THE INFLUENCE OF GOVERNMENT SPENDING, FINANCIAL, MONETARY AND FISCAL POLICIES ON THE GDP. COMPARATIVE ANALYSIS ROMANIA – LITHUANIA

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Abstract
The analysis of the way in which the economic growth is achieved represents one of the fundamental problems of economics. Recent research is based on the econometric models based on multiple regression.
This research aims to analyze how government spending, fiscal, monetary and financial policies influence the dynamics of the GDP. In this sense, it is constructed an econometric model in which the dependent variable is the gross domestic product and the independent variables are: fiscal freedom, government spending, monetary freedom and financial freedom.
A comparative analysis between two former communist countries of different sizes, with different economic features, is performed in order to capture and analyze the phenomenon better. They used data characterizing the period 2000 – 2012. The model of multiple regression shows the way in which the independent variables influence the economic growth in the two countries.

Keywords: economic growth, determinants of the economic growth, econometric model, the influence of variables on the economic growth, comparative analysis.

JEL classification: C13, E 42, E63

1. Introduction

The economic growth and its underlying theories have known over time a significant development in terms of interpretations and the analyses of the determinants, researchers trying to explain this phenomenon from a multiple perspective. Currently, the World Bank defines the economic growth as "*... the quantitative growth or expansion of an economy. The economic growth is measured conventionally by the percentage increase of the gross domestic product or the gross national product over a period of one year.*" (World Bank, 2012). Undoubtedly, the fundamental indicator that measures the economic growth is the gross domestic product. The recent theories and analyses attempts to capture the different models, links between this indicator and the factors that contribute substantially to its change in time (Kormendi and Meguire, 1985; Knight, Loayza and Villanueva,1993; Easterly and Rebelo, 1993; Zhang, 1999; Moudatsou, 2003; Barro, 2003, Bruneckiene, J. and Paltanaviciene, D. 2012). Most models use in the analysis the regression equations whose dependent variable is the gross domestic product, and the independent variables are considered various determinants of the economic growth.

The objective of this research is to create a model that highlights the following determinants of the economic growth: fiscal freedom, government spending, monetary freedom and financial freedom. The comparative analysis is performed between two EU member states, former Communist countries, with economies showing distinct features. The four independent variables included in the model capture the most important aspects of fiscal policy, government spending, monetary and financial policies. They make up the Index of Economic Freedom, calculated annually by the Heritage Foundation.

Fiscal freedom is a measure of the tax burden imposed by the government. It includes direct taxes, in terms of the top marginal tax rates on individual and corporate incomes, and

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overall taxes, including all forms of direct and indirect taxation at all levels of government, as a percentage of GDP. Thus, the fiscal freedom component is composed of three quantitative factors: the top marginal tax rate on individual income; the top marginal tax rate on corporate income and the total tax burden as a percentage of GDP (Heritage Organization, 2013).

Government spending – this component considers the level of government expenditures as a percentage of the GDP. Government expenditures, including consumption and transfers (Heritage Organization, 2013).

Monetary freedom combines a measure of price stability with an assessment of price controls. Both inflation and price controls distort market activity. Price stability without microeconomic intervention is the ideal state for the free market (Heritage Organization, 2013).

Financial freedom is a measure of banking efficiency as well as a measure of independence from government control and interference in the financial sector. State ownership of banks and other financial institutions such as insurers and capital markets reduces competition and generally lowers the level of available services.

In an ideal banking and financing environment where a minimum level of government interference exists, independent central bank supervision and regulation of financial institutions are limited to enforcing contractual obligations and preventing fraud (Heritage Organization, 2013).

The aim of this research is to analyze the impact of the mentioned determinants on the gross domestic product, the correlations existing between the variables and to explain the differences between the two countries.

The methodology of research comprises: the exploratory research of the literature, the quantitative literature, the qualitative research, the creation of the model and the interpretation of the data obtained.

