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The Analysis on the Cyclical Behaviour of Fiscal Policy in the EU Member States

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Abstract

This paper deals with the topic of cyclicality of fiscal policy. The main purpose of this paper is to determine the cyclical behaviour of fiscal policy in the EU member states, using historical time series for all the European countries during the period between 1995-2011. The results pointed out that the procyclical fiscal policies are a feature of developing countries and the countercyclical and acyclical fiscal policies are a feature of developed counties.

Keywords: procyclical fiscal policy, countercyclical fiscal policy, budget balance, public expenditures

1. Introduction

Starting from the question "what should the fiscal policy behaviour be along with the economic cycle?" we decided to analyse the cyclical behaviour of the fiscal policy of Romania in the context of the European countries. The economic literature treats the above mentioned question at least from two points of view: the standard Keynesist Models are for the countercyclical fiscal policy, promoting an expansionist fiscal policy in the recession periods and a restrictive one in the booms. For contrary, the neoclassical view sustains the implementation of the neutral fiscal policy, that should not be influenced by the economic cycle.

The fiscal policy plays a key role in the reduction of budget deficit. Among the others, Stiglitz et al. (2006) sustain the adoption of a countercyclical fiscal policy as in the recession periods, characterised by reduced fiscal revenues

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and rising budget expenditures, and corresponding deeper budget deficits, the Government should adopt programs to reduce the taxes and increase the expenditure.

According to the literature, the procyclical policies are specific to the boom periods (see Gavin and Perotti 1997 ; Kaminski, Reinhart, and Vegh, 2004; Alesina and Tabellini, 2005), as these periods are characterised by a facile access to the resources, offering to the debtors (including the state), the possibility to excessive lending. The procyclical policies are all those economic policies, that in both the recession and the booms periods do not act like stabilising the economy. The fiscal policy, as well as the capital flows and the credit dynamics could induce procyclical shocks (positive/ negative when the economy is over/under the potential level). Also, a procyclical fiscal policy defined by a greater increase in expenditures than incomes in the boom periods will lead to the manifestation of excessive budget deficits in the recession periods as the elasticity of budget expenditures with respect to GDP growth is lower than the elasticity of incomes.

Alesina and Tabellini (2005) are wondering why those countries do not accumulate reserves during booms in order not to face the loan restrictions from recession. The answer is considered to be very closed to the political arena of every country. The electorate faces corrupt governments that allocate a part of the fiscal incomes to the unproductive public consumption (in favour of the public sector employees or the "friends" of the Government). Additional to this behaviour is the electorate's lack of information, that observes the economic boom, but does not observe the public debt that is hiding behind. The electorate considers that the boom is a beneficial period for the state, and puts pressure to the Government asking for a greater utility (tax reductions or high quality of public goods and services), constraining the Government to borrow more.

Among the conclusions reached by Alesina and Tabellini (2005) regarding this issue, we can include: the existence of a positive correlation between procyclicality and corruption (more corrupted countries face a more procyclical fiscal policy); the correlation between procyclicity and corruption is a characteristic of democratic countries. The main conclusion is that the procyclicality of fiscal policy is represented by the government failure, not by the market failure. The fiscal policy is procyclical as the rational and uninformed electorate states larger demands to the Government in good times than in bad times. Kaminsky, Reinhart and Végh (2004) define the cyclicality of fiscal policy in terms of budgetary expenditures (g) and tax rates (π), that is contrary to the defining the fiscal policy in terms of budget balance and fiscal incomes. The cyclicality is defined as:

Table 1: The cyclicality of fiscal policy

	Budgetary expenditures (g)	Tax rates (π)
Countercyclical fiscal policy	-	+
Procyclical fiscal policy	+	-
Acyclical fiscal policy	0	0

Source: Kaminski, Reinhart and Vegh (2004)

Following to the paper of Kaminski, Reinhart and Vegh (2004), we proceeded to define the three aspects of fiscal cyclicality:

- a countercyclical fiscal policy deals with lower (higher) budgetary expenditures and higher (lower) tax rates in the boom (recession) periods. This policy aims to stabilize along with the economic cycle (for example: the fiscal policy contracts in the economic booms and it is expansionist in the recession).
- a procyclical fiscal policy deals with higher (lower) budgetary expenditures and lower (higher) tax rates in the boom (recession) periods. This policy aims to strengthen along with the economic cycle (for example: the fiscal policy is expansionist in the boom periods and contracts in the recession). It worth mention that according to this definition, a procyclical fiscal policy implies o negative correlation between the level of taxation and the economic growth, this terminology being different from that used in the economic literature regarding the real business cycle, where every variable that is positive (negative) correlated to the economic cycle is considered to be procyclical (countercyclical).

