ANALYZING FISCAL BALANCE EVOLUTION
FOR DEVELOPED AND EMERGING COUNTRIES

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Abstract

The purpose of our paper is to analyze the main factors which influence fiscal balance's evolution and thereby identify solutions for configuring a sustainable fiscal policy. We have selected as independent variables some of the main macroeconomic measures, respectively public debt, unemployment rate, economy openness degree, population, consumer goods' price index, current account balance, direct foreign investments and economic growth rate. Our research method uses two econometric models applied on a sample of 22 countries, respectively 14 developed and 8 emergent. The first model is a multiple regression and studies the connection between the fiscal balance and selected independent variables, whereas the second one uses first order differences and introduces economic freedom as a dummy variable to catch the dynamic influences of selected measures upon fiscal result. The time interval considered was 1999-2013. The results generated using the two models revealed that public debt, current account balance and economic growth significantly influence the fiscal balance. As a consequence, the governments need to plan and implement a fiscal policy which resonates with economy priorities and the phase of the economic cycle, as well as ensure a proper management of the public debt, stimulate sustainable economic growth and employment.

Keywords: fiscal balance, public debt, economic growth, fiscal sustainability

JEL classification: H62

1. INTRODUCTION

In the aftermath of the economic crisis which started in 2007, both fiscal authorities and researchers focused their attention upon fiscal policy, which similar to the monetary policy, has to be controlled and planned as responsible regulations (Leeper, 2010; Daniel and Shiamptanis, 2013). To become responsible fiscal policy needs to be sustainable. Moreover, the appropriate use of fiscal policy tools according to economy's characteristics

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and economic cycles' phases, as well as finding an optimal policy remain a challenge for fiscal authorities and researchers across the world.

The diversity of fiscal policies is justified by reasons such as country's base characteristics, economy's development stage, financing constraints, exchange rates' regime, public finances' sustainability and economic policy's objectives.

The need for analyzing fiscal balance also originates from the effects it has upon aggregated demand and payment balance's current account. The budgetary deficit can stimulate aggregated demand, whereas the surplus can contract it. On the other hand, financing the budgetary deficit affects economy's real sector through the crowding-out effect.

We approach the relation between fiscal balance and some fiscal and macroeconomic variables to identify the main factors which can contribute to configuring a sustainable fiscal policy. We have also researched whether country size (population) has a significant bearing upon fiscal sustainability.

Our article has for starting point the research of Benetrix and Lane (Bénétrix and Lane, 2010). However, whilst their research follows fiscal balance's short term evolution (2007 – 2009) for a large number of countries, we analyze for a longer period of time (hence without being confined to economic crisis' period) a smaller sampler of countries.

Our research method uses two econometric models for a sample of 22 countries, 14 of which are developed and the remaining 8 emergent. The first model is a multiple regression studying the connection between fiscal balance and selected independent variables, whereas the second one uses first order differences and introduces economic freedom as a dummy variable to catch the dynamic influences of selected measures upon fiscal result.

Our paper does not intend to analyze sustainability or a-/pro-cyclicality of fiscal policy. Rather we are looking to identify and check the main factors influencing fiscal result. The analysis follows the way these factors influence fiscal balance and its evolution to contribute reaching a state of fiscal sustainability.

The paper is structured as follows: Section 2 shortly approaches field literature; Section 3 presents data, methodology and empirical results and Section 4 presents an analysis of fiscal balance's evolution, whilst Section 5 concludes.

2. SHORT REVIEW OF FIELD LITERATURE

The global financial crisis which started in 2008 generated a whole set of debates about the design of fiscal policies, public debt sustainability and the nexus between fiscal and financial sustainability.

Favero *et al.* (2011) analyzed the impact of fiscal policy multiplier and found that the effect of fiscal policy on output is different depending on the different debt dynamics, the different degree of openness, and the different fiscal reaction functions across different countries. The authors concluded that there is no unconditional fiscal policy multiplier.

Pareto optimality refers to a state of resource allocation in which the improvement of one individual's living standards does not affect the living standards of any other individual.

