

ISCKMC 2020**International Scientific Congress «KNOWLEDGE, MAN AND CIVILIZATION»****APPROACHES TO DEVELOPING METHODOLOGY FOR
TYPOLOGIZING REGIONAL BUDGETS BY LEVEL OF
SUBSIDIZATION**

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Russia, t_sitohova@mail.ru**Abstract**

State interbudgetary regulation and long-term budgetary policy of Russia in recent years is increasingly focused on solving the problem of imbalance in regional budgets. This circumstance has a significant impact on the stability of the entire budgetary system, especially during periods of economic crisis. In such conditions, the relevance of studies aimed at identifying the features of the formation and use of regional budgets that have a high degree of financial dependence on interbudgetary transfers, in particular, on subsidies, increases. The main problem faced by the financial management of the state in matters of regulating the budgetary provision of territories is associated with effective inter-budgetary equalization and the achievement of a balanced budget system. The authors see the solution to these issues in the transformation of the methodology of subsidized equalization of the budgetary provision of the depressed territories of the country, which is possible provided that approaches to the typology of regional budgets are developed according to the level of their subsidization. This article is aimed at developing a methodology for a comprehensive assessment of the fiscal and financial and economic conditions of regional budgets with an average and high level of subsidization for their typologization. A methodology for a comprehensive budgetary assessment of subsidized regions has been systematized and developed. The novelty of the research lies in the development of scientific thought regarding approaches to a comprehensive assessment of the budgetary state of subsidized territories and the authors methodology for their typologization.

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1. Introduction

The effective development of regional socio-economic systems is impossible without ensuring budgetary sustainability and budgetary self-sufficiency, which is understood as the ability of regional financial authorities to fully meet the region's expenditure commitments with revenue sources over a long period of time (Mikhailova, 2019). Various domestic scholars, such as Mikhailova and Klimanov (2019), Dombrovskii (2016), Akindinova et al. (2016) were engaged in studying the issues of sustainability of budgets of individual territories and inter-budgetary relations in order to increase the level of balance and financial security of regions. In the world scholarly literature, disputes continue regarding the understanding of the term "budgetary sustainability". The most complete definition of the budgetary sustainability of the region can be represented as follows – the equilibrium financial state of the territory between the dynamic development of human society and the effective exploitation of available resources, which allows, in the event of negative risks, to return this state with minimal financial losses (Hill et al., 2008). The main factor in achieving budgetary sustainability not only in the region, but also in the balance of the country's budgetary system as a whole is the increase in the financial independence of the territories and the decrease in the degree of their transfer dependence (Dombrovskii, 2016). This problem can be interpreted through the category of subsidization of regional budgets, the aggravation of which causes an increase in difficulties in regulating interbudgetary relations (Tavbulatova et al., 2019).

Over the past 20 years, the number of regions with a high dependence on subsidized assistance from the federal center (over 40 %) has rapidly decreased from 12 to 6 constituent entities, but the problem of low financial autonomy of the group of highly subsidized territories persists. On the other hand, over the past 4 years, out of 85 constituent entities of the Russian Federation, 47 regions for the period 2016–2019. have subsidization above 10 %, and in 38 out of which the degree of subsidization has been growing for three years in a row. 6 constituent entities for the period under review are highly subsidized regions of Russia (Tashtamirov, 2020).

The problem of subsidization of territorial budgets of Russia was considered in the scholarly works of the following authors (Grebennikov, 2018; Iushkov et al., 2018; Kazakova, 2018; Magomedov, 2018; Milchakov, 2017; Sugarova, 2019). These researchers have made a huge contribution to the development of scholarly thought within the framework of issues of interbudgetary regulation and ensuring sustainable development of the country's budgetary system. However, the aspect of typologization of regions with high subsidization dependence has not been sufficiently considered.