- an acyclical fiscal policy implies constant budgetary expenditures and constant tax rates along with the economic cycle. Such a policy neither stabilizes nor strengthens the economic cycle.

2. The empirical analysis of the cyclical behaviour of fiscal policy in the EU Member States

2.1. The determination of the correlations between the cyclical components of real public expenditures and real GDP

The main purpose of this paper is to accomplish an analysis on the cyclicality of the fiscal policies implemented by the EU member states, starting with the impact of the economic cycle on the public expenditures and then the impact on the evolution of the budget deficit.

The first part of the paper deals with the determination of the correlation between the cyclical components of real public expenditures and of real GDP, in order to observe the fiscal policy behaviour promoted by each state. For the scope of the analysis we used the historical time series available in the Ameco data base for all the UE member state for the period 1995-2011. So, for the public expenditures we used the real total expenditure of general government, adjusted with GDP deflator, expressed in local currency. For the easiness of the computing and for comparability, we constructed a fixed base index of real public expenditures, considering year 2000 the base year (2000=100). For the real GDP series we used a fixed base index representing the GDP at current market prices series adjusted with GDP at current market prices deflator (2000=100).

As the purpose of the present analysis is to test the existence of the correlation between the cyclical components of the two series described above, it is absolutely necessary to determine them first. So, in order to determine those components we used an econometric technique that discomposes each series in a stochastic trend and a cyclical component. Applying the Hodrick-Prescott Filter represents the easiest method that can be achieved in the econometric soft EViews.

After applying the Hodrick-Prescott Filter to the real series of public expenditures of general government and to the real GDP, we determined the cyclical components of the both series, for each EU member state. The next step was to compute the individual correlations between the cyclical components of public expenditures and GDP, for the period 1995-2011, the stylised results being presented in Table 2. The correlations are used to analyse the simultaneous evolutions of the interest variables, in order to be able to reach conclusion regarding the cyclicality of fiscal policy.

Table 2: The correlations between the cyclical components of real public expenditures and real GDP, for the EU member states (1995-2011)

Country	Correlation coefficient	Country	Correlation coefficient	Country	Correlation coefficient
Austria	-0.23	Germany	-0.25	Poland	0.21
Belgium	-0.60	Greece	0.77	Portugal	0.05
Bulgaria	0.79	Ireland	-0.35	Romania	0.68
Czech R.	0.18	Italia	0.22	Slovakia	0.00
Cyprus	-0.35	Latvia	0.77	Slovenia	0.02
Denmark	-0.89	Lithuania	0.40	Spain	0.04
Estonia	0.44	Luxemburg	-0.55	Sweden	0.34
Finland	-0.36	Malta	0.21	UK	0.17
France	-0.31	Holland	-0.27	Hungary	0.85

Source: author calculations

Based on the results presented on Table no. 2, Figure no. 1 presents the graphic representation of the correlation between the cyclical component of public expenditures and the cyclical component of GDP. As we can figure from

