Model for Integrating Monetary and Fiscal Policies to Stimulate Economic Growth and Sustainable Debt Dynamics

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Abstract:

This article examines the main integration trends of the state's monetary and fiscal policy in influencing economic growth and maintaining the sustainability of public debt. It is argued that the relationship between these trends of macroeconomic regulation is predetermined, on the one hand, by the potentially negative impact of fiscal expansion from the point of view of inflation, and by the negative impact of a likely state default in failing to refinance the debt from the Ministry of Finance, on the other hand.

The paper studies the selected array of statistical data using the fiscal policy multipliers concept, the relationship between the effect of increase/decrease in budget expenditures, the slowdown in economic activity and the efforts by the Central Bank to offset fiscal measures, on the one hand, and the ratio of an increase/decrease in budget revenues and debt expenditures used to finance the budget investments, on the other hand.

It is revealed that the investments are effective if implementing budget expenditures in the presence of the GDP gap and unrealized expectations of economic agents, while reducing spending in such a situation will intensify the recession. The GDP growth determined by these investments should provide the tax effect sufficient to cover the expenses. Otherwise, there can be negative effects of debt that establishes the need for measures to refinance public debt by the Central Bank.
The conclusions of the paper can be used to assess the possible integration of monetary and fiscal policy based on various states.

Keywords: monetary policy, fiscal policy, budgetary policy multipliers, the Central Bank, economic growth, public debt

JEL Classification: O10, E63

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1. Introduction

Nowadays, in world economy the need for integration of monetary and budgetary policy has ripened. This is due to the continued low rate of economic growth following the crisis of 2007-2008. If, following the end of the dot.com crisis and until 2008, the growth rate of the world economy, according to the IMF, was 4-6 %, and then from 2011 to 2017 this range was 2.8-3.5%. This situation is emerging against the background of curbing of active economic support measures in the leading countries. Thus, the United States have no 'quantitative easing' program in place since 2015; in the Eurozone, following the signing of agreements aimed at tightening fiscal discipline in 2012, measures to buy 'problem countries' bonds by commercial banks were gradually reduced to a minimum through refinancing of the ECB; in China, following the major credit defaults in 2014 and the widening of the exchange-rate gap between the yuan used within the country (CNY) and the Hong Kong (offshore) yuan CNH to 3% in 2015-2016, measures have been initiated to move to the market principles of monetary policy (Auerbach and Gorodnichenko, 2010).

At the same time, there is no incentive to intensify economic growth, as manifested in negative interest rates in a number of European countries (deposits as well as bonds), lower Brent oil prices by more than 50% in 2014-2016 (and generally low business activity in the energy market), negative expectations of investors (as manifested by the stagnation of returns on the financial market).

Integration between monetary and fiscal policy can provide an integrated approach to overcoming this situation. Integration should be based on the main postulates of the efficiency and balance of budgetary policy, i.e., the public expenditure multiplier and the tax multiplier. These are indicators that demonstrate the potential of the budgetary policy's galvanizing effect on GDP.

2. Methods

Several works could be distinguished, where the authors considered multipliers in terms of monetary and budgetary policy integration.

Baum, Poplawski-Ribeiro and Weber (2012) draw attention to the relationship between the budgetary policy multipliers and the stages of the business cycle. The authors analyze data for the G7 (Group of Seven) countries based on statistics from the 1960s to 2011, using vector-based autoregression based on the definition of the output gap threshold values. These thresholds divide the economic cycle into two phases- recovery and decline-and allow determining the value of multipliers because of the positive and negative shock of budget expenditures and incomes at each phase. In 6 out of 7 countries, the government spending multiplier showed a high degree of impact on GDP growth (and in 4 countries it was higher than 1, i.e. the increase in output was higher than the cost). At the same time, the tax multiplier

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showed less efficiency, with only 4 countries out of 7 where tax cuts provided for a slight increase in output, while a more negative effect has been observed in the remaining 3 countries. For the economic recovery stage, the increase in government spending was effective only in Japan and the United States, which, for the period under study, was due to state participation in the development of new technological trends. Tax reductions in 5 cases out of 7, and tax increases in 4 cases out of 7 worsened the economic growth. On this basis, the authors conclude that there is a strong correlation between the efficiency of the government spending multiplier and the stage of the economic cycle and the weaker similarity of the tax multiplier, which appears to be due to the degree of manifestation of the Ricardian nature of budgetary policy (Thalassinos and Dafnos, 2010; Thalassinos and Pociovalisteanu, 2009).

