



# MODELING GOVERNMENT POLICIES USED FOR SUSTAINING ECONOMIC GROWTH IN ROMANIA<sup>1</sup>

---

---

Cristian Nicolae STĂNICĂ\*

## Abstract

*This paper presents some government policies scenarios and proposes the appropriate policies for stimulating the economic growth in Romania. The GDP dynamics, budgetary revenues, employment and wages are forecasted using a macroeconomic model of the Romanian economy. The direct effects of the fiscal policies and the indirect effects of the economic growth changes are investigated by three alternative scenarios as compared to a baseline scenario. The baseline should meet the following requirements: update of the macroeconomic indicators and maintenance of the same fiscal policy in the forecast period 2012-2013 as to 2011.*

**Keywords:** financial programming, simulation models, mix of policies, fiscal relaxation, minimum wage, taxation bases

**JEL Classification:** E17, E27, E62, H61, H68

## 1. Introduction

The traditional econometric macromodels applied to the weakly structured economies are usually confronted with some sources of errors in modeling, among which the omission of institutional factors that are important for such economies, the short and broken data series, or the difficulties regarding the consistency of the forecasted indicators after the simulation of the overall model. Due to such reasons, the forecasts resulting from the econometric models should be analyzed using the financial programming models like the ones used by the IMF and the World Bank.

In the Romanian modeling literature, some important models may be found, for example the "Dobrescu Macromodel of the Romanian transition economy", the Link-Dobrescu model, the Hermin model and other specific models, for instance, the estimation of potential GDP (Altăr, Necula, Bobeica, 2010).

---

<sup>1</sup>This paper is supported by the Sectorial Operational Programme "Human Resources Development 2007-2013 (SOP HRD)", financed from the European Social Fund and by the Romanian Government under the Contract SOP HRD/89/1.5/S/62988.

\* Institute for Economic Forecasting, Romanian Academy, E-mail: stanica\_cris@yahoo.com.

This paper presents some applications of a model improved by the author in order: (1) to forecast the GDP and taxation bases as a response to the government policy changes, (2) to estimate the impact on the budgetary revenues by the direct effects of the government policies and by the indirect effects of the economic growth changes.

Since it is a financial programming model, it is not used for building own forecasts. The model forecasts the IMF financial modules like Balance of Payments, General Consolidated Budget, Monetary Survey, by using few exogenous variables of the other medium-term econometric models and details the respective forecasts on the institutional sectors' accounts. These ones, in their turn, have the advantage of being previously verified by econometric relations or by qualitative analyses resulting from the economic theory. Thus, we may have a feedback connection that allows us to find certitudes about the forecasts consistency regarding the exogenous variables and the forecasted indicators in the IMF structure.

Another objective of the model is to provide alternative forecasting scenarios in relation to a baseline scenario. The versions of such scenarios are drawn up depending on the change in certain governmental policies, while the impact on macroeconomic indicators is assessed through the differences from the baseline scenario.

In this paper, the model was particularly used for the simulation of fiscal policies under the conditions of keeping the other variables unchanged.

The advantage against other models consists in the detailed number of resulting indicators and in their structure, which allows for carrying out economic analyses specialized in various fields. The model could be easily approached in drawing up economic policies, based on the "balanced" statistical relations, with a reduced share of behavior equations to be calibrated starting from a baseline scenario.

## **2. Peculiarities of the Model Related to the Government Policies Scenarios**

The model is built on the relationships across macroeconomic indicators of the IMF financial modules and the modules of the institutional sectors (the public, private and foreign sectors). The indicators of the IMF accounting system are structured in six primary modules: «NatAcc» National Accounts Indicators (GDP and the aggregate incomes); «GovAcc» Public Accounts (General Consolidated Budget); «Labor» Labor Force Indicators (Unit Labor Cost, Compensation of Employees); «Foreign» Foreign Sector (Exchange Rates, Balance of Payments, Romania's International Investment Position); «MoneyAcc» Monetary Sector (Monetary Survey); «PrivSect» Private Sector, as a residual for the overall model.

Model specification and parameters estimation are based on the published annual national accounts, on the data by the Ministry of Public Finance regarding the consolidated general budget, and on the data by the National Bank of Romania regarding the balance of payments.

According to the statistical correspondence between the primary modules and the Flows of Funds Table (FF), the model applies the conversion of the indicators of the

primary modules to a new set of indicators of the derived modules consisting of the Current Account and the Capital Account for three institutional sectors: the public sector (government), the foreign sector and the private sector (financial institutions, public enterprises, non-financial institutions and households). The indicators of the monetary sub-sector (Central Bank, commercial banks) are separated within the private sector.

