The growth is based on a decline in defense spending and the tax rate and an increase in spending on public services. The evolution of each category of public expenditure is generally the same, but the optimal size of the adjustment varies by country.

Like in our recent study, Reinhart C. and M. Khan (July 1989) stated that research studies that treat the effects of economic growth do not distinguish between private and public investment. Through in their research study, they separated the effects of public and private sector, analyzing 24 developing countries (in Asia and Latin America) in the period 1970-1979. The results explain the greater impact that the private sector has on economic growth versus the public sector.

B. Bayraktar (2003) examined the role of private investment in the economic development of members of the Organization of Islamic Cooperation in 1990-2000. The study aims to investigate the way in which developing countries are trying to achieve higher economic growth using an appropriate level of investment. The author has analyzed the most important factors: macroeconomic, microeconomic incentives and institutional influences. Also, developing countries require a high degree of foreign direct investment and the article is focusing on these types of funds. Research results have shown that macroeconomic stability and efficient political institutions are difficult and lengthy processes, but it would result in a higher level of private investment, thus a higher level of economic growth.

4. METHODOLOGY

The research paper envisages an analysis of the private and public sector influence on economic growth. The dependent variable (economic development) will be measured as GDP / capita.

The public component will consist of all the categories of state government spending that comply with the functional classification made by the UN and public debt. All these variables are expressed as percentages of GDP. According to the functional classification (COFOG), public expenditures are grouped into 10 categories:

general public services, defense, public order and safety, economic affairs, environmental protection, housing and community amenities, health, culture, recreation and religion, education and social protection. This classification is made according to the national system of accounts, which groups public expenditure by nature and their use.

The private sector will have the following variables: gross fixed capital formation (% of GDP), labor productivity (Euro / working hour), private debt (% GDP), financial sector leverage (debt / equity in percentage), final energy consumption for all sectors (equivalent to 1000 tons of oil / year) and final energy consumption of households (equivalent to 1000 tons of oil / year).

We will introduce variables that can be classified as part of both sectors, such as the savings rate (%), total population income and for gender (purchasing power), the life expectancy of the total population and by gender (years), the rate of motorization (cars per 1000 inhabitants), the dependency ratio of pensioners (% share of total assets), the unemployment rate by gender and educational level (%), investment by sector - business, government and households.

The values of the independent variables and GDP / capita were collected from the Eurostat statistics database.

Many of the research studies use panel data models to understand the links between the variables. For example, using panel data models to estimate demand and supply (the current depends on the last), the dynamic equations for the evolution of wages, unemployment, capital investment.

We started with the following simple regression:

$$y_{it} = a_0 + a_1 Pub_{it} + a_2 Priv_{it} + a_3 SR_{it} + a_4 PI_{it} + a_5 LE_{it} + a_6 RM_{it} + a_7 DRP_{it} + a_8 UR_{it} + a_9 INV_{it} + a_{10} D_{it} + u_{it}, i = \overline{1, N}, t = \overline{1, T} \quad (1)$$

where,

y_i - \ln (GDP / capita);

Pub_{it} is the vector of public sector - the 10 public expenditure and public debt (% GDP)

$Priv_{it}$ is the vector of the private sector - GFCF - gross fixed capital formation (% GDP), LP - labor productivity (euro / hour labor), PDebt - private debt (% GDP), FSL - financial sector leverage (%), FEC - final energy consumption of all sectors (equivalent to 1000 tons of oil / year), CG - household final energy consumption (equivalent to 1000 tons of oil / year).

