Implications of Fiscal Responsibility on Economic Growth

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Abstract: Governmental decisions play an important role in the critical periods of the economy and usually in base of the strategy adopted, can make an effective contribution to the budget process while preserving fiscal discipline. This study tests the implications of fiscal responsibility on economic growth with the scope to analyze and find out the major issue of responsible public finances. In base of logistic regression results, the study leads to the conclusion that may be wise to re-evaluate plans to cut net government revenue in future budgets and instead take a more strategic approach to nurturing growth in the EU economy.

Keywords: fiscal responsibility; fiscal rules; economic growth

JEL Classifications: G28; E62; H72

1. Introduction

Many decisions involve "temporal dilemmas", that is conflicts between the immediate and delayed consequences of one's actions. In the same way, governmental decision, have a direct impact on the standard of life and economic stability of entire populations, being very important that this decisions to have like support a solid strategy, a good management and a solid legal framework. We find also like argue that fiscal, or budgetary transparency has large, positive effects on fiscal performance (James, Dreyer, 2002, p. 141).

There are a lot of people who believe that fiscal responsibility, a concept who involves transparency, efficiency of public administration and care for future generations by improving sustainable development, has large and positive effects on fiscal performance. According to the IMF, "transparency in government operations is widely regarded as an important precondition for macroeconomic fiscal sustainability, good governance, and overall fiscal rectitude" (Kopits & Craig, 1998,

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p. 1). However, while such asserted effects are common, there is not much empirical evidence about institutional transparency and fiscal policy outcomes. Some links appear between fiscal transparency and fiscal performance in European countries, and between indirect measures of transparency and fiscal performance in Latin American countries. Many remain convinced of the importance of fiscal policy, unrealised the role of consolidate a series of principles to guide to the way of public health finance and care for future generations.

Ewijk and Casper (2006), relate that healthy public finances contribute to macroeconomic stability and support monetary policy in maintaining stable prices at low interest rates. Both effects are conducive to private investment and savings. On the other hand, by reducing public debt and the interest burden, this also creates room for a reduction in distortionary taxes and an increase in productive public spending (Wong, Christine, 2000, p. 55). The theoretical literature on the causes and consequences of fiscal, or budgetary, responsibility and transparency is not large (Rogoff, 1990). From a theoretical point of view, Shi and Svensson (2002) emphasizing that voters want more competent politicians in office, as they can provide more public goods for given levels of taxation and private consumption. In this way, besides issues related to the theory of public choice (Buchanan, Musgrave, 1999 p. 16), a theory widely treated by economists consecrated in the field, more important is the citizens' trust in the representatives of the central level. From other studies, results on deficit and debt accumulation: that transparency decreases debt accumulation, at least partly through an effect on the electoral cycle (Shi & Svensson, 2002), that increasing political polarization increases debt accumulation[1].

The economic and financial crisis badly weakened public finances in EU countries and significant efforts in recent years and an improved economic outlook are bearing fruit and Member States have succeeded in reducing deficits and stabilising debt levels. The purpose of this paper is to tests the implications of fiscal responsibility on economic growth with the scope to analyze and find out the major issue of responsible public finances. In base of logistic regression we want to offer an opinion on the specifics of fiscal responsibility, in order to predict GDP growth in the nature of tax rules (rules that based on own specific content, summarizes compliance with fiscal responsability of the budget).

2. Data and Methodology

The methodology used is quantitative, based on the use of logistic regression, wich in contrast to the multiple linear regression, where you can predict, based on several independent variables, a numeric dependent variable, logistic regression allows

[1] See, for instance, (Alesina & Tabellini, 1990).

predicting a dichotomous nominal variables. Linear regression method assumes that both factorial variables and variable the result is the continuous type; by contrast, logistic regression allows working other types of variables. Logistic regression model describe the relationship between a dichotomous variable Y, which takes values 1 (Success) and 0 (failure), and k factorial variables x_1, x_2, x_3…..x_k. Thus, we can focused to analysis the influence of variables on GDP growth, wanting to show the implications of fiscal responsibility on administrative work and indirectly, on economic growth.