Buchanan (1962) claims that the Pareto positions' allocation procedure, allowing a person to benefit without negatively affecting another person is incomplete and it should be extended to include a set of organizational rules reflecting the popular decision regarding allocation.

Closely connected with optimal allocation, Ramsey (1927) has defined the Ramsey equilibrium, which concerns funds allocation to the private system through fiscal policies, a set of rules and a price function. As such, the equilibrium is reached when the efficiency of

funds allocation to the private system is maximized, ensuring a higher utility within existing set of rules.

Based upon Pareto optimality and Ramsey allocation, several economists have studied fiscal optimality and sustainability across various economic models. Inside an exchange based economy, with a public debt having sufficiently diverse maturities, the optimal fiscal policy is time-consistent (Lucas and Stokey, 1983). The public debt homogenizes economical distortions and remains efficient as long as government keeps its commitment to reimburse it and maintains the same taxation level.

Chari and Kehoe (1998) have analyzed fiscal and monetary policies' optimality under variants of neoclassical models of economic growth. Fiscal optimality relies on a-cyclicality regarding income taxes. The capital taxes average to zero during an economic cycle and monetary policy's interest rate also tends to go to zero. The monetary mass has an a-cyclic evolution concerning technological shocks and a pro-cyclic one regarding government consumption (Chari *et al.*, 1991).

Inside a stochastic model of economic growth Zhu (1992) characterizes taxation optimality assuming governments commit to elaborate policies which will be arbitrarily implemented during future periods. This assumption is important given the time–inconsistency of the policies that turn out to be optimal (Klein and Ríos-Rull, 2003).

Chari *et al.* (1994) have proven, for a model based on the business cycle, that only a small fraction of welfare is given by a-cyclicality, with most welfare coming from significant capital taxation during the transit periods.

A strong capital taxation also appears when government cannot commit to maintain a stable taxation level across time. In this framework, income taxes are less volatile (Klein and Ríos-Rull, 2003).

The fiscal optimality concept and its determinants were studied by Lukkezen and Teulings (2013), respectively by Bénétrix and Lane (2010).

Ali Abbas *et al.* (2011) examined the relationship between fiscal policy and the current account, drawing on a large sample of advanced, emerging, and low-income economies and found that on average, a strengthening in the fiscal balance by 1 percentage point of GDP is associated with a current account improvement of about 0.3 percentage point of GDP.

Lukkezen and Teulings (2013) reached the conclusion that in the long run unemployment rate and economic growth as measures of welfare and fiscal policy's optimality tend towards natural rates, uninfluenced by the discretionary fiscal policy. Nevertheless, public debt strongly influences these two measures and it is influenced in its turn by the discretionary fiscal policy.

The optimal policy is seen as having a counter-cyclic response to economic cycle evolution (Lukkezen and Teulings, 2013). For many developing countries, fiscal policy is often pro-cyclic, as researched and proven by numerous economists (Gavin and Perotti, 1997; Lane, 2003; Talvi and Végh, 2005; Kaminsky *et al.*, 2004; A. Alesina *et al.*, 2008; Klemm, 2014).

Industrialized and Eurozone countries seemingly employ an overall counter-cyclical fiscal policy, however in reality they tend to have pro-cyclic policies in the "good" periods and countercyclical in the "bad" periods (Langedijk, 2004). Cimadomo (2012), starting from an ex-ante and ex-post analysis of the fiscal policy, using real-time data for an OECD country panel, has shown that even when governments plan a countercyclical policy the ex-post results reveal a pro-cyclic policy.

Alberto Alesina and Ardagna (2010) have analyzed fiscal stimuli and fiscal adjustments' impact upon public debt, budgetary deficit and economic activity. The results show that in case of fiscal stimuli cutting taxes is much more expansionist than increasing expenditures. For fiscal adjustments, the authors claim that cutting expenditures is more efficient than increasing taxes in order to stabilize the public debt and avoid economic recession periods.