the graphical representation, the fiscal policy differs from one country to another with respect to the development level. So, the most of the EU New Member States are characterised by a positive correlation, that stands for a procyclical policy, and the most of the developed European economies are characterised by a negative correlation, that stands for a countercyclical fiscal policy. The results of our analysis are in concordance with the results of previous studies (Kaminski, Reinhart and Vegh, 2004).
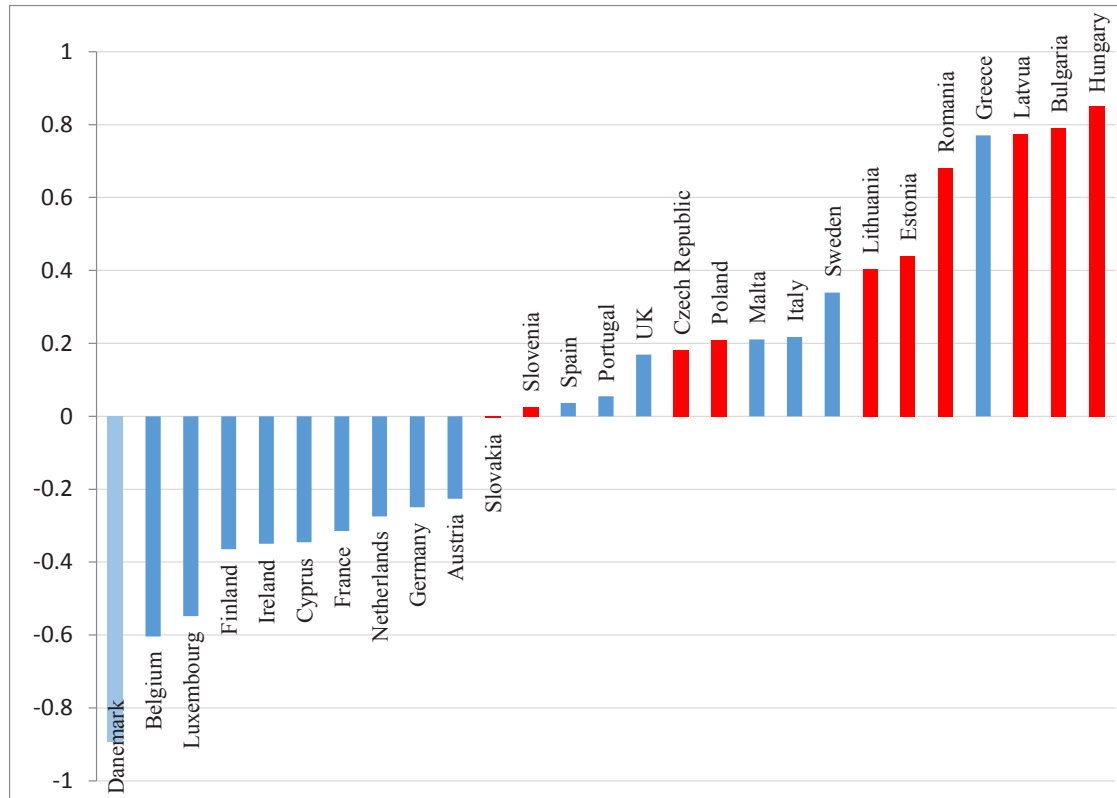

Figure 1: The correlation* between the cyclical component of public expenditures and the cyclical component of real GDP, for the EU member states, in 1995-2011. Note: *The computation of the correlation coefficients was realised with the econometric soft EViews, resulting a correlation matrix of the two series for each state. The EU New Member States are presented in red colour, Source: own estimates based on Ameco time series

Between the countries that promoted a strong procyclical fiscal policy (corresponding to a high correlation coefficient, larger than 0.6) there is Romania, Latvia, Hungary and Bulgaria (the developing countries, except with Hungary). These countries witnessed increased public expenditures during booms and reductions during recession that was reflected on the evolution of budget deficits. As can be noticed from the Figure 2, these countries faced excessive budget deficits most of the analysed period. Only Bulgaria, Estonia and Hungary realised positive budget balances. Also, the world economic crisis deepened the budgets deficits after 2008, this being the result of the previous procyclical fiscal policies.

