



Volume:	Effects of Budget Rules on Fiscal Policy and Economic Growth
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Abstract

This research aims to study and systematize the world experience of introducing rules into fiscal policy and to identify the grounds that determine the impact of fiscal policy rules on economic growth. The accumulated world experience of using budget rules is very contradictory. Existing studies do not explain why in some cases the application of the rules contributed to the achievement of the goals of their introduction in others, while the goals were not achieved. In a number of cases, it was noted that the rule restrictions were simply not enforced. In a number of other cases, the effectiveness of the rules was found: reduction of debt problems, reduction of the budget deficit. It is noted that the introduction of rules can strengthen business cycles, limit opportunities for countercyclical policies. The dissertation research is based on the methods of econometrics and macro econometric modeling, as well as on modern approaches to the macroeconomic analysis of economic policy. At The End this paper finds a direct influence of three types of fiscal rules: expenditure rules, fiscal balance rule, and debt rules.

Keywords: Economic Growth, Fiscal Policy, Budget Rules.

1- Introduction

One of the main goals of macroeconomic policy is to create and maintain stable conditions in the economic system. The high volatility of macroeconomic factors increases the overall level of uncertainty and can inhibit investment activity and economic development of the country. Among the main mechanisms for neutralizing both external and internal shocks is the instrument of the rules of economic policy.

The purpose of this research is to study and systematize the world experience of introducing rules into fiscal policy and to identify the grounds that determine the impact of fiscal policy rules on economic growth. The decisive factor in this setting is the government's efficiency, which affects both the size of the fiscal multiplier and the choice of the parameters of the budget rule. Thus, the ability of a government to adhere to a rule that has been introduced may depend on the effectiveness of the government — a rule may “fail” under a poorly effective government that is actually unable to follow it. As the efficiency of government grows, so does the ability to adhere to the rule and the ability to manage growth.

2- Literature Review

2-1- Budget rules

Budget rules are understood as the officially established restrictions on certain fiscal indicators (budget deficit, debt level and the amount of expenses, revenues). The main objectives of fiscal rules are often:

- ensuring macroeconomic stability;
- increasing confidence in government fiscal policy and facilitating debt reduction;
- ensuring long-term sustainability (balance) of fiscal policy; alignment of budgetary policy within the framework of international association;
- Reducing the procyclicality of fiscal policy.

Following the work (Budina, et al. 2015), we will consider the main types of budget rules.

Debt Limitation

The rule sets the ceiling for the amount of public debt. The advantage is that the rule mechanism is easy to implement and understandable to economic agents, which increases the predictability of budgetary policy. The main disadvantages include the lag in the action of the instrument on the ultimate goal, which makes it difficult to use the rule as a short-term policy benchmark. In addition, not all the amount of debt is under the control of the fiscal authorities.

Limiting the Budget Deficit

This category of rules targets variables that affect the amount of debt, but are under the direct control of the fiscal authorities, such as budget revenues and expenditures. The rule allows a number of specifications, including the general budget balance rule, the structural (adjusted for the cyclical component) balance rule, and the so-called cyclical balance rule (the balance is performed not in one time step, but for a certain time interval, equal, for example, to the full business phase. cycle). The designs are aimed at reducing the procyclical nature of the budgetary policy. The rule may apply to certain groups of income (expenses), for example, raw materials.

Limiting Costs

The rule restricts general expenditures or expenditures of a certain type, for example, public sector final consumption expenditures. This type of rules significantly reduces the procyclicality of budgetary policy, and can be an effective mechanism for stabilizing the system, both in times of high revenues (budget revenues) and in times of recession.

Finally, the fourth class is the income rules that regulate the regime of the fiscal burden on the economy (the level of taxation). The rule does not control the level of debt and can be highly procyclical.

In countries where the extraction and export of raw materials dominate the sectoral structure, fiscal rules have a number of features. When choosing a fiscal rule, countries usually strive to achieve two main goals - uniformity in the consumption of resource wealth and consistency in the consumption of resource wealth with its estimated value equal, as a rule, to the present value of income from the sale of raw materials. The structural budgetary balance rule most closely meets the stated objectives (see, for example, Baunsgaard, T, Villafuerte, M, Poplawski-Ribeiro, M, Richmond C, 2015, as well as a large IMF report prepared by a team of authors led by Tiwari, S., Cottarelli, C., Blanchard, O., Sayeh, AM, Viñals J., 2015), where rule parameters are selected based on the hypothesis of permanent income (Permanent Income Hypothesis, PIH).

2-2-Experience in Applying Budget Rules

A considerable number of works have been devoted to the study of budget rules, but researchers could not come to a consensus on the nature of the impact of budget rules on the economy.

A number of economists associate the emergence of the rules with the rapid widespread growth of public debt and the growing imbalance of the public budget in many countries following the fall of the Breton Woods system, as well as the oil crisis of the 1970s. By that time, there was

a need to restore fiscal discipline and normalize the volume of debt. In the 1980s, Japan introduced the budget deficit rule.

This was followed by a reduction in the budget deficit, and debt stabilization began. After the collapse of the financial bubble in 1991, fiscal discipline deteriorated sharply. A similar picture has developed in European countries. In 1996, the average debt level in the countries that signed the Maastricht Agreements a few years earlier was 75.2 percent of GDP, while the Agreements limited the debt level to 60 percent of GDP. The decrease in the amount of debt in the period from 1998 to 2018 (4.5%) in these countries is also largely associated with the economic recovery. During the period of slowdown in growth, budgetary indicators returned to their previous levels (El-Chaarani, 2015; El-Chaarani et al., 2022). A similar result, but for a slightly wider set of countries, was obtained by Kennedy and Robbins (2018).