Bénétrix and Lane (2010) have analyzed fiscal result according to different characteristics of fiscal optimality, such as the evolution of country's main macroeconomic indicators and dummy variables, respectively the evolution of credit, country ratings and IMF assistance, as well as political constraints for a group of 22 developed countries and 30 emerging countries. Their econometric model follows the evolution of the difference between budgetary revenues and expenditures for the economic crisis period. The researchers have obtained consistent results for the studied sample regarding the connection between fiscal balance and pre-crisis credit increase, unemployment rate and political constraints. Variables such as bank crisis, decreased country ratings or taxation level were found insignificant (Bénétrix and Lane, 2010).

Our paper tests and analyzes the connection between fiscal balance and certain macroeconomic indicators using a multiple regression. To reveal the influences of the macroeconomic measures upon the evolution of fiscal balance we have used first order difference for both dependent and certain independent variables and also employed several dummy variables. Moreover, we have tested the delayed effects of certain variables upon fiscal result, using one and two years' lags. The sample comprises 22 countries, respectively 14 developed and 8 emergent for 1999 to 2013 period.

3. DATA, RESEARCH METHOD AND EMPIRICAL RESULTS

We have used data from World Bank's, IMF's and OECD's data bases. The economic freedom measure is obtained from Free the World's data base.

To analyze the main determinants of the fiscal balance we have used an econometric model inspired from Bénétrix and Lane (2010). Our model tests fiscal's balance evolution in relation with different economic and financial indicators to establish the connection between government's revenues and expenditures and national economy's situation. The analysis period is 1999-2013, with a sample made of 22 countries (Australia, Canada, Denmark, Switzerland, Germany, Iceland, Ireland, Netherlands, New Zealand, Norway, United Kingdom, Singapore, Sweden, United States of America, South Africa, Brazil, China, India, Indonesia, Mexico, Russia, Turkey).

We have chosen two different groups of countries, developed and emergent countries, to check whether chosen variables exert similar type of influences upon fiscal balance for the two groups. We have selected the emergent countries since in their case fiscal policies' effects are more visible for the entire economic cycle's period, whereas for developed countries those are evident only during transitional periods. Another motivation for choosing this sample was identifying some leverages for optimizing fiscal policy for both developed and developing countries. We have looked to identify the correlations for each of the two groups as well as for the entire sample.

The first 14 countries are classified as the most advanced HDI (Human Development Index) countries according to the 2013 ranking. The remaining 8 are part of the BRICS emergent countries, plus Indonesia, Mexico and Turkey, which are also generally

considered as emergent countries. The period selected for our study is appropriate as it includes the pre-crisis economic boom, the economic recession and economic growth recovery periods.

The descriptive statistics are presented in Tables no. 1 and no. 2 below.

Table no. 1 – Summary statistics

Variables	No. of observations	Mean	Std. Deviation	Min	Max
F_bal	330	1.463305	13.19924	-29.337	69.39376
Debt	330	52.3073	24.60858	7.876	122.014
Crt_acc	330	2.613637	10.17145	-23.5917	98.98
Openness	330	81.2401	74.56735	2.548	439.6567
GDP_growth	330	3.337656	3.368249	-7.790248	15.24038
Pop	330	1.72e+08	3.44e+08	277381	1.36e+09
FDI	330	4.265778	5.505245	-5.695222	26.52124
CPI	330	87.5698	18.0709	12.4452	131.9747
Unempl	330	6.745152	4.618628	2	27.2

Source: data processed by the authors

Table no. 2 – Summary statistics - Correlation

	F_bal	Debt	Crt_acc	Openness	GDP_growth	Pop	FDI	CPI	Unempl
F_bal	1								
Debt	-.2824	1							
Crt_acc	.6433	.1847	1						
Openness	-.0637	.4108	.3116	1					
GDP_growth	.1898	-.1660	.1227	.0520	1				
Pop	-.1221	-.0642	-.0451	-.2299	.4852	1			
FDI	.0400	.1686	.1454	.6358	.1733	-.1486	1		
CPI	-.1727	.0359	-.1447	.1952	-.2214	-.0452	.1007	1	
Unempl	-.0545	.0074	-.0815	-.1732	-.0792	-.1437	-.1627	-.1062	1

