# The Estimation of the Structural Budgetary Deficit for Romania in the Context of Accession to the Euro Zone

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**Abstract.** *Romania is preparing to enter a superior stage of integration - the admission in the euro zone. In this context, the study estimates the structural budgetary deficit, considering it as being one of the most relevant indicators to evaluate the performance of the fiscal management, as well as the degree to which the Romanian fiscal policy is ready to act as a single instrument capable of stabilizing the national economy after the Euro zone admission. The paper is structured as follows: (i) estimating the potential GDP and the output gap by the production function approach and by using the Hodrick-Prescott filter; (ii) estimating the budgetary cyclical deficit based on the sensitivity of the deficit (using the elasticities of government revenues and expenditures in relation to GDP) and the level of the output gap and, afterwards, the structural budgetary component; (iii) conclusions and recommendations.*

**Key words:** Potential GDP; output gap; elasticities of revenues and expenditures in relation with GDP; the production function approach; Hodrick-Prescott filter; cyclical budgetary deficit; structural budgetary deficit.

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## Introduction

When joining a monetary union, a country renounces at one of its two macroeconomic instruments – the monetary policy, but maintains complete control of the second – the fiscal policy. In the case of asymmetric shocks – identified by the optimal monetary zone theory as being the main source of costs in a monetary union, the fiscal policy remains the sole macroeconomic instrument available.

The European Monetary Union (EMU) is underpinned by a complex set of economic policies, formed by an unique monetary policy as well as by national fiscal ones, applied independently and decentralized. Fiscal policies of the member states of the Euro zone are national, but they should comply with the Stability and Growth Pact (SGP), considered an instrument of fiscal coordination. Its objective is the consolidation of public finances inside the Euro zone, sustaining thus the achievement of the objective of price stability, assumed by the Central European Bank.

All these suppose, though, the coordination of fiscal policies in order to assure the macroeconomic stability of the whole. This is due to the fact that fiscal policies of one country could be in the benefit or in the damage of the others. In such a case, when a country makes a decision, it cannot ignore its effect on its partners, and vice versa, taking into consideration the policies of other countries. If a member state of a monetary union has problems regarding the sustainability of the budgetary deficit, then this generates negative externalities inside the monetary union. In the situation that a country allows a raise of the current budgetary deficit so that the interest rate for the governmental debt exceeds the rate of economic growth, then this state will have to make use of capital markets inside the monetary union more often, thus generating pressure that raises the level of interest rates. However, the increase of the interest rates enlarges the burden of the debt for the other countries inside the monetary union. If the governments of these countries decide to stabilize the ratio between debt and GDP, they will be obliged to adopt restrictive fiscal policies.

As a result, the unsustainable increase of the budgetary deficit for some countries forces the others from the monetary union to follow deflationist policies, the latter being those countries that sustain the necessity of having a mechanism of control that restricts the dimensions of budgetary deficits.

Another possible externality of the unsustainable budgetary deficits affects the central bank inside the union. The countries affected by the increase of the interest rate may pressure the central bank to relax its monetary policies. By these means, the unsustainable fiscal policies promoted by the national governments may enter into conflict with the monetary policy that covers the entire union.

One of the most used indicators in the analysis of the measures of short and medium term fiscal and budgetary policies

– especially for the EMU member states, that have to comply with the conditions of the Stability and Growth Pact (SGP)[1], but also for the countries that prepare to enter the Euro zone – is the structural budgetary deficit[2] (deficit measured at the level of the potential GDP).

SGP considers that current budgetary deficits are excessive when they are around 3% of the GDP. With the purpose of leaving a margin of maneuver so that the automatic stabilizers play their role, SGP stipulates that the participants to the monetary union action for a medium term budgetary position "of equilibrium or surplus". By "medium term" we understand a period of around 3 years. By the reform of 2005, the revised SGP has not only a corrective component – the reduction of the current budgetary deficit under 3% of the GDP, but also a preventive one, that envisages assuming a medium term objective by member states in relation with public finance stability[3].

In this context, every member state commits itself on the medium term to maintain a budgetary position as close as possible to the equilibrium, or even an exceeding one. This would allow the automatic stabilizers to function, when the case, during the entire lifecycle of the business, without surpassing the reference value of the budgetary deficit of 3%. Due to the fact that the Stability and Growth Pact does not mention the precise meaning of "as closer to the equilibrium as possible", it was hence implicitly considered that the decomposition of the budgetary component in two parts is imposed: a structural one – due to the adopted fiscal measures, and, respectively, the cyclical one – due to the economic fluctuations (Hagemann, 1999). For the economies that have not consolidated enough their public finances, the revised Stability and Growth Pact has established a target of 0.5% annual growth of the ratio structural budgetary balance in GDP.

Romania has been accepted in the European Union (EU) on January 1, 2007. In 2003, the European Council stated that the EU would accept Romania entering the European Union providing that it would respect the admission criteria. After years of hesitation, the performance of Romania has improved, managing to fulfill the imposed criteria and to be accepted in the "club". EU requirements regarding the candidate states were based on the conclusions of the European Council in Copenhagen (1993), where the admission conditions have been set for the future members[4].