Despite the formal declaration of the policy of rules, many countries, especially those on which the rules are imposed from the outside (to some extent), for example, by donor organizations (IMF, WB), in fact, may not follow the policy of the rules. These effects lead to bias in empirical research and may be one of the reasons for the different results.

In contrast, Elbadawi et al. (2020) find that the probability of introducing rules is higher for stable governments. In addition, in this work it turns out that the probability is higher in countries following inflation targeting and / or fixed exchange rate regimes.

It should be noted that in recent works the factor of stability (or "culture" of stability) occupies one of the central places. Researchers agree that the culture of stability factor influences both the effect of a rule and the likelihood of its introduction. To control this factor, three proxy variables are used: inflation, which, according to the authors, is the lower the higher the agent's value stability; party preferences in relation to the size of expenditures and budget revenues; level (index) of trust.

The authors further complement the empirical analysis by including interactive members containing a rule indicator variable and one of the stability preference proxy variables. As a result of this step, it is possible to find that in countries with a low culture of stability; the introduction of the rule is effective, significantly reducing the country risk premium.

Since institutional factors, and in particular a high culture of stability, influence the risk premium, perhaps fiscal rules are an unnecessary policy tool, and discretionary policy can quite cope with the task of ensuring macroeconomic stability? The work (Mandon, 2018) examines the relationship between rules and procyclical fiscal policy. Similarly to the work (Tapsoba, 2015), the "therapeutic" effect is controlled, but in addition the factor of culture of stability is included in the analysis. It appears that rules are effective in a low culture of stability that

is characteristic of developing countries and countries with low per capita income. Another work (Badinger, 2015) also monitored a culture of stability and found causal rules for larger budget surpluses and low output volatility. Thus, we can conclude that the rules have an additional independent effect, both in a stable and in an unstable economy.

One of the key goals of the rules is the goal of reducing the procyclicality of fiscal policy, as well as its volatility, in connection with which a significant amount of work is devoted to the study of the influence of rules on the procyclical and volatility of policy. For more details, see Bova ME, Carcenac N., Guerguil MM (2018), Canova F., Pappa E. (2018), Guerguil et al, (2020).

In our opinion, indicators of volatility and procyclicality do not contain enough information to fully analyze the consequences of the introduction of rules for the economy. By itself, the budget rule does not imply the exclusion or reduction of policy discretion. On the contrary, the rule is only a quantitative guideline of policy, and its implementation is the result of government actions. The more elusive a target is, the more corrective action may be required from policy and the volatility and procyclicality of policy may increase. Much more important, therefore, then, as a rule, contributes or does not contribute to the achievement of the country's primary goals.

In 2002, Fiess made another observation. As a result, important categories of expenditures usually suffer with strong externalities and impact on long-term economic growth. The rule, therefore, can lead to a decrease in the quality of budgetary policy. For more details, see Fiess N. et al (2002).

In recent years, many countries have made significant efforts to improve the architecture of fiscal rules¹the flaws in the rules turned out to be especially noticeable for the EU countries, which were forced to follow the same rules, but had heterogeneous institutional and economic structures.

A focus on improving the discipline of rule enforcement is a general trend, but has been accompanied by attempts to make rules more flexible². Typically, such attempts take the form of a wider use of structural balance rules and targeting in cyclically adjusted terms. In some cases, however, dividing the goals of the budget process into long-term and medium-term corresponds to targeting them with different types of rules. The creation of mechanisms for revising medium-term goals, as well as mechanisms for automatic adjustment of policy,

¹ See Rules and institutions for sound fiscal policy after the crisis // Workshop and Conferences. - Bank of Italy, Economic Research and International Relations Area, 2012. - no. eleven.

² See . IMF Fiscal Monitor April 2012.

ensuring its return to the framework of existing restrictions, is discussed. Very complex structures are often created. Thus, a rule can set the rate of growth of expenditures in accordance with the trend of economic growth, but at the same time take into account the goal of balancing the budget and the goal of limiting debt. The rule, therefore, contains several goals at once and allows the rejection of some goals, provided that other goals are compensated for. The debate on the effectiveness of rules and the role of institutions is far from over. The design of effective rules and their implementation requires high efficiency and skill from the government.

2-3-Fiscal Rules and Economic Growth

As follows from the previous discussion, the overwhelming majority of work on the topic of fiscal rules focuses on the question of the impact of rules on the volatility and procyclicality of fiscal policy. The academic community is dominated by the point of view that the volatility of economic growth has a negative impact on its rates. One of the main sources of growth volatility is the volatility and procyclicality of fiscal policy and, therefore, reducing these characteristics to a possible minimum should be the main goal of the rules.

Indeed, the high volatility of economic growth can increase the overall level of uncertainty in a country and force economic agents to delay making investment decisions. This issue was discussed by Hnatkovska V. & Loayza N. in 2018 and by Fatas & Mihov in 2020. As a result, the use of the fiscal policy volatility indicator as a tool, nevertheless, allows one to identify a negative relationship between volatility and average growth rates.

