

Econometric model Concerning The Impact Of The Fiscal Policy Upon The Economic Development. The Case Of The Countries From Central And Eastern Europe, Members Of The European Union

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This article aims to demonstrate the confirmation or the refutation of the hypothesis that there is a connection between fiscal policy and economic development. The study begins with an overview of the main theoretical contributions. A few indicators that give the measure of the economic development are analysed for the sample of the Central and South Eastern European countries, members of the EU. The empirical analysis seeks to establish the relevance of the main determinants of the economic development (GDP per capita) and the three levers of the fiscal policy (fiscal pressure, the share of public expenditure in GDP and budgetary balance in the share of GDP), for each country, of the sample of the 12 countries of Central and South Eastern Europe, the new members of the European Union, during 2001-2010.

Keywords: economic development; economic growth; fiscal policy; panel data; EU.

JEL Classification: C21, C23, E62, H20, O11

Introduction

The economic growth is a complex process that aims the economic system as a whole and its dynamics. Through its content, it means a positive ascending evolution, of the national economy, without excluding the conjectural fluctuations and even some certain temporary regressions. Even terms like “zero economic growth” and “negative economic growth” are used. The results of the economic growth can be measured through synthetic indicators as gross domestic product (GDP), gross national product (GNP), national income, both total and per inhabitant (NI)¹.

The types of economic growth are:

- The extensive type, corresponding to quantitative sides of the direct factors which contribute to GDP forming;
- The intensive type, corresponding to qualitative sides. It is specific, especially to advanced economies. The two aspects are not exclusive, alternating in the economic development of a country.

In conclusion, the characteristics of the process of economic growth can be:

1. conducted on the basis of an ample process of formation of a new technical way of specific to corporations;
2. a type of mainly intensive growth is taking shape;
3. is related to the quality of life.

The economic development simultaneously captures quantitative, qualitative and structural aspects of the economic evolution, in conjunction with demographic development and general issue of the human, and with the evolution of the ecological balance. The basic idea that defines the economic development is that of change, of transformation of structures in economy, of economic system behaviour, of the relationship between the human activities and the environment.

The concept of economic development is multidimensional.

Firstly, the economic development implies the economic growth itself, there is no economic development process, without an increase of the macroeconomic results on long term.

Secondly, economic development has an ample historical connotation; it captures the process of the economy transition of a given human society, from an inferior form of evolution to another superior one, including numerous

¹ In our study the synthetic indicator, which quantifies the economic growth is GDP per capital

temporary zigzags caused by different historical situations.

Thirdly, the economic development can be defined in a narrower sense, as the development of production factors, namely the development of the main components of the economy within the framework of a national-state space.

Fourthly, the concept of economic development concerns, especially at present, in particular the progress made in the relations between operators and their economic environment, the structures not only technical, but also social and psychosocial of the production and the national environment.

In conclusion, any economic development supposes also an economic growth, but not any economic growth represents an economic development.

In this context, of a given economic growth, we are trying to capture the economic development influenced by the fiscal policy levers (fiscal pressure, the share of public expenditure in GDP and the budgetary balance in GDP).

Fiscal policy ranks as a sphere of coverage within the budgetary policy, which falls it self within the scope of the financial policy and further into the economic policy.

The fiscal policy, as part of the economic policy of the State includes the set of methods, techniques, principles relating to operations, relations, institutions and rules specific for determining and levying the taxes, the fees and the contributions, materializing the state options, at a given time in this area.

The fiscal policy, like all economic policy, is characterized by dynamism, because the economic-social life also is in a continuous change and diversification.

In any context, it should be borne in mind at all times an important aspect; the fiscal policy is only one of the financial policy components, namely, the economic one. Therefore, the fiscal policy cannot solve alone the problems of the errors in an economy compassed by the crisis and it is unable to maintain the process of macroeconomic stabilisation, under the terms of a growing unemployment and a high rate of inflation.