2. Problem Statement

The solution to the problem of subsidizing Russia's territorial budgets is seen in the transformation of the methodology for equalizing budgetary security and regulating interbudgetary relations. Consideration of the directions of modification and transformation of the mechanism for the distribution of budgetary subsidies for the equalization of budgetary security of territories and the implementation of interbudgetary policy is possible after the development of approaches to the typology of regional budgets by the level of subsidization. An important aspect is the definition of a set of criteria for attributing the regional budget to a particular type of subsidized territory. The gradation of regional budgets according to

the level of subsidization will allow solving a number of problems: to determine the factors and reasons for the high and stable subsidization of budgets; to develop an adaptive mechanism for regulating interbudgetary equalization; to reduce the degree of financial dependence of territorial budgets on federal aid.

3. Research Questions

The subject of the research is the author's approach to the classification and typology of regional budgets of Russia according to the level of their subsidization to form a basis for considering the directions of transformation of the mechanism for equalizing budgetary security. Disclosure of the subject of research is seen in the following issues:

1. To consider the approaches of domestic authors to the typology of subsidized regional budgets;
2. To determine the criteria for attributing the regional budget to the corresponding type of subsidized budget.

4. Purpose of the Study

On the basis of systemic approach, to form a typology of regional budgets of Russia according to the level of their subsidization to determine the interdependencies of the development of regional socio-economic systems with a low quality of resource potential implementation.

5. Research Methods

The gradation of regional budgets according to the level of subsidization should be based on the coefficient of subsidization, which characterizes the share of the volume of subsidies provided to the regional budget as a part of its own revenues. The author recommends the following formula for calculating the coefficient of subsidization of the regional budget:

$$C_s = VD/OR * 100 \% \quad (1)$$

where

C_s – coefficient of subsidization of the regional budget;

VD – volume of subsidies provided to the regional budget during the reporting year;

OR – volume of the regional budget own revenues (tax and non-tax revenues, subsidies and grants) during the reporting year.

Using the above formula in the study of the author (Tashtamirov, 2020), the following results were obtained for the types of regional budgets of Russia in terms of their level of subsidy dependence (see Table 1).

Table 1. Typology of regional budgets of Russia for the period 2016–2019

Regional budget type	Share of the volume of subsidies provided to the regional budget as a part of its own revenues	Number of regions
Self-sufficient	0 %	12
Low subsidized	<10 %	32
Moderately subsidized	10–25 %	22
Medium subsidized	25–40 %	13
Highly subsidized	>40 %	6

Most of the regional budgets (41 constituent entities of the Russian Federation) have a level of subsidization above 10 %, the number of self-sufficient regions is 12, and the highest subsidization is traced in 6 constituent entities of the country. For the period under review 2016-2019 there is a negative trend towards an increase in the number of regional budgets of the type of moderately subsidized and medium subsidized, which indicates an increasing risk of instability of regional finances, especially those overloaded with public debt.

According to the proposed methodology, the following regions with a highly subsidized type can be distinguished (see Table 2).

Table 2. Dynamics of subsidization of regional budgets of Russia for the period 2016-2019.

Region	Share of subsidies provided as a part of of the consolidated regional budget own revenues, %				Average rate of subsidization
	2016	2017	2018	2019	
Kamchatka Krai	55	52	49	42	50
Republic of Altai	55	58	54	47	54
Republic of Ingushetia	43	50	50	58	50
Republic of Dagestan	53	56	56	55	55
Chechen Republic	64	61	65	57	62
Republic of Tuva	60	63	65	58	62

For the period 2016–2019 the highest average value of subsidization is observed in the Republics of Tuva and Chechnya – 62 %, a lower level in the Kamchatka Territory – 50 %. At the same time, positive dynamics can be traced in two regions in terms of reducing the level of budget subsidization (Kamchatka Krai and Republic of Altai), which is a consequence of a systematic increase in tax and non-tax revenues.

The considered methodology for typologization of regional budgets through the coefficient of subsidization characterizes the degree of dependence of territorial budgets on the federal center in matters of financial support of expenditure commitments in the absence of balance but does not fully assess the comparable level of subsidization and budgetary sustainability in the context of the country's regions.