2. Theories and concepts regarding the economic growth and the determinants of economic growth

The economic growth is influenced by many factors. A first analysis of the growth and the factors that influence it was achieved by A. Marshall (1890) showing that "*the industrial and social progress and development..... depends on numerous factors that influence this process*". Subsequently, the analyses related to the economic growth and its implications have been captured by a growing number of economists. Colin Clark (1947) considers that "*the first element of the economic growth is that of the real income received by a worker in an hour of work*," the economic growth being thus explained by the theory of labor productivity. K. E. Boulding (1953) explains this phenomenon of the economic growth with the help of the phenomenon "butterfly" – economies grow and are developed like a butterfly from being a larva and then an insect. Hicks (1956) explains the economic growth through utility – utility maximization leads to the economic growth.

The analysis of the different types of relationships between the economic growth and its potential determinants is highlighted by various models created by economists over time. J. M. Keynes (1936) highlights the relationship between income (V), consumption (C) and investment (I).

$$V = C + I \qquad (1)$$

If in the Keynesian model we look at the overall income (V) as an indicator of the economic development, its modification is based on the following relationship:

$$\Delta V = \Delta C - \Delta I, \qquad (2)$$

It would result that an increase of the investment leads to the increase of consumption and thus of the income. Keynes also explains the impact created by investments on the

income and implicitly on the economic growth. The investment multiplier (K) is the indicator that allows the quantification of these effects:

K = ΔV/ ΔI,   (3)

This shows how income changes if investments increase by one unit. Another well-established pattern of the economic growth is developed by R. Solow (1956). It reveals how two fundamental factors – labor and capital – affect growth. Through a function of the type Cabb – Douglas it generates the production function:

$Y = F (K, L)$, so $Y = AK^a L^{1-a}$,   (4)

where: Y – represents the global production, A – the technological contribution, K – money capital (can be viewed as an investment in achieving production), L – labour (human resources used in production).

The second specific equation that goes into the model developed by Solow is the accumulation of capital:

K = sY – dK,   (5)

where: sY is the gross investment, and dK is the depreciation incurred by the capital.

Important contributions to the identification and explanation of the links between growth and its determinants were also brought by the creators of the endogenous growth models such as Paul Romer (1990, 1994) that conceived the AK model which demonstrates the link between production of a country and the capital it has, showing the proportionality between the two elements.

Another established model is the model "Human Capital Accumulation" (HCA) of Lucas (1988). It puts the spotlight on the accumulation of human capital as the basis for economic growth. In this case, the production function has become:

Y=AK (uhL),   (6)

where: Y – global production, A – technological contribution, K – money capital (can be viewed as an investment in achieving production) L – labor (human resources used in production). $0 < a < 1$, u – the time spent working, and h – stock of human capital.

The role of human capital in the economic growth is further highlighted by other economists (Levine and Renelt, 1992; Benhabib and Spiegel, 1994; Topel, 1999; Hanushek and Kimko, 2000, Krueger and Lindahl, 2001; Pritchett, 2001).

Along with the determinants presented in the previous models, there were identified other factors that contribute to the economic growth. Levine and Zervos (1993) show that countries with higher enrollment rate in secondary education have a higher growth rate than those with a lower rate, demonstrating a direct link between the formation of the new generation and growth. Borensztein, De Gregorio and Lee (1998), Hermes and Lensink (2000), Lensink and Morrissey (2006), demonstrate the close relationship existing between foreign direct investment and economic growth. Khan and Kumar, (1997), Knack and Keefer, (1995) examine the way in which public and private investment influence the economic growth, capturing significant differences between the two factors. The fact that investments are the fundamental determinant of the economic growth is highlighted in numerous research studies (De Long and Summers, 1991, Levine and Renelt, 1992, Mankiw, 1992, Auerbach et al, 1994, Barro and Sala – I – Martin, 1995, Bond et al, 2001; Podrecca and Carmeci, 2001).

Hall and Jones (1998), Rodrik D. (2000) believe that a great influence on the economic growth is held by public institutions and government policies, the state being, through the policies developed, a decisive factor influencing the economic growth.

Ulku (2004) highlights the implications that innovation and research-development have on the economic growth, demonstrating that a country that invests in research, development and innovation generates higher economic growth than the countries that do not show such a trend or not give importance to this aspect.

R.J. Barro(1991, 1999, 2000, 2003). pays particular attention to the determinants of the economic growth in various studies and analyses. He analyzed the effects on the economic growth: human capital, demographic growth, government consumption, rule of low, terms of trade, regional variables and investment ratio.

