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Theoretical Bases of the Russian Federation Constituent Entity Reserve Fund Volume Estimation

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***Abstract*— Reserve funds of the Russian Federation constituent entities can be created in order to ensure financial stability of the regional financial system, starting from 2009. However, practice has shown that these reserves were not created and are not created in any of the constituent entity of Russia. This type of budgetary reserves is practically not investigated in modern science. At the same time, certain regions made attempts to form them in their practical financial activities, but as a result they faced with multiple difficulties in the methods of their creation, management and usage. This article offers theoretical principles for the formation and usage of this type of reserve. The theoretical significance of proposals relates to the addition of the methodological tools of financial theory with indicators used to estimate the volume of the budgetary Reserve Fund of the Russian Federation constituent entity. The practical importance of proposals is connected with the ability to manage the volumes of this budget reserve on the basis of a retrospective method for assessing the region budget.**

Keywords*— *Russian Federation constituent entity Reserve fund; regional reserve funds; state financial reserves

I. INTRODUCTION

The formation of the RF entities Reserve Fund (CERF) is regulated by two main documents – the Budget Code of the Russian Federation (Article 81.1, introduced by the Federal Law No. 310-FL of 30 December 2008) and the laws of the Russian Federation constituent entities. This fund is created in the regions with quite a specific purpose – "to fulfill the expenditure obligations of the Russian Federation constituent entity in the event of inadequate budget revenues of the Russian Federation constituent entity for financial provision of expenditure liabilities" [1]. The regions may not create this reserve fund, but if a decision to create it is taken, a corresponding law must be necessarily adopted, since the regulation of the CERF solely by the provisions of the law of the Russian Federation constituent entity on its budget for the next financial year is not allowed (Article 81.1 paragraph 1 of the RF Budget Code). Thus, the legislator is stressing the long-term existence of the CERF. The second important norm of the RF Budget Code is the norm that this reserve is a part of the "budgetary funds of the Russian Federation constituent entity" [1].

Two years after the introduction of the CERF regulations, the Russian Federation Ministry of Finance published Methodical Recommendations dated 27.08.2010, which described some additional features of its formation and usage [2]. In these recommendations, specific sources for the CERF formation and methodological methods for assessing its volumes were established. The analysis of the Methodological recommendations undertaken in this article showed their inconsistency and impossibility of their practical application. Acknowledgment to these conclusions may be the fact that by 2017 only one constituent entity, the Novosibirsk region, has developed legislative grounds for creating this type of reserve [3, 4].

II. PROBLEM INTRODUCTION

An estimation of the CERF volume size can be made on the basis of a retrospective analysis of the Russian Federation constituent entity budget for the period under study (call it the calculation period).

If in unfavorable years the expenditures of the region significantly exceed their incomes for the period under study, the lack of funds can be covered by the CERF. This article does not touch upon the problems of this reserve formation. For example, according to current legislation, one of the sources is the regional budget revenues excess over the expenditures in favorable years. We have the following statement of the problem. In accordance with a retrospective analysis of the regional budget statistical data, a model should be constructed according to the following principle: for the settlement period, the total volume of the CERF should be equal to the total attracted credit resources (formula 1). That is, the lack of budgetary funds would be covered not at the expense of the loans, but at the expense of the CERF. Therefore, for example, in years with a positive financial result, the region, allocating the share of the funds remaining in the CERF, must collect it in such a volume that for the whole study period the total reserve funds, taking into account investment activities, were equal to the amount of borrowed by the region funds for the given period. That is, the rule must be fulfilled:

$$\text{CERF} + II = KL. \qquad (1)$$

Here CERF –total funds of the modeled financial reserve of the Russian Federation constituent entity for the settlement period;

II – investment income on the reserve for the period;

KL – the amount of state and commercial loans attracted by the region for the period under study.

This is a basic equation of equivalence, which determines the correspondence of the simulated reserve funds and the region actually attracted credit resources, and is the main one for determining the method of CERF formation. This equivalence equation allows:

- to determine the amount of annual allocations to the CERF, corresponding to the actual amounts of resources involved;

- to control and regulate the volumes of accumulated reserve.