In the work of Kozlov (2010) it is proposed to classify municipal budgets by the level of budgetary security into donors and recipients. The typology is based on the coefficient of budgetary security as the ratio of the estimated volume of municipal budget revenues to the estimated volume of expenses.

Grigoreva and Sentizova (2019) propose to carry out a gradation of municipal budgets through two indicators: the subsidization coefficient and the cost coverage ratio. However, the calculation of the

subsidization coefficient is based on the ratio of the amount of subsidies to own income, which the authors identify as tax and non-tax income. This approach contradicts the legislative understanding of the category of own revenues, which in the Budget Code of the Russian Federation are defined as general budget revenues, excluding subventions. These contradictions in the interpretation of the budget's own revenues are quite often found in domestic scholarly works (Tavbulatova & Kulakova, 2019).

A more detailed typology of territorial budgets, depending on the level of subsidization, should be based on various indicators and criteria that reflect the complex state of the budget: its sustainability, balance, autonomy, etc.

The proposed approaches do not take into account such criteria as: the size of the region's population, which is the main consumer of budget services; direction of the regional budget (share of social spending); the degree of influence of the budgetary and tax potential on economic regional indicators; the level of debt burden and the degree of financial independence of the budget (Kuklin & Chichkanov, 2017).

In view of this, it is proposed to form a comprehensive methodology for assessing the budgetary and financial conditions of regional budgets, depending on the level of subsidization, and on this basis to carry out their typologization. The assessment is based on qualitative relative indicators, broken down into 5 groups and characterizing the fiscal and financial and economic state of the regional budget under the influence of subsidization. The assessment is in Figure 1.

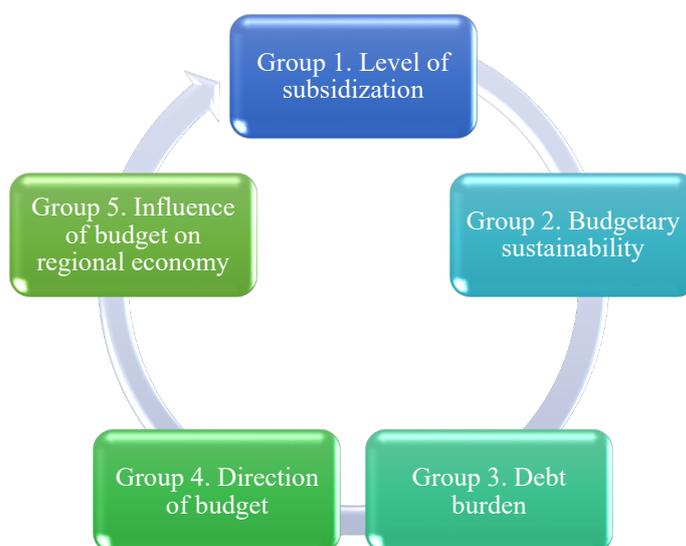


Figure 1. Groups for assessing the budgetary state of the subsidized region

The actual values of the indicative indicators are compared with the threshold values, then the overall score for the group is calculated. Based on the estimates obtained for individual groups, a final estimate of the budgetary state and the possibilities of the subsidized region is formed.

The assessment is aimed at defining factors that negatively affect the budgetary sphere with the subsequent identification of opportunities for further improvement and management of the state of the territory's budget.

It is proposed to classify the assessment of regional budget indicators according to the following states:

1. Moderate;
2. Unsatisfactory;
3. Crisis.

Group 1 includes the definition of the basic indicator – the level of subsidization, which is calculated by formula (1) and allows one to determine the degree of subsidy dependence on the federal center on issues of ensuring the region's unmet expenditure commitments. The second indicator is per capita subsidization of the regional budget – the ratio of the total amount of subsidies to the population of the region.

Group 2 makes it possible to assess the budgetary sustainability and financial autonomy of the regional budget. It includes the following indicators: balance coefficient, the share of the budget deficit of the territory in the regional budget revenues and the coefficient of financial independence.

The indicator “Balance ratio of regional budgets” reflects the extent to which budget expenditures are covered by the total volume of regional budget revenues. The recommended value for this ratio is less than 1. This means that the budget is balanced and has a low risk of not covering expenditure commitments.