Auerbach and Gorodnichenko (2010; 2011) assess the intensity of the government spending multiplier by measuring the effect of fiscal shock, i.e. increasing government spending, on macro-variables. The analysis is carried out based on the United States data from 1947 to 2008, as well as OECD countries from 1985 to 2010. Private consumption and investment have been identified as being marginalized by government spending during the recovery phase, but are supported by them during depression. At the same time, unemployment, due to increased government spending, decreases in depression and does not change on the rise, while real wages show a backlash. Imports and exports are generally neutral to increase government spending on the rise and are susceptible in depression, but the trend of change may depend on the interest rate and the national currency rate. Prices in the short term have an inflationary effect on the rise, and deflationary - on the decline (Akhmadeev *et al.,* 2016). The authors conclude that such results demonstrate the cyclical nature of the multiplier intensity, which may be associated with the zero lower limit of the interest rate of the Central bank.

Summers and DeLong (2012) addressed the question of the influence of the zero lower limit of the interest rate on the government spending multiplier. They proceeded from the assumption that in "non-crisis times" the central bank was inclined to compensate for stimulus measures on the part of the regulator of budgetary policy, fearing for the inflationary effect of such influence methods. But if the lower limit is reached, the Central Bank will not be able to take measures aimed at compensating fiscal incentives due to the lack of instruments. On this basis, the authors describe the mechanism for financing government spending without increasing the level of public debt. It is assumed that the relationship between the magnitude of change in government spending and the magnitude of the change in GDP is directly proportional to the difference between the rate of borrowing and the rate of economic growth and inversely proportional to factors such as the hysteresis (deceleration of economic activity)-η, the degree of substitution of budgetary investment by monetary measures μ, the reduction in output, while increasing the tax burden of the τ, the marginal tax rate for the economy.

Batini, Callegari, and Melina (2012) assessed the impact of fiscal consolidation on GDP change. Using the vector autoregression model, they calculated the government spending multiplier subject to reduction, and a tax multiplier subject to an increase for two phases of the economy (growth and recession). Statistics were used for the US, the Eurozone, Japan, Italy and France in 1970-2010. Based on the values obtained, the authors assessed the likelihood of an increase in the recession on the downtrend of the business cycle and its appearance on an upward basis for 1 quarter, 1 year, and 2 years. It has been found that GDP performance is highly sensitive to the government spending multiplier in the recession phase - each reduction in spending by 1 percentage point, according to the authors' estimates, for all 15 cases was accompanied by a decrease in GDP of not less than 1.5 percentage points (Danko, Petrikova and Petrikova, 2010). In this case, for a recovery phase, such a strong dependence was found only in France. In the rest of the world, the decline in GDP has been negligible, and in the US even the upward impact of the reduction in spending on economic growth in the 2-year period was revealed. The direct impact of fiscal consolidation on the probability of recession during the recovery phase was found only for the '1 quarter' period for all the countries reviewed. About the tax multiplier, the authors estimate that the impact is significantly less in terms of both multipliers and potential recession.

The issue of the integrated impact of restriction measures in monetary and fiscal areas was addressed in the analytical work of the European Central Bank (2015), where the effect of reducing government spending on GDP change was modeled for 14 countries of this integration association. Consideration was given to the situation of the standard policy of the Central Bank aimed at following the inflationary direction and the neutral one because of the zero lower limit of the interest rate. The authors' findings indicate that greater reduction in the potential for economic growth is being achieved in neutral fiscal policy rather than in the case of following a monetary regulator of inflationary direction, as could be presumed on the basis of logical analysis. This leads to the assumption that the shock of government spending is amortized through the interest rate mechanism.