Willa Boots J. Tolo (2011) considers that fiscal policies, external developments, political stability and reform indicators have a determinant role in development.

3. Model and empirical research

The analysis of the determinants analyzed on GDP as an indicator reflecting growth involves the following steps:

Step 1. the identification of the categories of variables that compose the model;
Step 2. the construction of the econometric model to make the impact assessment;
Step 3. the empirical research by the introduction and validation of the time using the model built;
Step 4. the interpretation of the obtained quantitative results.

Step 1. Identification of the variables that compose the model

For this research, the dependent variable Y is represented by the GDP as an expression of the economic growth. The independent variables Xi are the variables that are used in the model to characterize the influence they have on the independent variable. The independent variables helping to analyze the impact on the Gross Domestic Product are: fiscal freedom (FF), government spending (GS), monetary freedom (MF) and financial freedom (FIN.F).

Step 2. Construction of the econometric model to make the impact assessment;

The construction of the model expresses the gross domestic product as a dependent variable in accordance to the independent variables. In this context:

GDP= (the selected dependent variables); GDP= (fiscal freedom, government spending, monetary freedom and financial freedom).

In this context one can use a multiple regression function to characterize the phenomenon.

$Yt = a_0 + a_1 X1t + a_2 X_2 t + \ldots + a_k X_k t + et$, (7)

$t = 1, 2, \ldots, n$ where: a_0 – is the constant value, $a_1 – a_k$ equation parameters, and $x_1 t – x_k t$ variables of the function, et – standard error.

In our case the function is written:

$GDP = a_0 + a_1(FF) + a_2(GS) + a_3(MF) + a_4(FIN.F) + et$ (8)

In these circumstances we can quantify the influence of each indicator on GDP in each country that was analyzed.

Step 3. The empirical research

The empirical research was conducted for a period of 13 years between 2000-2012. The statistical data used in the analyses were taken from the official website of the national banks of the two countries in the case of the dependent variable, the gross domestic product, and from the official website of the Heritage Foundation in the case of the independent variables: fiscal freedom, government spending, financial freedom and monetary freedom. To produce no redundancy in the model and to make it statistically representative, we proceeded to the logarithms of all the absolute values used in the model. The tables 1 and 2 present the logarithmic values obtained.

Table 1: Logarithmic values of the dependent variable and the independent variables in the case of Lithuania for the period 2000-2012.

YEAR	GDP	fiscal freedom	government spending	monetary freedom	financial freedom
			LITHUANIA		
2012	10,63217	1,971275849	1,620136055	1,899273187	1,903089987
2011	10,49079	1,69019608	1,935003151	1,872156273	1,903089987
2010	10,44264	1,662757832	1,927370363	1,850033258	1,903089987
2009	10,42576	1,681241237	1,942504106	1,879669206	1,903089987
2008	10,51073	1,681241237	1,936010796	1,894869657	1,903089987
2007	10,45847	1,681241237	1,937016107	1,909020854	1,903089987
2006	10,38209	1,662757832	1,918554531	1,95616843	1,954242509
2005	10,32158	1,672097858	1,918030337	1,954724791	1,954242509
2004	10,26114	1,681241237	1,918030337	1,954724791	1,954242509
2003	10,21948	1,681241237	1,896526217	1,944975908	1,84509804
2002	10,17993	1,612783857	1,869818208	1,942999593	1,698970004
2001	10,13497	1,579783597	1,851258349	1,928395852	1,698970004
2000	10,09513	1,477121255	1,848189117	1,859138297	1,698970004

Source: author calculation using Eviews 5 and data from National Bank of Lithuania

Table 2: Logarithmic values of the dependent variable and the independent variables in the case of Romania for the period 2000-2012.

