

ECONOMIC GROWTH AND IMPACT FACTORS IN COUNTRIES OF CENTRAL AND EASTERN EUROPE

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Abstract

This paper starts from the premise that the performance of the economies of different countries, respectively their economic growth, is synthetically expressed by the GDP growth rate indicator, whose dynamics evolves under the impact of a variety of determining factors, including some of financial-monetary nature. Thus, there are highlighted specific causal linkages and influences of economic and financial factors represented by certain indicators (inflation, unemployment, exports as percentage of GDP, imports as percentage of GDP, domestic credit as percentage of GDP, non-performing loans rate) to GDP growth rate, by using econometric methods. Much of the paper is focused on shaping an econometric model in which GDP growth rate is dependent variable and the other mentioned indicators are impact factors, respectively determinant variables. Along the mentioned determining factors, in our model is evaluated also the impact of the manifestation of the recent financial crisis, considering it as an additional determinant dummy variable. By processing the data for a group of countries of Central and Eastern Europe, over the period 2000-2013, there result findings on the impact of each of the determining factors on the economic growth in the countries concerned and are formulated the appropriate assessments and conclusions.

Key words: *crisis, domestic credit as percentage of GDP, GDP growth rate, inflation rate, unemployment rate.*

JEL Classification: *C23; G01; O11*

I. INTRODUCTION

Ensuring economic growth and sustainable development are undoubtedly essential objectives for each country and, in particular, for the emergent ones. However, it can be seen that economic growth, especially in the last decades has become an important topic of theoretical and recently empirical research studies, aiming to identify applicable models or methods for accomplishing it. Nevertheless, most of the researchers admit in principle that scientific literature has not yet been able to reach a common understanding of the process of economic growth or to clearly establish its determinants, facts which still provide conditions for analyzing economic growth.

Based on the previous assumptions, we consider that, the early 21st century period, marked by profound transformations, both social and especially economic, including the manifestation of the phenomenon of global financial and economic crisis provides an appropriate framework for analyzing economic growth processes, both locally and regionally. We also appreciate that it is of interest also approaching the economic growth process, by reporting to the emerging countries and, in this context, the situation of CEE countries provides a good basis for analyzing this process at regional level and for the identification of some conclusions on its determinants.

II. LITERATURE REVIEW

Economic growth was a priority theme of research for many economists, starting with the classics Adam Smith, David Ricardo and Karl Marx. Many other researchers have continued later and especially in recent decades to study the economic growth seeking to identify factors that may influence the economy and how they act on it. Yet, although over time there were analyzed various such factors it still cannot be said there is a consensus on which are the most representative ones or on their mode of action. The studies, both theoretical and empirical often reveal conflicting views, which led to the conclusion that the economic growth process remains poorly understood (Easterly, 2001).

Theoretically, although there are several points of view, there are distinguished two main streams on the

role of various factors in determining economic growth. Thus, a first stream, the neoclassical one, initially developed by Solow (1956), considers essential the capital accumulation, while the second one, the theory of endogenous growth, developed by Romer (1986) and Lucas (1988), puts the accent on the human capital and the innovation capacity. Considered as the most representative, these theories were later discussed and completed by other researchers who have taken into consideration many other impact factors either of macroeconomic (Fisher, 1993; Edwin & Shajehan, 2001) or non-economic nature (Mankiw et al., 1992; Borensztein et al., 1988).

On the other hand, based on different theories developed over the years, various researchers have conducted empirical studies to identify and assess impact factors on the economic growth either of specific states (Chaudhary et al., 2007; Furuoka, 2007) or, most often, of groups of states belonging to certain regions (Mankiw et al., 1992; Fisher, 1993; Barro, 1996; Borensztein et al., 1988; Lee and Liu, 2005; Ristanovic, 2010). Those studies have analyzed the impact of several categories of factors, some of which non-economic (education level, technology etc.), but most of them studied macroeconomic determinants such as inflation, foreign direct investment, imports, exports etc., which we also consider to be important determinants.