III. Theoretical Part

The above equation (1) can be rewritten taking into account the investment income and inflation in the following form:

$$\left(\sum_{\tau=1}^{T} \mathrm{CERF}_{\tau-1} \cdot (1+\gamma_\tau) - KL_{\tau-1} \right) \cdot K^{T-\tau} = 0. \quad (2)$$

Here T – is the value of the calculation period;

CERF_τ – financial reserves of the Russian Federation constituent entity at the beginning of the τ year;

$K_\tau = (1+\gamma_\tau)^{\tau} (1+h_\tau)^{-\tau}$ – the multiplication factor;

$(1+\gamma_\tau)$ – the multiplication factor at the annual rate of investment income γ_τ;

γ_τ – the average annual value of investment income in the τ year;

h_τ – average annual inflation rate in the τ year;

KL_τ – attracted resources in the τ year.

Equation (2) is an equation for the net future value of the project (NPV), which is generally accepted in financial analysis, equal to zero, which means the equality of the accrued costs at the end of the analyzed period of positive and negative financial flows (Fig. 1).

Equation (2) describes this financial flow at the end of the calculation period (T). The effect of inflation is taken into account by introducing a $(1+h)^{-\tau}$ factor for the sums increasing process, so the real purchasing power of each sum at time T is found.

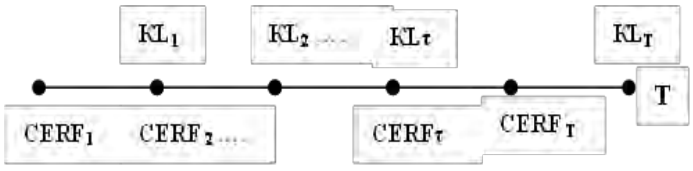

Fig. 1. The scheme of time flows at the study period

All financial indicators are reduced to one point in time T with the help of γ_τ-rates – the average annual interest rates on loans attracted by the credits budget. At the end of each *i*-th year allocations are performed in the CERF, then equation (2) can be rewritten as follows:

$$\sum_{i=1}^{T} \mathrm{ACERF}_i \cdot (1+r)^{T-i} + \sum_{i=1}^{T} \mathrm{CERF}_i \cdot (1+h) \cdot (1+r)^{T-i+1} \cdot I(\mathrm{ACERF}_i \le KL_i) +$$

$$+ \sum_{i=1}^{T} KL_i \cdot (1+h) \cdot (1+r)^{T-i+1} \cdot I(\mathrm{ACERF}_i > KL_i) = \sum_{i=1}^{T} KL_i \cdot (1+r)^{T-i}. \quad (3)$$

Here:

ACERF_i – the amount of allocations to the CERF at the end of each *i*-th year of the calculation period;

$\sum \mathrm{CERF}_i$ – the sum of all reserve values at the beginning of each year for the entire calculation period T;

KL_i – loan funds attracted by the budget in the *i* -th year;

$\sum KL_i$ – total loan funds attracted by the budget for the entire calculation period T;

I (A) – A event indicator; I (A) = 1, if the event A is completed; I (A) = 0, if the event A is not completed;

r – the real annual interest rate taking into account the investment yield γ and the inflation rate h (formula 4).

$$1 + r = (1+\gamma)/(1+h). \quad (4)$$

The left-hand side of the equation (3) is the total volume of the region CERF for the period under study, the right-hand side is the total loans for the same period. The second term on the left-hand side of the equation describes the total amount of the financial reserve for years when budget funds were insufficient and loans were raised, and the third term describes the same reserves in the years when the reserve funds were sufficient and no loans were involved.

It is necessary to take into account the additional positive effect of inflation for the budget: for the period from the beginning of the fiscal year to the moment of its end, the real value of money is reduced by (1 + h) times, however, payments put into the budget at the initial time are paid at the end of the year not taking into account the inflation rate for the year.

Thus, on the left-hand side of the equation there is the amount of allocations to the CERF for the tariff period at the end of each year and the amount of the excess of this reserve at the beginning of each year. In the left-hand part – there is the amount of loans for the study period, which is equal to the payments from the CERF of the missing in the budget money.

This equation can be used to solve two problems:

a) estimation of annual allocations to the CERF for known other parameters of the task (and adjusting, if necessary, its volume);

b) estimation of the CERF size for known values of the value of allocations and other parameters of the problem:

- determination of total allocations to the CERF amount for the period under study;
- determination of the allocations amount (in per cent) from the difference between the CERF and the Constitutional Court;
- determination of the CERF maximum value;
- adjustments for these parameters, if necessary.