In the analysis of the fiscal policy impact upon the economic growth, we must not ignore the short-term effects – the fiscal policy is an instrument through which short-term fluctuations are alleviated, the budgetary taxes and expenses being used as levers in changing the aggregate demand in order to move the economy to the potential level of GDP. “The fiscal and budgetary policy is more a political priority than an economic one”, conclusion that was

reached as a result of the econometric analyses carried out during 1997-2003 for Romania, Bulgaria, Lithuania, Latvia, Estonia, Poland, Hungary, the Czech Republic, Slovakia and Slovenia (Fabrizio & Mody, 2006).

The objective of this study is to analyse the determinants of the economic development starting with a theoretical approach, continuing with a descriptive one and finishing with an empirical one. The countries concerned are the EU member countries, observed during 2001-2010. The study captures also the implications, in terms of public policies, in the current context of the world economic crisis.

The article is structured as follows: section 2 constitutes a review of the main contributions at theoretical level brought over time, with reference to the models of economic growth; section 3 is a descriptive analysis of the main determinants of the economic growth; an empirical approach to these problems is presented in section 4; and section 5 concludes.

Theoretical Fundamentals and Hypotheses

The *hypothesis tested was as follows: the existence of a connexion between the fiscal policy and the economic development*. The development of Solow's neoclassical model of growth has allowed the study of the dynamic impact that taxation has on growth. In the same context, Diamond introduces in the model the intergenerational factor and he highlights the growth effect generated by the fiscal policy. As in the neoclassical model to achieve the status of stationary state is determined by external factors (the population dynamics and the technological progress), the fiscal policy can only influence the rate of growth during the period of transition towards it. Because of that, it may be considered that the differences in the fiscal system, from the deficit or from the budgetary policy can be considered as important factors for the level of production, but less for long-term growth rates (Diamond, 1956).

The models of endogen growth tend to transform the temporary effects of the fiscal policy in permanent effects of growth (Romer, 1986). Most of the growth models consider taxes on investment and on income as having a negative effect on economic growth. These taxes affect the rate of growth, directly, by reducing the net profit earned. But not all taxes affect the growth. In the models in which the employment offer is considered to be exogenous, the rate of growth is immune to the level of taxes on consumption. These taxes do not distort the relative price of consumption in the current period in

relationship with the future, leaving unchanged the desire of accumulation of capital.

In conclusion, in what concerns the fiscal system, the elaborated economic patterns highlighted the fact that, thanks to the dues and taxes characteristics to distort the economic activity of private agents, an increase of their level limits the economic growth.

The effect of a growth in the governmental consumption can be considered to be null under the circumstances where we consider this component of the public expenses not modifying the productivity of the private area. On the contrary, Aschauer and Barro consider that public investments have a positive impact on the private area and implicitly on the growth rate (Aschauer & Barro, 1990).

The effects of the governmental shortage are much more complex. In the intergenerational patterns, governmental shortage leads to a decrease of the saving rate and the growth rate (Alogoskoufis & Rodrick, 1991). In patterns with unlimited horizon, the shortage depends on the variables that must be adjusted in the future for clearing (Chamley, 1986). If a raised shortage in present time will be equalised in the future with a more increased level of taxes and dues, the growth rate will diminish.

The fiscal policies may exert important macroeconomic effects, especially short term, the use of different instruments leading to differenced results (Skinner, 1992). Thus, a change in the budgetary expenses determine a raise of the public economic sector, while a decrease of the tax rate will make the permanent available income raise, leading to the increase of the consumption expenses, implicitly, to the development of the private economic sector. The choice between the two instruments will be made according to the social benefits expected to be obtained from a larger consumption of from more products in services that are oriented to the public area. Another element that may be taken into consideration is the clients' choice to increase consumption expenses or saving, after the income increase due to fiscal system rate reduction. If they choose the second option, the immediate effect over the production is little perceptible, expecting to be expressed on long term by transforming savings in investments. This differentiation does not appear in case of the budgetary expenses modification, the effect being immediately felt in the aggregated request, namely in the production level. The differentiation between the two instruments of the fiscal policy is disclosed also by the changes character. Thus, a permanent change in the fiscal system rate leads to a much

stronger effect as in case of a temporary change that could be compensated by the economy's fluctuations. Concerning the budgetary expenses modifications, their temporary character has a much stronger impact.