The exogenous variables are those that “play” the role of command (impulse) variables in the model. They consist of two categories: policy variables, whose numeric values (quantifications) are generated by the governmental policy, and inertial variables, that are generated by the history of the phenomenon in discussion and maintain their influence in the analyzed period as well.

In the forecasting algorithm of the GDP components, General Consolidated Budget and Balance of Payments, the following exogenous variables are considered:

- Several indicators forecasted by the National Commission for Prognosis or the “Dobrescu Romanian Macromodel”: GDP growth rate, inflation, number of employees;
- The general consolidated budget deficit as percent of GDP;
- The effective exchange rate of the national currency;
- The package of fiscal policies linked to the fiscal relaxation and administration:
  - reduction in the legal rates for the income tax and for the profit tax;
  - reduction in the legal rates for the social contributions;
  - policies in the VAT and excises areas;
- The package of budgetary policies that influence capital or public consumption.

The structure of the model and the causal relations between the blocks are different as compared to the standard models of the IMF and the World Bank. One of the original elements consists in the direct link between the GDP account, the Labour account and the General consolidated budget account, through the decomposition of GDP into the factors’ incomes, and also separating the official taxation bases for the main budgetary revenues. Thus, one can scientifically support and control both the dynamics of the budgetary revenues and the dynamics of the taxation bases, in direct relation with the government policies: among the budgetary revenues and taxation bases from GDP twofold causal relations act, while the fiscal and labor policies and the aggregate demand are the mediators of these causal relations.

One of the main purposes of the model is represented by the planning of the budgetary revenues and expenditures, and, resulting thereof, the analysis of the impact of financial policy measures. For this reason, the «GovAcc» block has an important role within the model. In the «GovAcc» module, the revenues and the expenditure of the general consolidated budget are forecasted (the economic method), as well as the public debt, which finances the deficit. The fiscal revenues depend on the level and dynamics of the taxation bases specific to each component, and on the effective tax rates (empirical), in their turn determined by the fiscal policies (legal tax relaxation, improvement of tax administration).

The taxation bases are forecasted according to the macroeconomic equations in the «NatAcc», «GovAcc» and «Labour» modules, according to the forecasts of the main economic indicators:

By forecasting the gross value added and by knowing the objectives of the fiscal policy (reduction in the legal tax rates of income tax, social contributions and taxes on profits) the taxation bases for the direct taxes can be calculated:

- the official gross wages in economy = gross average wage \* average number of employees = taxation base for Social contributions and Taxes on income and salaries;
- the official gross profit and other incomes = taxation base for Taxes on profits.

By forecasting the consumption and the imports, and by knowing the objectives of the budgetary consumption policy, the taxation bases for indirect taxes can be calculated:

- market private consumption = taxation base for VAT;
- import = taxation base for Customs taxes.

The effective tax rates are established in the forecasted period in accordance with the objectives of the fiscal policies (legal tax rates) and with the specific behavior due to other factors difficult to explain (quantified by the “improvement of tax collection” parameter). The effective tax rates used in the model correspond to the following budgetary revenues: **cpt**=taxes on profits; **cwt**=taxes on income and salaries; **csc**=social security contributions; **cvat**=value added tax, excises; **cd**=customs taxes.

The model equations forecast the budgetary revenues depending on the taxation bases forecast. These are directly linked to the GDP and aggregated demand forecasts. The mechanism on the base of which the change in fiscal policy entails the GDP change is as follows: any important change in the fiscal policy, particularly related to a fiscal relaxation, would entail a surplus of factors’ incomes (net salaries of employees, net profits of employers) which, in their turn, would generate a surplus of aggregate demand (consumption and investments). This surplus would be carried forward to GDP and imports, so that, in the end, the gross value added would be adjusted, thus determining the increase in gross salary earnings and new jobs on the labor market. The additional economic growth would be carried forward to the increase in taxation bases and to additional collection of budgetary revenues.

### **3. The Impact of Government Policies on GDP Growth and Budgetary Revenues**

As an application of the model, I have simulated three scenarios for 2012-2013 regarding the impact on the economic growth and the evolution of the budgetary revenues in relation to the fiscal policies.

To project the budgetary revenue it is imperative to define a baseline scenario, which should meet the following requirements: update of the macroeconomic indicator forecast in relation to the first part of 2011 and maintenance of the same fiscal policy in 2012-2013 as to 2011 (corresponds to the 2011Spring Forecast of the National Commission for Prognosis – see Table 1).