The procyclicity can be explained by the fact that, during recession, the developing countries are not able to contract loans, or they can borrow at higher interest rates, and in order to avoid excessive deficits have to reduce expenditures. During the booms, these countries can borrow easily, and the corresponding loans increase the budgetary expenditures.
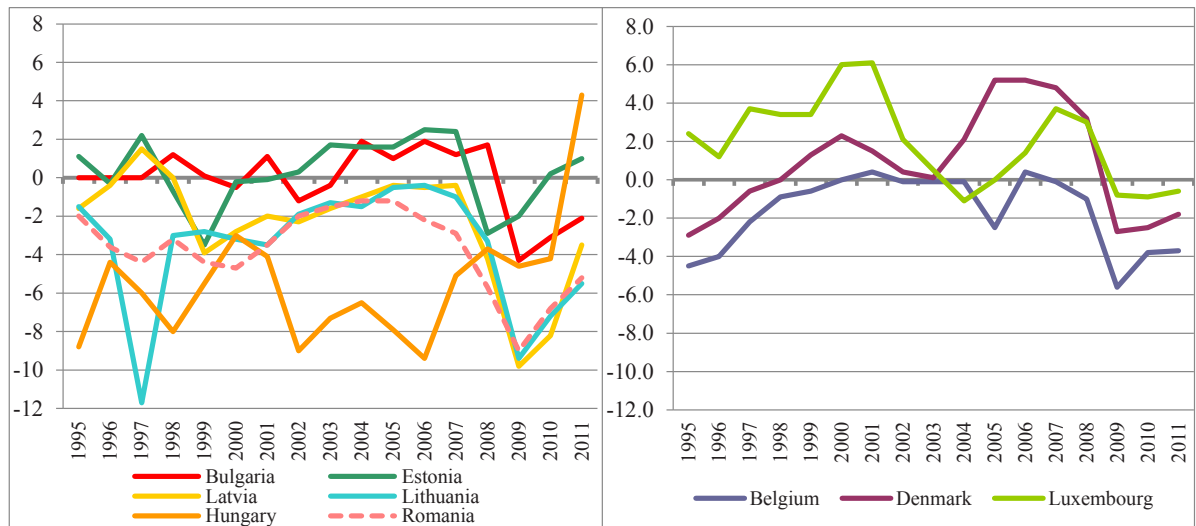
Figure 2: The evolution of general government budget balance (% of GDP, ESA 95) for selected countries from the New Member States Group and developed EU countries, 1995-2011, Source: Figure realised by the author based on the time series from Eurostat.

On the other side, there are the developed countries, and among these, Denmark is the only country that promoted a strong countercyclical fiscal policy, with a correlation coefficient of -0.9. Other countries with a high correlation coefficient are Belgium and Luxembourg. The countercyclical fiscal policies assume positive budget balances during boom periods and negative budget balances during recession. The analysis results also present correlation coefficients lower than 0.4 for the rest of the developed countries, that states for a weak countercyclical fiscal policy that emerges to acyclicality. For countries like Slovakia, Slovenia, Spain, Portugal, UK the fiscal policy was not influenced by the fluctuations of the economic cycle, according the low level of the correlation coefficient (less than 0.2). Moving to Romania, the analysis emphasises a procyclical fiscal policy, sustained by the correlation coefficient (0.68). The pre-crisis boom period was characterised by the increase of budgetary expenditures and the reduction of taxation. But, along with the recession the large dimension of public expenditures proved to be hard to finance and the budgetary correction became impetuously necessary as Romania did not had manoeuvre space. Due to the procyclical fiscal policy from the past, the Romania's Government confronted with a situation without precedent and was forced to adopt an austerity measure plan in order to reduce the budget expenditures.

2.2. The determination of the amplitude of the cycle of general government public expenditures in the EU Member States

The next step of the current analysis is to analyse a quantitative measure that surprises the change of real growth rate of public expenditures with respect to the economic cycle. Also, the analysis was extended to all the EU member states, and the analysed period was 1996-2011. The analysed period was reduced with one year (1996-2011) as a result of computing the annual growth rates of public expenditures and GDP.

Regarding the determination of the inflexion points of the economic cycle, an alterative to the statistical methods (eg. the Hodrick-Prescott filter) is the nonparametric approach by Kaminski, Reinhart și Vegh (2004). This approach assumes dividing the sample in time periods as it follows:

- the time episodes corresponding to an annual growth rate of real GDP superior to the median value (named the good times);
- the time episodes corresponding to an annual growth rate of real GDP inferior to the median value (named the bad times).

In order to determine the good times and the bad times for each country separately we computed for the beginning the series of the growth rates of real GDP (%) based on the indexes defined previously. The descriptive statistics of real GDP growth rate are presented on Table 3, the median representing the reference point for the determination of good and bad periods. For example, for the Romania we considered the good times those periods corresponding to a

real GDP growth rate superior to the median value of 3.7 pp (2001-2007) and the bad times those periods corresponding to a real GDP growth rate inferior to the median value.