SR_{it} is the savings rate (%)

PI_{it} is the vector consisting of TPI (total population income (purchasing power)), MPI male population income (purchasing power), FPI female population income (purchasing power)

LE_{it} is the vector consisting of TLE (total life expectancy (years)), MLE (life expectancy for men (years)), FLE (life expectancy for women (years))

MR_{it} is the motorization rate (number of cars per 1,000 inhabitants)

DRP_{it} represents dependency ratio of pensioners (% share of total active persons)

UR_{it} is the vector consisting of the unemployment rate by gender and level of education (%)

INV_{it} is vector consisting of investments by sector, INVB (average business investment (% GDP)), INVG (government investment (% GDP)); and INVH (household investment (% GDP))

D_{it} - Vector of dummy variables D_{it}

U_{it} - two-component vector for statistical errors

The index i indicates cross-sectional size and index t the time period.

$$u_{it} = \mu_i + \varepsilon_{it}$$

μ_i - individual fixed effects, by a normal distribution law $(0, \sigma_\mu^2)$

ε_{it} - error term, by a normal distribution law $(0, \sigma_\varepsilon^2)$

The dependent variable $\ln(\text{GDP} / \text{capita})$ measures the degree of growth by dividing GDP per capita in each country. To alleviate the abnormal variations of values of GDP in the period we opted for the logarithms.

The model contains the following dummy variables:

- Member-state with which we wanted to analyze whether the EU accession for the countries of the sample has an influence on economic growth. The variable takes the value 1 for the years when the state analyzed is part of the European community, and 0 for the years when the state was not a part of the European Union;

- Crisis - reflects the emergence of the economic and financial crisis, so we want to observe its impact on economic growth. In the period 2008-2011, when the global economic and financial crisis took place the dummy variable takes the value 1 and 0 in other years;

- Development - reflects the status of development of the countries analyzed, namely whether they are developed or developing countries. The World Bank and IMF published a report in 2012 listing the developing countries. The dummy variable takes the value 0 for the state included in the developing country category and 1 if they are not in this class.

- The six governance indicators will have four dummy variables attached, so as to measure the effectiveness of government. Each dummy variable is divided into four stages, more specifically very high level of governance, high level of government, satisfactory and very low. Each indicator has an annual estimated index (θ) from -2.5 (minimum score) to 2.5 (maximum score). The four dummy variables have the following ranges: very high ($\theta \geq 1.5$), high level ($1.5 > \theta > 0$), satisfactory ($0 > \theta > -1.5$), very low ($-1.5 \leq \theta$).

According to the research work of the authors Bingxin Yu (2009) and Bond et al (2002), to correct the effects produce by the GMM model and to address unobserved heterogeneity as in models with fixed effects, we applied variable differentiation and rewrite the model as follows:

$$\Delta y_{it} = a_1 \Delta Pub_{it} + a_2 \Delta Priv_{it} + a_3 \Delta SR_{it} + a_4 \Delta PI_{it} + a_5 \Delta LE_{it} + a_6 \Delta RM_{it} + a_7 \Delta DRP_{it} + a_8 \Delta UR_{it} + a_9 \Delta INV_{it} + a_{10} \Delta D_{it} + \Delta \varepsilon_{it} \quad (2)$$

Before analyzing the links between private and public expenditure and economic growth, we will check the following conditions:

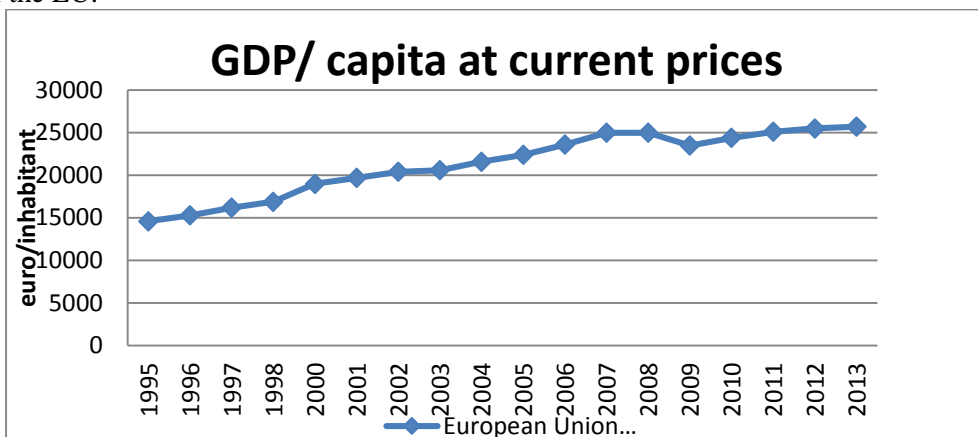
- a. If the data series of GDP / capita and public and private sectors are stationary
- b. If the series are cointegrated I (1)

Andrea Zaghini and Serena Lamartina (2010) used Hadri test, Levin-Lin-Chu, Breitung, Pesaran, Fisher to check the two conditions above. The same tests were used by Arpaia and Turrini (2008) to check stationary and cointegration for GDP / logarithmic and the independent variables for a panel of homogeneous data.