For the time being, Romania is preparing to enter the final stage of its integration, the Euro zone. The convergence criteria of the Economic and Monetary Union represents the economic test for the evaluation of the degree to which an economy is prepared to enter this union. The Maastricht treaty does not stipulate a strict calendar for the adoption of the Euro currency, leaving this process at the latitude of each country, after having consulted the European Commission and the Central European Bank[5]. The Treaty stipulates that *only the states that prove the achievement of a durable convergence* can participate at

the final stage of the Economic and Monetary Union.

Our study estimates the cyclical and the structural budgetary deficit for the Romanian economy by considering this indicator the most relevant for the evaluation of the Romanian fiscal management, as well as the degree to which the fiscal policy is prepared to take action as an independent instrument capable of stabilizing the national economy after having entered the Euro zone.

In the process of evaluation of the fiscal and budgetary policies, the current budgetary deficit is an indicator with a very limited utility. We have taken into consideration on one hand that these policies cannot be analyzed based on short-term indicators (a year), and on the other hand that an indicator such as the current budgetary deficit cannot detect the fiscal "burden" that is to come for the future generations.

The output gap is a measure of the cyclical position of a country, the percentage difference between the actual and the potential GDP: a negative gap shows an underperforming economy, one that operates beneath its potential. The structural budgetary deficit (cyclically adjusted) represents an estimation of what this balance would be for a certain year if the output gap was null.

By these means, the structural deficit can be seen as a measuring indicator for the degree of discretion manifested at the level of adopted fiscal and budgetary policies. In other words, the changes in the budgetary deficit should not be treated as effects of the economic fluctuations but

rather as their cause (Muller, Price, 1984).

If the government did not ever modify the fiscal policy, the adjusted cyclical budgetary balance would remain constant. In other words, the changes of the structural budgetary deficit represent actions of discretionary policy. In the last years the adjusted cyclical budgetary deficit is decreasing when the output gap become lower, a sign for the success of the anti cyclical actions, but in the other years this deficit is improving when the gap is diminishing, a sign of the pro cyclical action (Baldwin, Myplosz, 2006).

Numerous studies that analyze the sustainability of fiscal and budgetary policies promoted by the European Union member states are using in this sense the indicator of structural budget deficit, and an interpretation as accurate as possible of the information transmitted by the indicators that measure the size of the budgetary misbalance presents a considerable importance. When the budgetary deficit is considered the cause of phenomena such as the inflation or the "crowding-out" effect it is very important to know which deficit is to be blamed (the actual deficit, the cyclic deficit, the structural deficit), as well as the way in which the size of this budgetary balance has been quantified (Boskin, 1987, Eisner, 1989).

In order to remove the influence of short-term fluctuations and also to evaluate the real performance of fiscal policies, institutions such as the European Commission (EC), International Monetary Fund (IMF) or the Organization for Economic Co-operation and Development (OECD) estimate the structural budgetary

deficit. In this context, the current budgetary component is delimited under its two components: the cyclical and the structural one.

Computing this variable is necessary because the budgetary balance shows both the influence of cyclical factors (temporary) and structural ones (permanent). The cyclical component refers to the variations generated by the cyclical evolution of the gross domestic product (GDP), as long as the structural component takes into consideration the changes of the budgetary balance, if the economy produced at the level of the potential GDP (Leeuw, Holloway, 1985).

Another vision upon the influences of economic fluctuations on the size of the budgetary deficit is through fiscal and budgetary policies promoted by the public authorities. It is considered that the connection between the budgetary deficit and the cyclic nature of economic activities can be observed through the perspective of: (i) discretionary modifications due to the adopted fiscal and budgetary policies and (ii) modifications brought by fluctuations in the economic activities (Braconier, Holden, 1999). Also, Dornbusch and Fisher (2006) consider that the link between the current budgetary deficit and the cyclic nature of the economic activity could be seen through the perspective of discretionary modifications due to adopted fiscal and budgetary policies and to the changes brought by the fluctuations of economic activities.

In the case of an unsustainable growth of public debt induced by an increase of the budgetary deficit, fiscal and budgetary policies measures are imposed in order to improve the situation. Fluctuations in the size of the structural budgetary deficit offer information regarding the degree to which the aggregate demand is stimulated through policies of public finances, as well as information related to the degree of fiscal consolidation (Giorno et al., 1995).

Empiric evidence shows that different computation methodologies conduct to different results, which suggests that there is no such thing as a standard, "perfect" method for estimating the structural budgetary deficit (Bradner et al., 1998, Bouthevillain et al., 2001). The methodology used by the European Commission is the one described by the IMF and OECD (Hagemann, 1999) – procedure used by this study in order to estimate the structural deficit for Romania.

## The methodology used

The estimation of the structural deficit is realized in three stages: (1) estimation of the gap between effective GDP and potential GDP (output gap); (2) estimation of the cyclical deficit on the basis of the output gap and the elasticities of budgetary revenues and expenditures in relation to GDP; (3) estimation of the structural deficit by eliminating the cyclical component from the actual budgetary deficit (Hagemann, 1999).

Due to the fact that potential GDP is an unobservable variable (it cannot be taken directly from statistical data), estmating its level is one of the main difficulties in calculating the structural deficit.