Table 3 : Descriptive statistics for the real GDP growth rate (%), EU Member States (1996-2011)

Country	Real GDP growth rate (%)			Country	Real GDP growth rate (%)			Country	Real GDP growth rate (%)		
	Min	Max	Median		Min	Max	Median		Min	Max	Median
Austria	-3.8	3.8	2.4	Germany	-5.1	3.7	1.6	Poland	1.2	7.1	4.4
Belgium	-2.8	3.7	1.9	Greece	-6.9	5.9	3.4	Portugal	-2.9	5.1	1.5
Bulgaria	-9.4	6.7	4.6	Ireland	-7.0	11.2	5.2	Romania	-6.6	8.5	3.7
Czech R.	-4.7	7.0	3.1	Italia	-5.5	3.7	1.4	Slovakia	-4.9	10.5	4.5
Cyprus	-1.9	5.1	3.7	Latvia	-17.7	11.2	6.7	Slovenia	-8.0	6.9	3.7
Denmark	-5.8	3.5	1.9	Lithuania	-14.8	10.3	6.8	Spain	-3.7	5	3.4
Estonia	-14.3	11.7	6.7	Luxemburg	-5.3	8.4	4.3	Sweden	-5.0	6.1	3.2
Finland	-8.4	6.2	3.7	Malta	-2.7	6.4	3.1	UK	-4.4	4.5	2.9
France	-2.7	3.7	1.8	Holland	-3.5	4.7	2.1	Hungary	-6.8	4.8	3.5

Source: own calculation

In the Figure 3, there are presented the good and bad times determined according to the nonparametric approach, for all the EU member states. It worth mentioning that the year 2007, prior to the crisis, was a good period for 85% of the member states, and the year 2009 was a bad year for all the countries.

Tara	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Austria	F	N	F	F	F	N	N	N	F	N	F	F	N	N	N	F
Belgium	N	F	F	F	F	N	N	N	F	N	F	F	N	N	F	N
Bulgaria	N	N	N	N	F	N	F	F	F	F	F	F	F	N	N	N
Cyprus	F	N	N	N	F	N	N	F	F	F	F	F	F	N	N	N
Czech Rep.	N	N	F	F	F	F	N	N	F	F	F	F	N	N	N	N
Denmark	F	F	F	F	F	N	N	N	F	F	F	N	N	N	N	N
Estonia	N	F	F	N	F	N	N	F	N	F	F	F	N	N	N	F
Finland	N	F	F	F	F	N	N	N	F	N	F	F	N	N	F	N
France	N	F	F	F	F	F	N	N	F	N	F	F	N	N	N	N
Germany	N	F	F	F	F	N	N	N	N	N	F	F	N	N	F	F
Greece	N	F	N	F	F	F	F	F	F	N	F	N	N	N	N	N
Ireland	F	F	F	F	F	N	F	N	N	F	F	N	N	N	N	N
Italy	N	F	N	F	F	F	N	N	F	N	F	F	N	N	F	N
Latvia	N	F	N	N	N	F	F	F	F	F	F	F	N	N	N	N
Lithuania	N	F	F	N	N	N	F	F	F	F	F	F	N	N	N	N
Luxembourg	N	F	F	F	F	N	N	N	F	F	F	F	N	N	N	N
Malta	F	F	F	F	F	N	N	N	N	F	N	F	F	N	N	N
Netherlands	F	F	F	F	F	N	N	N	F	N	F	F	N	N	N	N
Poland	F	F	F	F	N	N	N	N	F	N	F	F	F	N	N	N
Portugal	F	F	F	F	F	F	N	N	F	N	N	F	N	N	N	N
Romania	N	N	N	N	N	F	F	F	F	F	F	F	F	N	N	N
Slovakia	F	N	N	N	N	N	F	F	F	F	F	F	F	N	N	N
Slovenia	N	F	N	F	F	N	F	N	F	F	F	F	N	N	N	N
Spain	N	F	F	F	F	F	N	N	N	F	F	F	N	N	N	N
Sweden	N	N	F	F	F	N	N	N	F	N	F	F	N	N	F	F
U.K.	N	F	F	F	F	F	N	F	F	N	N	F	N	N	N	N
Hungary	N	N	F	N	F	F	F	F	F	F	F	N	N	N	N	N