At the same time, we believe that unemployment as an expression of low utilization of labor resulting in decreased productive capacity is therefore, rationally, a factor with a negative impact on economic growth. Moreover, from a reverse perspective, also other empirical studies demonstrated that an increase in labor is a factor favoring economic growth (Edwin & Shajehan, 2001).

In the literature, inflation is one of the macroeconomic factors considered most often as having a negative impact directly or indirectly on growth (Fisher, 1993; Barro, 1996; Bilan and Roman, 2014), although the authors acknowledge that the negative effect refers to the situations when inflation is high and they find even situations where on the background of the existence of inflation some countries managed to record economic growth. In addition, analyzing 5 CEE countries, during 1993-2007, Ristanovic (2010) finds a positive impact of inflation, attributed to measures taken by the governments of these countries to maintain it at a low level.

Also, foreign direct investments (FDI) are considered in most empirical studies as an important factor with a positive impact on economic growth (Moudatsou, 2003; Lensink and Morisey, 2006), but its impact depends on the existence of sufficient absorptive capability of the host economy (Borensztein et al., 1988). On the other hand, the analysis of Lee and Liu (2005) on a panel of 84 countries, highlights in most cases a positive impact of FDI on economic growth, but also remarks that in countries with the technological gap, FDI has a significant negative impact on economic growth.

Export-Led-Growth as well as Import Led-Growth hypotheses were launched as theories and tested later in various empirical studies, many of them confirming these hypotheses (Chaudhary et al., 2007 etc.), but not all of them (Furuoka, 2007; Ristanovic, 2010 etc.). Yet, trade openness, considered either in terms of exports to GDP or in terms of total exports plus imports to GDP, still remains approached in literature as one of the main determinants of economic growth (Barro, 1996 etc.).

On the other hand, we note that some studies (Wu et al., 2010) identify a direct and significant impact of banking sector and financial markets development on economic growth, especially in financing the economic activity. In this context, analyzing the CEE economies we find a reduced development of financial markets, which makes the financing of these economies to depend mainly on the domestic banking system operation. Thus, it results that, for these states, domestic credit represents an important lever as it remains the main source for financing the economy.

We also appreciate that, within the mentioned context, there are tight linkages between bank lending performance and economy. Thus, if the economy deteriorates its performance, the decrease of people and companies income can increase non-performing loans (NPL). At the same time, however, the increase in NPLs may cause banks to react in order to strengthen the prudence in lending, thereby reducing the resources directed to the economy, as demonstrated empirically in some papers (Filip, 2014). On the other hand, a low or decreasing level of NPLs encourages banks to assume higher risks and to finance additionally the economy, thereby contributing to economic growth.

III. DATA AND METHODOLOGY

Considering the above mentions, our research focuses on the selection and analysis of the impact of specific factors on growth in CEE. Thus, we aim to identify some conclusions regarding both the resulted experience and possible courses of action necessary to ensure sustainable economic growth and development in the Central and Eastern Europe region.

We use in the analysis, annual data, taken from international databases Global Financial Development Database (GFDD) of World Bank, World Bank Databank and Financial Soundness Indicators (FSI) database of the IMF, for the period 2000-2013, corresponding to 11 Central and Eastern European countries: Bulgaria,

Czech Republic, Croatia, Estonia, Hungary, Lithuania, Latvia, Macedonia, Poland, Romania and Slovenia. The analysis aims processing and interpretation of data related to the Central and Eastern European countries panel by using Pearson correlations, respectively by building an econometric model, testing it and interpreting the results, using the Panel Least Squares method.

In this context, we chose to evaluate economic growth in Central and Eastern Europe, by econometric methods, using GDP annual growth rate indicator (GDPGR) as dependent variable, because it is currently the most widely accepted indicator as measure of economic growth, frequently used in comparisons between different countries.

On the other hand, in relation to the previous arguments, in the analysis on the group of 11 CEE countries, we considered as factors that impact on growth and as independent variables: the inflation rate (INFLR), the change in unemployment (Δ UNEM), the variation of exports as percentage of GDP (Δ EXP_G), the variation of imports as percentage of GDP (Δ IMP_G), the variation of foreign direct investment as percentage of GDP (Δ FDI_G), the variation of domestic credit provided by financial sector as percentage of GDP (Δ DCR_G) and the variation of non-performing loans rate (Δ NPLR).