The next stage after developing the baseline scenario is building up alternative scenarios, containing the suggested fiscal changes by simulating the macroeconomic development over 2012-2013, to measure the effects induced by the changes in the fiscal policy upon the economic indicators. The alternative scenarios are the following:

Variant 1: flat tax decrease by 4%, from 16% to 12%;

Variant 2: security contribution decrease by 3.4 %, from 44.4% to 41.0%, and minimum wage increases from 670 Lei to 800 Lei;

Variant 3: simultaneous application of both above-mentioned policies.

The alternative scenarios are defined as deviations from the baseline scenario due to the change in governmental policies, under the conditions of keeping the other variables unchanged.

The first two versions were subject to large debates in mass media between political personalities from opposition parties, by launching the draft governance program. In their opinion, Romania needs a fiscal relaxation to stimulate the economic growth and to render the fiscal conditions more attractive, because competition exists on the side of neighboring countries, particularly from Bulgaria, where the flat tax is 10%. The decrease in contributions is another proposal, but this measure should be accompanied by the increase in the minimum wage, which is at a very low level in Romania (about 165 euro) as compared to other EU Member States.

In the IMF's and Government's opinion, these scenarios are to be postponed because they determine an increase in the budgetary deficit and Romania needs, at present, a diminution in public expenditure and fiscal consolidation. This policy considered by the Government is to be found in the assumptions of the baseline scenario.

There are also some other possible evolutions that could affect Romania in the future, such as a second wave of crisis, a situation that could be introduced in the baseline scenario if considered by the National Commission for Prognosis.

The direct effects of the fiscal policy (the impact of the new taxation quotas) and the indirect effects (new macroeconomic developments due to the influences of the new fiscal policies) are measured for each of the alternative scenarios. For instance, the decrease in the social security contribution legal rate has as a direct result the drop in social security contribution receipts (negative effect). At the same time, a lower fiscal burden brings about an increase in the number of employees in the formal economy and an increase in production, investments, consumption and exports. These will contribute in their turn to increased budgetary revenues (from income tax, profit tax, VAT, excises), indirectly bringing additional revenues to the budget (positive effect).

The forecast of macroeconomic and budgetary indicators was based upon some assumptions regarding the economic agents' behavior:

- the positive reaction of the companies to the fiscal relaxation by tax base enlargement, stimulation of employment as compared to what would result from the normal elasticity between the economic growth and employment;
- the improvement of collection of social security contributions and income tax; also the dynamics of the taxes on products is higher than the one of the GDP;
- the behavior of companies towards competitiveness and a moderate wage increase, in accordance with the economic growth.

### 3.1. The Baseline Scenario

The baseline scenario (Table 1) corresponds to the Spring 2011 European Economic Forecast and to the forecast of the National Commission for Prognosis, also to the estimations of the consolidated budget, approved by the Ministry of Finance. The Spring Forecast covers the 2011-2014 period and consists of a set of indicators regarding the GDP by formation and utilization, the foreign trade, the labor force and prices, which are the indicators corresponding to the modules of the model.

Starting in 2010, the Romanian economy evolved towards the consolidation of the upward trend of the main indicators related to supply, which pointed out the end of the crisis. Industrial output was the first GDP component indicating the start of economic growth: electric and thermal energy production recorded growth beginning with the second quarter of 2009; it was followed by manufacturing, with positive dynamics beginning with the last quarter of 2009, while, at present, the growth recorded an acceleration by over 11% in Q1 2011. The improved evolution of the economic sectors led to a GDP growth by 0.7% in Q I 2011 as compared to Q IV 2010 and to exit from recession, since growths were recorded for two consecutive quarters as against previous period. Should this behavior continue in the next quarters, the GDP could be in 2011 over 1.5% higher as against 2010, and over 0.2% as compared to 2009.

Table 1

The Baseline Scenario

	2011	2012	2013
<b>Economic growth GDP (%)</b>	<b>1.5</b>	<b>4.0</b>	<b>4.5</b>
Private consumption	1.9	3.9	4.2
Public consumption	-1.1	1.5	1.8
Gross capital formation	2.0	4.3	6.4
Exports	8.1	9.7	9.5
Imports	7.1	8.3	8.7
<b>Inflation rate (%)</b>	<b>6.5%</b>	<b>3.5%</b>	<b>3.2%</b>
Gross average earnings (Lei)	2026	2125	2232
Average number of employees (thou. pers.)	4610	4655	4705
<b>Budget deficit (% GDP)</b>	<b>4.4%</b>	<b>3.0%</b>	<b>2.5%</b>

Source: 2011 Spring Forecast of the National Commission for Prognosis.