The solution of the second problem is as follows. Taking into account the factor of time, the total value of the allocations to the CERF, accumulated by the end of the study period, will be:

$$\text{SCERF} = \sum_{i=1}^{T} \text{ACERF}_i \cdot (1+r)^{T-i} =$$

$$= \sum_{i=1}^{T} KL_i \cdot (1+r)^{T-i} - \sum_{i=1}^{T} \text{CERF}_i \cdot (1+h) \cdot (1+r)^{T-i+1} \cdot I(\text{CERF}_i \le KL_i) -$$

$$- \sum_{i=1}^{T} KL_i \cdot (1+h) \cdot (1+r)^{T-i+1} \cdot I(\text{CERF}_i > KL_i). \qquad (5)$$

The amount of allocations to the CERF in the *i*-th period is determined in the same proportion to the financial result (FR) throughout the entire study period:

$$FR_i = KL_i - CERF_i. \qquad (6)$$

$$ACERF_i = k \cdot FR_i; \qquad (7)$$

$$SCERF = \sum_{i=1}^{T} k \cdot FR_i = k \cdot \sum_{i=1}^{T} FR_i; \qquad (8)$$

Then this proportionality coefficient, defined is this article as *the financial reservation coefficient* can be calculated in accordance with the formula:

$$k = SCERF / \sum_{i=1}^{T} FR_i. \qquad (9)$$

The coefficient of financial reservation characterizes the share of the allocations amount for the calculation period in the reserve in the total value of annual positive financial results for the whole period and varies from 0 to 1.

The maximum possible value of the accumulated reserve should be determined as follows. With the already known value of the total allocations to the CERF and the total values of this reserve at the beginning of each year, it becomes possible to assess the ratio of these indicators:

$$\mu = SCERF / \sum_{i=1}^{T} CERF_i (1+r)^{T-i+1}. \qquad (10)$$

This coefficient, called as *the total reservation coefficient*, characterizes the share of the value of total allocations to CERF in the sum of all values of this reserve at the beginning of each year for the study period. It is obvious that the permissible values of this coefficient lie in the range from 0 to 1. In the known value of this indicator, the maximum allowable value of the investigated reserve is determined. Suppose that in the presence of all the parameters for solving the second task (statistical data for previous years), the budget for the next year is determined, while the CERF reserve at the beginning of the year – CERF_{T+1} (Fig. 2) is known. Then, having information on the aggregate values of the reserve at the beginning of each year for T of the previous period and the new subsequent year, the maximum allowable amount of allocations to the reserve for the period (T + 1) is defined as:

$$SCERF_{нов} = \mu \cdot \sum_{i=1}^{T} CERF_i (1+r)^{T-i+1}. \qquad (11)$$

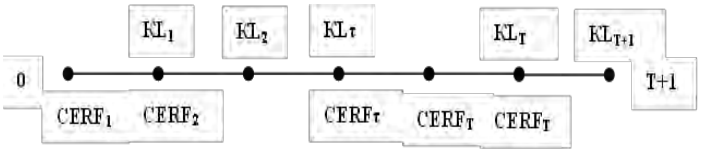

Fig. 2. Temporary scheme for the CERF formation for the calculation period (T + 1)

Then the maximum possible amount of allocations to the CERF in the period (T + 1) will be calculated by the formula:

$$ACERF_{new} = SCERF_{new} - SCERF = SCERF_{new} - \sum_{i=1}^{T} ACERF_i \cdot (1+r)^{T-i} \qquad (12)$$

That is, if the amount of allocations to the CERF in the (T + 1)-th year, calculated according to the formula (7), is greater than the ACERF_{new}, then allocations are made in the amount of ACERF_{new}, if not, then allocations are made according to the reservation ratio taking into account the calculated reserve maximum. If in the subsequent year the maximum amount of allocations to the reserve is negative, then allocations to the reserve are not made. Thus, the maximum value of the CERF is determined annually, which adequately regulates the fluctuation in the lack of financial resources of the regional budget.

IV. CONCLUSION

Thus, the principles of for ming the CERF proposed in this article allow to adequately estimate its volumes for the next budget year. Besides, the following tasks are solved:

1) the estimation of the annual allocations to the CERF volue;

2) the estimation of the CERF size with known values of the allocation value and other parameters of the problem set, including the determination of the CERF maximum value.

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