Also, in many studies such as Fatas and Mihov, 2020, De Ferranti et al. (2000) & Gavin et al. (1995), it is possible to identify the relationship, now, of the volatility of fiscal policy and the volatility of growth.

In our opinion, such a formulation of the question of the influence and role of fiscal policy in many respects predetermines the results of research, oversimplifying the extremely complex issue of the emergence of economic growth. Key aspects of economic development remain outside the scope of consideration. The impact of high growth volatility on growth rates is just one of many effects. The introduction of new technologies leads to greater volatility of growth and its greater unevenness, however, with all the evidence it increases its rates in a slightly longer term. Also, fiscal policy aimed at creating a lacking infrastructure in the country can increase.

The issue of reducing volatility is more relevant for countries where the tasks of economic development are solved mainly by the private sector of the economy, and the budget policy faces fundamentally different tasks. Developing countries, however, have to solve non-

standard tasks of launching economic growth, which requires additional efforts on the part of budgetary policy.

In the context of the issue under consideration, the most important indicator that allows differentiating countries is government effectiveness. In the case of an ineffective government, it is useful to additionally restrain its activity by formally approved restrictions on the values of certain budget indicators. The introduction of the rule allows achieving the “second best”, reducing the negative impact on the economy from wrong and weak policies. However, the effectiveness of the government also affects its ability to comply with the restrictions imposed by the rule. At the same time, with an increase in the efficiency of the government, one should expect an increase in the quality of management influences aimed at stimulating economic growth and their greater effectiveness. Excessive hand-tying will hamper the country's economic development, and most opportunities will remain unfulfilled. Finally, the government's ability to adjust the rule in accordance with the balance of goals, including macroeconomic stability, fiscal sustainability, and economic growth goals, and, in addition, to promptly reconfigure the rule in response to a changed economic situation, also depends on the government's efficiency³.

3- Research Method and Data

An important condition for the study of the formulated provisions is the availability of relevant data. Recently (since 2015), the IMF, together with the World Bank, have been publishing on a regular basis an extensive database, including information on the application of budget rules by a country, the moments of introduction and cancellation of rules, types of rules, flexibility of the rule⁴etc. The information is presented according to the panel structure. This makes it possible to take into account the variety of effects associated with the introduction of budget rules and, in particular, to study the nature of the direct influence of the rule on growth. The second key indicator of the study - government efficiency - is contained in the Worldwide Governance (WG) database maintained by the World Bank and is also calculated relatively recently. The efficiency indicator ranges from -2.5 to 2.5. The data source for most of the remaining variables is the World Development Indicators database maintained by the World Bank.

³ In our opinion, it is precisely the exclusion of the government efficiency factor in the analysis that is the reason for such different conclusions presented in the first part of the research work.

⁴ The flexibility of the rule is understood in the sense of the presence of a predetermined set of conditions, upon the occurrence of which the policy has the right to depart from the rule, but with the obligation to return to it (escape clause).

Direct inclusion of the rule in the equation for economic growth did not allow obtaining a satisfactory result. The parameters of the equation turn out to be insignificant or contradicting the economic sense, and also extremely sensitive to minor changes in the specification. As shown below, this specification has a number of features that hinder grading.

The identification scheme implemented in this paper is a two-step procedure, where, at the first step, the influence of the rule on fiscal policy is investigated, and at the second, the effect of policy on economic growth. Formally, for each type of rule j , where $jj \in \{EEEE, DDEE, BBBBEE\}$, and $EEEE$, $DDEE$, $BBBBEE$ denotes a cost rule, the rule debt and the rule of budget (structural) balance, the identification scheme represents the following system of equations:

$$(3.1) \quad \begin{cases} Y_{i,t} = (a_1 E_{i,t} + a_2) BP_{i,t} + a_0 E_{i,t} + CV_{i,t}^Y + \varepsilon_{i,t} \\ BP_{i,t} = (b_1^j E_{i,t} + b_2^j) FR_{i,t}^j + b_0^j E_{i,t} + b_3^j Y_{i,t-1} + \\ + b_4^j D_{i,t-1} + b_5^j BD_{i,t-1} + CV_{i,t}^j + v_{i,t}^j \end{cases}$$

$(a_1 E_{i,t} + a_2)$ is an interactive term multiplier that parameterizes the impact of the budget rule on budget policy by the government's efficiency. The parameterization of the impact of policy on growth is described by a linear function. In the case of the debt rule and the expense rule, we manage to restrict ourselves to linear parameterization⁵. In the case of the balance rule, nonlinearity is detected, which is "captured" by the module function⁶. It is expected that the fiscal multiplier is the coefficient $(a_1 E_{i,t} + a_2)$ at the policy variable in equation (3.1) is a function of government efficiency. However, we expect that as efficiency increases government increases the fiscal multiplier. In other words, the parameter a_1 has a positive sign, and the parameter a_2 allows identifying a threshold level, if present. This hypothesis is consistent with the results of a number of studies (Ilzetzki and Végh 2008, Perotti 2018, IMF 2008⁷) where it is shown that the value and even the sign of the fiscal multiplier depend on the level of development of the country, including institutional characteristics³⁹. At the same time, the dependence of the fiscal multiplier on the presence or absence of a fiscal rule in the country is not revealed.

⁵ Specifications with higher degree polynomials were rejected on a set of statistical criteria.