A detailed presentation of logistic regression methodology and of the issues raised by its use was performed by Amemiya, T. (1985), Balakrishnan, N. (1991), Hosmer, David W.; Stanley Lemeshow (2000), Agresti, Alan (2002) and Green, William H. (2003). In this study, the dependent variables is: GDP growth, encoded in the analysis with 1 and 0-average under 2.27 = 0, over 2.27 = 1 and independent variables are: Total fiscal rules, Public Debt, Total revenue, Total fiscal pressure, Total general expenditure, GDP growth, Net lending (+)/net borrowing (-).

The variables considered in the logistic regression model are:

- ✓ **Dependent variable (Y)** – *GDPgr (*real GDP growth) – converted numerical variable in dummy variable- categorical: it resorted to calculating the average, was established as follows: 0 = average under 2.27 over 2.27 = 1.

- ✓ **Independent variables (X_j)**:

  - X_1 -Tfr (Total fiscal rules);
  - X_2-*Bl* (Legal basis of fiscal rules);
  - X_3-*Tec* (Type of economy).

By placing all variables used in the analysis of any nature whatsoever final logistic regression model used in the analysis is as follows:

$$\log\left(\frac{p}{1}-p\right) GDPgr = \alpha + \beta_0 Tfr + \beta_1 Bl + \beta_2 Tec$$

3. Results and Discussions

Statistical description of the evariables used in the analysis is shown in Appendix. no 1. It can be seen that the data set is complete quantitative variables, which each have a set of 28 records. Analysis of indicators aimed at central tendency, exemplified through the media, reveals that the average value: -1.50 GDP growth is

due to negative values in some countries such as Cyprus, Finland and Croatia, the tax rules 2.00, 10.70 Public debt, total revenues, 33.60, 26 fiscal pressure, total expenditure, 34.4 and deficit, surplus, 8.50 due to the preponderance of deficits values in 28 countries.

Standard deviation analysis highlights the following issues:

- ✓ total sales tax rules is one less dispersed, which varies from the average level of 1.16553% positively or negatively. We can say that 68.2% of the total tax rules fall between ± σ $\bar{x}$ respectively ± 1.6553% 3.3929%;

- ✓ distribution of public debt is very dispersed that vary from the average level of 39.16905% of GDP positively and negatively. We can say that 68.2% of the total public debt distribution is between ± σ $\bar{x}$ respectively 74.2643 ± 39.16905% of GDP;

- ✓ total income distribution is one less dispersed, which varies from the average level of 6.62096% positively or negatively. We can say that 68.2% of the total income is between ± σ $\bar{x}$ ie 43.1679% ± 6.62096;

- ✓ distribution of total fiscal pressure is one less dispersed that vary from the average level of 0.06395% positively and negatively. We can say that 68.2% of the total fiscal pressure is between ± σ $\bar{x}$ 0.3618 ± 0.006395% respectively;

- ✓ distribution of government spending is one less dispersed, which varies from the average level of 6.52418% of GDP positively or negatively. We can say that 68.2% of the total of private saving is between ± σ $\bar{x}$ respectively 46.1750 ± 6.52418% of GDP;

- ✓ distribution Net lending (+)/net borrowing (-).is one less dispersed, which varies from the average level of 2.49549% of GDP positively or negatively. We can say that 68.2% of the total of private saving is between ± σ $\bar{x}$ respectively ± 2.49549 -2.49549% of GDP;

Analysis of form distribution reveals that shape distributions for four of quantitative variables are asymmetric to the right since the coefficient of asymmetry Perason β_1 is greater than zero $\beta_1 > 0$ for all distributions respectively: 0.052 for fiscal rules, 0805 for public debt, 0.365 for total revenue, 0,283 the tax burden, 1222.

Logistic Regression Results

Table Case Processing Summary (Appendix 2.) shows that there are 28 records used in the analysis 0while Table Dependent Variables Codings highlights that are specific codes for dummy variable, with 0 being denoted countries with a growth

rate of GDP less than 2.27 to 1, those average over 2.27. Appendix 3. Classification Table, shows that there are 14 countries that have a GDP growth rate of less than 2.27, another 14 have rates above 2.27. It notes that the model fails to predict a probability of 57.5%.