The baseline scenario for 2012-2013 foresees the continuation of the positive effects of the economic growth recovery recorded during 2011 (Table 1):

The inflation rate will be gradually reduced, reaching 3.2% in 2013;

GDP will accelerate its growth from 1.5% in 2011 to 4.5% in 2013, corresponding to the accelerated growth of private consumption;

Gross fixed capital formation (investments) will be the most dynamic component of the domestic demand;

The government consumption will have a moderate growth of 1.8% in 2013, as a consequence of the restrictive budgetary expenditure;

Exports will increase by an average of 9.5%, being supported by the improvement of the external economic environment, by the increase in foreign investments, as well as by the mechanism of promoting the exports;

Imports are estimated to increase slower than exports, by an average of 8.5%, in the context of the dependence of the economy upon imported energy resources and raw materials;

The budget revenues share in GDP will increase from 33.1% in 2011 to 33.6% in 2013, mainly determined by the increase in VAT and EU assistance;

Under the conditions when total expenditure share in GDP falls from 37.5% in 2011 to 36.1% in 2013, the budgetary deficit will maintain within sustainable limits.

### 3.2. Alternative Scenarios

#### Variant 1 – Flat Tax (Profit and Income) Decrease by 4%, from 16% to 12%

The reduction of flat tax by 4 percentage points does not have inflationary impact, being tempered by the still low demand in times of crisis; moreover, this measure will accelerate the economic growth by supply and investments. The effect of the fiscal relaxation is the more important as the implementation moment overlaps the process of economic recovery, after two years of crisis faced by the Romanian economy.

Table 2

#### Alternative Scenario – Flat Tax Decrease by 4% from 16% to 12%

	Baseline	Alternat.	Baseline	Alternat.
	2012	2012	2013	2013
<b>Economic growth GDP (%)</b>	<b>4.0</b>	<b>5.7</b>	<b>4.5</b>	<b>4.6</b>
Private sector	4.6	6.4	5.6	5.6
Government sector	-0.5	-0.5	-1.0	-1.0
Consumption	3.5	5.5	3.7	3.8
Gross capital formation	4.3	5.8	6.4	6.6
Exports	9.7	10.8	9.5	9.5
Imports	8.3	9.8	8.7	8.7
Number of employees (th. pers)	4655	4730	4705	4800
Gross average earnings (Lei)	2125	2146	2232	2254

Source: 2011 Spring Forecast of the National Commission for Prognosis (baseline).

As compared to the other measures of fiscal policy, the tax reduction for profit and income has maximum effectiveness over the acceleration of economic growth, from 4.0% (baseline scenario) to 5.7% in 2012 (Table 2). Due to the surplus of revenues transferred from the budget to the private economy, for salaries and profits, both components of demand, consumption and investments, would be encouraged. The multiplicative effect of incomes and profits would entail the increase in demand and supply which, in their turn, would lead to the increase in the average gross wage earnings and to the generation of new jobs (at least 75-95 thousand people in 2012 and 2013) (Table 2).

Despite the fact that flat tax relaxation has positive effects, stimulating economic growth and investments, however, a decrease is expected for the budget revenues by

3.5-3.1 billion in 2012-2013 as a result of direct negative effects and indirect positive effects (Table 3):

- Direct effects: reduction of revenues from taxes on income and profit, with 7-7.5 billion lei less as compared to the baseline scenario;
- Indirect effects: the additional revenues from social contributions, VAT and excise duties of 3.6-4.5 billion lei, entailed by encouraging consumption and employment.

**Table 3**

**Alternative Scenario – Flat Tax decrease by 4% from 16% to 12%**

	Baseline	Alternat.	Differ	Baseline	Alternat.	Differ
(%GDP)	2012	2012		2013	2013	
Budget revenues	33.8%	32.6%	-3491	33.6%	32.5%	-3095
Taxes on profits	1.9%	1.4%	-2659	1.9%	1.5%	-2858
Taxes on income	3.4%	2.6%	-4443	3.4%	2.6%	-4698
Security contributions	8.7%	8.8%	1480	8.5%	8.6%	1825
Value added tax	8.6%	8.8%	1544	8.6%	8.7%	1940
Excise duties	3.4%	3.5%	578	3.3%	3.3%	686
EU assistance	2.4%	2.4%	0	2.7%	2.7%	0
Budget expenditure	36.8%	36.2%	0	36.1%	35.5%	0
Wages and salaries	7.2%	7.1%	0	6.8%	6.7%	0
Budget deficit	-3.0%	-3.6%	-3491	-2.5%	-3.0%	-3095

**Source:** 2011 Budgetary Forecast of the Ministry of Public Finance (baseline).

The apparent effect of decreasing the share of budgetary expenditure in GDP by 0.6 percentage points in 2012-2013 (Table 3) is coming from the unchanged level of expenditure related to a higher value of GDP. This effect of GDP growth also leads to the change in budgetary deficit's share in 2012 by only 0.6 percentage points as compared to the baseline scenario.