An overview on the economic growth in the countries of Central and Eastern Europe region, highlights, too, as can be seen from the chart below (Figure 1) that in the period under review there were recorded major fluctuations GDP growth rate in all these states, which has certain common characteristics.

GDP growth rate in CEE countries

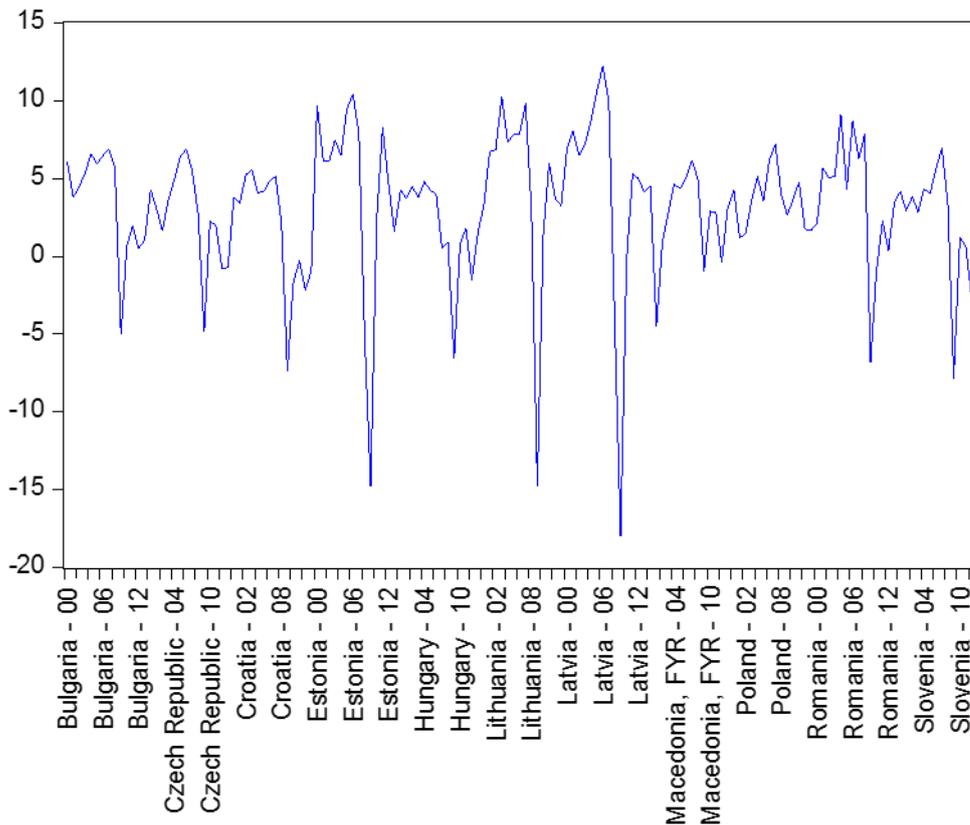


Figure 1 – GDP growth rate trend in CEE countries (2000-2013)

From Figure 1 we remark, in particular, for all the analyzed countries, significant decreases of GDP growth rate corresponding to the period of manifestation of the recent global financial and economic crisis. This fact encourages us to appreciate as necessary for our analysis to take into consideration also the crisis factor, as a determinant of the performance of the economy and therefore of the economic growth, by introducing a dummy variable named "crisis".

IV. RESULTS AND COMMENTS

In the first part of the analysis we used Pearson correlations, to identify the relationships between the evolution of GDP growth rate, regarded as a measure of economic growth and the impact factors taken into consideration. After processing the data corresponding to the considered 11 CEE countries, during 2000-2013, we obtained the results shown in Table 1.