Empirical model, dates and methodology

Through empirical analysis, we intend to identify the relevant determiners of the economic development, weighed through the gross domestic product per capita, estimated on the parity of the buying powers.

For their selection we have in view our intuitions and theoretical fundamentals and we consider as being relevant factors: (i) the fiscal system level from other countries and (ii) the weight of public expenses in GDP and (iii) the weight of budgetary balance in GDP.

(i) Concerning the fiscal system, the elaborated economic patterns highlighted the fact that, due to the taxes and dues characteristics to distort the economic activity of private agents, a raise of their level limits the economic growth, while a decrease of their level is able to stimulate economic growth.

(ii) A change in the budgetary expenses determines a raise of the public sector weight in economy, while a decrease of the tax rate will increase the available income, leading towards a consumption expenses growth, implicitly to the development of the economic private sector.

(iii) The effects of the governmental shortage are much more complex. In the intergenerational patterns, the governmental shortage leads to a decrease of the saving rate and of the growth rate.

Our empirical study is based on a panel from 12 countries (Bulgaria – BG, Cyprus- CY, Czech Republic – CZ, Estonia – EE, Hungary – HU, Latvia - LV, Lithuania – LT, Malta – MT, Poland – PL, Romania – RO, Slovenia – SI, Slovakia – SK) selected as being members of the EU and analysed between 2001-2010.

The empirical specification takes the following shape:

$$Y_{it} = \alpha + X_{it}\beta_{it} + \delta_i + \gamma_t + \varepsilon_{it}$$

where:

Y_{it} – dependent variable;

X_{it} – independent variables' vector;

α – coefficient of free term;

β – coefficient of independent variable;

δ – effect parameter specific to „sections“;
 γ – effect parameter (fixed or random) specific to time periods;
 ϵ_{it} – random variables;
 i – number of „sections“ after which the regression is made;
 t – period of time.

Results and Discussions

Descriptive Analysis

The role of taxes as fiscal policy elements manifests financially, economically and socially and its real mode of manifestation differentiate from an economic development step to another (Bebeșelea, 2010). In most of the countries in the world, the most important role of the taxes manifests financially because they represent the main means of obtaining the financial resources necessary to cover public expenses. Economically, taxes' role consists in the fact that, they are used as economical politic instruments, through which some activities, areas (regions), consumption of some merchandise and/or services, commercial relations with the foreign countries, generally, can be stimulated or limited. Socially, taxes role is materialized in the fact that, through them, the country performances for the redistribution of an important part from the gross domestic product between social groups and individuals. The great effect of the taxes role is socially represented by the fiscal pressure growth.

Fiscal pressure means how overwhelming the taxes are, or, in other words, how big the fiscal burden over the taxpayers' shoulders is.² Fiscal pressure is measured through the fiscal system rate. The term of fiscal pressure rate or fiscal system rate is closely connected to mandatory samples and equal to the rate between the taxes system and social dues really taken by the state and GDP. From here, this indicator has double meaning:

- *Widely speaking*, the fiscal degree (or fiscal system rate) macroeconomically may be expressed as a rate between budget collections as taxes and social dues, on one side, and GDP, on the other side;
- *Narrowly speaking*, fiscal degree is reflected through the percentage rate between budget collections as taxes (fiscal income), on one side, and GDP, on the other side.

This indicator allows the achievement of a comparison between states,

² The increase of tax burden is a source of conflict and does not generate a general motivation for work, thereby encouraging work on the black market and fraud.