Table 1. Variables not in the Equation

Variables not in the Equation					
			Score	df	Sig.
Step 0	Variables	TRF	1.287	1	.257
		Bazalegala	.206	1	.650
		Tipuleconomiei	2.800	1	.094
	Overall Statistics		5.177	3	.159

Source: own calculations using SPSS

In this table - Variables not in the Equation are presented variables that were not used in the initial stage forecasting logistic regression (Block 0), respectively: Type fiscal rules, the legal basis, the type of economy and value Sig. It shows how strongly influenced model as if it were introduced.

Table 2. Omnibus Tests of Model Coefficients

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	5.745	3	.125
	Block	5.745	3	.125
	Model	5.745	3	.125

Source: own calculations using SPSS

- ✓ *Hypothesis testing*

H_0: invalid model (independent variables have no influence on the dependent variable);

H_1: The model is valid (independent variables have influence on the dependent variable).

- ✓ Significance step: $\alpha = 0.05$;
- ✓ *Establishing the rule of decision:* If sig $\geq \alpha$ not reject the hypothesis H_0 &If sig $< \alpha$ reject the hypothesis H_0;
- ✓ *Interpretation of results.*

Omnibus test, shows that Sig = 0.12> α = 0.05, so the null hypothesis is accepted, the introduction of the model variables excluded in the preliminary stage significantly altered our ability to predict GDP growth based on the critical nature fiscale. Since the critical value = 0.125 Sig I can say with a 1% risk assumed that the model is statistically significant and its results can be used in predicting the dependent variable.

Table 3. Hosmer and Lemeshow Test

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	5.433	7	.607

Source: own calculations using SPSS

✓ *Hypothesis testing*

H_0: There is a good connection between the model and the data recorded;

H_1: There isn't a good connection between the model and the data recorded.

✓ Significance step: α = 0.05

Establishing the rule of decision

If sig ≥ α not reject the hypothesis H_0;

If sig < α rejected the hypothesis H_0;

✓ *Interpretation of results*

Sig = 0.607 > α = 0.05 which shows that the null hypothesis is accepted. It can guarantee a 95% probability that there is a good correlation between the model and the data recorded.

Table 4. Contingency Table for Hosmer and Lemeshow Test

Contingency Table for Hosmer and Lemeshow Test						
		GDP growth = under 2.27		GDP growth = over 2.27		
		Observed	Expected	Observed	Expected	Total
Step 1	1	2	2.545	1	.455	3
	2	2	2.205	1	.795	3
	3	3	2.123	0	.877	3
	4	0	.516	1	.484	1
	5	3	2.382	2	2.618	5

	6	1	1.395	2	1.605	3
	7	1	1.351	2	1.649	3
	8	2	1.064	2	2.936	4
	9	0	.420	3	2.580	3

Classification Table[a]					
			Predicted		
			GDP growth		Percentage
	Observed		Under 2.27	Over 2.27	Correct
Step 1	GDP growth	Under 2.27	7	7	50.0
		Over 2.27	3	11	78.6
	Overall Percentage				64.3
a. The cut value is .500					

Source: Own calculations using SPSS

Following the introduction of the logistic regression model of the independent variables, can be seen that the increased degree of accuracy estimation model from 50.0% (baseline when it was included only constant) to a 64% by inclusion of independent variables the legal basis, such as fiscal rules, such as the economy.

Table 5. Variables in the Equation

Variables in the Equation							
		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Tfr	-1.190	.820	2.107	1	.147	.304
	Legal base	.045	.283	.025	1	.873	1.046
	Type of economy	2.087	1.112	3.522	1	.061	8.063
	Constant	-.848	1.473	.331	1	.565	.428

Source: Own calculations using SPSS

The logistic regression model equation: $E(Y/X) = \pi(x) = \frac{e^{-0.848 - 1.190 \cdot X_1 + 0.045 \cdot X_{2+2.087.X3}}}{1 + e^{-0.848 - 1.190 \cdot X_1 + 0.045 \cdot X_{2+2.087.X3}}}$.

The estimate parameter β1 is set to -1.190. The negative value of this ratio shows that an increase of 1.0% fiscal rules, lowering the chances estimated growth rate of GDP is below the average of 0.5%.