3. Concept

The parametric estimation of budget multipliers should be conducted to determine both the effectiveness of possible additional budget investments and the negative impact of possible reductions in government spending. In this regard, it is important to consider the potential for increased fiscal revenue from higher economic growth rates in terms of the negative effect of reducing government spending.

The following parameters should be identified to assess the government spending multiplier:
a)   the economic activity slowdown rate;
b)   The extent to which fiscal investment is compensated by monetary policy measures.

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The economic activity slowdown rate (η) is an integrated parameter that reflects the deviation of key economic indicators from "natural" values. However, these indicators are influenced by fiscal policy - the dynamics of private investment, unemployment and the level of utilization of production capacities. The introduction of this parameter stems from the fact that, in accordance with the above conclusions on the evaluation of the effectiveness of procyclical and contracyclical fiscal policy measures, increasing public investment yields the best result in the downward phase of the business cycle. This can be attributed to the economic impact of a gap with the pre-crisis dynamics, which is the result of the expected activity of the agents. The more intensive the gap is, the more the effect of budgetary measures can be.

The dynamics of private investment amounts refers to the capital side of the use of the production factors. Financial difficulties for economic agents have led to their desire to forgo future investments in favor of the current consumption. The main method of macroeconomic regulation in this situation is to reduce the interest rate within the monetary policy. However, Central Banks are now able to apply broader measures, such as emission mechanisms, to fill the financial sector with liquidity and to transfer it to private investment. In this case, public investment can act as a shock absorber, compensating for the lack of private investment and not stopping the decline in investment activity, at least in the short term.

Unemployment characterizes the labor side of the production factors' use. When economic activity slows down at the downward phase of the business cycle, employment tends to suffer most. This is because unemployment and wage reductions significantly reduce the economic potential of society, thus having significant impact on current and future aggregate demand - apart from the short-term impact in the form of reduction in consumption this circumstance is characterized by the existence of a long-term effect in the loss of skills and incentives to work in a cyclically unemployed part of the employable population. In this way, in the future there is an increase in the natural level of unemployment. Cyclic unemployment, as a rule, is one of the targeted parameters for monetary policy. However, the central bank can only indirectly influence job creation, and there is a time lag between the application of incentive measures and the effect thereof (Akhm-Adeev *et al.,* 2016). In such a situation, fiscal policy acts as a shock absorber by using both self-regulatory measures-allowances, induced taxes, deposit guarantees and discrete measures to prevent the loss of skills by the unemployed person.

The production capacities used demonstrate the resource side of the use of the production factors. On the one hand, it should be considered that, in the current circumstances, they are largely linked to the share of imports in the national economy (Varlamov, Kostin, Mamedov, Omarov, Belyaev, Danko and Sekerin, 2016). For example, in the case of high imports, the decline in consumption of national products has no significant impact on economic dynamics. On the other hand, there exist systemically important companies (or whole sectors) in each

economy. The reduction in the production capacities that occurs in such companies (or sectors) is an argument for the use of the budget policy in the implementation of targeted support. However, production capacities may not fully reflect the specific characteristics of the modern post-industrial economy, in which significant share is occupied by the services sector, and most industrial production is deliberately transferred to less developed regions.

The indicators listed above are modified to account for the mutual influences of each other. Such influence can have both strengthening and weakening nature. In general, the nature of the gross product creation involves two phases-the transformation of income into investment and production factors and then the latter's transformation into a new income (Danko, Panova, Kazaryan, Kazaryan and Sekerin, 2017). Hence, the slowdown can be more pronounced in different phases. In the first phase, the fluctuations will relate to the volume of investment, while labor and productive resources should be taken as permanent ones. In the second phase, in turn, the level of investment in the production factors has already been set at the current level of budgeting by the state and other economic agents, and their transformation into new income is taking place with the variable use of manpower and production capacities. In the business activity slowdown, some of them will not be activated, resulting in a gap. In economic statistics, there exist the following types of GDP measurement that can be built into the logic described:

a) The actual year-end GDP, based on macroeconomic statistics;
b) Projected GDP at the beginning of the year, with some growth rate of investment;
c) The natural level of GDP, which is a conditional value that reflects its potential value with the full use of labor and productive resources.