Figure 3: The good and bad times for the EU member states, 1996-2011, Note: F – good times, N – bad time, Source: own calculates

We are moving forward to determine the extent to which the evolution of public expenditures is influenced by the economic cycle. The instrument used for this purpose is the amplitude of the cycle of the public expenditures, defined as the difference between the real public expenditures growth rate corresponding to good times and bad times. The high negative values suggests the fact that the real growth rate of public expenditures is higher in bad times (strong countercyclical fiscal policy), and vice-versa. Summarising, a positive amplitude indicates a procyclical fiscal policy.

In order to determine the amplitude o a cycle we compared the behaviour of the variable from good and bad times. The amplitude indicators were calculated for each member state and are presented in the following table and graphical illustrated in Figure 4.

Table 4: The amplitude of the cycle of general government public expenditures in the EU Member States, in 1996-2011, Source: own estimates

Country	Amplitude (percentage points)	Country	Amplitude (percentage points)	Country	Amplitude (percentage points)
Austria	1.30	Germany	-0.30	Poland	-0.25
Belgium	-2.98	Greece	5.10	Portugal	2.21
Bulgaria	8.43	Ireland	-2.67	Romania	6.68
Czech R.	-1.86	Italia	0.10	Slovakia	4.16
Cyprus	-2.36	Latvia	6.91	Slovenia	2.01
Denmark	-0.92	Lithuania	7.96	Spain	0.51
Estonia	5.00	Luxemburg	-1.58	Sweden	-0.44
Finland	-1.86	Malta	3.46	UK	0.86
France	-0.19	Holland	-1.91	Hungary	7.58

The information presented above indicates the existence of procyclical fiscal policies among the New Member States, as the amplitude indicator registered high positive values. From the analysed sample the extreme case of procyclical policy belong to Bulgaria, the real growth rate of public expenditures being with 8.43 pp higher in good time than in bad times. The opposite case is the Belgium, characterised by a countercyclical fiscal policy, with a negative amplitude of cca. 3 pp. Regarding the developed countries we can not generalise from the point of view of the amplitude indicator, but more than half of them are on the side of the countercyclical fiscal policies, but the dimensions are more reduced than those of the amplitude of procyclical fiscal policies.

