

The Impact of the Current and Capital Expenditures on the Economic Growth in Romania

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Abstract—The purpose of this paper is to analyze the impact of the current and capital expenditures on the economic growth in Romania. I decided to consider the economic structure of the government expenditures due to the fact that most of the researches use the functional structure of the government expenditures in order to study this topic. The study is realized over the period 1995 – 2013 using the vector autoregression model estimation. The real gross domestic product per total population is used as proxy for the economic growth. I found that the economic growth is decreasing after a shock into the current expenditures and is increasing after a shock in capital expenditures.

Keywords—current and capital expenditures, fiscal policy, Romania, vector autoregression model

I. INTRODUCTION

THERE are different researches that analyze the effects of the government expenditures components on the economic growth. Some of them consider the functional structure of the government expenditures (public spending on education, on health, with housing-community amenities, environment protection, recreation-culture-religion, economic affairs, general public services, defense, public order-safety expenses and social protection expenses), while others consider the economic structure of the government expenditures (current and capital expenditures).

The purpose of this article is to analyze the impact of the economic structure of the government expenditure (current and capital expenditures) on the economic growth in Romania. The current expenditures contain the public spending with: intermediate consumption, compensation of employees, property income/interest, subsidies, social benefits, other current expenditures/transfers, while the capital expenditures refer to public spending with capital transfers, capital investments. As proxy for economic growth I used the report between the real gross domestic product (GDP) and the total population. In order to analyze the impact of the government expenditure shocks on the economic growth I will estimate the vector autoregression model (VAR model) over the period 1995 - 2013.

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The results show that the economic growth is decreasing after a shock into the current expenditures and is increasing after a shock in capital expenditures.

The rest of the paper is structured as follows: section 2 summarizes the existing estimations on fiscal policy and growth done by other economists. Section 3 presents the econometric methodology, the data used and the variables transformations done based on the tests results. The results of the estimation are in section 4.

II. LITERATURE REVIEW

The effects of the capital and current spending on economic growth is studied for twelve Latin America countries over the period 1975 – 2000 using annual data. The result shows that the two components analyzed have no impact on the per capita economic growth rate. The author associates the inefficiency of the government expenditures with the poor governance and corruption, which are some typically characteristics of emerging countries [1].

The effects of different categories of government expenditures, revenues and deficits on economic growth are analyzed for 103 developing countries over the period 1970 – 1998, using another approach [2]. The countries are classified into low-income, high-income, mineral exports dependent and foreign aid dependent groups. The results show that the effects of the fiscal variables on growth vary across these groups of countries. Relevant for this paper is the impact of the government expenditures on the economic growth. High level of capital expenditure is found to hinder economic growth in the high-income and mineral exporting groups of countries. High level of overall current government spending is detrimental to growth, except in foreign aid dependent group of countries. The author studies also the components of the current expenditures. He concluded that high level of current expenditure on goods and services is detrimental to growth in all groups of countries, while the reverse is the case for high level of expenditure on wages and salaries. Other categories of current expenditures have mixed and often insignificant effects, depending on each group of countries.

The generalized method of moments (GMM technique) is used for 15 developing countries in order to determine the

effects of the government spending composition on the economic growth over the period 1972 – 1999 [3]. The results show that the current spending has a positive and significant effect on the growth rate, while the capital spending has a negative effect.

III. ECONOMETRIC METHODOLOGY AND DATA USED

I will consider the economic structure of government expenditures in order to analyze the impact of the public spending on the economic growth. For this, I will use VAR model framework [4] to observe the effects of the current and capital expenditures shocks on economic growth from Romania over the period 1995 – 2013.

The standard model used for VAR analysis is described in (1). In the current analysis I will include in the vector of exogenous variables only the real effective exchange rate due to the fact that the purpose is to observe how the economic growth is impacted by the internal macroeconomic factors. The vector of the endogenous variables used to estimate VAR model is described in (2) and the vector of the exogenous variables in (3).

$$Y_t = A(L)*Y_{t-1} + B(L)*X_t + \epsilon_t \tag{1}$$

where:

- Y_t – the vector of the endogenous variables;
- X_t – the vector of the exogenous variables;
- ϵ_t – the errors vector;
- $A(L)$ and $B(L)$ – the coefficients of the endogenous and exogenous variables vector.

The variables notations, used to estimate the VAR model, are described in table I. All of them are published on Eurostat (data from consolidated national budget) and are processed in Eviews. Due to the fact that I used annual data it is not necessary to analyze the series in terms of seasonality.