**Variant 2 – Security Contribution Decrease by 3.4 %, from 44.4% to 41.0%, and Minimum Wage Increase from 670 Lei to 800 Lei**

The measure of minimum wage increase is very useful for the Romanian economy, due to its low level (about 165 euro) and to the employment concentration around the lower wages. Minimum wage indexation by 19% would lead to a 5.1% increase in the average gross wage earnings, since the only professional categories affected would be those with low wage earnings. However, this measure alone would entail the inhibition of supply and the increase in labor cost on short term.

In view to minimize the financial effort, the social contributions on the employers' side are to be diminished by 3.4 percentage points, this being the optimal value resulting from the model's simulations. Naturally, the additional cost would not be entirely absorbed, but the companies' availability is to bring 5% of hidden economy to official employment.

The proposed mix of policies (fiscal and labor policies) has a moderate effect upon the GDP growth (Table 4), being only entailed by the positive effect of increasing wage earnings that would encourage consumption. The fiscal relaxation of security

contributions would not allow the companies to allot funds for investments, but to compensate the additional labor cost. At the same time, structural changes would occur due to reallocation of the factors' income and to hidden economy diminution.

**Table 4**

**Alternative Scenario – Security Contribution Paid by Employer Decrease by 3.4% and Minimum Wage Increase by 19.0%**

	Baseline 2012	Alternat. 2012	Baseline 2013	Alternat. 2013
Economic growth GDP (%)	4.0	4.3	4.5	4.5
Private sector	4.6	5.0	5.6	5.6
Government sector	-0.5	-2.0	-1.0	-1.0
Consumption	3.5	4.0	3.7	3.7
Gross capital formation	4.3	4.4	6.4	6.4
Exports	9.7	9.7	9.5	9.5
Imports	8.3	8.6	8.7	8.7
Number of employees (th. pers)	4655	4655	4705	4705
Gross average earnings (Lei)	2125	2234	2232	2346

*Source: 2011 Spring Forecast of the National Commission for Prognosis (baseline).*

The reduction in social contributions on employers' side by 3.4 percentage points entails the budgetary wage expenditure diminution by 0.9 billion lei in 2012-2013 as compared to the baseline scenario (Table 5). Thus, on the whole, this measure would improve the budgetary deficit.

**Table 5**

**Alternative Scenario – Security Contribution Paid by Employer Decrease by 3.4% and Minimum Wage Increase by 19.0%**

	Baseline 2012	Alternat. 2012	Differ	Baseline 2013	Alternat. 2013	Differ
(%GDP)	2012	2012		2013	2013	
Budget revenues	33.8%	33.7%	-197	33.6%	33.5%	-201
Taxes on profits	1.9%	1.9%	-149	1.9%	1.9%	-157
Taxes on income	3.4%	3.6%	813	3.4%	3.6%	863
Security contributions	8.7%	8.5%	-1517	8.5%	8.2%	-1613
Value added tax	8.6%	8.7%	469	8.6%	8.6%	509
Excise duties	3.4%	3.5%	186	3.3%	3.3%	196
EU assistance	2.4%	2.4%	0	2.7%	2.7%	0
Budget expenditure	36.8%	36.6%	-854	36.1%	35.9%	-880
Wages and salaries	7.2%	7.0%	-854	6.8%	6.7%	-880
Budget deficit	-3.0%	-2.9%	657	-2.6%	-2.4%	679

*Source: 2011 Budgetary Forecast of the Ministry of Public Finance (baseline).*

By combining the effects of both economic policy measures the overall budgetary revenues will remain unchanged (Table 5):

- Direct effects: the reduction in the legal quota of security contributions by 3.4 percentage points determines revenues lower by 4 billion lei in 2012-2013. These

amounts are compensated by the surplus of revenues due to minimum wage indexation; so that, on the whole, the budgetary revenues from social contributions would be by 1.5-1.6 billion lei lower in 2012-2013 as compared to the baseline scenario;

- Indirect effects: additional revenues of 1.3-1.4 billion lei in 2012-2013, resulted from stimulating consumption (VAT, excise duties) and from increase in wage earnings (taxes on income);

**Variant 3 – Flat Tax Decrease by 4%, Security Contribution Decrease by 3.4% and Minimum Wage Increase from 670 Lei to 800 Lei**

This scenario takes over the positive effects of the two scenarios discussed above and neutralizes their negative effects. The simultaneous fiscal relaxation both of direct taxes (income and profit) and of social contributions enables companies to support the additional labor cost naturally, as a consequence of minimum wage indexation. Thus, the employers may choose between faster payments of arrears or take over a higher percentage of employees from the hidden economy.