For the Romanian economy we were confronted with the next problems: statistical data on GDP are published with delay and are often revised afterwards; Romanian economy suffered during the analyzed period numerous structural changes that affect the results, regardless the estimation method used; moreover, even though we used quarterly data the size of the sample can be considered as low[6].

In this paper potential GDP and the output gap for Romania has been measured using two methods: the production function approach[7] and by using an econometric filter (Hodrick-Prescott).

Calculating the structural component of the budgetary deficit means identifying the cyclical component first. To estimate the last one we used the elasticities of budgetary revenues[8] and primary current expenditures with respect to GDP; having done that we have then calculated the sensitivity of the deficit[9].

This paper is structured as follows: first section contains the estimation of the potential GDP and the output gap for Romania using the production function approach and the Hodrick-Prescott filter; second part contains the estimation of the cyclical budgetary component using the sensitivity of the deficit (calculated on the basis of budgetary revenues and expenditures with respect to GDP) and the output gap determined using the two methods and, finally, the structural budgetary deficit; last section contains the conclusions of the paper and the suggestions of the authors.

The analyzed period is 1999-2007 (third quarter) and the source of the statistical data is the Ministry of Economy and Finance, National Institute of Statistics, National Bank of Romania and the Eurostat database.

## A.1. The estimation of the potential GDP and the output gap by the production function approach

Because the potential GDP is not statistical observable, in order to have it made operational, the concept of the potential GDP has been extensively defined in the economical literature.

We define potential GDP to be the level of the real GDP that can be obtained in the economy without generating inflationist pressure. On the medium term, the real GDP can temporarily oscillate from its equilibrium value on the long-term, the potential GDP. On the long-term, the level of the potential GDP depends on the production capacity of the economy. The production capacity depends on the total factor of productivity[10], the rate of capital growth and of the labor force. That means that the potential GDP offers information regarding the capacity of production in a non-inflationist growing economy.

The output gap is calculated as a percentage difference between the real effective GDP and the potential GDP, representing a sintetical aggregate indicator of the inflationist pressures in the economy (BNR working papers, no. 20, 2007).

To estimate the potential GDP using the production function approach (methodology described by Denis et al 2006) we have used quarterly data for the 1999-2007 (third quarter) period. The

main advantage of this method is the fact that it also reflects the aggregate supply part of the national economy.

For the real GDP we have used quarterly data in SDDS format (Special Data Dissemination Standard), units million Ron, 2000 medium prices, for the 1999-2007 period, published by the National Institute of Statistics. The seasonal adjustment of data was made using TRAMO-SEATS method. Figure 1 shows real GDP and seasonally adjusted GDP.
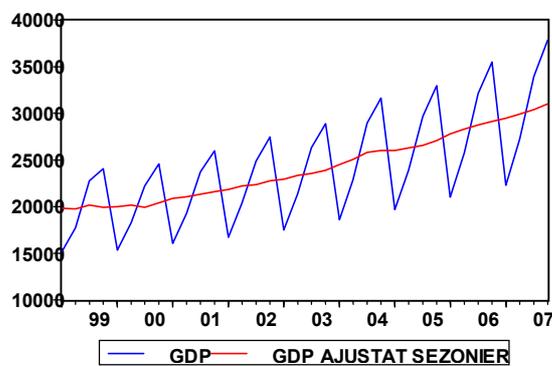


**Figure 1.** *Real GDP and seasonally adjusted GDP*

Estimating the potential GDP using the production function approach supposes following the next steps (Denis et al, 2006): (i) determining the form of the production function; (ii) estimating the parameters of the production function; (iii) determining the input of the production factors; (iv) calculating the total factor of productivity (PTF); (v) determining the potential GDP.

Considering the lack of data for the Romanian economy, and also the considerable use in the economic literature of a Cobb-Douglas production function, we have also chosen to use such a function, with constant scale output and decreasing factorial output,

supposing the coefficient for the capital to be 0.35 and for the labor 0.65[11].

Following the methodology described by Denis et al (2006), the Cobb-Douglas production function presents the GDP as a combination of labor force(L) and capital (K), corrected for the degree of excess capacity ($U_L$, $U_K$), and adjusted for the level of efficiency ($E_L$, $E_K$). Potential GDP is calculated using the formula:

$$Y = \left(U_L L E_L\right)^\alpha \left(U_K K E_K\right)^{1-\alpha} = PTF \times L^\alpha \times K^{1-\alpha}$$

where:

PTF contains both the degree of excess capacity and the adjusting for the level of efficiency.