Table 1. The correlation matrix

Covariance Analysis: Ordinary									
Sample (adjusted): 2001 2013									
Included observations: 143 after adjustments									
Balanced sample									
Correlation									
Probability	GDPGR	INFLR	ΔUNEM	ΔEXP_G	ΔIMP_G	ΔDCR_G	ΔNPLR	ΔFDI_G	CRISIS
	1.0000								

	0.1273	1.0000							
	0.1296	-----							
	-0.6733***	-0.0247	1.0000						
	0.0000	0.7701	-----						
	0.2128**	-0.0603	-0.0057	1.0000					
	0.0107	0.4747	0.9460	-----					
	0.5523***	0.0029	-0.3204	0.8276	1.0000				
	0.0000	0.9723	0.0001	0.0000	-----				
	0.1745**	0.0296	-0.0475	-0.2415	-0.1209	1.0000			
	0.0371	0.7260	0.5734	0.0037	0.1503	-----			
	-0.4953***	0.0309	0.3894	-0.0277	-0.2991	0.1241	1.0000		
	0.0000	0.7143	0.0000	0.7424	0.0003	0.1399	-----		
	0.2408***	0.0325	-0.1437	0.2535	0.2779	0.0083	-0.1056	1.0000	
	0.0038	0.6999	0.0869	0.0023	0.0008	0.9219	0.2094	-----	
	-0.5672***	-0.1295	0.2867	0.1137	-0.1106	-0.3411	0.3990	-0.2437	1.0000
	0.0000	0.1231	0.0005	0.1762	0.1884	0.0000	0.0000	0.0034	-----

***, **, * - denotes significance at 1%, 5%, respectively 10% level

Analyzing the data in Table 1 we remark, as expected, that there are significant negative correlations of GDP growth rate indicator with the unemployment rate variation (coef. = -0.6733, Prob. = 0.0000), respectively with the NPL rate variation (coef. = - 0.4953, prob. = 0.0000). In addition, the variable "crisis" is significantly negative correlated with GDP growth rate (coef. = -0.5672, Prob. = 0.0000) in the period 2000-2013, within the group of countries in the analyzed region.

On the other hand, the results confirm significant positive correlations of GDP growth rate with the variation of exports to GDP (coef. = 0.2128, prob. = 0.0107), with the variation of foreign direct investment to GDP (coef. = 0.2408, prob. = 0.0038) and with the variation of domestic credit provided by financial sector to GDP (coef. = 0.1745, prob. = 0.0371). At the same time, we observe that for the analyzed region, the variation of imports to GDP and the GDP growth rate are significantly and positively correlated (coef. = 0.5523, prob. = 0.0000), which leads to the conclusion that the development of these countries has depended substantially of imports.

Surprisingly, unlike other studies, changes in inflation rate appear to be statistically insignificant and positively correlated (coef. = 0.1273, prob. = 0.1296) with the GDP growth rate, while the inflation trend is largely corresponding to the trend of GDP growth rate, according to data for the analyzed period, both indicators

reacting against a sum of different factors and economic policy measures.

Based on the above identified correlations and considerations, we consider that deepening the analysis of the impact factors on economic growth in CEE countries can be carried out, using the Panel Least Squares method, by building and testing an econometric regression model. Thus, considering the GDP growth rate as the dependent variable, respectively the other economic indicators, as determinant variables, we propose an econometric model whose regression equation is as follows (1):

$$y_{jt} = c + \sum_i \beta_i X_{ijt} + \gamma_{jt} crisis + \varepsilon \quad (1)$$

,where j stands for the specific country, t stands for the year, y represents GDP growth rate, X_{ijt} represent the impact factors (excepting crisis), β_i are the coefficients of these determinants, “crisis” is the dummy variable for crisis manifestation, γ is the coefficient of crisis dummy variable and ε stands for the error term.