Similarly to the first measure, namely the reduction of flat tax from 16% to 12%, the net salary earnings would increase rapidly on short term and would act as a boom on the domestic demand. The supply of competitive companies already existing on the market would have enough time for adjustment along one year, particularly due to the funds allotted for investments in the private economy, by reducing the tax on profit. On the other side, the available resources from the reduction of social contributions and of taxes on income and profit would act as credits for small and medium-sized enterprises in difficulty due to the economic crisis, supporting them to recover.

**Table 6**

**Alternative Scenario – Flat Tax Decrease by 4%, Security Contribution Paid by Employer Decrease by 3.4% and Minimum Wage Increase by 19.0%**

	Baseline 2012	Alternat. 2012		Baseline 2013	Alternat. 2013
Economic growth GDP (%)	4.0	6.0		4.5	4.6
Private sector	4.6	6.8		5.6	5.7
Government sector	-0.5	-2.0		-1.0	-1.0
Consumption	3.5	6.0		3.7	3.8
Gross capital formation	4.3	5.7		6.4	6.5
Exports	9.7	10.8		9.5	9.6
Imports	8.3	10.0		8.7	8.7
Number of employees (th. pers)	4655	4730		4705	4800
Gross average earnings (Lei)	2125	2256		2232	2370

*Source: 2011 Spring Forecast of the National Commission for Prognosis (baseline).*

The economic growth would be also supported by foreign direct investments, as a consequence of the fiscal facilities provided.

In this case, the model forecasts an acceleration of economic growth to 6.0% in 2012, as compared to 4.0% from the baseline scenario; afterwards, in 2013, the economic growth foreseen is over 4.5% (Table 6). This would entail the creation of at least 75 thousand jobs in 2012, concomitantly with the increase by over 6.2% in gross wage earnings, as compared to the baseline scenario. Another advantage of the packages of measures is reducing the budgetary wage expenditure, thus being helpful for the reduction in budgetary deficit.

Table 7

**Alternative Scenario – Flat Tax Decrease by 4%, Security Contribution Paid by Employer Decrease by 3.4% and Minimum Wage Increase by 19.0%**

	Baseline	Alternat.	Differ	Baseline	Alternat.	Differ
(%GDP)	2012	2012		2013	2013	
Budget revenues	33.8%	32.5%	-3553	33.6%	32.4%	-3159
Taxes on profits	1.9%	1.4%	-2760	1.9%	1.4%	-2956
Taxes on income	3.4%	2.8%	-3569	3.4%	2.8%	-3749
Security contributions	8.7%	8.5%	-85	8.5%	8.4%	153
Value added tax	8.6%	8.8%	2065	8.6%	8.8%	2486
Excise duties	3.4%	3.5%	784	3.3%	3.4%	895
EU assistance	2.4%	2.3%	0	2.7%	2.7%	0
Budget expenditure	36.8%	35.9%	-854	36.1%	35.2%	-880
Wages and salaries	7.2%	6.9%	-854	6.8%	6.5%	-880
Budget deficit	-3.0%	-3.4%	-2699	-2.6%	-2.9%	-2280

Source: 2011 Budgetary Forecast of the Ministry of Public Finance (baseline).

Though the fiscal relaxation measure has a major impact upon the acceleration of economic growth and employment increase, these benefits would entail, on short term, the diminution in budgetary revenues. On medium and long terms, the economic growth would be able to ensure the surplus of revenues necessary for filling the gaps caused by fiscal relaxation. To preserve the target of budgetary deficit share in GDP at 3% in 2012, other compensatory measures would be needed for supplementing the budgetary revenues with at least 2 billion lei (Table 7).