⁶ Nonlinearity is also captured by the quadratic formula, which describes the data in the middle of the interval well, however, it diverges from the data at the edges, since the quadratic term begins to grow too quickly outside the vicinity of zero.

⁷ Fiscal policy as countercyclical tool, IMF, 2008 (<http://www.imf.org/external/pubs/ft/weo/2008/02/pdf/text.pdf>)
39 Spilimbergo et al., 2009

Further, we assume that government efficiency influences the choice of budget rule parameters: the higher it is, the higher noninertial budget expenditures, which accelerate growth in accordance with equation (3.1). When efficiency is low, the rule is chosen (possibly wrongly) so that costs are reduced.

Consequently, the coefficient bb_{1jj} under the budgetary policy variable is positive, and the sign of the coefficient bb_{2j} is negative. Of course, the positive dependence of the growth rate on government spending can take place only in a small range of their change. With an excessive increase in government spending, a drop in growth rates is inevitable. In fact, our hypothesis is consistent with Wagner's law: it means that as the government becomes more efficient, it makes sense to increase budget spending.

The control variables, $CCCC_{i,t}$, of the growth equations are: the ratio of public debt to GDP, real GDP growth rates at the previous point in time, per capita GDP in constant prices, the dummy variable of the 2008 crisis and the dummy variable of wars and serious catastrophes, monetary growth base, share of investment in GDP⁸Per capita GDP (level) effectively controls individual differences in rates economic growth. Among the control variables, $CCCC_{ii,j}$, the equations for fiscal policy, indicators are highlighted to which the fiscal authorities directly or indirectly pay attention: real GDP growth rates, $YY_{ii,tt}$, the ratio of public debt to GDP, $DD_{ii,tt}$, and deficit state budget, $BBDD_{ii,tt}$. Enabling this group indicators allows us to find out, as a rule, orients the budgetary policy in relation to its main goals. Other control variables include GDP per capita in dollar terms, as well as indicators of wars, disasters and the 2008 crisis. Note that both steps of the procedure we are implementing correspond to the existing approaches in macroeconomics. The implicit combination of the two approaches for analyzing budget rule is actually used.

Let us now consider in more details a one-step identification scheme, which implies the direct inclusion of rules in the equation for growth⁹. Substitute the second equation from (3.1) into the first and group the terms:

$$(3.2) \quad Y_{i,t} = a_1 b_1^j \times FR_{i,t}^j E_{i,t}^2 + (a_1 b_2^j + a_2 b_1^j) \times FR_{i,t}^j E_{i,t} + a_2 b_2^j \times FR_{i,t}^j + a_1 b_0^j \times E_{i,t}^2 + (a_2 b_0^j + a_0) \times E_{i,t} + \overline{contr. var}_{i,t}^Y + \tilde{\varepsilon}_{i,t}$$

$$(3.3) \quad \text{где } \tilde{\varepsilon}_{i,t} = a_1 \times E_{i,t} v_{i,t}^j + a_2 v_{i,t}^j + \varepsilon_{i,t}$$

⁸ Both in the first and in the second equation, to control the significance of the interactive variable, the quadratic terms of the corresponding factors were included.

⁹ Consider the case when the corresponding coefficients are linear functions of government efficiency.

It is seen that $CCcccc (XX, \tilde{\varepsilon}) \neq 0$, where XX is the set of repressors for equation (3.2). Since among repressors and error (3.3) always contains government efficiency, OLS estimation does not work in this case, and the choice of effective instruments is impossible, since any set of instruments that have zero correlation with residuals will have zero correlation with repressors. Budget indicators consist of inertial and non-inertial components. The first is largely due to the income of the economy and, being an endogenous component of the government spending indicator, does not affect economic growth. The non-inertial or exogenous component, which actually represents the measures of budgetary policy or the very budgetary policy, on the contrary, may have an impact on growth, not necessarily positive. The presence of an endogenous component in the dynamics of budget indicators prevents the identification of the influence of policy on growth and requires a special technique for separating the non-inertial component.

Let us describe the procedure for identifying the non-inertial component of the budget policy. There is no universal way to separate this component from the inertial (endogenous) component on real data, so the choice of the method will be determined by the purpose of the study. The methodology implemented in this work is one of the most widespread (Fatas, Mihov, 2020, Blanchard, Perotti 1999, Alesina et al., 1999).

As noted, this paper focuses on government spending¹⁰ or rather, the share of government spending in GDP¹¹. Let us write down the ratio for budget expenditures depending on the real growth rates and a number of benchmarks, which include the previous value of the share of government spending in GDP, as well as per capita GDP. As tools for the moment conditions of the generalized method of moments¹² used: lags of GDP growth rates, lags of per capita GDP (in levels), lags of the dependent variable.

$$(3.4) \quad \Delta G_{i,t} = \text{Contr.Var} + FE_i + c_G \times \Delta G_{i,t-1} + c_Y \times Y_{i,t} + \varepsilon_{i,t}$$

Where $GG_{ii, tt}$ is the share of non-interest expenditures in GDP for the country ii at the moment $^{, YY}_{ii, tt}$ are real rates GDP growth, and among the control variables there are dummy

¹⁰ Excluding interest expenses - a predefined component

¹¹ By itself, the indicator already largely excludes the inertial component of government spending, and, moreover, facilitates cross-country comparisons.