Having considered that, the Cobb-Douglas production function on the Romanian economy has the next form:

$$Y = PTF \times L^{0,65} \times K^{0,35}$$

Regarding the labor input (L), in Romania the data series for the working population contains important changes – structural breaks – in the fourth quarter 2001- first quarter 2002 period, which appears as a result of the change in the methodology of INS. Due to these results, we have used as labor input the number of employees[12]. Figure 2 shows the structural breaks in the series for the labor force[13].
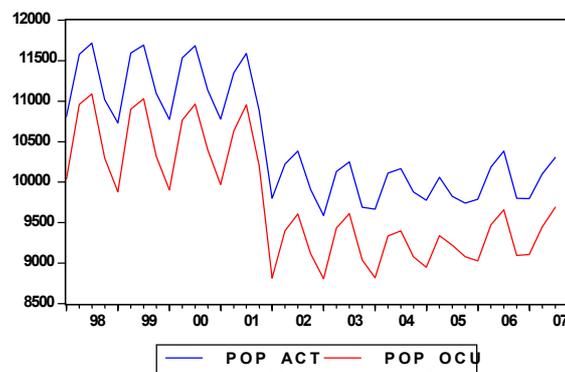


**Figure 2.** *Active and working population*

We have calculated the total factor of productivity (PTF) with the formula:

$$\ln PTF = \ln Y - (\alpha \times \ln(L) + (1-\alpha)\ln(K))$$

The relation to determine the potential GDP is:

$$Y = PTF^{pot} \times L^{pot\ \alpha} \times K^{pot\ (1-\alpha)}$$

The potential values of the factors that make up the potential GDP are the trend components of these factors filtered Hodrick-Prescott. Having calculated that, the output gap is determined using the next relation (real GDP – potential GDP)/ potential GDP. Figure 3 shows the output gap using the production function approach.
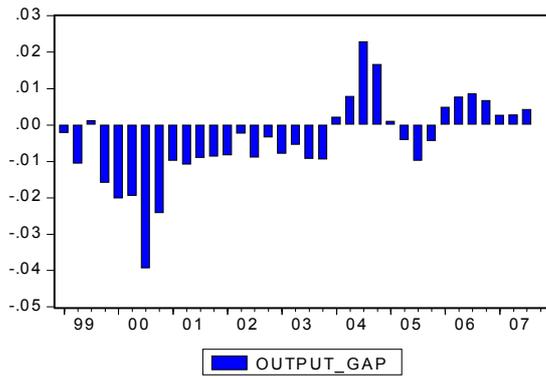


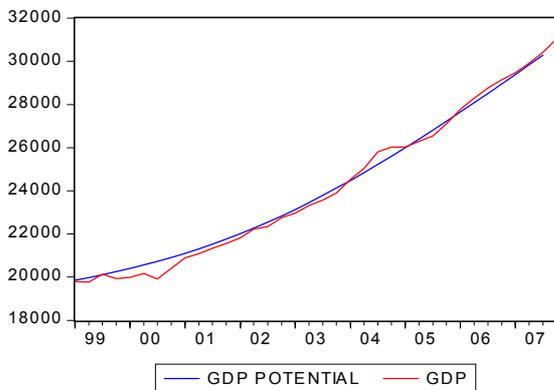**Figure 3.** *Output gap using the production function approach*



**Figure 4.** *Potential GDP by production function approach and real GDP*

## A.2. Estimating the potential GDP using the Hodrick-Prescott filter

Hodrick-Prescott filter is the most used method of determining the potential GDP in the econometric studies. Despite being often criticized in the economical literature, it is the most frequently used instrument in empirical studies and policy analysis to identify the trend component in time series data.

Hodrick and Prescott have proposed in 1980 a procedure having the objective to determine the trend of a time series (potential level of the real GDP), so as to minimize the squared deviations of the series from the trend (volatility gap) taking into account the rate of change in the trend. The compromise between the two objectives is realized through a multiplier, l, which sets the relative weight of the two. Hodrick-Prescott filter determines the trend as a minimum solution of the next equation:

$$\underset{y_t^p}{Min} \sum \left[ \left(y_t - y_t^p\right)^2 + \lambda \left[\left(y_{t+1}^p - y_t^p\right) - \left(y_t^p - y_{t-1}^p\right)\right]^2 \right]$$

where:

$y_t$ and $y_t^p$ are the natural logarithm of GDP and potential GDP;

$\left(y_t - y_t^p\right)^2$ is the sum of the squared deviations of the real GDP from the trend;

$\lambda\left[\left(y_{t+1}^p - y_t^p\right) - \left(y_t^p - y_{t-1}^p\right)\right]^2$ is a function that penalizes the squared deviations in the rate of growth of the trend component.

In order to estimate the potential GDP we considered $\lambda = 1600$, value that is recommended for the quarterly series. For annual data $\lambda = 100$ is more appropriate.
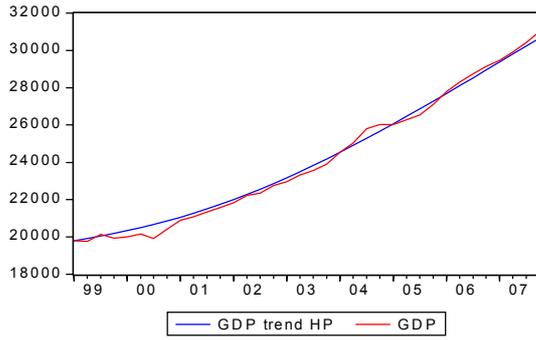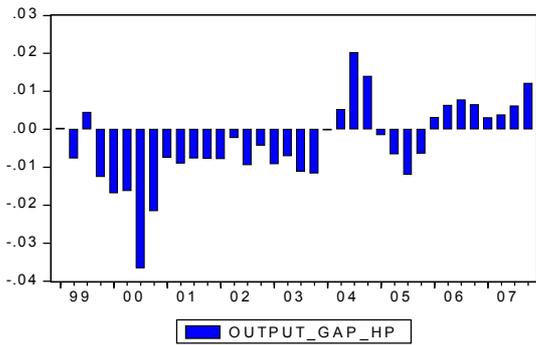
**Figure 5.** *Potential GDP by Hodrick-Prescott filter*