Year	GDP	fiscal freedom	government spending	monetary freedom	financial freedom
			ROMANIA		
2012	11,27875	1,941511433	1,741151599	1,870988814	1,698970004
2011	11,11835	1,938519725	1,760422483	1,871572936	1,698970004
2010	11,09457	1,933487288	1,776701184	1,865103975	1,698970004
2009	11,0726	1,939519253	1,84509804	1,875061263	1,698970004
2008	11,1454	1,932473765	1,850033258	1,860338007	1,698970004
2007	11,09597	1,933993164	1,851258349	1,843232778	1,77815125
2006	10,99012	1,942008053	1,838219222	1,823474229	1,698970004
2005	10,90201	1,845718018	1,838219222	1,796574333	1,698970004
2004	10,78579	1,844477176	1,873901598	1,754348336	1,698970004
2003	10,7208	1,839478047	1,79518459	1,705863712	1,698970004
2002	10,68677	1,808885867	1,770115295	1,668385917	1,477121255
2001	10,65664	1,760422483	1,901458321	1,617000341	1,477121255
2000	10,60907	1,765668555	1,80140371	1,580924976	1,698970004

Source: author calculation using Eviews 5 and data from National Bank of Romania

The empirical research was carried out by following the steps specific to the quantitative analysis methodology: descriptive statistical analysis, analysis of correlations between this phenomenon and the influence factors and the analysis of the resulted regression equations.

The statistical analysis indicates a very small standard deviation in both countries, such as the dependent variable and the independent variables. The values are close to zero, showing a slight dispersion to mean. The other two important elements of the statistical analysis, skewness and kurtosis indicating the distribution and degree of flattening of the variables, in the case of Lithuania, show negative values for the GDP, government spending, monetary freedom and financial freedom, indicating a distribution oriented to the right, with extreme values to the left, while the value of the independent variable fiscal freedom is positive, and the inclination of the distribution is to the left. In the case of Romania, all values are negative, so the distribution is skewed to the right. Regarding the degree of flattening, values higher than the significant threshold "three" are met in the case of Lithuania at the independent variables fiscal freedom and government spending, indicating a leptokurtic distribution. The dependent variable and the other independent variables have values less than three, so they have a platikurtic distribution. In the case of Romania, all variables except the variable designating financial freedom have values smaller than three indicating a leptokurtic distribution.

Table 3: Descriptive statistics for Lithuania – Calculations based on table 1

LITHUANIA	GDP	FISCAL FREEDOM	GOVERNMENT SPENDING	MONETARY FREEDOM	FINANCIAL FREEDOM
Mean	10.35038	1.671922	1.886034	1.911242	1.863329
Median	10.38209	1.681241	1.918030	1.909021	1.903090
Maximum	10.63217	1.971276	1.942504	1.956168	1.954243
Minimum	10.09513	1.477121	1.620136	1.850033	1.698970
Std. Dev.	0.162852	0.108199	0.086223	0.038344	0.098173
Skewness	-0.055712	1.263615	-2.459025	-0.211573	-0.980356
Kurtosis	1.950577	6.293953	8.227840	1.605820	2.341538
Jarque-Bera	0.603256	9.336716	27.90532	1.149845	2.317228
Probability	0.739613	0.009388	0.000001	0.562749	0.313921
Sum	134.5549	21.73498	24.51845	24.84615	24.22328
Sum Sq. Dev.	0.318250	0.140483	0.089214	0.017643	0.115655
Observations	13	13	13	13	13

Source: author calculation using Eviews 5

Table 4: Descriptive statistics for Romania – Calculations based on table 2

ROMANIA	GDP	FISCAL FREEDOM	GOVERNMENT SPENDING	MONETARY_ FREEDO	FINANCIAL FREEDOM
Mean	10.93514	1.878936	1.818705	1.779452	1.670930
Median	10.99012	1.932474	1.838219	1.823474	1.698970
Maximum	11.27875	1.942008	1.901458	1.875061	1.778151
Minimum	10.60907	1.760422	1.741152	1.580925	1.477121
Std. Dev.	0.220598	0.070485	0.048117	0.104231	0.088733
Skewness	-0.143955	-0.541924	-0.029657	-0.763352	-1.627175
Kurtosis	1.617796	1.735497	1.950822	2.122180	4.310762
Jarque-Bera	1.079747	1.502418	0.598158	1.679920	6.667317
Probability	0.582822	0.471796	0.741501	0.431728	0.035662
Sum	142.1568	24.42616	23.64317	23.13287	21.72209
Sum Sq. Dev.	0.583964	0.059618	0.027783	0.130369	0.094482
Observations	13	13	13	13	13

Source: author calculation using Eviews 5

The analysis of the correlation matrix reveals the intensity of the existing links between the dependent and the independent variable. Table no. 3 highlights the links between the GDP and the four independent variables of the model.