¹² The generalized method of moments is robust to the problem of missing variables, which is important because there are many factors influencing fiscal policy, different for each country, which cannot be taken into account, but if they are not included in the regression, it can lead to bias in estimates and misidentification of non-inertial component. When calculating the norm of the vector of moment conditions, an iterative method for choosing a weight matrix is used, which makes it possible to take into account information more fully and does not require the independence of errors and repressors, allowing conditional

variables for crises, wars, and disasters, as well as the per capita GDP indicator, which largely controls inter country differences. , which indicates good model specification and uncorrelated residuals with instrumental variables. The hypothesis of the presence of a correlation (for the second lag) in the residuals is also rejected. The policy (non-inertial component) is thus given by the following expression:

$$(3.5) \quad BP_{i,t} = FE_{i,t} + \varepsilon_{i,t}$$

Since the variable $BP_{i,t}$ by construction is exogenous for the variable of economic growth, $Y_{i,t}$, the system does not contain variables with feedback, and the equations included in it can be estimated separately. When evaluating the equation, the apparatus of dynamic panels and the generalized method of moments are also used.

4- Results

According to the estimates obtained, the impact of fiscal policy on growth is as follows:

$$(4.1) \quad Y_{i,t} = BP_{i,t} \times \left(\underset{(0,0741)}{0,1606} \times E_{i,t} + \underset{(0,0609)}{0,2390} \right) + \underset{(0,0150)}{0,2382} \times E_{i,t} + CV_{i,t}^Y$$

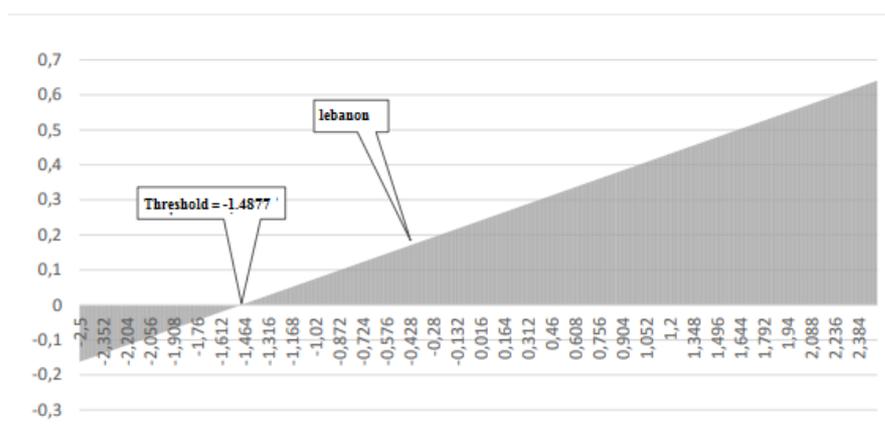
$J = 33,1599, Instrument\ rank = 36, Pval = 0,6044, AR2 = 0,5715$

We transform the expression to a form that allows us to identify the threshold:

$$(4.2) \quad Y_{i,t} = 0,1606 \times BP_{i,t} \times (E_{i,t} + 1,4877) + 0,2382 \times E_{i,t} + CV_{i,t}^Y$$

Fiscal impulses from governments below this level negatively impact growth. Ineffective governments are unable to organize efficient use of budget funds and choose the right goals. As the government becomes more efficient, the quality of fiscal policy and the effectiveness of each additional unit of budget expenditures for economic growth increase. The value of the fiscal multiplier for the Russian economy is in the positive area and amounts to 0.1747. The expression is clearly shown in Fig. 4.1:

*Figure 4.1 Profile of the impact of fiscal policy on economic growth rates depending on government efficiency **



* on the horizontal axis - the government efficiency index, on the vertical axis - the fiscal multiplier (the impact of a 1 p.p. change in spending on real GDP growth rates)

Consider now the impact of the rules on fiscal policy. Below are the results for three types of rules: spending cap rules, debt cap rules, and fiscal (structural) balance rules. The rule of limiting income was also considered, however, we were not able to establish the form of its influence on government spending.

Table 4.1 Impact of Fiscal Rules on Fiscal Policy Impulses

Variables	Balance rule	Cost rule	The rule of duty
$FR_{t,t}^j \times E_{t,t} $	0.0846 (0.0258)	-	-
$FR_{t,t}^j \times E_{t,t}$	0.0327 (0.0274)	0.0999 (0.0264)	0.0381 (0.0101)
$FR_{t,t}^j$	-0.0939 (0.0260)	-0.1323 (0.0327)	0.0188 (0.1434)
$E_{t,t}$	0.0904 (0.0158)	-0.0832 (0.01570)	-0.0441 (0.0133)
$Y_{t,t}$	-0.0689 (0.0187)	-0.0790 (0.0224)	-0.007 (0.0214)

$D_{i,t}$	-0.0003 (0.00007)	-0.0008 (0.0001)	-0.001 (0.0214)
$BD_{i,t}$	0.0002 (0.0003)	0.0018 (0.0003)	-0.001 (0.00009)
Sargen test (J-statistic)	29.1388	25.9157	27.6416
Instrument rank	36	36	36
P-value	0.2786	0.6299	0.4832
AR (-2)	0.4364	0.5750	0.7413

* Coefficients significant at the level of 5% and higher are in bold For convenience, we write out separately significant terms related to the budget rules (the variable itself and the interactive members), and transform the expression to a form that allows identifying threshold values. The aggregate the rest of the variables are denoted by $CCaacc_{i,t}$, where jj , as before, is the rule type.