## 4. Conclusions

The main conclusions resulting from the model simulations concerning the impact of the government policies on the state budget revenues and sustainable economic growth are the following:

- The end of the two-year recession in Romania (2009-2010) requires the implementation of government policies able to ensure the economic recovery and to consolidate the positive effects of the economic crises.
- One of the factors stimulating the economic growth and improving the employment by reducing the “hidden economy” is the fiscal relaxation. According to the model results, the best package for Romania is the reduction in the flat tax simultaneously

with reducing the social contributions paid by the employer and with the minimum wage indexation;

- The proposed mix of policies has a direct impact on the GDP growth acceleration to 6.0% in 2012, as compared to 4.0% from the baseline scenario, and afterwards will continue to be sustainable around 4.5%. This would entail the creation of at least 75-95 thousand jobs in 2012-2013 over the level of the baseline scenario, simultaneously with the additional increase by 6.2% in the gross wage;

Despite the fact that fiscal relaxation has a positive impact upon employment and economic growth, these benefits would entail, on short term, a diminution in budgetary revenues by at least 0.4% of GDP. On medium and long terms, the improvement of economic activity would be able to ensure the surplus of revenues necessary for filling the gaps caused by fiscal relaxation.

## Acknowledgments

This paper is supported by the Sectorial Operational Programme “Human Resources Development 2007-2013 (SOP HRD)”, financed from the European Social Fund and by the Romanian Government under the Contract SOP HRD/89/1.5/S/62988, Project “Scientific Economic research, support of welfare and human development in the European context”, “Costin C. Kirişescu” National Institute for Economic Research, Romanian Academy.

## References

- Albu, L.L., Pelinescu, E., Scutaru, C., 2003. *Modele și prognoze pe termen scurt. Aplicații pentru Romania*. Bucharest: Institute of Economic Forecasting, Romanian Academy.
- Albu, L.L., Scutaru, C., Nicolae, M., 2004. *Modelarea ciclurilor economice. Cazul României*. Bucharest: The Expert Publishing House.
- Altar, M., Necula, C., and Bobeica, G., 2010. *Estimating Potential GDP for the Romanian Economy. An Eclectic Approach*. *Romanian Journal of Economic Forecasting*, 13(3), pp.5-25.
- Ciupagea, C., 2000. *Economic and Econometric Models for Romania*. Editura IEM, Bucharest.
- Ciupagea, C., and Manda, A., 1999. *The Romanian HERMIN Model*. ACE Project P96-6242-R Paper, Presented in Seminar Brussels, Belgium.
- Dobrescu, E., 2010. *Macromodels simulations for the Romanian economy*. *Romanian Journal of Economic Forecasting*, 13(2), pp.7-28.
- Dobrescu, E., 2008. *A Desirable Scenario for the Romanian Economy during 2008-2013. Some Considerations Concerning the Global Economic Context*. *Romanian Journal of Economic Forecasting*, 9(4), pp.15-58.
- Dobrescu, E., 2006. *Macromodels of the Romanian Market Economy*, Bucuresti: Editura Economica.

- Dobrescu, E., 2002. *Tranziția în România: Abordări econometrice*, București: Editura Economica..
- Institute for Economic Forecasting, Centre for Macroeconomic Modelling, 2011. The Dobrescu Macromodel of the Romanian Market Economy – 2005 version – Yearly Forecast, Spring Forecast 2012, March estimate. *Romanian Journal of Economic Forecasting*, 14(1), pp.277-281.
- Mohora, M.C., 2006. *RoMod: A Dynamic CGE Model for Romania - A Tool for Policy Analysis* (PhD dissertation). Rotterdam: Erasmus University Rotterdam.
- National Commission for Prognosis, 2009. *Proгноза pe termen mediu 2011-2014-varianta de primavara 2011*. Available at: <[http://www.cnp.ro/user/repository/proгноза\\_primavara\\_2011.pdf](http://www.cnp.ro/user/repository/proгноза_primavara_2011.pdf)>.
- Pereira, A. M., and Shoven, J. B., 1988. A survey of dynamic computational general equilibrium models for tax policy evaluation. *Journal of Policy Modeling*, 70(3), pp.401-436.
- Stanica, C.N., 2007. *Modelarea sectoarelor instituționale în economia de tranziție*, București:Editura BREN.
- Stanica, C.N., 2004. Macroeconomic forecasting with a SAM model for the Romanian Economy. Part II – Equations of the Model. *Romanian Journal of Economic Forecasting*, 5(3), pp.66-73.
- Stanica, C. N., 2004. Macroeconomic Forecasting based on a SAM model of the Romanian Economy. Part I – Main Features of the Model. *Romanian Journal of Economic Forecasting*, 5(1), pp.92-96.

