

# HOW CAN BE INVESTIGATED THE FISCAL POLICY EFFECTS ON THE ROMANIAN ECONOMY?

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## **Abstract:**

Effects of fiscal policies have been and still continue to be a topic of interest for the political and academic debates. Although there is a dynamic of the investigation methods it reach to a point of having so many variables, models and methods that can be taken into account. Therefore the analytical results will differ substantially. In this context, it is natural to address the question of the appropriate method for identifying the effects that are generated by the fiscal policies in the economy. The answer seems as simple as it is complicated because the differences between states are visible and they propagate including in the specific fiscal policy research. Paper aims to explore the application possibilities regarding some models and methods for investigating the effects of fiscal policy on the Romanian economy.

**Key words:** *fiscal policy; growth; shock; model.*

**JEL classification:** E62; H20; H62.

## **1. Introduction**

Effects of fiscal and budgetary policies have been and still continue to be a topic of interest to the political and academic fields. Although there is a dynamic of the investigation methods it reach to a point of having so many variables, models and methods that can be taken into account. It is therefore natural to address the question of the appropriate method for identifying and sizing the actual effects those fiscal and budgetary policies generates real in the economy. The answer seems as simple as it is complicated because the differences between states are visible and they propagate including specific research focused on fiscal and budgetary policies. In addition, it should be taken into consideration that major influences come from politics, population and other factors (level and public debt sustainability, size and persistence of the fiscal impulse, changes in revenues and expenditures). These factors are not the paper subject.

The paper aim is to analyze the models and methods that can be used to study the effects of fiscal and budgetary policies in the case of the Romanian economy that is known how frequent changes the legal, institutional and not only in terms of public finances. So, for such a changing economy is much more difficult the approach to investigate what happens in the real economy due to government measures. These dynamics reflect the lack of coherence of the propagated consequences of state policies in the macroeconomic variables. The paper is structured to suit the purpose better. In section two models are presented that allow investigation of the effects of fiscal and budgetary policies, and in the next section indicate the emphasis is on methods that can be used to indicate the effects of government measures on the Romanian economy. Conclusions are given in the last section.

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## 2. Investigation models of the fiscal and budgetary policies effects

Studying the models to investigate the effects of fiscal and budgetary policies on the economy can be achieved using models such as the Keynesian model, equilibrium model, model dynamic stochastic general equilibrium (DSGE) model proposed by the European Central Bank, global fiscal model (GFM), et others.

### 2.1. Keynesian model

In the Keynesian model, fiscal and budgetary policies are the result of state budget choice for economic and social purposes. This implies, on the one hand, revenue mobilization and, on the other hand, public expenditure. Keynesian model is designed to assess the rationality of budget deficits as a linear expression of fiscal and budgetary policies. Thus, it was highlighted both the strategic approach of on political field to leave a legacy difficult to manage, and the conflicts between parties that can influence government budgetary choices. Two models were developed (simplified and completely) which aim to highlight the stabilizing role of public budgets in relation to the major objective of full utilization of labor.

In simplified Keynesian model is used representations that consider two possible representation based on global supply and demand, or on the equality between saving and investment.

The completely Keynesian model explains the resulting macroeconomic equilibrium by the simultaneous operation of market goods and services and money market. Thus, to reach equilibrium model allows also the indication of the effects of the imbalance (between fiscal and budgetary policies) on the economy, especially on GDP and capital formation. For it is considered that the level of public spending is not affected by the formation of public resources, their volume remained unchanged, while taxes decrease. This temporary reduction in taxes is followed by an increase in their future value, according to the current value of debt. This policy would increase incomes, leading to improved living standards while the demand for goods and services increases.

Economists try to answer the question on the impact of changes in aggregate demand on the economy. Therefore, in the case of a Keynesian economy in the short term it appears that aggregate demand increases national income. The rigidity of wages, prices, wrong expectations, changes in aggregate demand affect production factors. The Keynesian analysis provides a common justification for the policy of reducing taxes or increase spending when the economy is confronted with recession.

Supporters of this approach have shown that the rigidity of wages, prices, the short-term changes in aggregate demand, are less important in the long run. As a result, fiscal policy affects national income just by changing the supply of inputs.

According to the model, long-term impact of government measures reduce national saving and its consequences. The effects can be explained starting from the private sector budget constraint, which implies the relation:  $Y = C + S + T$ , where Y: GDP, C: private consumption, S: private savings, T: taxes and fees, less transfers. Also, GDP can be divided into four types of expenditure, the relationship:  $Y = C + I + G + NX$ , where I: investment; G: public spending, NX: net exports. Equating the two relationships, it get:  $C + S + T = C + I + G + NX$ , so  $S + (TG) = I + N$ . Thus, public and private savings amount must be equal to the amount of investment and net exports.