Table 5: Matrix of the correlations – Lithuania

LITHUANIA	GDP	FISCAL FREEDOM	GOVERNMENT SPENDING	MONETARY FREEDOM	FINANCIAL FREEDOM
GDP	1.000000	-	-	-	-
FISCAL FREEDOM	0.787833	1.000000	-	-	-
GOVERNMENT SPENDING	-0.181970	-0.589324	1.000000	-	-
MONETARY FREEDOM	-0.316098	0.056303	0.037351	1.000000	-
FINANCIAL FREEDOM	0.698640	0.550088	0.221130	0.120476	1.000000

Source: author calculation using Eviews 5

Table 6: Matrix of the correlations – Romania

ROMANIA	GDP	FISCAL FREEDOM	GOVERNMENT SPENDING	MONETARY FREEDOM	FINANCIAL FREEDOM
GDP	1.000000	-	-	-	-
FISCAL FREEDOM	0.938246	1.000000	-	-	-
GOVERNMENT SPENDING	-0.288010	-0.255140	1.000000	-	-
MONETARY FREEDOM	0.947131	0.964374	-0.199483	1.000000	-
FINANCIAL FREEDOM	0.551826	0.615466	-0.097618	0.592241	1.000000

Source: author calculation using Eviews 5

The correlation of the dependent variable GDP with the independent variables included in the model reveals that Lithuania has a strong intensity in the case of the independent variable fiscal freedom, a moderate intensity in the case of financial freedom, and weak ties with the variable monetary freedom and insignificant ties with government spending.

Regarding Romania, the links are more intense. There is a strong link between the GDP and fiscal freedom and between the GDP and monetary freedom, a link of medium intensity with financial freedom and a weak link with government spending.

The regression equations resulting from the application of the model using Eviews 5 are:

GDP =1.37*FF+0.62*GS -1.70*MF + 0.28*FIN F + 9.59 in the case of Lithuania (9)
GDP=0.94*FF-0.37*GS+1.39*MF- 0.07*FIN F + 7.50 in the case of Romania (10)

Table 7: The regression equation – the case of Lithuania

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FISCAL_FREEDOM	1.371606	0.403781	3.396904	0.0094
GOVERNMENT_SPENDING	0.626976	0.433876	1.445058	0.1864
MONETARY_FREEDOM	-1.701218	0.467582	-3.638332	0.0066
FINANCIAL_FREEDOM	0.285652	0.369371	0.773349	0.4616
C	9.593835	1.256970	7.632512	0.0001
R-squared	0.904459	Mean dependent var		10.35038
Adjusted R-squared	0.856689	S.D. dependent var		0.162852
S.E. of regression	0.061650	Akaike info criterion		-2.450959
Sum squared resid	0.030406	Schwarz criterion		-2.233670
Log likelihood	20.93123	F-statistic		18.93344
Durbin-Watson stat	1.321231	Prob(F-statistic)		0.000385

Source: author calculation using Eviews 5

Table 8: The regression equation – the case of Romania

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FISCAL_FREEDOM	0.942556	1.303490	0.723102	0.4902
GOVERNMENT_SPENDING	-0.379654	0.504385	-0.752706	0.4732
MONETARY_FREEDOM	1.394966	0.848480	1.644075	0.1388
FINANCIAL_FREEDOM	-0.079467	0.329940	-0.240852	0.8157
C	7.505128	1.557024	4.820175	0.0013
R-squared	0.913039	Mean dependent var		10.93514
Adjusted R-squared	0.869559	S.D. dependent var		0.220598
S.E. of regression	0.079673	Akaike info criterion		-1.938057
Sum squared resid	0.050782	Schwarz criterion		-1.720769
Log likelihood	17.59737	F-statistic		20.99892
Durbin-Watson stat	1.317974	Prob(F-statistic)		0.000266

Source: author calculation using Eviews 5

These show the impact of each independent variable on the GDP dependent variable.