Regarding the Romania's case, the value of the amplitude indicator is 6.68 pp, due to the fact that the annual average real growth rate of public expenditures (6.66 pp growth) during the good times was with 6.68 pp higher than the value registered during the bad times (0.02 pp decrease). The strong positive amplitude, strengthen the idea of procyclicality of the fiscal policy of Romania during the analysed period.
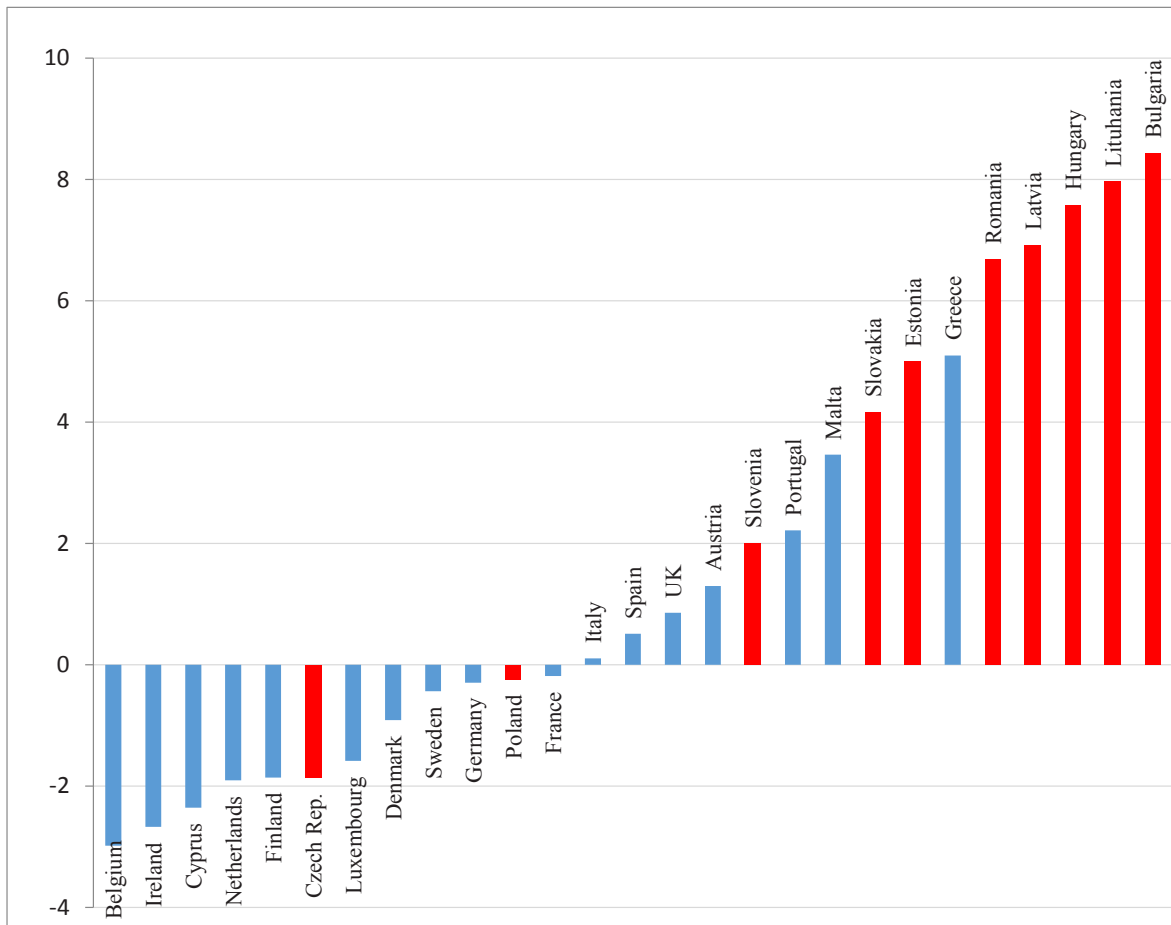
Figure 4: The amplitude of the cycle of general government public expenditures (percentage points, 1996-2011), Note: The EU New Member States are presented in red colour, Source: own estimates based on Ameco time series

3. Conclusions

The present analysis proved that the fiscal policy is often procyclical, meaning that the budget expenditures expressed as share of GDP are rising in the boom periods and going down in the recession, meanwhile the budget deficits are raising in booms and going down in recession. This was the case of most of the developing countries in the EU. The analysis based on the determination of the correlation coefficients between the cyclical components of the real public expenditures and the real GDP emphasises the fact that the fiscal policy differs from one country to another in terms of the development level. The conclusion we reaches is that most of the EU New Member States are characterised by a positive correlation, that stands for a procyclical policy, and most of the developed European economies are characterised by a negative correlation, that stands for a countercyclical fiscal policy.

Moving forward to the determination of the extent to which the evolution of public expenditures is influenced by the economic cycle, we computed for this purpose a tool of measure: the amplitude of the cycle of public expenditures. After determining the amplitude for all the EU Member States we could draw the conclusions: the procyclicality describes the fiscal policies of most of the New Member States as the amplitude indicator registered high positive values, but regarding the developed countries we coull not generalise from this point of view, but more than half of them are on the side of the countercyclical fiscal policies, the dimensions being more reduced than those of the amplitude of procyclical fiscal policies.

Analysing Romania in the context of the European countries we proved that the fiscal policy during 1995-2011 was a procyclical one, with a strong correlation between the cyclical components of real public expenditures and real GDP, and a strong positive value of the amplitude indicator, that strengthen the idea of procyclicality. Due to the procyclical fiscal policy from the past, the Romania's Government confronted with a situation without precedent in the recent years as it have been forced to adopt an austerity measure plan in order to reduce the budget expenditures.

In conclusion, we strongly recommend the adopting of countercyclical fiscal policy that would create sufficient manoeuvre space, so needed in the recession period. The recent word economic crisis was the answer of how painful the recession period could be on the background of previous procyclical fiscal policies.

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