Mackinnon (1991) suggests checking lag and the level of integration of the variables using ADF and PP tests.

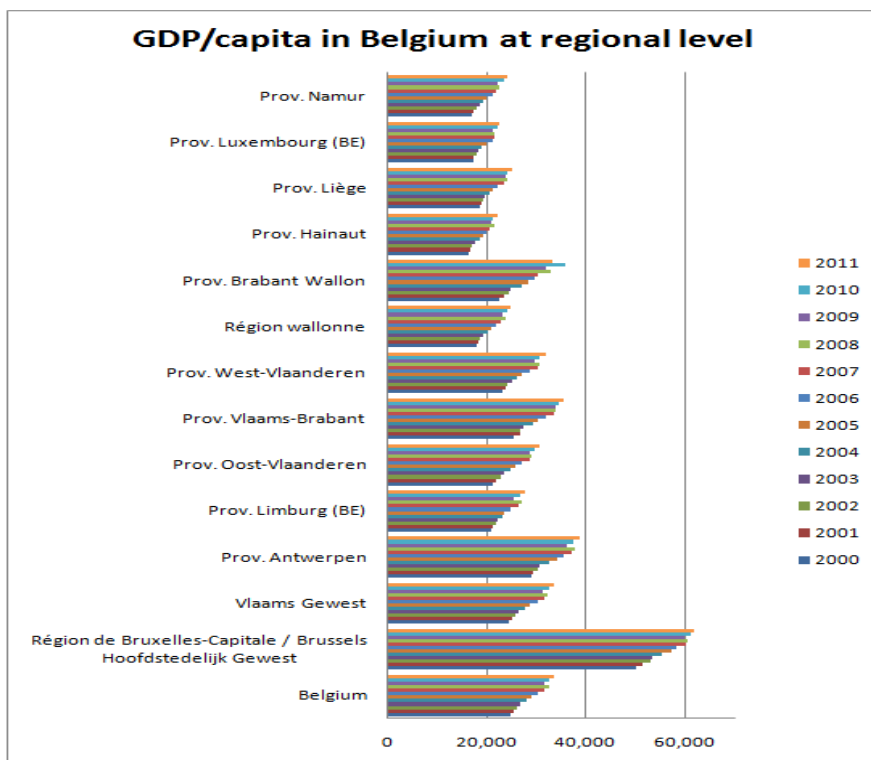
5. ANALYSES

This article is a working process study. The main subject of discussion are the impact of public and private sector on economic growth, the role of the socio-political factor on the economy and also a deeper analysis of the factors that influence growth at regional level in the EU. As is shown in the next figure, GDP/capita has steadily grown since 1995. Globalization and the European integration fostered productivity and trade in the EU.