Step 4 Interpretation of the results obtained at step 3

It appears that in the case of Lithuania and Romania, the coefficient of determination (R -squared) is higher than 90% (90.44 % in the case of Lithuania and 91.30% in the case of Romania) and adjusted R-squared is 85.66%, respectively 86.95%, so the phenomenon is explained by the regression equations in a very high percentage. In this context, the sample and the variables can be considered representative in making the analysis. In both cases Prob (F – statistic) is lower than 5%, so the regression model is statistically valid.

The interpretation of the coefficients of the regression equations indicate that the modification with one unit of the values of the independent variables produce different effects in the case of the two countries.

In the case of Lithuania, the increase with one unit of the fiscal freedom produces an increase of the GDP with 1.37 units, while in the case of Romania it produces an increase of only 0.94 units. The modification with one unit of government spending is in the same direction in the case of Lithuania (0.62 units), while Romania produces a change in the opposite direction by 0.37 units.

Monetary Freedom produces different effects in the case of the two countries. In the case of Lithuania, the modification produces effects in a different way with an amplitude of 1.7 units, while in the case of Romania, the change produced is in the same direction with an intensity of 1.39 units. A different aspect is observed in the case of financial policies. Their impact produces reverse effects for Romania (0.07 units) while in the case of Lithuania it produces effects in the same direction with a higher intensity (0.28 units).

4. Conclusions

The research carried out shows that the independent variables that compose the model greatly influence the economic growth in the two countries under analysis (the phenomenon is explained in greater proportion of 90 % of the four dependent variables). They found correlations and different influences of the analyzed determinants on the economic growth. For both countries, the fiscal policies play an important role in stimulating the economic growth. The effects produced by these policies indicate a higher GDP growth for Lithuania as compared to Romania. However, in Romania, this factor is more strongly correlated with the growth of the GDP than in Lithuania. This is explained as a consequence of the fact that Lithuania has a fiscal system more stable than in Romania, with a lower overall tax. If in Romania the tax system were more coherent, it would achieve a fiscal relaxation especially in the taxation of labor and the GDP could grow faster than in the case of Lithuania. The government spending in both countries indicates negative correlations. They are insignificant in the case of Lithuania, while in the case of Romania they show a weak link. The increase of public spending in the case of Lithuania leads to an increase of the GDP, while in the case of Romania it leads to a lower GDP. The explanations are many, but the way in which funds are spent, the efficiency of these have a significant impact on the GDP. Lithuania compared to Romania is a better administrator of the public funds, as they have a higher efficiency. In Romania the inefficient administration of public funds and public investments creates a negative impact on investor's perception and consequently on the GDP.

Regarding the monetary policies, we observe that in Lithuania there is a correlation with low intensity of the GDP, compared to Romania, where the correlation is 94.7 %. The effects produced by price stability over the economic growth are contrary. In the case of Lithuania, the decrease of inflation leads to a real economic growth. In January 2007 – July 2008 there has been a substantial increase in the inflation rate from 4% to over 12%. In this context, the economic growth was affected in real terms. In Romania, price stability was higher, the

inflation rate exceeding 6 %, decreasing from one year to another. According to the model, in Romania, the increase of inflation leads to the growth of the GDP in nominal terms.

Between the financial policies and the GDP in both countries, the correlations present medium intensities. The modifications generated by the access to finance, the degree of independence of the central bank to banks produce relatively small changes in both the case of Lithuania and in the case of Romania. The difference lies in the meaning of these changes. The financial index Freedom, higher in the case of Lithuania, led to an increase of the GDP, while in Romania the effects are on the contrary.

The conducted research shows that between the GDP and fiscal freedom, government spending, monetary freedom and financial freedom) there is a strong connection, the four factors representing determinants of the economic growth. It is also emphasized the different nature of the influences from one country to another. The final conclusion drawn from the research indicates that the more stable and favorable to investment is the tax system, the higher is the impact on the economic growth in the positive way. The increase of government spending does not necessarily mean an increase in the GDP implicitly. If the efficiency of this public expenditure is high, the effect on the GDP is positive. If, on the contrary, the public expenditure increases and the efficiency are low, the GDP has a negative impact. In terms of monetary and financial policies, their improvement produces positive effects on the GDP in real terms.

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