Thus, the ratio of actual to projected GDP will make it possible to assess the investment component of the deceleration factor and the ratio of the actual to natural - component of the use of labor resources and production capacity. The expressed first component reflects a stronger lack of investment, while the higher second component makes the economy structurally inefficient. The method of estimating the deceleration factor may be presented as follows:

$$\eta = \frac{\sum_n (Y - GDP_{forecasted})}{\sum_n (Y - Y^*)}, \tag{1}$$

where η – is the slowdown rate,
Y – is the actual current year's GDP level,
Y* – is the natural current year's GDP level,
GDP forecasted – is the current year's GDP level by last year's forecast,
n – is the number of years.

Constraints will be related to the following circumstances: first, if η is negative, it means that there is no slowdown in economic activity. Secondly, the calculation of

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the coefficient is meaningless if the dividend and/or divisor is greater than zero (that is, if the economy is overheated).

$$\begin{cases} \eta \geq 0 \\ \sum_n (Y - GDP_{forecasted}) < 0 \\ \sum_n (Y - Y^*) < 0 \end{cases}$$

However, the practical value of this parameter cannot be overemphasized, as the basic principles for the creation of GDP were utterly formalized while its evaluation. In this context, the high scientific and practical potential has a more profound approach to assessing the parameter, considering the dynamics of the three indicators of the production factor use, considering the two-phase specifics of the investment process (Slepov, 2014).

Another parameter required to properly estimate the intensity of the government spending multiplier is the extent to which monetary policy has compensated for budgetary investments. The importance of this parameter stems from the fact that Central Banks tend to adhere to the goal of inflation in their policies and consider as unacceptable the incentive measures as additional government spending (Bykanova, *et al.,* 2017).

However, this may not be the case if the Central Bank has other objectives than inflation (which is particularly the case in the downward phase of the economic cycle) or if it does not have enough instruments to compensate for the budget investments. In the latter case, this could take place if the main instrument - the interest rate, becomes inactive under the liquidity trap, or is the authority in the national financial policy. Hence, the intensity of the compensation manifestation is due, first, to the current objectives of the monetary regulator and the instruments it uses, secondly, to the distribution of roles in the macroeconomic regulation system. Different methodologies may be used to assess the extent of compensation.

In Summers and DeLong (2012) the question is addressed through the prism of the displacement of the corresponding curves in the IS-LM model. The authors infer that the slope of the curve is the ratio of the difference between expected and actual inflation to the release break, since these are the parameters that guide the Central Bank in its decision-making. If inflation and release breaks are optimal, the central bank will compensate for any active budgetary measures, which are reflected in the LM perpendicular position. In other cases, the inclination of the Philips curve will be opposed to the LM curve slope. Therefore, the Phillips curve slope factor, taken with the opposite sign, equals the monetary policy response rate to the budget expansion (Batini, Callegari and Melina, 2012).

The work of Gonzalez-Astudillo (2013) suggests an approach whereby the interdependence of actions of the Central Bank and the Ministry of Finance is

determined through the ratios of the monetary and budgetary policy rules. At the same time, the rules are based on the monetary regulator's reaction to inflationary dynamics, which can be detected through a change in interest rate, and the reaction of the fiscal authority to the change in public debt through tax levels.

Volkov (2017) proposes an assessment of the extent to which monetary policy has been reimbursed through the use of an empirical assessment methodology based on the identification of the focus of measures of the Central Bank and the Ministry of Finance for a certain period based on which an assessment is made, firstly, of neutral or separate nature; secondly, the nature of the orientation (stimulating, neutral or restrictive) is determined (Kitova, Kolmakov, Dyakonova, Grishina, Danko and Sekerin, 2016).