Source: data processed by the authors

Our first model is:

$$Fbal_{i,t} = \alpha + \beta_1 Debt_{i,t} + \beta_2 crt_{acc_{i,t}} + \beta_3 Openness_{i,t} + \beta_4 GDP_{growth_{i,t}} + \beta_5 Pop_{i,t} + \beta_6 FDI_{i,t} + \beta_7 CPI_{i,t} + \beta_8 Unempl_{i,t} + \varepsilon_{i,t}$$ (1)

where:

$Fbal_{i,t}$: the fiscal balance (the difference between budgetary revenues and expenditures), as percentage of GDP for the *i* country in the *t* year;

$Debt_{i,t}$: total government debt as percentage of GDP for the *i* country in the *t* year;

$crt_{acc_{i,t}}$: current account balance, as percentage of GDP for the *i* country in the *t* year;

$Openness_{i,t}$: economy's openness degree, or the sum between exports and imports as percentage of the *i* country's GDP for the *t* year;

$GDP_{growth_{i,t}}$: the annual GDP growth against precedent year $(t – 1)$ for the i country in the t year;

$Pop_{i,t}$: i country's population (number of inhabitants) for the t year;

$FDI_{i,t}$: foreign direct investments (the net value) as percentage of GDP for the i country in the t year;

$CPI_{i,t}$: the consumer goods price index, (with year 2010 as base year) for the i country and the t year;

$Unempl_{i,t}$: the unemployment rate, as percentage of total labor force for the i country and the t year;

$\varepsilon_{i,t}$: specific error term.

We first used Hausman test, to check whether the regression has fixed or random effects and implies subsequent testing hypotheses. William Greene (2008) recommends Hausman test to establish effective coefficients for the regression model.

As a result of the test we obtained Prob>chi2=0.0004, which allows for H1, respectively the regression has fixed effects in this situation. The results are presented in Table no. 3 below.

Table no. 3 – Fixed effects' regression results

Variable	Coefficient	Std. Deviation	t	P>|t|
Debt	-0.0780935	0.0135935	-5.74	0.000***
Crt_acc	0.2750957	0.0304035	9.05	0.000***
Openness	0.0245671	0.0156586	1.57	0.118
GDP_growth	0.4293949	0.0608793	7.05	0.000***
Pop	-4.12e-09	1.01e-08	-0.41	0.683
FDI	0.128678	0.0414707	3.10	0.002***
CPI	0.0061587	0.114854	0.54	0.592
Unempl	-0.5816406	0.1219556	-4.77	0.000***

*, **, *** *symbols correspond to statistical significance thresholds of 10%, 5%, 1% for α variables*
Source: processed by the authors

We can notice a close relation between fiscal balance and several of selected independent variables used in our model, respectively public debt, current account balance, annual GDP growth, foreign direct investments and unemployment rate. The model's main variables display a significant influence upon fiscal balance, contributing either to achieving the revenues or to the distribution of expenditures. They have a positive/negative impact upon fiscal balance, depending on the correlation with the dependent variable.

Analyzing the correlation between the dependent variable and significant independent variables we can notice a series of predictable results for correlation values. As such, public debt and unemployment rate are negatively correlated to fiscal balance, whilst foreign investments, economic growth and current account balance exert a direct positive influence upon fiscal balance.

With a 90% probability, population is significant for our model. Even using a 99% confidence level, all the significant variables for the 95% interval remain significant for this situation.

Testing the correlation between the dependent variable and each significant independent variable for the fixed effects' regression we can show that current account balance presents the strongest correlation, with the value of 0.6433, a very important positive direct influence. A high value, however of opposite sense, shows the correlation between fiscal balance and public governmental debt.

In the fixed effects' framework, the errors are correlated with the regressors, inducing the need to test the model for heteroskedasticity. To test for heteroskedasticity we use the Wald test for fixed effects' regression models. In wake of running the model we have found that variables present no in-between variables' correlation, with a 95% probability.