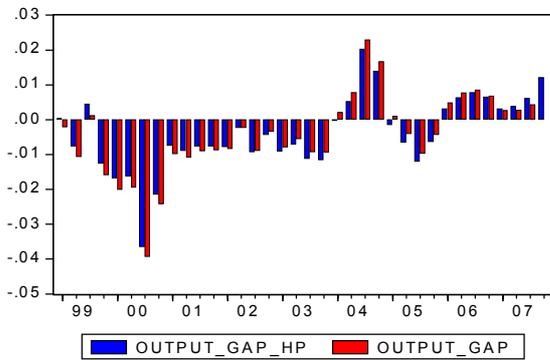**Figure 6.** *The Output gap by Hodrick-Prescott method*



**Figure 7.** *The Output gap using the two methods*

## B. Estimating the cyclical and structural budgetary deficit

The structural budgetary component is the actual budgetary deficit minus the cyclical component of the budgetary deficit. The cyclical deficit is determined using the sensitivity of the deficit and the economic fluctuations. Actually, the sensitivity of the deficit with respect to the cyclical economic fluctuations is the percentage variation of the budget when the output gap changes by a percent.

The structural component of the budget is determined as the difference between the actual budgetary deficit and the cyclical component, as in the next formula:

$$CAB_t = B_t - B_t^C = B_t - \sum_j B_t{}^C{}_j$$

where:

$CAB_t$ = structural components of the budget (adjusted cyclical component);

$B_t$ = actual budgetary balance;

$B_t^C$ = cyclical budgetary components on revenues and expenses.

The formula used to calculate the cyclical component is:

$$B_t{}^C{}_j = B_t{}_j \times \alpha_j^{PIB} \times output\_gap_t$$

The cyclical component of each category of revenues and expenditures ($B_t{}^C{}_j$) is calculated using the output gap and the elasticity with respect to GDP ($\alpha_j^{PIB}$). The sensitivity of the budgetary deficit with respect to the GDP (noted $\phi$ - is in fact the first differential of the actual budgetary deficit ($B_t$) with respect to GDP ($\phi = B_t{}_j \times \alpha_j^{PIB}$) ) is calculated as the difference between the sensitivity of total budgetary revenues ($\phi_v$) and total budgetary expenditures ($\phi_G$) with respect to the change in internal production.

$$\phi = \phi_v{}^{(14)} - \phi_G{}^{(15)}$$

To estimate the elasticity of budgetary revenues (on categories of revenues) (($\alpha_v$) and of primary current expenditures ($\alpha_G$), and also the deficit sensitivity we have used the OECD and EC methodology, described by van den

Noord (2000) and Girouard (2005). The aggregate elasticity of revenues (income tax, profit tax, social contributions, indirect taxes), the elasticity of primary current expenses and the deficit sensitivity are presented in the next table:

**The obtained results obtained by OECD and EC methods**

Table1

| Quarter | Revenues Elasticity | Expenditure Elasticity | Sensitivity of the Deficit |
|---------|---------------------|------------------------|----------------------------|
| 1998Q1 | 0.938 | -0.122 | 0.33 |
| 1998Q2 | 0.937 | -0.081 | 0.28 |
| 1998Q3 | 0.926 | -0.090 | 0.24 |
| 1998Q4 | 0.954 | -0.123 | 0.28 |
| 1999Q1 | 0.931 | -0.108 | 0.36 |
| 1999Q2 | 0.936 | -0.109 | 0.31 |
| 1999Q3 | 0.940 | -0.115 | 0.28 |
| 1999Q4 | 0.934 | -0.100 | 0.27 |
| 2000Q1 | 0.938 | -0.084 | 0.34 |
| 2000Q2 | 0.932 | -0.088 | 0.31 |
| 2000Q3 | 0.935 | -0.090 | 0.25 |
| 2000Q4 | 0.944 | -0.083 | 0.27 |
| 2001Q1 | 0.927 | -0.063 | 0.33 |
| 2001Q2 | 0.928 | -0.062 | 0.29 |
| 2001Q3 | 0.924 | -0.062 | 0.244 |
| 2001Q4 | 0.928 | -0.076 | 0.236 |
| 2002Q1 | 0.927 | -0.071 | 0.329 |
| 2002Q2 | 0.928 | -0.069 | 0.288 |
| 2002Q3 | 0.933 | -0.073 | 0.250 |
| 2002Q4 | 0.935 | -0.064 | 0.232 |
| 2003Q1 | 0.937 | -0.080 | 0.325 |
| 2003Q2 | 0.937 | -0.082 | 0.291 |
| 2003Q3 | 0.946 | -0.081 | 0.245 |
| 2003Q4 | 0.940 | -0.084 | 0.236 |
| 2004Q1 | 0.941 | -0.092 | 0.360 |
| 2004Q2 | 0.947 | -0.090 | 0.300 |
| 2004Q3 | 0.950 | -0.087 | 0.242 |
| 2004Q4 | 0.944 | -0.111 | 0.234 |
| 2005Q1 | 0.925 | -0.116 | 0.346 |
| 2005Q2 | 0.930 | -0.118 | 0.304 |
| 2005Q3 | 0.926 | -0.129 | 0.246 |
| 2005Q4 | 0.925 | -0.135 | 0.238 |
| 2006Q1 | 0.921 | -0.117 | 0.342 |
| 2006Q2 | 0.926 | -0.119 | 0.300 |
| 2006Q3 | 0.924 | -0.132 | 0.260 |
| 2006Q4 | 0.925 | -0.142 | 0.261 |
| 2007Q1 | 0.912 | -0.112 | 0.327 |
| 2007Q2 | 0.932 | -0.118 | 0.327 |
| 2007Q3 | 0.928 | -0.132 | 0.267 |