Another important identity is between current account balance and capital account balance. Current account balance is defined as net exports given by (NX) plus net investment and net transfers of residents, but the last two are ignored. Negative capital account balance is foreign direct investment (FDI), which are investments made by residents in other countries, less investment by foreign residents. This leads to the third form of identity:  $NX = FDI$ . Thus, international flows of goods and services must be equal to the international flow of funds.

The relation  $S + (TG) = I + NFI$  expressing equality between national savings, as the sum of public and private saving, and use these funds for investment in the country and abroad.

It is assumed that the government maintains constant public spending and reduces taxes, leading to deficit reduction and public savings. This identity can be achieved through several complementary ways: increasing private savings, reducing investment in the country, reducing the foreign net investments.

On private savings, it was defined two views on the pace of their variation: i) some economists argue that the growth rate of private savings equals the reduction in public savings; ii) the conventional view, private savings increase less than the value that lower public savings, so that national economies decline. In this case, total investment - at home and abroad - lower, which will give the gross domestic product and national income lower. Thus, with less capital available then the marginal cost of capital increases, interest rate and therefore increase profitability per unit of capital held. Meanwhile, labor productivity will be lower because there is a reduction in real average wage and total income (salary) work.

Reduction of net foreign investment, in a period of time, means that residents will have less capital abroad and that foreign residents will hold more capital in the country. In both cases, capital income will decline. Decline in net foreign investment takes place simultaneously with the decline in net exports, leading to an increased trade deficit. This link between budget deficit and trade deficit are called "twin deficit".

Other effects could include: i) short-term aggregate demand growth and reducing long-term capital stock are the most important effects of budget deficit, ii) the so-called "tax loss" in the sense that taxes are used for debt reimbursement, but debt service is regarded as a transfer between members of society and not as a cost to society as a whole; iii) affect the political process that determines fiscal policy. Some economists argue that government can reduce the discipline to borrow the budget process as politicians are less concerned with the strict limitation of the level of public expenditure in the budget revenues, because they can borrow. Thus, there is a reduction in government's fiscal flexibility, iv) the vulnerability of economies to international crises because the dependence on external resources for budget deficit financing and refinancing; v) reduce freedom of action of policy makers (policy).

## **2.2. Other models**

General equilibrium models are theoretical models that reflect cyclical fluctuations in the economy. Having a long tradition in economics, especially in international trade theory, the models are considered for the calculation of equilibrium. In contrast - stochastic dynamic general equilibrium models (Dynamic Stochastic General Equilibrium - DSGE) are typically used by central banks for forecasting inflation and monetary policy. The key feature and main advantage of such models is that their parameters are derived from rigorous microeconomic foundations. More specifically, these parameters derived from analysis of relations expresses the fundamental motivations of economic and technological constraints, elements that are less subject to fluctuation and, thus, are more stable than the global relations between observable macroeconomic aggregates.

The DSGE (Dynamic Stochastic General Equilibrium - sometimes abbreviated as SDGE or DGE), as a branch of applied general equilibrium theory, is extensively used in modern macroeconomics. DSGE methodology seeks to explain aggregate economic phenomena (such as economic growth, economic cycles), and the effects of monetary and fiscal policy based on macroeconomic models derived from microeconomic principles. Thus, using macroeconomic models are based on

microeconomic foundation to eliminate the shortcomings of traditional forecasting models.

DSGE model has seen a significant development which led to the development and use of models derived from it. For example, the IMF uses its own model IMF's Global Integrated Monetary and Fiscal Model (GIMF) is a development of GEM (Global Economy Model), while the ECB uses AWN (Area-Wide Model for the Euro Area).

Through DSGE models is described the behavior of the economy as a whole by analyzing the interaction between many microeconomic decisions. Decisions taken into account in most DSGE models correspond to macroeconomic aggregates such as consumption, saving, investment and labor supply and demand. Policy makers in this model are called "agents" and include households, businesses and governments, central banks and other entities.

In addition, DSGE models are dynamic as studying how the economy evolves over time. They are also stochastic, taking into account that the economy is affected by random shocks such as technological changes, fluctuations in oil prices or changes in macroeconomic policy. This contrasts with static models of Walrasian general equilibrium theory, general equilibrium models.

Currently, there are two main theories are based on the DSGE, respectively: i) real business cycle theory (RBC), which is based on neoclassical growth model (with flexible prices assumption) to study how real economic shocks could cause business cycle fluctuations (Kydland and Prescott, 1982, Cooley, 1995 ); ii) Neokeynesian DSGE models are based on a structure similar to RBC models without considering that prices are set by monopolistic firms and cannot be adjusted instantaneously and without cost. Paper that first introduced this framework was Rotemberg and Woodford (1997). Presentations of the model are made by Gali (2008) and Woodford (2003). In addition, monetary policy implications are investigated by Clarida, Gali, and Gertler (1999).