In any case, the degree of compensation is limited to 0 and 1, i.e. total opposition and promotion of public investment by the monetary regulator, respectively, i.e.:

$$0 \leq \mu \leq 1$$

The assessment of the tax multiplier should be conducted to determine the ability of the budget authority to finance the maintenance of the accumulated public debt. Even though in the classic Keynesian approach, the relationship between the change in GDP and the amount of taxes levied from this multiplier was viewed from the point of view of using a tax instrument to stimulate or restrain economic growth, the tax multiplier can also be applied to assess the ability of the economy to generate additional budget revenues due to economic growth. However, such proceeds must be compared with the value of the public debt. This will allow assessing whether the budget revenues can cover the existing and future debt burden at the expense of newly created tax resources (Baum, Poplawski-Ribeiro and Weber, 2012).

Thus, the intensity of the tax multiplier allows the following parameters to be determined:

a) the ratio of the change in the amount of tax revenues and budget expenditures;
b) ratio of budget interest expenses and borrowings to tax revenues;
c) the nature of tax expectations.

The ratio of tax incomes to debt (τ) makes it possible to assess the ability of the budget authority to cover public debt by increasing the tax base. The need to deal with tax revenues as a fundamental source of independent public debt is linked to the following. It is the tax in any economic system that is a standard and unconditional element. About non-tax revenues, this type of incoming cash flow to the budget is highly dependent, first, on country-specific, secondly, on the market factors. The tax revenue of the budget must be compared to its debt costs. At the same time, such expenses should include the amount of new debt that is being

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formed to finance current budget deficits, the amount of spending to pay off the expiring debt, interest expenses on available debts (Slepov and Volkov, 2016).

The increase in fiscal revenue may occur when the tax base increases because of GDP growth, as well as by increasing the tax burden. The change in GDP is the main source of increased tax revenue for the Ministry of Finance and, consequently, for the payment of debt, since in practice the change in major tax rates is very rare. In this regard, when assessing the tax multiplier, comparison with debt costs should be subjected to the dynamics of changes in tax revenues to GDP (Danko, Ekimova, Bolvachev, Zarova, Shemetkova, Solovyova and Sekerin, 2016a).

To measure the ξ parameter, it is necessary to consider in detail the dynamics of the taxes for which the rate changes occurred. If there was a relevant increase or decline in the rate of exemptions for the tax in the year of change, the reaction of the economic agents should be mentioned. If tax revenues were changed in the same direction as the rate, but weaker, not changed, or moved in the opposite direction, we should speak there was no reaction from the economic agents. In our opinion, this methodology is related to the general conclusions on the expression of Ricardian equivalence in the economic system. In accordance with the Ricardian equivalence concept, economic agents should be prepared in advance for raising taxes in response to future growth of public debt. That is, the growth or decline in tax revenues should be manifested not at the time of the direct raising of rates, but when the growth of government spending, financed by an increase in debt, is taking place.

4. Results

In accordance with the approach developed in (Danko, Petrikova and Petrikova, 2010), a non-linear dynamic model of the interaction between monetary and fiscal policy of Russia was considered, consisting of a system of two differential equations describing the dynamics of the changes in the state debt stock, b, and the interest rate, r.

$$\dot{b} = (r - g) * b - S \tag{2}$$

$$\dot{r} = \alpha * (\pi - \pi^*) \tag{3}$$

where g- is the economy growth rate; $b = \frac{B}{y}$ is the relationship of a public debt to GDP; G – is the government spending; T – is the tax revenues; $\frac{(T-G)}{y} = S$ corresponds to the share of the public sector's GDP balance; (π) −is the effective level of inflation; (π^*) −is the targeted rate of inflation.

It follows from equation 2 that when effective inflation is higher (below) the targeted one, then the real interest rate rises (decreases).