**Source:** authors calculus.

**Note:** The elasticity of budgetary revenues is a weighted average of the four main categories of revenues (income tax, profit tax, social contributions, indirect taxes) the weight of each category being the proportion in the total budgetary revenues. In the same time, out of the primary current budgetary expenses

only the transfers towards the unemployed are considered to be sensitive to the variation in production. Indirect tax elasticity has been considered as 1.

The output gap was determined using the two methods: the production function approach and the Hodrick-Prescott filter. In the next table we have the values for the output gap.

**Estimated Output gap for Romania**

Table 2

| Year | Output-gap (%) | Output-gap HP (%) |
|------|----------------|-------------------|
| 1999 | -2.75 | -1.55 |
| 2000 | -10.34 | -9.13 |
| 2001 | -3.86 | -3.19 |
| 2002 | -2.32 | -2.40 |
| 2003 | -3.23 | -3.92 |
| 2004 | 4.93 | 3.90 |
| 2005 | -1.74 | -1.67 |
| 2006 | 2.78 | 2.37 |
| 2007 | 2.19 | 2.21 |

**Source:** authors calculus.

The cyclical component is calculated as the product between the sensitivity of the deficit previously determined and the output gap. The next table shows the cyclical budgetary deficit for Romania for the period 1999-2007 (third quarter), having used the output gap estimated through both the methods described earlier in the paper.

**Cyclical Deficit in Romania (% GDP)**

Table 3

| Year | Cyclical Deficit (production function approach) | Cyclical Deficit (HP filter) |
|------|------------------------------------------------|------------------------------|
| 1999 | -0.79 | -0.43 |
| 2000 | -2.94 | -2.58 |
| 2001 | -1.07 | -0.88 |
| 2002 | -0.64 | -0.66 |
| 2003 | -0.87 | -1.05 |
| 2004 | 1.25 | 0.95 |
| 2005 | -0.43 | -0.70 |
| 2006 | 0.79 | 0.66 |
| 2007 | 0.29 | 0.38 |

**Source:** authors calculus.

By subtracting the cyclical component from the actual budgetary deficit we obtain the structural budgetary deficit. The results are shown in Table 4.

**Structural Deficit for Romania (%GDP)**

| Year | Structural Deficit (production function approach) | Structural Deficit (HP filter) |
|---|---|---|
| 1999 | -1.05 | -1.41 |
| 2000 | -1.04 | -1.40 |
| 2001 | -2.15 | -2.34 |
| 2002 | -1.96 | -1.95 |
| 2003 | -1.35 | -1.17 |
| 2004 | -2.43 | -2.14 |
| 2005 | -0.45 | -0.78 |
| 2006 | -2.07 | -2.35 |
| 2007 | -3.29 | -3.54 |

**Source:** authors calculus.

The output gap is a measure of the cyclical position of a country, the percentage difference between real GDP and potential GDP: a negative output gap shows the economy is producing below its potential level, or is underperforming; a positive output gap, on the contrary, suggests the economy is producing above the potential level. From this point of view, the Romanian economy had an interesting evolution: between 1999 and 2003 the output gap was negative, except one quarter in 1999, when it was slightly positive. The output gap is consistently negative in 2000, after that it starts decreasing, tough remaining still negative. The output gap becomes positive in 2004, but then again in 2005 falls negative, so that in 2006 and 2007 rises and remains positive.

The structural deficit (cyclical adjusted deficit) is an estimation of what the actual deficit would be in a particular year if the output gap is zero (the budgetary deficit for the level of the potential GDP).

The structural budgetary deficit is calculated to observe the character of the fiscal policy (restrictive or expansionist). In other words, if the promoted fiscal policy is expansionist, then the structural budgetary deficit will increase. If, on the other hand, we have a restrictive fiscal policy, then the structural component of the deficit will decrease. If the government would never change its fiscal policy, budgetary deficit would stay at the same level, would be constant. Then, this means that changes in the cyclical adjusted budgetary deficit are nothing but actions of discretionary fiscal policies. Considering that, the structural deficit can be seen as an indicator that measures the degree of discretion that is at the level of fiscal and budgetary polices.