The European Central Bank (ECB) has developed a DSGE model, often called Smets-Wouters model, which is used to analyze the euro area economy as a whole (in other words, the model does not consider individual European countries, specifically). It is designed as an alternative to the Area-Wide Model (AWM), a traditional empirical model prediction that the ECB has used for many years. Also, Smets-Wouters model presents the advantages of build a DSGE model rather than rely on traditional methods.

AWM is a relatively standard structural model macroeconomic for euro area. It is based on a specific data set that includes "synthetic" historical series for the euro area as a whole. The model is regularly used for forecasting and simulation effects. Keynesian model AWM is a classic short and long term in the sense that GDP is determined by aggregate demand in the short term, while on long-term aggregate supply matters. Deviations of actual GDP from potential GDP and unemployment in the long-term exogenous wage and price adjustment conditions make the return to equilibrium neoclassical model. The long-term equilibrium for aggregate supply is determined by a Cobb-Douglas production function with exogenous NAIRU and a consistent set of conditions derived from profit maximization under perfect competition.

Components of aggregate demand are consistent with this balance through a stock-flow adjustment mechanism involving net foreign assets and real exchange rate. Regarding prices, the long-term nominal anchor chosen is determined by the model (eg, a target inflation rate falling in setting interest rates, money supply or, if a fixed exchange rate, price "universal").

AWM has the following features: i) consider the euro as a single economy, and the model contains equations for all the variables (for example, the consumer is modeled as a function relating to income and wealth for the whole area; ii) is a quarterly model, largely based on national accounts; iii) in comparison with some other

structural models, AWM is a relatively small model because it has about 89 equations, of which 15 are behavioral equations, which are estimated based on historical data area, since 1970, rather than being calibrated; iv) on long term it is considered equation for error correction; v) dynamic homogeneity conditions are considered appropriate for the model to ensure a real balance independent of nominal variables ( so-called vertical Phillips curve), vi) model has explicit expectations, which are, however, largely modeled. A detailed presentation of the model is made by Fagan, Henry, Mestre (2001).

Since 2002, the ECB has a new model known as model Smets - Wouters (Smets, Wouters, 2002), which in 2011 was replaced with NMCM (New Multi-Country Model for the Euro Area NMCM) (Dieppe, Pandiella, Willman, 2011).

On the other hand, its quarterly IMF uses a model focused on the basics the entire DSGE model. Details of this model are presented by Rajan, (2004), Laxton (2008), Botman, Laxton, Muir, Romanov, (2006), Coenen et al. (2010). Current economic conditions have forced the need for reconsidering the 2010 model which is why the IMF uses GIMF (Global Integrated Monetary and Fiscal Model) (Kumhof, Laxton, Muir, Mursula, 2010).

Comparing these macroeconomic models is made in the work of Wieland, Cwik, Müller, Schmidt, Wolters, 2009).

Also, national bank develops their own macro model in order to indicate how the economies function.

In the Romanian case, it is used the Romanian economy quarterly model that is a Keynesian model in short term and a neoclassical model on the long term (Dobrescu, 1998).

### **3. Empirical methods of analysis of the effects of fiscal and budgetary policies**

Empirical methods are based on quantitative investigations on the dynamics and structure as well as econometric tests (regression, cointegration, causality, VAR, SVAR, VECM, et others).

To analyze the effects of fiscal and budgetary policies on the economy are used in the literature data from official sources (OECD, World Bank, IMF, EBRD, Eurostat, and AMECO). In terms of frequency data used in testing there is no consensus in the literature. Synthesizing the research findings in the literature it can be said that the effects of fiscal and budgetary policies can be determined more accurately using data on a quarterly basis than annual (Afonso, Sousa, 2009b). Pros use quarterly data are indicated by Blanchard and Perotti (2002) who argue that the frequency of time is useful because: i) are eliminated the effects of discretionary adjustments of fiscal and budgetary policies in response to unforeseen events during the quarter; ii) analysis of the fiscal and budgetary policies indicates that policy makers suggest that they need more than a quarter to understand the output shock, to decide the measures to be applied in response to shocks found to develop framework for this action and implement the measures. All these may make the use of data with annual frequency.

However most studies rely their analysis on annual data, mainly for developed countries and OECD or EU. In this respect, Perotti (2007) consider this a problem because the annual data cannot be excluded that the estimated levels of government spending are contaminated by a discretionary policy response to other changes in the economy.