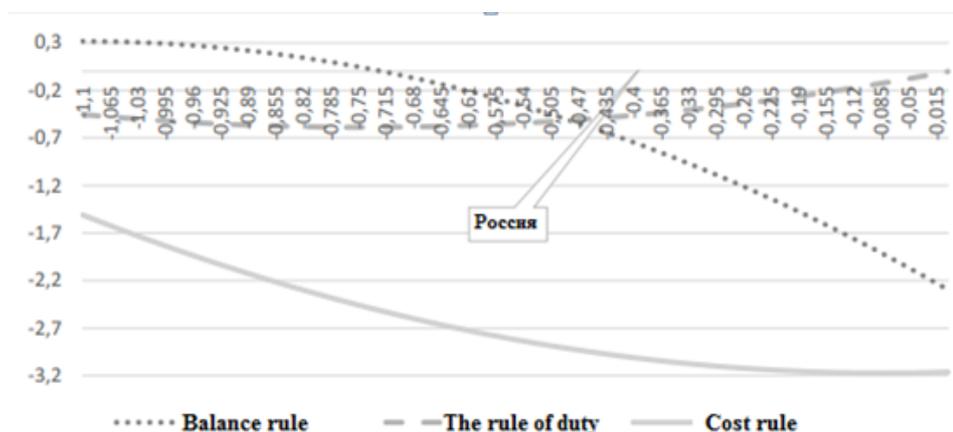
$$(4.3) \quad BP_{i,t}^{bb} = Var_{i,t}^{bb} + 0,0846 \times FR_{i,t}^{bb} (|E_{i,t}| - 1,1099)$$

$$(4.4) \quad BP_{i,t}^{expen} = Var_{i,t}^{expen} + 0,0999 \times FR_{i,t}^{expen} (E_{i,t} - 1,3233)$$

$$(4.5) \quad BP_{i,t}^{debt} = Var_{i,t}^{debt} + 0,0381 \times FR_{i,t}^{debt} (E_{i,t} - 0)$$

From (4.3) - (4.5) it can be seen that the dependence of the influence of the (structural) balance rule on the efficiency (the factor of the interactive term) is nonlinear and has two threshold values -1.1099 and 1.1099 The conditionality of the influence of the debt rule and the expenditure rule (multipliers of interactive members) is linear. In the first case, the threshold value is zero, in the second, the threshold level is 1.3233. Let us depict (Fig. 4.2) the conditionality profile of the influence of the rule on the policy from equations (6), (7) and (8):

*Figure 4.2 Impact profile of balance sheet rule, debt rule and spending rule on fiscal impulses depending on government efficiency **



* The horizontal axis is the government efficiency index, the vertical axis is the discretionary impulse in shares of GDP (the value of the coefficient at the dummy variable of the budget rule) The rule of (structural) balance orients the policy of medium effective governments to contain. The debt rule holds back the policies of underperforming governments. The expenditure rule turns out to be the most "stringent", restraining the policy over most of the interval [-2.5; 1.3233]¹³

5- Discussion

Let us determine the impact of fiscal rules on economic growth, taking into account the discovered influence of rules on policy, as well as the effect of policy on economic growth. For this purpose, we substitute equations for the fiscal policy variable (4.3) - (4.5) in relation (4.2) and, after simple transformations, express the variable of economic growth through the variable of fiscal rules and the variable of government efficiency for each type of rules under consideration. We write the resulting expressions in a form that allows us to identify the threshold levels. The set of the remaining variables will be denoted by $CCaac_{tt}$.

¹³ When the present study was completed and the work was being prepared for publication, a preprint by UM Bergman and M. Hutchison, 2014, was released, where the analysis also includes government efficiency and uses the interaction of the efficiency indicator with budget rules, or rather, with the budget rules index. The authors' main interest, however, is focused on the effect of rules on the correlation between the cyclical component of GDP and the cyclical component of government spending. The question of the influence of the rule on growth is not investigated in the work. Despite the fact that the work differs significantly in the direction of research and methodology, the dependence of the influence of the rule on the effectiveness of government is found by the authors, which is consistent with the results of this work.

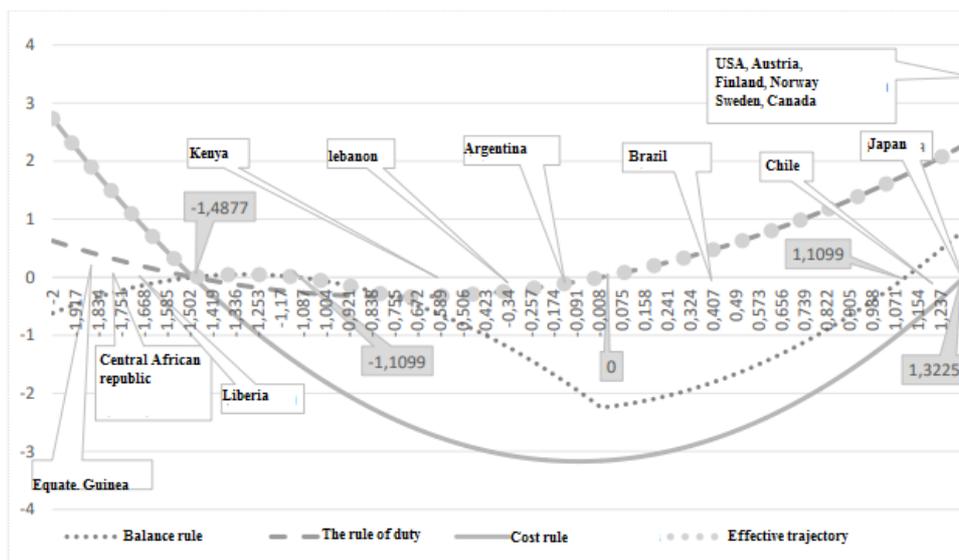
$$(5.1) \quad Y_{i,t} = \widetilde{Var}_{i,t}^{bb} + FR_{i,t}^{bb} \times \begin{cases} -0,0136 \times (E_{i,t} + 1,1099) \times (E_{i,t} + 1,4877), E_{i,t} < 0 \\ 0,0136 \times (E_{i,t} - 1,1099) \times (E_{i,t} + 1,4877), E_{i,t} > 0 \end{cases}$$