On the other side, fiscal policy is considered pro-cyclical if it is restrictive whilst the production output gap is recessionary (negative) or expansionist whilst the production output gap is inflationist (positive). An anti-cyclical fiscal policy is one that tries to stop the recession and slow down the expansion of the economy (Baldwin, Wyplosz, 2006).

Looking closer at the Romanian economy, we can observe the strong expansionist character of the fiscal policies for the years 2005-2007 (structural deficit has increased considerably from -0.45% back in 2005, to -2.07% in 2006 and -3.29% in 2007

with the production function approach, and from -0.78% in 2005 to -2.35% in 2006 and -3.54% in 2007 using the HP filter). So considering the Romanian economy is preparing to enter the Euro zone, firstly having to be admitted[16], and then having to follow certain imposed regulations[17], we consider it is highly necessary to implement a *restrictive fiscal policy,* which will be capable of reducing both the actual budgetary deficit and the structural component.

Moreover, the output gap for the year 2006 and 2007 in Romania was positive, which is another indicator that imposes the necessity of a restrictive fiscal policy in the Romanian economy. From this point of view, we can say that for this period we had a pro-cyclical fiscal policy.

Analyzing the nature of the Romanian fiscal policy based on the evolution of the structural deficit, we observe that for the years 1999-2001 it was an expansionist policy, for the years 2002-2003 a restrictive one, again expansionist in 2004, and then restrictive in 2005. Based on the output gap, we had an anti-cyclical policy between 1999-2001 and pro-cyclical for the 2002-2004.

Though Romanian economy has offered and is still offering "signs" of the necessity of a restrictive fiscal policy, we can also take the example of developed countries from the European Union, that for several years have promoted restrictive policies, in the context of the output gap being still slightly negative. As a consequence, the structural deficit has decreased in the Euro zone from -2% in 2005 to -0.8% in 2007.

**Conclusions**

When a country is admitted to a monetary union, it has to renounce to one of the two macroeconomic instruments that can make use of – the monetary policy, but in the same time maintains full control on the second one – the fiscal policy. In the case of asymmetrical shocks – identified by the theory of the optimum monetary zone as being the main source of costs in a monetary union, the fiscal policy remains the sole macroeconomic instrument available.

Our working paper estimates the cyclical and structural budgetary deficit for the Romanian economy, considering this to be the most significant indicator in evaluating the performance of the fiscal management, and also considering the way in which the fiscal policy is ready to act as the sole instrument capable to stabilize the national economy after acceding the Euro zone.

The estimation of the structural budgetary deficit has been done in three stages: (1) estimation of the output gap; (2) estimation of the cyclical deficit based on the output gap and the elasticity of revenues and expenditures in relation to the GDP; (3) estimation of the structural component by eliminating the cyclical component from the actual budgetary deficit.

Analyzing structural budgetary deficit shows very clearly the lack of efficiency of polices regarding the public finances in establishing a more advantageous fiscal position. In certain periods there can be observed a

determination in the process of fiscal consolidation, though the evolution of the structural budgetary deficit in Romania in the considered period (1999-2007) reveals inconsistency in the way budgetary and fiscal policies were applied.

Taking into account that Romanian economy is preparing to accede the Euro zone, which means first it has to be admitted, and then will have to obey the rules of the union, we consider necessary the implementation and sustainability for at least a few years of a restrictive fiscal policy, capable of decreasing both the structural and actual deficit. In order not to generate negative consequences, the government should not adopt expansionist discretionary policies, but to continue the process of fiscal consolidation.

## Notes

[1] (i) maintaining the budgetary deficit of maximum 3%, (ii) maintaining a medium term balance as close as possible to "the equilibrium", or registering an exceeding balance.

[2] We need to mention that for the countries facing transition, that implement structural reforms, a more relevant indicator is the core deficit – a variant of the structural budgetary deficit. This indicator eliminates not only the effects of the cycles in economy, but also the temporary shocks, such as the arrears, temporary taxes, postponement of paying the salaries; starting from the premises that the transition countries might face perturbations that could seriously influence the GDP size.

[3] The pact recognizes that serious recessions beyond the governmental control can easily conduct to profound deficits. Trying to maintain low deficits during recessions implies adopting a restrictive policy that can deepen the recession, with potential disastrous consequences. Consequently, the pact defines the exceptional circumstances for those situations when its provisions are automatically suspended. A deficit exceeding 3% is considered exceptional when the GDP of a country for a certain year diminishes with less than 2% and no more than 0.75%. In the case that a country can/could demonstrate that the recession is exceptional from the point of view of the slope or compared with the former trends,

the situation is also exceptional. If the output falls with less than 0.75%, no exceptional circumstance can be solicited.

(4) Copenhagen criteria are: the political criterion (stability of the institutions that guarantee democracy, integrity of the state, human rights and minorities protection); the economic criterion (the existence of a functional market economy and its capacity to face the pressure of competition and of the European Union market); technical criterion (the capacity of assuming the obligations as a member state, including those regarding the adhesion to the objectives of the political, economic and monetary union – the implementation of the acquis communautaire).

(5) The European Commission is not to allow any permanent derogation regarding the switch towards the unique Euro currency, as it was the case of Great Britain and Denmark.