## Appendix

### «NatAcc» and «GovAcc» blocks equations

The additional incomes and profits remaining in economy, due to taxation reduction, cause a shock to the aggregate demand, stabilized at the expected level ( $\Delta Dm\_ref$ ). This correspond to the change in the compensation of employees ( $\Delta CEM\_ref$ ) at the expected level of demand change, adjusted with the secondary effect of change in imports ( $\Delta M\_ref$ ), exports ( $\Delta X\_ref$ ) and of taxes on products ( $\Delta TP\_ref$  – collected on the demand surplus):

$$\Delta CEM\_ref = \Delta Dm\_ref + X_0 * f_x - M_0 * f_M - TP_0 * f_{TP}$$

where:  $M_0$ ,  $X_0$ ,  $TP_0$  are imports, exports and taxes on products from the baseline scenario

$$\Delta X\_ref / X_0 = f_x (\Delta Dm\_ref / M_0, X_0 / M_0)$$

$$\Delta M\_ref / M_0 = f_M (\Delta Dm\_ref / M_0, X_0 / M_0)$$

$$\Delta TP\_ref / TP_0 = f_{TP} (\Delta Dm\_ref / TP_0, TP_0 / Dm_0)$$

are empirically estimated functions.

The expected level of change in the compensation of employees ( $\Delta CEM\_ref$ ) sets out the number of employees (NE) and the gross wage (W) in the alternative scenario, based on elasticities existing in the baseline scenario. For example, gross wage is calculated in the alternative scenario at the same elasticity in relation with GDP as in the baseline scenario.

The budgetary block is operating based on the accounting relations (Table 8):

$$R = PT + WT + SC + VAT + CD + NR + KR + EU$$

$$E = WS + GS + IPE + SB + TR + KE + RL$$

$$B = R - E$$

Table 8

### «GovAcc» Block – Main Indicators

R	Budget revenues	Endogenous
PT	Taxes on profits	Endogenous
WT	Taxes on income	Endogenous
SC	Social security contributions	Endogenous
VAT	Value-added tax	Endogenous
CD	Customs duties	Endogenous
NR	Nontax revenues	Endogenous
KR	Capital revenues	Exogenous
EU	Grants, including EU disbursements	Exogenous
E	Budget expenditure	Endogenous
WS	Wages and salaries	Endogenous
GS	Goods and services	Exogenous
IPE	Interest payments	Exogenous
SB	Subsidies	Endogenous

TR	Transfers	Endogenous
KE	Capital expenditure	Exogenous
RL	Repayments and loans	Exogenous
B	Budget balance	Endogenous

**Source:** Consolidated budget reported by the Ministry of Public Finance.

The equations with parameters estimated from historical series are the following:  
Budgetary revenues (Table 8)

$$\begin{aligned}
 PT &= cpt * [GDP - (TP + CEM + VH)] \\
 TP &= TP (-1) * (VAT + CD) / (VAT + CD)(-1) \\
 WT &= cwt * NE * W * (1 - Lsce) \\
 SC &= csc * NE * W \\
 VAT &= cvat * MH \\
 CD &= cd * M * ER \\
 NR &= nr * GDP
 \end{aligned}$$

where: GDP = gross domestic product

TP = taxes on products, according with national accounts

CEM = compensation of employees, according with national accounts

VH = mixed income of households

NE = number of employees

W = gross wage

MH = market private consumption

M = import of goods and services (billion Euro)

ER = exchange rate, RON per Euro

*cpt*, *cwt*, *csc* and *cvat* are "effective tax rates", being dependent of fiscal policies (legal tax rates) and the presumptions on tax collection.

In case of taxes on income, since it comprises other taxes on free lance incomes, interests, etc., beside the tax on wages (majority), the *cwt* parameter is linearly increasing during the accelerated economic growth periods, indicating the expansion of freelance activities as compared to those entailing wages and salaries.

Budgetary expenditure (Table 8):

$$\begin{aligned}
 WS &= f(NEG, WG) \\
 SB &= sb * GDP \\
 TR &= tr * GDP \\
 CG &= cws * WS + cgs * GS + cg
 \end{aligned}$$

where: NEG = number of employees in government sector

WG = gross wage of budgetary employees

CG = government consumption, according with the national accounts

*Modeling Government Policies for Sustaining Economic Growth in Romania* 

$cws$  and  $cgs$  are correction parameters estimated from historical series, equal to the ratio of public gross value added to budgetary wages and salaries, respectively the ratio of public intermediate consumption to budgetary goods and services.

$cg$  is a correction value ( $cg/CG < 1$ ) equal to the difference between social benefits in kind and the residual sales of public administration.

These parameters could be set out as being constant during the forecasting period or could be extrapolated from the historical series trends.