$$(5.2) \quad Y_{i,t} = \widetilde{Var}_{i,t}^{bb} + FR_{i,t}^{bb} \times \begin{cases} -0,0136 \times (E_{i,t} + 1,1099) \times (E_{i,t} + 1,4877), E_{i,t} < 0 \\ 0,0136 \times (E_{i,t} - 1,1099) \times (E_{i,t} + 1,4877), E_{i,t} > 0 \end{cases}$$

$$(5.3) \quad Y_{i,t} = \widetilde{Var}_{i,t}^{debt} + 0,0061 \times FR_{i,t}^{debt} \times E_{i,t} \times (E_{i,t} + 1,4877)$$

Let's depict the influence of the rules on growth (Fig. 5.1). To preserve clarity, we will restrict ourselves to the area [-2; 1.4]. Outside this region, the corresponding functions behave monotonically and there is no sign change. So, to the left of the lower bound is the positive area for the debt rule and the spending rule. The negative area corresponds to the balance rule. To the right of the upper border there is a positive area for rules of all three types.

*Figure 5.1 Profile of the influence of rules on economic growth rates depending on government efficiency **



* on the horizontal axis - the government efficiency index, on the vertical - real rates of economic growth, %

The impact of all three types of rules on economic growth does not depend on government performance in a linear fashion. For the balance rule, three threshold levels are identified: -1.4877; -1.1099; 1.1099 specifying four sign reversal areas. For the expense rule, the

thresholds are -1.4877 and 1.3233, which define three sign reversal areas. For the long threshold level rules are also two: -1.4877 and 0 and three sign reversal areas.

Recall that we distinguish between the following main groups of effects, the occurrence of which is associated with the effectiveness of the government, and the mutual influence will determine the effect on economic growth. First, the government's ability to comply with the rule's limitations is conditioned by the government's efficiency. Second, efficiency determines the government's ability to interact with the rule - to choose it optimally. Third, the quality of the non-inertial policy itself depends on efficiency. Next, we will consider these effects in detail for the fiscal balance rule. For the rule of debt and the rule of expenditure, we will indicate only the distinguishing features.

5-1- Balance Rule

As follows from the previous discussion, the governing actions of low-performing governments only destabilize the economy and negatively affect the rate of economic growth. The fiscal (structural) balance rule "does not work" for ineffective governments that is virtually unable to follow it. This type of rule is relatively loosely related to purpose (government spending) and therefore leaves a much wider margin for government abuse.

In addition, the very structure of the rule amplifies external shocks, transferring the volatility of the economy's income almost entirely to the expenditure side of the budget.

Further, as government becomes more efficient, so does the government's ability to adhere to the constraints of the rule. Along with the growth of the government's efficiency, the quality of the non-inertial component of the budget policy also increases. The organization of the mechanism for selecting and implementing goals is improving. The absorption by the system of each additional unit of government spending becomes more efficient - the influence of the fiscal impulse on economic growth, which has become positive after the threshold level, increases. At this time, the rule becomes an obstacle to the implementation of optimal policies. The government's inability to "tune" the rule optimally, as well as to re-tune the rule in time to respond to negative shocks, leads to insufficient flexibility of the rule. The rule reduces the possibility of pursuing a non-inertial policy necessary for solving non-standard tasks of accelerating economic development. The effect of the rule on growth in this area becomes negative ⁴⁷.

Finally, highly effective governments are able to adhere to the rule and tune it optimally, as well as re-tune the rule in a timely manner, which is not manage to make governments less efficient.

5-2- Cost Rule

This type of rule is simple and, therefore, does not require high government efficiency to implement it. The rule limits the growth of spending and with it the destabilizing policies of ineffective governments. In contrast to the previous case, the effect of the rule on growth for such governments is thus positive. At the same time, as the efficiency of the government increases and the quality of policy improves accordingly, the stringency of the rule becomes an ever greater obstacle to pursuing non-inertial policies and solving the problems of accelerating growth.

The rule has a depressing effect on growth over most of the efficiency interval. The ability to interact with this type of rule - to tune and re-tune the rule in time - only arises after the government has reached an extremely high level of efficiency. The rigidity of the rule is due to the direct connection of the rule with the goal :

- Government spending
- Which results in a strong countercyclical nature of the rule.