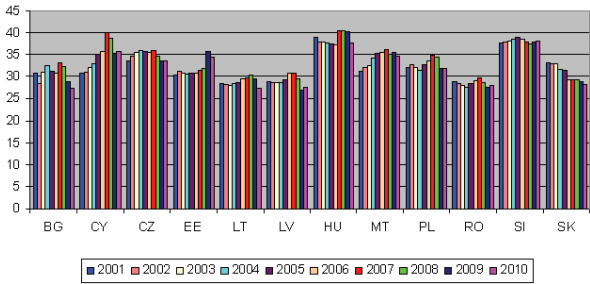
because the weight of those taxes and social dues is not indifferent in financing the social security assured by the public power.

Thus, in developed countries, the state takes over, at its will, through taxes a larger part from the gross domestic product, than in developing countries.

To mention is, thus, the fact that there are differences, sometimes pretty important, and between developed countries, as between developing countries as well.

Comparative evolutions of fiscal pressure in central and south east countries, new members of the EU are presented as:

Figure 1 Tax burden ratio (excluding SSC) in central and south east countries new members of the UE



Source: elaborated by authors, in Eurostat database (online data codes: gov_a_tax_ag)

As we mentioned, above, fiscal pressure, calculated based on the budgetary income, leads to the following conclusions. The lowest values are specific to the less developed countries, while to more developed countries we associate a higher fiscal pressure. It is normal to be this way because where there is a high level of life, there also is a contributive capacity, therefore the possibility to attract significant resources to the budget.

Taking these differences concerning the fiscal level in one country or another, into consideration, it is normal the importance given the identification of factors that express this fact.

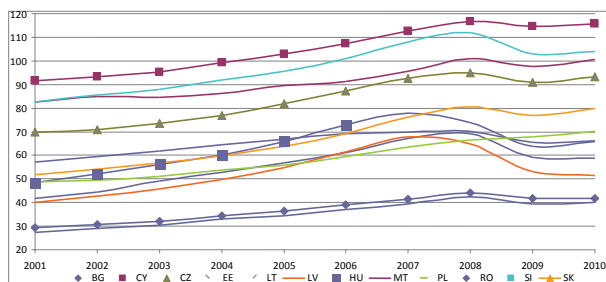
In specialty literature we find opinions according to which the fiscal rate level from a certain country is influenced, both by factors extern to the taxes system and by its internal factors.

From **external factors** category, we firstly exemplify the development degree of a country, highlighted through the gross product per inhabitant. Thus, in developed countries, the income and the wealth of individuals are

more consistent, their contributive capacity is higher and the state can decide high taxes, without the fiscal burden become unbearable.

GDP evolution per individual in central and south east countries, new members of the EU, is presented as:

Figure 2 GDP per capita (%) in central and south east countries new members of the UE



Source: elaborated by the author based on the Eurostat database (online data codes: nama_gdp_c, nama_gdp_k, tecoooo1 or tsiebo2o)

As noticed from the GDP per capita evolution, an active performance, until 2007 was registered by Estonia, Latvia, Lithuania, Slovenia and Slovakia.

After crucial year 2008, also the perspectives for the future two years are less thrilling, although there are signs of economies revival. Prognosis elaborated indicate the fact that in the next few years, ECSE countries will develop pretty unequal, with a high diversity and will not reach the growth level before the crisis. The ECSE countries evolution can be separated in 3 groups 1) Poland –with the solidest economy in the area; 2) 4 countries that achieved a modest growth during 2010 – Czech republic, Slovenia, Romania and Slovakia; 3) 5 countries whose economies decreased during 2010 – Hungary, Bulgaria, Lithuania and Latvia.