Despite favorable results concerning the estimators we have to further approach the lags problem. When changing the values of any given fiscal balance's influencing variables, their effects upon the evolution of expenditures and revenues are not immediate. Also, some variables which do not appear as significant for the model can influence the dependent variable over time. To check for this effect, we employ an Arrellano-Bond regression with one, respectively two years lags – Table no. 4 below.

Table no. 4 – Arrellano-Bond regression

Variable	Coefficient	Std. Error	Z	P>|z|
Lag 1	0.4437552	0.0552376	8.03	0.000***
Debt	-0.0203372	0.0174908	-1.16	0.245
Crt_acc	0.2016762	0.0405674	4.97	0.000***
Openness	0.0288494	0.0173751	1.66	0.097*
GDP_growth	0.4389936	0.0535231	8.20	0.000***
Pop	-2.03e-08	1.24e-08	-1.64	0.102
FDI	0.0912331	0.0376389	2.42	0.015**
CPI	0.018187	0.0134446	1.35	0.176
Unempl	-0.3408927	0.1579774	-2.16	0.031**
Variable	**Coefficient**	**Std. Error**	**Z**	**P>|z|**
Lag 1	0.488916	0.0637972	7.66	0.000***
Lag 2	-0.1742982	0.0480599	-3.63	0.000***
Debt	-0.0361263	0.0186512	-1.94	0.053*
Crt_acc	0.217619	0.0445754	4.88	0.000***
Openness	0.0160525	0.0182252	0.88	0.378
GDP_growth	0.4057247	0.0556614	7.29	0.000***
Pop	-1.89e-09	1.39e-08	-0.14	0.892
FDI	0.0646146	0.0413778	1.57	0.117
CPI	0.0045483	0.0148384	0.31	0.759
Unempl	-0.4447169	0.1681181	-2.65	0.008***

Source: data processed by the authors

We can notice that both lags are regression significant along with some variables which influence either both or just one of the regressions. For both regression models, economic growth and current account balance appear as correlated with country's fiscal balance and implicitly with the chosen measure to outlie fiscal policy' efficiency. Direct foreign investments, as well as unemployment rate affect coming year's fiscal balance.

For the two lags regression, public debt appears as significant, however with a rather weak influence (for $\alpha = 90\%$), yet unemployment rate becomes more significant compared

to the single lag regression. The result shows that one country's fiscal balance is largely influenced by passed rather than current unemployment rate values.

For the first check-up the results remain relatively consistent. The applied lag is significant for the model with public debt being the one variable excluded from the initial sample of significant variables for the model. In this situation it appears as insignificant for the all three categories of confidence intervals tested. The rest of the variables remain be significant for $\alpha = 10\%, 5\%$ and 1%.

For the two years' lag the results are quite similar. The lag is significant for the regression and the variables previously proven as influencing the sample still remain significant. Public debt is still not significant for the model, having only a marginal impact.

The results show the importance of altered economic factors upon budgetary expenditures and revenues in the average run and not just for the current budgetary year. In case of modifying the macroeconomic measures, the situation of expenditures and revenues is affected for a period of several years. This proves the necessity of state intervention for correcting economy negative imbalances. Based on this results, governments can adopt more efficient fiscal, budgetary and social policies, adapted to the economic cycle's phases and economy needs.

Fixed effects' regression also need to be checked for cross-sectional dependency. The impact of this dependency in estimation naturally depends upon a series of factors, such as cross-section correlations and the nature of cross-sectional dependency. Assuming this phenomenon is caused by the presence of common factors, unobserved and uncorrelated with the regressors, models' estimators for both fixed and random effects are consistent, yet not efficient and standard errors are influenced.