Table 6. Variables in the Equation

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.000	.378	.000	1	1.000	1.000

Source: Own calculations using SPSS

Table Variables in the Equation are presented probabilities of Wald test (Sig = 0.1). For independent variables considered in the analysis, the value of these probabilities is greater than the materiality threshold α (0.05), thus accepting the null hypothesis (H0: βj = 0). Basically, there is a good connection between the model and the data recorded.

4. Conclusion

The way in wich the state uses the mechanisms of public finances to counteract some disturbing phenomena of the economy, is a subject of intense debate and I would say there are many studies that test the connection between the state and public finance mechanisms, but few bring into discussion the importance of fiscal responsibility and accountability of governments. In other, on the occasion of establishment of the economic crisis and an ever increasing need for efficiency in using financial resources and support sustainable development, has become a need for regulation at EU level, with implications for Member States, which led to the consolidation of certain tax rules, all this having as finality the creation of public administration efficiency.

The methodology is based on the use of logistic regression, wich in contrast to the multiple linear regression, where we can predict, based on several independent variables, a numeric dependent variable, logistic regression allows predicting a dichotomous nominal variables. Linear regression method assumes that both factorial variables and variable the result is the continuous type; by contrast, logistic regression allows working other types of variables. We had focused to analysis the influence of variables on GDP growth, and showed the implications of fiscal responsibility on administrative work and indirectly, on economic growth.

In base of study results, Sig = 0.607 > α = 0.05 which shows that the null hypothesis is accepted. It can guarantee a 95% probability that there is a good correlation between the model and the data recorded. Following the introduction of the logistic regression model of the independent variables, can be seen that the increased degree of accuracy estimation model from 50.0% (baseline when it was included only constant) to a 64% by inclusion of independent variables the legal basis, such as fiscal rules, such as type of economy economy. Wald test (Sig = 0.1). For independent variables considered in the analysis, the value of these probabilities is greater than the materiality threshold α (0.05), thus accepting the null hypothesis (H0: βj = 0). Basically, there is a good connection between the model and the data recorded.

Basically, the result of our study demonstrate that there are a lot of implications of fiscal responsibility on economic growth, because, in terms of transparency, care for

future generations and a legal framework capable to assured a solid systems of public finances, responsibility, resolve the major issue of responsible public finances.

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Appendix

Appendix 1. Statistical description of the e variables

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Total fiscal rules	28	2.00	5.00	3.3929	1.16553	.052	.441	-1.482	.858
Public Debt	28	10.70	179.70	74.2643	39.16345	.805	.441	.726	.858
Total revenue	28	33.60	56.70	43.1679	6.62096	.365	.441	-.759	.858
Total fiscal pressure	28	.26	.48	.3618	.06395	.283	.441	-.905	.858
Total general expenditure	28	34.40	58.10	46.1750	6.52418	-.023	.441	-.773	.858
GDP growth	28	-1.50	8.50	2.2714	2.28081	1.222	.441	2.380	.858
Net lending (+)/net borrowing (-)	28	-8.80	1.50	-2.9321	2.49549	-.228	.441	.065	.858
Valid N (listwise)	28								

Source: Own calculations using SPSS

Appendix 2. Case Processing Summary

Case Processing Summary					
Unweighted Cases[a]		N	Percent		
Selected Cases	Included in Analysis	28	82.4	**Dependent Variable Encoding**	
	Missing Cases	6	17.6	Original Value	Internal Value
	Total	34	100.0	Under 2.27	0
Unselected Cases		0	.0	Over 2.27	1

Total	34	100.0
a. If weight is in effect, see classification table for the total number of cases.		

Appendix 3. Classification Table[a,b]

Classification Table[a,b]					
	Observed		Predicted		
			Cresterea PIB		Percentage Correct
			mai mic de 2.27	peste 2.27	
Step 0	Cresterea PIB	mai mic de 2.27	0	14	.0
		peste 2.27	0	14	100.0
	Overall Percentage				50.0
a. Constant is included in the model.					
b. The cut value is .500					

Source: Own calculations using SPSS