(6) For example, it doesn't even cover a whole economical cycle.

(7) Data regarding the evolution of potential GDP for Romania were included for the first time in the study "Calculating potential growth rates and output gaps – a revised production function approach" , Denis et al.(2006); the estimations for the EU-27 member states are made using the production function approach.

(8) The following groups of government revenues were taken into consideration: income tax, profit tax, social contributions and indirect taxes.

(9) For more details see the methodology described by Van den Noord (2000).

(10) We denote the total productivity factor with

PTF, capital with K and labour with L.

(11) The coefficients represent a mean of those used in other studies where the potential GDP is estimated for the Romanian economy: the coefficients of Dobrescu (2006): 0.65 and 0.35; BNR working paper, no. 20: 0.67 and 0.33; Denis et al.: 0.63 and 0.37. For low variations of this coefficients the obtained results are approximately the same.

(12) In addition regardless the methodology described by Denis et al.(2006) we consider that for Romanian economy we cannot use the number of hours worked because on one hand, we don't have concrete data on quarterly hours worked, and on the other hand, the efficiency of an hour worked by a neurosurgeon for example is not comparable with that of an unqualified worker. As a result the uncertainty degree of final estimation would significantly raise. Moreover, in Romania the working population is composed by "all persons over 15 that have conducted economic activities producing goods and services for at least one hour in the base period (…)", according to the computation methodology used in statistics.

(13) Due to the absence of official statistical data regarding the amount of fixed assets in Romania, these have been estimated using the PIM method recommended by OECD (estimated within the consultancy project "Consultancy services for improving the capacity of analyzing the polices for elaborating the forecasts inside the Ministry of Economy and Finance") – consultants prof Moisă Altăr (ASE, Bucharest) and prof Ali Bayar (Free University of Brusells).

$^{(14)}$ $f_v = \alpha_V \times$ ratio of total revenues in GDP.

$^{(15)}$ $f_G = \alpha_G \times$ ratio of current primary expenditures in GDP.

$^{(16)}$ Maastricht Treaty criteria.

$^{(17)}$ Regulations from the Stability and Growth Pact.

## References

Baldwin, R., Wyplosz, Ch. (2006). *Economia integrării europene*, Editura Economică, București

Bouthevillain, C., Courthimann, P., Van den Dool, G., Hernández de cos, P., Langenus, G., Mohr, M., Momiglianoand, S., Tujula, M., "Cyclically Adjusted Budget Balances: An Alternative Approach", *European Central Bank, Working Paper*, No. 77, 2001

Braconier, H., Holden, S., „The Public Budget Balance – Fiscal Indicators and Cyclical Sensitivity in the Nordic Countries", *NIER WP* 67, 1999

Bradner, P., Diebalek, L., Schuberth, H., "Structural Budget Deficits and Sustainability of Fiscal Positions in the European Union", *Oesterreichische Nationalbank Working Paper*, No.26, 1998

Denis, C., Grenouilleau, D., McMorrow, K., Roger, V., "Calculating potential growth rates and output gaps – A revised production function approach", European Economy, *European Commission Economic Papers*, no. 247, 2006

Dobrescu E., (2006). *Macromodels of the Romanian Market Economy*, Editura Economică, București

Dornbusch, R., Fischer, S., Startz, R. (2007), *Macroeconomie*, Editura Economică, București

Eisner, R., "Budget Deficits: Rethoric and reality", *Journal of Economic Perspectives*, vol. 3, nr. 2, 1989

Gălățescu, A., Rădulescu, B., „Copaciu, M., Estimarea PIB potențial în România", *Caiete de studii BNR*, nr. 20, 2007

Giorno, C., Richardson, P., Roseveare D., van den Noord, P. "Potential output, output gaps and structural budget balances". *OECD Economic Studies* 24, 1995

Girouard, N., André, C., "Measuring Cyclically-adjusted Budget Balances for OECD Countries", *Economics Department Working Papers*, No. 434, OECD, Paris, 2005

Gujarati, D. (2003), *Basic econometrics*, Ediția a patra, Mc Graw Hill, New York

Gunaydm, E., Ulku, U., "Cyclically adjusted primary balance: the case of Turkey", *Economic Research Department*, Turkish Treasury, 2003

Hagemann, R., "The Structural Budget Balance The IMF's Methodology", *IMF Working Paper* nr. 55, International Monetary Fund (IMF); National Bureau of Economic Research (NBER), Iulie, 1999

The Estimation of the Structural Budgetary Deficit for Romania in the Context of Accession to the Euro Zone

Leeuw, F., Holloway, Th., "The measurement and significance of the cycllicaly adjusted federal budget and debt", *Journal of Money*, Credit and Banking, Vol 17, nr. 2, 1985

Muller, P., Price, R., "Structural Budget Deficits and Fiscal Stance", *OECD Economics Department Working Papers*, nr. 15, 07/1984

Romer, D (2006). *Advanced Macroeconomics*, Ediția a treia, Mc Graw Hill Irwin, New York

van den Noord, "The Size and Role of Automatic Fiscal Stabilizers in the 1990s and Beyond", OECD WP, nr. 230, 2000