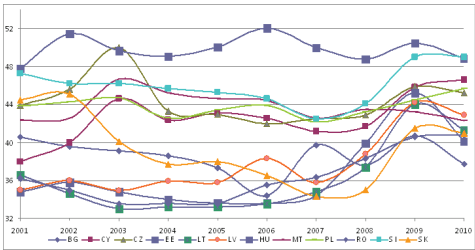
Priorities established by the public authorities regarding the destination of financial resources concentrated for the state, represent another external factor of influence of the fiscal pressure.

Thus, in countries with high life level of people, in which the state spends more for the social security, education, health, fiscal system rate is higher. The state is involved in the social and economic life, and the degree of taxes reversibility is high. This fact is shown in the demand increase and the new jobs creation.

Other external factors are: property structure, the degree of

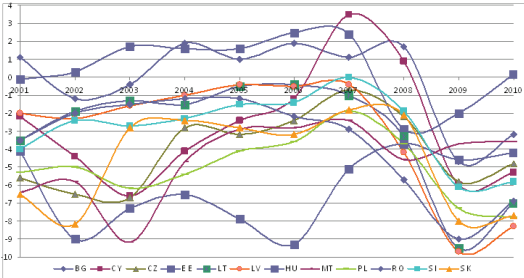
understanding by the taxpayers the budgetary necessities and political adhesion to the Government's politics, but also the democracy stage in one country or another. Also, public credits used for public financing expenses could appear short term as a decrease factor of fiscal pressure, but in long term they strengthen it.

Figure 3 Public expenses evolution in GDP in central and south east countries new members of the UE



Source: elaborated by authors in Eurostat database (online data codes: gov_a_main)

Figure 4 Budgetary balance evolution in GDP in central and south east countries, new members of the EU



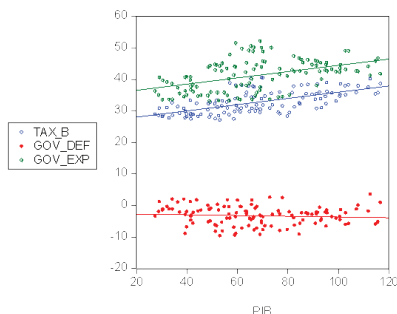
Source: elaborated by authors in Eurostat tsieb o8o and tsieb o9o

Among **internal factors** of taxes system, there is, firstly, progression taxation quotas ladder, progressive taxes attracting solidier income than proportional ones. Thus, in countries where gains from taxes have a higher weight in gross domestic product, we also find taxation quotas with a higher progression. Related to this aspect, we have to underline that countries with a lower fiscal degree achieve to attract a part form the capitals in countries with higher fiscal system. In the internal factors category, there is also placed the taxable subjects' determination method. Here, important are the deductions admitted and what are the criteria involved, as well as the fiscal facilities

importance.

Empirical Results

For the identification of the connection form of the variables, we will represent graphically the cloud of dots:



The analysis of the method in which the dots are disposed on the graph surface, allows the study of the following aspects, related to:

1. **connection existence:** whereas dots are not spread, but grouped, placed on a line, fact which reflects that variables do not modify simultaneously after a rule, we can assert that between Y (dependent variable) and X (independent variable) there is a connection in the pattern;

2. **connection sense:** because most of dots are placed on a descendent line, the connection is inverse proportional, which means that a growth of the gross domestic product determines the decrease of fiscal pressure, the weight of budgetary expenses in gdp and budgetary shortage weight in gdp;

3. **connection form:** the form of the part where the dots are placed suggests the connection form between the variables. In our case the part is linear (looks like a line), fact that suggests a linear connection, $Y = aX + b + \varepsilon$;

4. **connection intensity:** the lateral where the dots are is inverse proportional with the connection intensity – a wide side indicates a connection of low intensity, a narrow side – a strong, tight one. In our case, the relatively narrow side suggests the existence of a medium intensity to strong connection in the values pattern.