It is assumed that changes in the state debt result in a change in the primary balance of the state account in the same direction: $S_b > 0$, in accordance with many empirical results, such as in the work (Gonzalez-Astudillo, 2013). In addition, it is assumed that the rate of inflation also changes in the same direction as the change in the state debt: $\pi_b > 0$. Table 1 shows Russia's macroeconomic indicators, according to the IMF (2014a, 2014b).

Table 1 - *Macroeconomic data of Russia (2013) (Kirsanova, Leith and Wren-Lewis 2009)*

Public debt (% GDP)	Real GDP growth (%)	Inflation (%)	Primary balance of the state sector (% of GDP)	Interest rate (%) p.a.
13,4	13	6,8	- 0,8	5,5

Source: The IMF (2014a, 2014b)

Data from the table were used to verify the model and to analyze the shared public debt dynamics and real interest rate. A regression analysis was carried out to quantify the model parameters (coefficient of the system of differential equations). In the end, the model of the interaction of Russia's fiscal and monetary policy is as follows:

$$\dot{b} = (r - 0.013) * b + 0.008$$

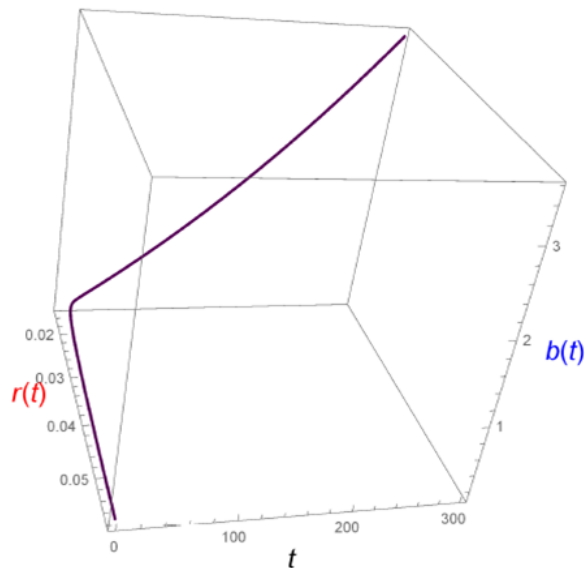$$\dot{r} = 0.5 * (0.055 - r - 0.04)$$

In view of the fact that inflation corresponds to the difference between the nominal interest rate (5.5 % p.a.) and the real interest rate, and that the inflation target is 4 % p.a., and taking into account the initial conditions: *b (0)* = 0,134 and *r(0)* = 0,038, the combined dynamics of the two model variables can be presented in Figure 1.

As can be seen from the figure, the joint trajectory of public debt and interest rate is unstable. The equilibrium point with coordinates r ~ 1.5% and b ~ 400% of GDP is unstable. As can be seen from Figure 1, the trajectory of public debt reaches this value because of a sudden or explosive change.

5. Discussion

Nonlinear dynamic interaction between monetary policy aimed at achieving the target level (targeting) or inflation, or economic growth through the selection of simple rules for establishing the necessary rate of interest rate and fiscal policy changes, as a measure of which the size of public debt is used, is considered (Bertella, Rego, Neris, Silva, Podobnik and Stanley 2015; Denisova, Rukina, Samoylova and Takmazyan, 2017).

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Figure1 – *Dynamics of public debt and interest rates for the economy of Russia (it)*

Let's analyze possible interactions between fiscal and monetary policy in the case of Brazil and the United Kingdom based on the non-linear dynamic model discussed above. The following observations and conclusions can be drawn from the results of the simulation of the interaction between fiscal and monetary policy in the case of Russia with similar results for Brazil and the United Kingdom.