Source: Eurostat adaptation

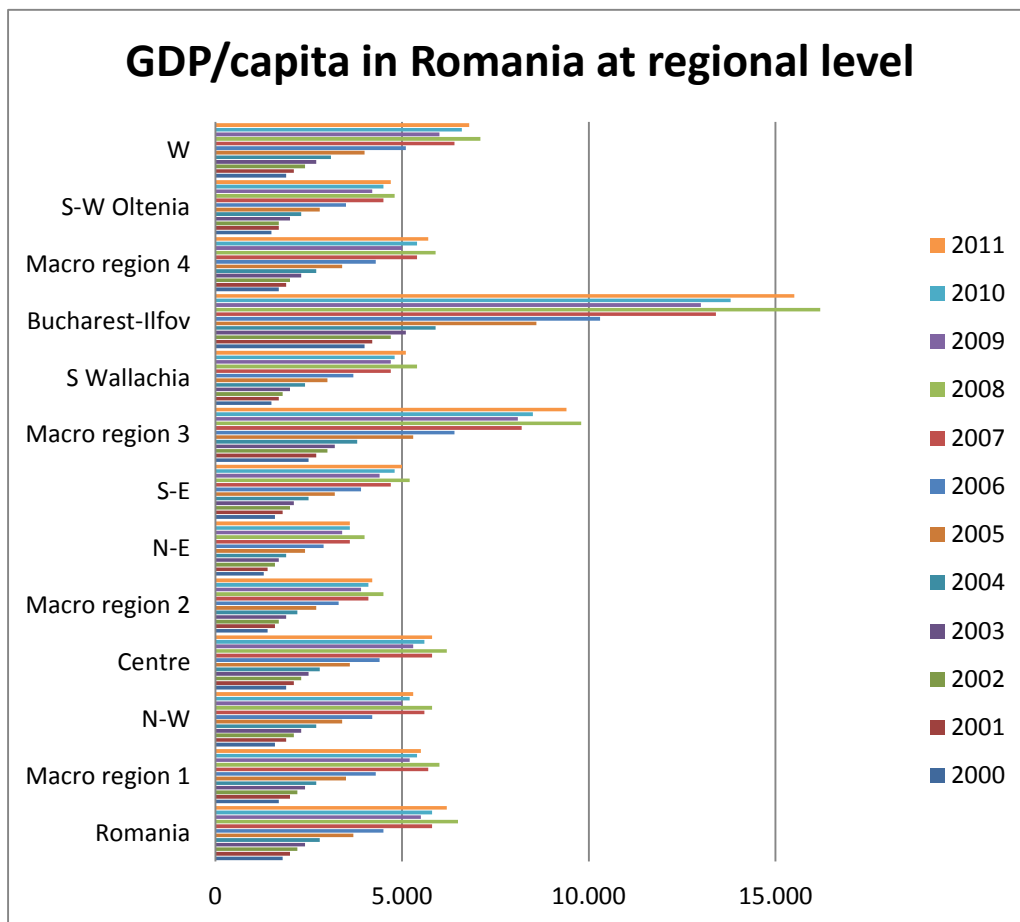
Figure no. 1 GDP/capita at current prices



Source: Eurostat adaptation

Figure no. 2 GDP/capita at current prices in Belgium at regional level

GDP/capita has shown also a significant rise at regional level. But the differences are very visible regarding growth at regional level. For example Brussels region has the highest GDP/capita in Belgium, followed by almost all the regions in Flanders. The Walloon region has the smallest growth.



Source: Eurostat adaptation

Figure no. 3 GDP/capita at current prices in Romania at regional level

The same trend can be seen in case of Romania. The GDP/capita has more than tripled between 2000 and 2011. Also there is a big difference between macro regions and between West and Est. Bucharest-Ilfov stands out in regard of the impact on growth in Romania.

The empirical analysis at macro and micro economic level is very important these days, especially after the big changes produced by the crisis. For the survival of the European Union and for future integration we have to better understand how to allocate funds to stimulate and enhance private and public investment. Our work-in-process paper will tackle these important issues and try to come with some solutions.

6. CONCLUSIONS

The scientific results will be compared with previous ones to make an analogy to the research literature. Regarding public spending, we expect the results to confirm the previous studies especially those made by Robert Barro in the early 1990s. Social protection might have a negative effect on growth because of the large spending that was made between 2008 and 2012. The productive expenditures that have a statistically significant effect on the variation of GDP/capita might have a positive influence on growth, while the unproductive ones, a negative effect, but the statistical results can invalidate these assumptions. Regarding the private sector, labor productivity, gross fixed capital formation, investment, should positively influence GDP / capita and private debt leverage should have a negative influence. This would demonstrate that the private sector indebtedness directly affect economic growth.

Also, states with a high level of government efficiency, with a high level of rule of law, with corruption control should grow more than states with a high degree of corruption, an inefficient governance, etc.

A regional analysis would be appropriate at this time because the efficient allocation of resources and understanding the factors that positively influence economic growth will lead to decreasing disparities between administrative areas of European countries.

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