Testing the model for determining the impact of the factors taken into account as independent variables on GDP growth rate for the period 2000- 2013, in the case of the 11 analyzed Central and Eastern European countries, has led to the results presented in Table 2:

Table 2. Results of testing the proposed model for GDP growth rate

Dependent Variable: GDPGR				
Sample (adjusted): 2001 2013				
Total panel (balanced) observations: 143				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFLR	0.076332	0.049992	1.526873	0.1291
Δ UNEM	-0.837439	0.115846	-7.228903	0.0000
Δ EXP_G	-0.153403	0.109833	-1.396697	0.1648
Δ IMP_G	0.437414	0.091700	4.770030	0.0000
Δ DCR_G	0.071947	0.043078	1.670174	0.0972
Δ NPLR	-0.117818	0.074345	-1.584746	0.1154
Δ FDI_G	-0.003904	0.032468	-0.120253	0.9045
CRISIS	-2.947788	0.517271	-5.698734	0.0000
C	3.535058	0.464390	7.612260	0.0000
R-squared	0.747578	Prob(F-statistic)		0.000000
Adjusted R-squared	0.732508	Durbin-Watson stat		1.658797

The data in Table 2 confirm the good level of viability of the proposed and tested model (R-squared = 0.7476, Adjusted R-squared = 0.7325), which expresses the fact that the dependent variable GDP growth rate is relevantly determined by the considered determining factors.

We note the negative impact, significant both in terms of the value of coefficient and in statistical terms (below the significance threshold of 1%) of the unemployment rate variation and of the financial crisis on the GDP growth rate, which confirms the above results and expectations. Also we find further a negative impact of non-performing loans rate variation, although above the materiality threshold of 10%, but close to it.

At the same time, however, it appears that, unlike the correlations recorded before, exports and foreign direct investments result having a negative and insignificant impact (especially in the case of the second factor) on the economic growth in the period under review in CEE countries, which may express that their dimensions were insufficient in relation to the needs of developing countries in the region.

On the other hand, it is confirmed once again the positive and statistically significant impact of the imports (prob. = 0.0000) and domestic credit provided by financial sector (prob. = 0.0972) factors on the economic growth, which corresponds to our expectations. At the same time, however, it confirmed also the insignificant positive impact of inflation on GDP growth rate, which corresponds to the previously established correlation between these indicators.

V. CONCLUSIONS

Our research is focused on the idea that ensuring economic growth, as key objective of the different countries, and especially of the countries in developing regions, such as the Central and Eastern Europe, is dependent on the action of several impact factors, both non-economic, and especially of macroeconomic type.

In this context, the empirical analysis has been developed on a group of 11 CEE countries, for the period 2000-2013, aiming to identify the magnitude and the direction of determination of economic growth, proxied by

the synthetic indicator GDP growth rate, by several impact factors expressed through macroeconomic indicators such as inflation, foreign direct investments to GDP ratio, imports to GDP ratio, exports to GDP ratio and unemployment. We also took into consideration the impact of the development and the performance of the banking systems as main financiers of the economies in Central and Eastern Europe area and the impact of the manifestation of the recent financial and economic crisis.

Thus, in a first part of the analysis on the countries in CEE we found significantly positive correlations of the economic growth with exports, imports, foreign direct investments and the domestic credit provided by financial sector. On the other hand, we note significant negative correlations of GDP growth rate with unemployment, respectively with the NPL rate and the manifestation of the financial and economic crisis.

The analysis was deepened by building and testing of an econometric regression model, with GDP growth rate as the dependent variable and considering the mentioned impact factors as independent variables. Thus, unlike in correlations case, exports and foreign direct investments appear to impact negatively and insignificantly (especially the second factor) on economic growth in the period under review in Central and Eastern European countries, which suggests that their size was insufficient, to the needs of developing countries in the region. At the same time and relatively surprising, inflation seems to have a positive impact on economic growth, but not a significantly one, in terms of the resulted coefficients both in the case of correlations and after testing the proposed model, due to its action in conjunction with several other factors and possibly on the background of the measures taken by central banks for limiting this phenomenon.

The test results of the proposed model showed, however, primarily, significant positive impact of the factors imports and domestic credit provided by financial sector on economic growth and significant negative impacts of unemployment, respectively of the manifestation of the financial and economic crisis. Also, the lack of performance in banking sector lending activity (proxied by the NPL rate variation) proves to be a negative impact on the economic growth. Under these circumstances, we consider that the main goal of the Central and Eastern European countries should be to create the necessary climate in order to reduce significantly the unemployment rate and to provide means for the development and improvement of the banking system performance. On the other hand, it is necessary to stimulate exports and to attract foreign direct investments to make them help the future economic growth.

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