These countries represent an example of developed (Britain) and developing (Brazil and Russia) countries with sharply differing macroeconomic characteristics. While the UK economy experienced moderate unemployment for three months before February 2014 (6.9%), high public debt as a share of GDP (90.1%), low economic growth (1.8%), and low inflation (2.6%), in the case of the Brazilian economy there was a very low unemployment rate in December 2013 (4.6%), relatively low level of public debt (66.3%), low level of economic growth (2.3%), as well as high level of inflation (6.2%). As far as the Russian economy is concerned, it was observed in the same period: the low unemployment rate in December 2013 (5.2 %), the relatively low level of public debt (13.4 %), the relatively low level of economic growth (1.3%) and the high inflation rate (6.8%) (Balikhina and Kosov, 2014).

In the case of the inflation targeting regime, the necessary but insufficient conditions for the existence of a non-explosive growth area of the public debt when the interest rate changes are considered (Osipov, Bykanova, Akhmadeev, Kosov, Bogoviz and Smirnov 2017; Danilina, Gaifutdinova and Kuznetsof, 2015).

It has been established that, for Russia, the joint trajectory of public debt and interest rate is unstable (the point of equilibrium with coordinates r = 1.5% and b = 400% of GDP), the trajectory of public debt is achieved because of an explosive (abrupt) change. In the case of Brazil, the joint trajectory of public debt and interest rate is also unstable: the equilibrium point (with the coordinates r = 5.5% and b = 59.4% of GDP) is unstable, and the trajectory for public debt reaches this value because of an explosive abrupt change. In the case of the UK, it follows from the simulation that the achievement of a stable level of public debt takes about 150-time units to achieve its equilibrium with values b = 136.4 cent of GDP and real interest rate R = 1.5% p.a. (Kosov, 2014).

From the analysis of the results of the simulation of the interaction between fiscal and monetary policy in cases of the economies of Brazil, United Kingdom and Russia, it follows that the public debt trajectory for the case of Brazil is unstable (explosive); for the case of United Kingdom- stable; for the case of Russia -unstable, and it is intermediate between the cases of Brazil and the United Kingdom. Of course, in the case of a trajectory of sharp growth in public debt, the government could take steps to change that trajectory, for example, by reducing real interest rates to stimulate economic growth. However, such a measure should be implemented in cases where the economy is far from full employment. In the case of Brazil, there was an attempt to apply in the period from August 2011 to October 2012 when the Central Bank voluntarily reduced the base interest rate, an action that led only to an acceleration of inflation and a rise in popular discontent (Kosov, Akhmadeev, Bykanova, Osipov, Ekimova and Frumina, 2016; Ratnasih, 2017).

Thus, the important steps that need to be taken in the case of Brazil and Russia should take place in the fiscal area, while the Central Banks of these countries need to focus on controlling inflation and regaining confidence in them. In the case of United Kingdom, Central Bank is wisely pursuing a monetary policy that pursues the achievement of some real growth rate through the inflation targeting regime. In addition, the UK Government has made important fiscal adjustments in order to balance the budget for future years.

6. Conclusion

Budgetary policy multipliers should be considered in assessing the need for budgetary investments to stimulate economic growth and the impact of budget balances. In general terms, the change in GDP by increasing or lowering the budget costs depends on the government spending multiplier. Its value, in its turn, is determined by the coefficient of the intensity of the interaction between monetary and budgetary policy, as well as by the index of economic activity estimated for a certain period (Colander, Haas, Goldberg, Juselius and Kirman *et al.*, 2009; Mirgorodskaya, Andreeva, Sugarova and Sichev, 2017). At the same time, the increase in budget expenditures is minimized by a tax multiplier, which is determined by the ratio of the rate of an increase in tax revenue to changes in total

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debt expenditures, as well as the assessment of the capacity of the Ministry of Finance to increase tax revenue by raising tax rates. For the investments to be efficient, it is necessary to assess whether budget costs will lead to an upward price dynamic, so that the Central Bank does not resort to higher interest rates. This value is most likely to be achieved in a situation where economic activity is declining. A slowdown in economic activity also prejudges the need for economic agents to invest, which makes them more effective (Kosov, 2016). The GDP growth determined by these investments should provide the tax effect sufficient to cover the expenses. Otherwise, there can be negative effects of debt that establish the need for measures to refinance public debt by the Central Bank.

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