TABLE I

NOTATIONS FOR THE VARIABLES USED TO ESTIMATE THE VAR MODEL

Notations	Variables (non-seasonally adjusted data)
gdp_pop	real gross domestic product per total population
current_exp	current government expenditure (percentage of GDP)
capital_exp	capital government expenditure (percentage of GDP)
reer	real Effective Exchange Rate (deflator: consumer price indices - 28 trading partners)

$$Y_t = [gdp_pop_t, current_exp_t, capital_exp_t, reer_t] \tag{2}$$

$$X_t = [reer_t] \tag{3}$$

The choice regarding the number of lags for VAR model was determined by the error minimization criterion given by

the following five criteria: sequential modified LR test statistic, Final prediction error, Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion. According to these criteria, the chosen number of lags is 2. The VAR model estimation is analyzed based on the following hypotheses that are specified in the economic literature:

- Residual series has to follow a normal distribution;
- Residual series cannot be auto correlated;
- Residual series should be homoscedastic.

For the first hypothesis the Jarque-Bera probability of the test must be higher than 5% in order to state that the residual series follows a normal distribution. The Autocorrelation LM test verifies the second hypothesis. The null hypothesis indicates that the residual series is not auto correlated and it is accepted if the test probability is higher than 5%. White test is used for the last hypothesis. If the statistics probability is higher than 5% the null hypothesis is accepted and therefore the residual series is homoscedastic.

Before the VAR model I will analyze the series by estimating a multiple regression using the components of the current and capital expenditures in order to determine the direction in which they impact the economic growth and which of them are significant for the analysis. Table II describes the variables notations used for the estimation. Formula (4) shows the standard multiple regression relation.

$$y_t = a + b_{1t}*x_{1t} + b_{2t}*x_{2t} + \dots + b_{nt}*x_{nt} + \epsilon_t \tag{4}$$

where:

- y_t – the dependent variable;
- x_{nt} – the n independent variables;
- b_{nt} – the variables coefficients;
- a – the constant;
- ϵ_t – the vector of errors

TABLE II

NOTATIONS FOR THE VARIABLES USED TO ESTIMATE THE MULTIPLE REGRESSION

Notations	Variables (non-seasonally adjusted data)
gdp_pop	real gross domestic product per total population
interm_consum	intermediate consumption (percentage of GDP)
compens_employ	compensation of employees (percentage of GDP)
interest	property income/interest (percentage of GDP)
subsidies	subsidies payable (percentage of GDP)
social_benefits	social benefits payable (percentage of GDP)
other_current_exp	other current expenditures/transfers (percentage of GDP)
cap_investm	capital investments (percentage of GDP)
cap_transf	capital transfers (percentage of GDP)
reer	real Effective Exchange Rate (deflator: consumer price indices - 28 trading partners)

As already mentioned, the components of the government expenses taken into consideration follow the economic

structure: current expenditures (intermediate consumption, compensation of employees, property income/interest, subsidies, social benefits, other current expenditures/transfers) and capital expenditures (capital transfers, capital investments). The government expenditure components are used as percentages of real GDP for the multiple regression estimation and for the VAR model estimation. As proxy for the economic growth I will use the real GDP per total population.

First step in processing the data is to check for the existence of unit roots using Augmented Dickey Fuller (ADF) test and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test. If the tests indicate that some variables are not stationary they were integrated of the first order, therefore I differentiated them once. The null hypothesis of the ADF test characterizes the series as non-stationary or unit root process. This hypothesis is accepted if p-value associated to the statistic of the test is higher than 5%.

IV. RESULTS

As mentioned before I will estimate the multiple regression in which the dependent variable is the economic growth and the independent variables are the two main government expenditures components and the exchange rate. It can be seen in Fig. 1 that the evolution of the capital expenditures have a positive impact on the economic growth, while the modification of the current expenditures have a negative impact. If I also take into consideration the probability of the T test, I can affirm that only the influence of the capital expenditures is significant due to the value smaller than 5%.

Dependent Variable: GDP_POP
Method: Least Squares
Sample: 1995 2014
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20162.44	26849.93	-0.750931	0.4636
CAPITAL_EXP	3932.392	1582.688	2.484629	0.0244
CURRENT_EXP	-52.62888	816.0746	-0.064490	0.9494
REER	174.7457	93.47885	1.869361	0.0800
R-squared	0.659343	Mean dependent var	14603.45	
Adjusted R-squared	0.595470	S.D. dependent var	11816.55	
S.E. of regression	7515.644	Akaike info criterion	20.86422	
Sum squared resid	9.04E+08	Schwarz criterion	21.06336	
Log likelihood	-204.6422	F-statistic	10.32269	
Durbin-Watson stat	0.781955	Prob(F-statistic)	0.000505	

Fig. 1 The results of the economic growth regression based on the main two government expenditures economic components

In Fig. 2, it is represented the estimation of the multiple regression using the variables explained in table II. Regarding the current expenditures components, the evolution of the intermediate consumption, social benefits payable and other current expenditures/transfers have a positive impact on the economic growth, while the others (compensation of employees, property income/interest, subsidies payable) have

a negative one. With respect of capital expenditures components, the modification of the public expenses with the capital investments has positive impact on the economic growth, while the public expenses with the capital transfers has a negative effect.