Table no. 5 – Driscoll – Kraay regression

Variable	Coefficient	Drisc./Kraay Std. Error	t	P>|t|
Debt	-0.0622274	0.0167977	-3.70	0.002***
Crt_acc	0.2918801	0.0349685	8.35	0.000***
Openness	0.0132169	0.0189512	0.70	0.497
GDP growth	0.440072	0.1001661	4.39	0.001***
Pop	-2.12e-09	9.13e-09	-0.23	0.820
FDI	0.0737182	0.0334621	2.20	0.045**
CPI	0.0789201	0.0376149	2.10	0.055*
Unempl	-0.4307478	0.1762222	-2.44	0.028**
Year 2000	0.816193	0.1376757	5.93	0.000***
Year 2001	0.3305853	0.2680699	1.23	0.238
Year 2002	-0.09001282	0.2820427	-3.19	0.007***
Year 2003	-1.140286	0.3936228	-2.90	0.012**
Year 2004	-0.7360819	0.575294	-1.28	0.222
Year 2005	0.1835842	0.5964922	0.31	0.763
Year 2006	-0.0964977	0.7097699	-0.14	0.894
Year 2007	-0.7785864	0.7514266	-1.04	0.318
Year 2008	-0.9689426	0.8789583	-1.10	0.289
Year 2009	-2.52453	0.8621064	-2.93	0.011**
Year 2010	-5.562552	1.236844	-4.50	0.001***
Year 2011	-3.585197	1.343906	-2.67	0.018**
Year 2012	-2.724445	1.365159	-2.00	0.066*
Year 2013	-3.012379	1.490835	-2.02	0.063*

Source: data processed by the authors

To study this phenomena, Rafael E. De Hoyos and Vasilis Sarafidis (2006) recommend the Pesaran cross-sectional independency test. For our regression, the absolute value of the elements non-pertaining to the diagonal is of 0.322, leading us to conclude the existence of cross-sectional dependency.

To correct this, we can use a standard errors' Driscoll-Kraay regression, as it leads to a better estimation of regressors and errors for fixed effects, cross-sectional dependency's regressions – see Table no. 5.

According to Daniel Hoechle (2007) standard errors for running a Driscoll-Kraay regression are calibrated and estimation results for panel data regressions are less influenced by cross-sectional dependencies. In light of running the regression the results remain pretty much the same, however the index of consumer goods' variable becomes marginally insignificant.

As we can see from Table no. 5 fiscal balance is especially correlated with time variables from economic crisis period (2009- 2013).

4. ANALYSIS OF FISCAL BALANCE'S EVOLUTION

Even if precedent's regression results have revealed connections between fiscal balance and various macroeconomic measures, it cannot properly reflect the annual evolution of the difference between budgetary revenues and expenditures, evolution which can better evidence the fiscal policy's optimization methods.

To follow this evolution, we will adjust certain indicators to become suited for this purpose. As such, we will calculate first order differences between current and precedent year for fiscal balance, economic openness and unemployment rate. We will keep the measures concerning foreign direct investments and stable consumer prices. As GDP growth is calculated against precedent year, this measure will remain unmodified. On the other hand, we will use a logarithm for population to ensure a similar framework for this measure to the remainder indicators.

In their regression, Bénétrix and Lane (2010) introduce a series of dummy variables regarding various economic phenomena and the way they can affect the fiscal balance. They include fiscal constraints, banking crisis, lowering country ratings and others. The dummy variables do not have a significant bearing upon their model, however they cannot be ignored totally, since they represent economic phenomena which can affect in a great deal a country's fiscal balance.

In our model we will introduce the index of economic freedom, which was developed by Heritage Foundation, considering that it incorporates a series of other relevant indicators for our study.

According to the methodology, economic freedom is a composite measure, which accounts for 10 different quantitative and qualitative measure holding different weights into the model, addressing four categories of liberty expression, respectively law compliance, government, regulations and market functioning.

Our new econometric model reads:

$$\Delta Fbal_{i,t} = \delta + \gamma_1 \Delta Debt_{i,t} + \gamma_2 \Delta crt_{acc_{i,t}} + \gamma_3 \Delta Openess_{i,t} + \gamma_4 GDP_{growth_{i,t}} + \gamma_5 \ln(Pop_{i,t}) + \gamma_6 FDI_{i,t} + \gamma_7 CPI_{i,t} + \gamma_8 \Delta Unempl_{i,t} + \gamma_9 ec\_freedom + \varepsilon_{i,t} \tag{2}$$

The way of reporting the measures remains identical with the one from previous model. The country sample is the same, however the time interval is reduced to 2000-2012 period caused by the lack of data and losing one year after applying first order differences.