5-3-The Rule of Duty

This type of rule is also simple and does not require high efficiency to satisfy constraints. Often, underperforming governments are saddled with significant debt problems. Opportunities for their solution by measures related to the revenue side of the budget are very limited in the short term. Restraining the growth of debt, thus, simultaneously extends to the expenditure side of the budget and allows reducing the destabilizing policy, thereby achieving a positive effect on economic growth. As debt problems are resolved and debt stabilizes at normal levels, the government has a wide range of opportunities to pursue growth policies.

Each rule type has its own performance threshold. Thus, the debt rule helps to accelerate growth from the middle of the efficiency interval; the fiscal (structural) balance rule can be recommended for governments with efficiency higher than 1.1099, and finally the expenditure rule ceases to prevent the reduction of policy inertia only for highly efficient governments. It is in this sequence - the expenditure rule, the fiscal balance rule, the debt rule - that the transition from one type of rule to another should occur as the government becomes more efficient.

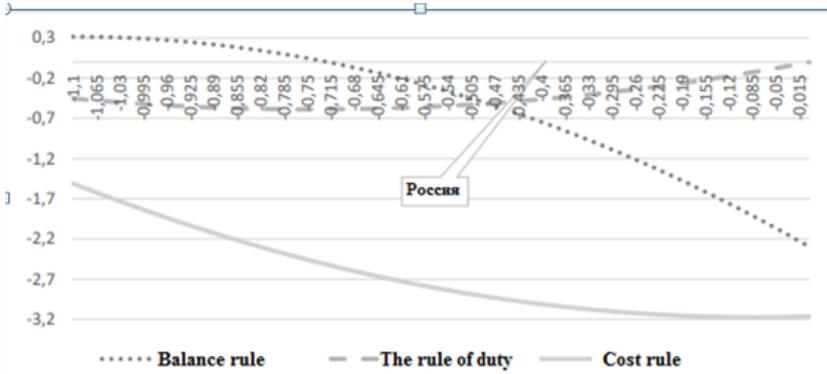
5-4-Discussions for Case of Russia

The effectiveness of the Russian government is in the range of -0.35 to -0.4, which allows for a relatively good policy. The government is able to manage growth, and budget spending has

a pronounced effect on economic growth. The analysis showed that rules of all three types are an obstacle to economic growth. The efficiency of the government has reached a level that allows it to comply with the restrictions of the rule, however, the level of efficiency remains insufficient to ensure the optimal adjustment of the rule (and readjustment) in accordance with the balance of objectives of both financial stability and economic growth. To a lesser extent, the debt limitation rule suppresses economic growth, the introduction of which may lead to a slowdown in rates of only 0.26 pp. The slowdown in growth rates in the event of the introduction of the balance rule could amount to 0.74 pp. The rule of limiting expenditures is the most stringent type of rules in the conditions of the efficiency of the Russian government; its introduction can lead to a decrease in the growth rate of up to 3 pp.

It should be noted that in Russia in 2018, the current in 2018-2015 was reintroduced structural balance rule. However, if growth objectives are taken into account, the debt limitation rule is preferred.

Figure 5.4 Profile of the impact of rules on economic growth depending on government efficiency *



* on the horizontal axis - the government efficiency index, on the vertical - real rates of economic growth, %

Using the rules in Russia requires a lot of effort to set them up. It is necessary to develop a mechanism that restrains "bad" discretionary activity, but does not hinder the solution of economic development problems. The rule should take into account the goals of growth, and "non-optimal" should be compensated for by an increase in the selectivity of the rule. The tracing of world experience in this area can turn into a time of missed opportunities

6- Conclusion

In the presented work, the reasons for the differences in the results of using the rules by countries of the world are investigated. One of the main factors determining the success or failure of a rule is the effectiveness of a country's government. Its non-inclusion in the analysis, in our opinion, is the reason for such different conclusions of the existing studies. Thus, the need to introduce a rule may be due to the weak efficiency of the government. At the same time, however, an ineffective government may be simply unable to adhere to the introduced rule. As the government becomes more effective, the quality of government policy should be expected to improve. At this time, "tying the hands" of the government by the rule may be excessive. The lack of flexibility of the rule and the inability of the government to "tune" the rule can limit the possibilities for conducting optimal policies and harm the economic development of the country, which requires solving non-standard problems. We found a similar effect for medium-efficient governments. Finally, highly effective governments are able to both adhere to the rule and tune it optimally, and re-tune the rule in a timely manner. The government's ability to interact with the rule, including more complex versions, is increasing. The mechanism of discretionary valves (escape clause) is used more effectively. The introduction of regulations saves government attention and forces to carry out a non-inertial policy of high performance. For effective governments, enacting rules does not stifle growth.

This paper finds direct influence of three types of fiscal rules: expenditure rules, fiscal balance rule, and debt rules. As follows from the analysis, each level of government efficiency can be recommended its own type of rules. Thus, low-efficient governments are best suited to the expenditure rule, medium-efficient governments are best suited to the balance rule, efficient governments are best suited to the debt rule, and high-efficient governments are best suited to all three types of rules (starting at different thresholds). It is in this sequence - the expenditure rule, the fiscal balance rule, the debt rule - that the transition from one type of rule to another should occur as the government becomes more efficient. For the Russian economy, the use of all three types of rules has a negative direct effect. The least stringent is the debt rule, and the most stringent is the spending cap rule. The use of the rule in Russia requires the creation of a mechanism of selective action that restrains "bad" discretionary activity and does not interfere with the solution of economic development problems.

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