Problems arising from the choice of the frequency were also notified by Höppner (2001) and are represented by the following: i) income tax, for example, are not always received in the same quarter of income achievement that are taxable; the same is true for budgetary expenditures that are engaged in one period and completed the payment to another period. This interfere the registration system of financial flows from the government (system of "cash" or accrual) (Giordano, Momigliano, Neri,

Perotti, 2008); ii) from the economic point of view, the effects of fiscal and budgetary policies have to be identified when applied the government.

Given the specification of point i), quarterly data has its limitations in that they are characterized by seasonal effects that may be removed by specific econometric techniques of seasonal adjustment.

Using annual data could be a way to solve the problem of point ii) as the budget is developed and approved, usually for a year and each fiscal position and budget refers to a given fiscal year. The effects of these income and expense budget are felt in the economy with a lag which is found in econometric equations.

To estimate as appropriate the effects of fiscal and budgetary policies are recommended in the literature to use a large number of observations in order to have statistically valid results, but also to be consistent with reality. Here is another argument in favor of quarterly data that would provide a large number of observations. In the case of a small number of observations is recommended to use econometric techniques based on panel data rather than series data.

Important in applying the relevant investigative methods is also the choice of the necessary variables and the manner of expressing them. Investigations from the literature summarize that it can be said that the fiscal-budgetary and macroeconomic variables are included in the equation with an expression of: i) the logarithm of real per capita (Mountford, Uhlig, 2009, Blanchard, Perotti, 2002; stammer, Meier, Muller, 2008) (where the econometric equations are obtained elasticities), ii) logarithm of real (Afonso, Sousa, 2009, Afonso, Claeys, 2007), iii) seasonally adjusted real terms for variables (Giordano, Momigliano, Neri, Perotti, 2008).

Methods of empirical research for the effects of fiscal and budgetary policies on the economy are co integration and VAR (Vector Autoregression) or S-VAR (Vector Autoregression Structural) which allow the identificatio of the sign, size, usually lag 4 for quarterly data or even 6 (Mountford, Uhlig, 2009). VAR method (Blanchard, Perotti 2002; Kuismanen, Kämpfi, 2009) has diversified through S-VAR (Perotti, 2007) which in turn expanded the B-SVAR (Structural Vector Autoregression) (Afonso, Sousa, 2009a, Afonso de Sousa, 2009b). S-VAR criticism is expressed by Auerbach and Gale (2009).

Another method of investigation is VSPD (Vector Stochastic Process with Dummy Variables) (Kuismanen, Kämpfi, 2009).

Analysis of the effects of fiscal and budgetary policies is made not only at country level, organizations, but also the regions / provinces (eg, effects of budget deficit financing through vertical and horizontal transfers are analyzed using panel Stehn, Fedelino (2009)).

Considering the diversity of the empirical methods it is not surprising the different investigation results regarding the effects of fiscal and budgetary policies.

In Romanian case can be used the empirical methods but it must be resolved the problems of the lack of the stationarity of the variables without affecting the number of observation. The official data availability represents a major concern because it is difficult to construct a data base based only on a single official source. Using different sources may cause some problems regarding the data comparability. Therefore, many studies on emerging economies apply panel data for the investigation of the effects of fiscal and budgetary policies.

#### **4. Conclusions**

The debates on fiscal and budgetary policies effects on the economy have not indicate the most adequate investigation methods because of the dynamic of modeling and empirical investigation on this issue. The multiple model and methods make difficult the research in this subject because it must follow a certain model or method

that is suitable for the investigation purposes. In order to do so, it is necessary to know these model and methods in order to decide which is useful for the analyze of fiscal and budgetary policies effects.

The paper aim is to present the basics features of the model and methods that can be applied for studying the effects of fiscal and budgetary policies. Therefore, the first step consists in indicating the models that was developed initially for monetary policy and then was extended to the fiscal and budgetary policies to highlight the link between macroeconomic variables and the impact that a shock has on these variables. As a result, these models reflect the effects of shock transmission from the fiscal and budgetary policies generated by the changes in macroeconomic variables. But these models are difficult to test because of the data lack. In this context, the main finding of the literature is based on empirical methods in order to indicate the sign, size, lag and other aspect of the effects of fiscal and budgetary policies on economy.

The empirical methods are based on quantitative investigations on the dynamics and structure as well as econometric tests (regression, cointegration, causality, VAR, SVAR, VECM, et others) and involve quarterly or annual data regarding different variables. The data frequency causes some problems that are indicated in the literature but it is a consensus that quarterly data are more adequate to have a large number of observations.

Also, the paper points out the possibilities to investigate fiscal and budgetary policies in the Romanian case.

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