The Hausman test results applied for the new regression reads *Prob>chi2 = 0.2701*, higher than the 0.05 value corresponding to the significance interval, which suggests a random effects' regression. In this context the regressors are not correlated with errors. The results of the regression are presented in Table no. 6 below.

Table no. 6 – The random effects' regression results regarding fiscal balance evolution

Variable	Coefficients	z	P>|z|
Debt	-0.1185331	-4.70	0.000***
Crt_acc	0.2540888	5.84	0.000***
Openess	0.0581150	3.18	0.001***
GDP_growth	0.2178572	3.36	0.000***
Unempl	-0.5079315	-2.60	0.009***

*, **, *** symbols correspond to statistical significance thresholds of 10%, 5%, 1% for α variables
Source: processed by the authors

Compared with the initial situation, the measures of public debt, current account balance, economic growth and unemployment rate continue to be model significant. The evolution of economy openness degree also influences the evolution of fiscal balance, however direct foreign investments become irrelevant. Economic freedom variable is also irrelevant.

Breusch Pagan test establishes the relevance of random effects for our model. In wake of running the test, the result obtained of 1.000 is higher than the 0.05 limit, leading us to reject the significant random effects' hypothesis and to approach the regression as an OLS regression.

Running an OLS regression upon our data generates results consistent with the fixed effects' one, none of the countries appearing as irrelevant for our model.

Similar to the previous model we have to check whether fiscal balance's evolution was influenced by changes in level of other macroeconomic measures. Anderson and Hsiao (1981) propose using lags upon the dependent variable included in the dynamic data panel after the panel effects were eliminated by first order differences. After running an Arellano-Bond regression with one, respectively two lags we notice that the influence of the two lags upon regression results are not significant.

The variables still significant for the model are public debt, economy openness, current account balance and economic growth. Unemployment rate becomes marginally irrelevant, whereas economic freedom continues to be overall irrelevant even if some of its components obviously impact upon fiscal balance.

To check whether fiscal balance reacts differently along the economic crisis to selected independent variables from our regression we have chosen to divide our interval into three sub-periods: years 2000-2006 (the pre-crisis period), 2007-2009 (recession) and 2010-2012 (post-crisis recovery). One can expect that running this regression for the three sub-periods may result into different factors influencing fiscal balance as the economic context varies significantly.

Nevertheless, running the regression for the three sub-periods does not bring significant modifications over previously generated results. The small number of observations existent especially for the last two sub-periods leads to a poor estimation of the coefficients.

Overall, the results obtained in wake of running the regression for the entire analyzed period better reveal the effect of macroeconomic indicators upon fiscal balance.

5. CONCLUSIONS AND DISCUSSIONS

In light of analyses performed with the two models, we reach similar conclusions for both situations. Important measures influencing fiscal result are economic growth, public debt, unemployment rate, current account balance and economy openness.

To design a sustainable fiscal policy, we have to consider the evolution of fore-mentioned measures, as they influence respective year's fiscal result. It is not enough for the government to adjust the level of taxes or expenditures to generate a sustainable fiscal policy. The changes should also address social and monetary policies, as they affect in a great deal the economic and social situation of the country.

Our research has revealed a strong connection between unemployment rate, public debt and fiscal balance. In our paper we have used economic freedom index as a dummy variable, however it has proven to be irrelevant for our model. This can be explained to the fact that economic freedom variable comprises a series of other measures which influence in a greater or lesser deal the fiscal balance.

Analyzing fiscal balance and its factors, as well as reaching fiscal sustainability remains an interesting topic for future researches.

Fiscal sustainability remains a specific issue. Even if we can identify a series of variables relevant for a group of states or generally valid models for fiscal sustainability, a generalist approach cannot lead to consistent and efficient results.

Increased public debt requires special attention when it originates from non-productive public spending, which cannot contribute to sustainable economic recovery or to long-term unemployment reduction.

Starting from previous experiences and based on research results, political leaders can substantiate measures and strategies for reaching fiscal sustainability.

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