The econometric testing of the relation between GDP per capita and fiscal policies instruments (fiscal pressure, budgetary expenses weight in gdp and budgetary shortage

weight in gdp)

Correlated Random Effects - Hausman Test

Equation: REGRESIE

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.2941193	0.0981	

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TAX_B	2.040224	2.649749	0.087912	0.0398
GOV_EXP	-0.895759	-1.060103	0.028621	0.3313
GOV_DEF	-0.960684	-1.275455	0.054611	0.1780

Cross-section random effects test equation:

Dependent Variable: PIB

Method: Panel Least Squares

Date: 03/28/12 Time: 14:21

Sample: 2001 2010

Periods included: 10

Cross-sections included: 12

Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34.69382	19.44086	1.784582	0.0772
TAX_B	2.040224	1.065780	1.914301	0.0583
GOV_EXP	-0.895759	0.885372	-1.011732	0.3140
GOV_DEF	-0.960684	1.045979	-0.918454	0.3605

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.883116	Mean dependent var	67.70167
Adjusted R-squared	0.867531	S.D. dependent var	22.96210
S.E. of regression	8.357357	Akaike info criterion	7.200630
Sum squared resid	7333.768	Schwarz criterion	7.549066
Log likelihood	-417.0378	Hannan-Quinn criter.	7.342132
F-statistic	56.66591	Durbin-Watson stat	0.253968
Prob(F-statistic)	0.000000		

Source: Eviews

Conclusions

To evaluate the results obtained thanks to the linear pattern of multiple regression, it is necessary to establish, from the very beginning, if this can be considered to be correct, and the results that this offers, can be used in real macroeconomical analysis.

As it can be noticed, the probability that this pattern be a correct one is extremely high – approximately 88.3%, this conclusion being able to be formulated on the values determined with the help of Eviews program for R tests – squared (0,883116) and Adjusted R – squared (0,9989). Determination coefficient R has an extremely high value, fact which matches the validity of the pattern used. Additionally, specific to “pool” type regressions, Durbin-Watson test indicates certain existent autocorrelations in residual variables, fact which doesn’t validate though the global quality of the pattern.

Also, the validity of this regression pattern is confirmed by the F tests values – statistically (18023,91 – value a lot superior to the tables’ level which can be considered a marker point in the validity analysis of econometric patterns), as well as the null risk degree (reflected through Prob F value – statistic). Based on the elements mentioned above, we can consider the regression pattern that describes the correlation between the gross domestic product value and fiscal politics variables, as being correct, which reflects the real level of the economic development.

This regression pattern allows us to establish a series of aspects regarding the existent relation between variables used. To remark is the fact that between the gross domestic product value and fiscal politics instruments,

between 2011 -2010 there is a significant relationship. Thus, we can mention the fact that the results obtained emphasize the following:

1. between gross domestic product evolution and fiscal pressure evolution, there is an inverse relationship, in the sense that a decrease of the fiscal system level determines in time a growth of the gross domestic product per capita level;
2. between the gross domestic product evolution and public expenses evolution there is an inverse relation in the sense that a public expenses decrease determines in time a growth of gross domestic product per capita level. This situation is a paradox, but it can be explained through the fact that the governmental authorities in these countries, most of which were ex-communist, diminished governmental intervention in economy to offer a higher degree of markets democracy;
3. Between gross domestic product evolution and budgetary balance evolution, there is an inverse relation, in the sense that a decrease of the budgetary shortage determines in time a growth of the gross domestic product per capita level.

In conclusion, we appreciate that the economic development process can be influenced through fiscal policies measures taken by the governmental authorities. Thus, effects of such measures are diverse and different from a particular case to another, which triggers the lack of a universal valid solution for governmental authorities that wish to stimulate economic development. In consequence, the success of using fiscal politics instruments by the authorities for training and intensification of economic development depends decisively on their capacity to appreciate current economic situation, to choose the right intervention instrument and to correctly anticipate the effects produced by its use in the economy.

Acknowledgements

I should like to thank to referees of this journal for future helpful comments on an version of this paper.

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