Dependent Variable: GDP_POP
Method: Least Squares
Sample(adjusted): 1995 2013
Included observations: 19 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5337.978	19991.80	0.267008	0.7955
INTERM_CONSUMP	3071.045	2200.907	1.395354	0.1964
COMPENS_EMPLOY	-2148.444	1303.743	-1.647905	0.1338
INTEREST	-7088.831	2734.056	-2.592789	0.0291
SUBSIDIES	-6637.803	2261.741	-2.934820	0.0166
SOCIAL_BENEFITS	3029.255	1161.423	2.608228	0.0284
OTHER_CURRENT_EXP	1572.101	2104.743	0.746932	0.4742
CAP_INVESTM	66.14110	1386.823	0.047693	0.9630
CAP_TRANSF	-360.8941	1771.007	-0.203779	0.8431
REER	-12.19316	98.29502	-0.124047	0.9040
R-squared	0.962437	Mean dependent var	13613.11	
Adjusted R-squared	0.924874	S.D. dependent var	11255.35	
S.E. of regression	3084.989	Akaike info criterion	19.21190	
Sum squared resid	85654389	Schwarz criterion	19.70897	
Log likelihood	-172.5131	F-statistic	25.62202	
Durbin-Watson stat	1.868891	Prob(F-statistic)	0.000023	

Fig. 2 The results of the economic growth regression based on the government expenditures economic structure

Following the regressions results obtained I can conclude that the economic growth, measured by the real GDP per total population, is also impacted by other variables that are not included in the model. The limitation of the estimation is that it is testing a specific relation between variables. This relation is based on economic theory but it is possible that the theoretically approach is not a sufficient condition in order to determine the correct specification. The solution of this issue could be the estimation of the VAR model.

Table III shows the results for the VAR model estimation with a number of lags equal with 2. As mentioned before for the VAR model I used the variables explained in table I.

The current expenditures have a negative impact on the economic growth in Romania over the period analyzed. The results regarding the impact of the capital expenditures on the economic growth is ambiguous.

TABLE III
VAR MODEL RESULTS

	GDP_POP	CURRENT_EXP	CAPITAL_EXP
GDP_POP(-1)	0.508207	0.000589	0.000059
GDP_POP(-2)	0.417136	-0.000553	0.000084
CURRENT_EXP(-1)	-248.8896	1.298793	0.005857
CURRENT_EXP (-2)	-30.82501	-0.629236	-0.069001
CAPITAL_EXP (-1)	694.3643	0.226483	0.619165
CAPITAL_EXP (-2)	-202.3237	-0.324451	-0.180406
C	6185.666	13.76236	2.629705
REER	37.95282	-0.048136	0.023473

I will analyze the impulse response functions of the economic growth to a shock into one of the main two government expenditures components (Fig. 3). The economic growth is decreasing after a shock into the current expenditures and is increasing after a shock in capital expenditures.

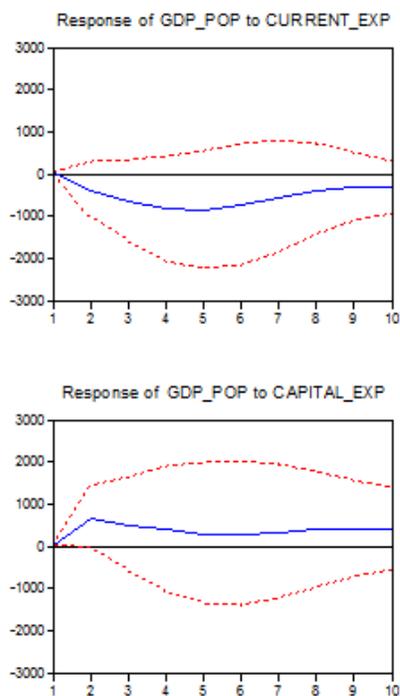
Response to Cholesky One S.D. Innovations ± 2 S.E.

Fig. 3 (a) Response of economic growth to the shock of the current expenditures; (b) Response of economic growth to the shock of the capital expenditures

V. CONCLUSION

Due to the fact that the growth literature shows that investment is an important factor in explaining growth, I will split the government expenditures into capital and current expenditures in this paper. In this way I can establish whether

or not capital spending has an important impact on the economic growth in Romania over the period 1995 - 2013. The results show that capital expenditures determine the economy to growth. This means that capital expenditures are used efficiently. In order to have a more significant impact it is important to improve the way of managing the corruption and the governance.

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