“The share of the budget deficit of the territory in the revenues of the regional budget” shows what is the part of the deficit in the income of the territory. The presence of a budget deficit indicates an excess of the expenditure side over the revenue side. The budget code establishes the maximum level of the budget deficit of the constituent entity, it should not exceed 15 % of the approved volume of income, excluding uncompensated receipts. For a number of constituent entities, the deficit should not exceed 10 %. If the budget is adopted with a deficit, then the sources of financing the budget deficit for the next financial year should be approved.

"The financial dependence coefficient" reflects the part of uncompensated receipts in the total amount of the region's income. The higher the value of the coefficient, the more dependent the regional budget is on additional financial aid.

Group 3 is aimed at assessing the debt liabilities of the regional budget. The group uses two indicators: the ratio of volume of the state debt of a constituent entity of the Russian Federation to the total volume of budget revenues of the constituent entity of the Russian Federation (excluding uncompensated receipts and budget loans) and the level of debt burden of the regional budget.

For the indicator "The ratio of the volume of the state debt of the constituent entity of the Russian Federation to the total volume of budget revenues of the constituent entity of the Russian Federation (excluding the volume of uncompensated receipts and budget loans)", the standard value is considered to be a number not exceeding 1. There is an exception for constituent entities of the Russian Federation, which have a share of subsidies exceeding 40 % in the last two out of three years, the standard for this coefficient is considered to be a value not exceeding 0.5.

The indicator "The level of debt burden of the regional budget" is calculated as the ratio of the state debt of a constituent entity to tax and non-tax revenues and reflects how much the region cannot independently ensure the fulfillment of its expenditure commitments. With the help of this indicator, the authorities of the constituent entry can control the permissible volumes of borrowings. Each constituent

entity of the Russian Federation has the right to establish its own maximum (permissible) value of the level of debt burden. Scholars have proposed various gradations of the level of debt burden.

For example, in the methodology of Ermakova (2014) it is proposed to divide the values of the debt burden into four levels: 1) Low (up to 30 %). 2) Medium (30–50 %). 3) High (50–80 %). 4) Critical (over 80 %).

Group 4 assesses the focus of the regional budget using the indicator "Share of social items in regional budget expenditures." Supporting the least protected strata of the population is a priority of the state's social policy. Social policy takes a special place in the structure of budget expenditures. Effective use of allocations for social dimensions leads to positive dynamics of socio-economic indicators directly related to the social sphere.

Group 5 examines the impact of budget indicators on the key economic indicators. GRP (gross regional product) and population size were considered the main economic indicators. GRP is the main indicator of economic development, which is the total cost of final goods, works and services produced in a certain territory.

The indicator "The share of the main regional taxes in GRP" shows what is the part of main tax receipts of the territory is in the gross regional product. The main taxes included: personal income tax, corporate income tax and property taxes.

The next indicator for assessing the block was chosen "Coefficient of provision of the population with budgetary funds". It reflects the level of budget allocations per inhabitant of the territory. For calculations, data on the average annual population size of a certain territory are used.

6. Findings

Summarizing the considered groups of indicators for a comprehensive assessment of the fiscal and financial and economic state of a subsidized region, we systematize the calculation formulas of indicators and their standard values in Table 3.

Table 3. Groups and indicators for a comprehensive assessment of the fiscal and financial and economic state of the subsidized region

Indicator	Calculation formula	Normative values
<i>Group 1 – level of subsidization</i>		
Subsidization coefficient	$C_s = VD_i / OR_i$	Moderate – 0.1–0.25
	VD _i – volume of subsidies granted of i-region OR _i – own revenues of i-region	Unsatisfactory – 0.25–0.4 Crisis – >0.4
Subsidization per capita	$S_s = VD_i / PS_i$ PS _i – population size of i-region	The higher the value, the higher the dependence of the cost of public services to the population of the region on subsidies
<i>Group 2 – budgetary sustainability</i>		
Degree of balance coefficient	$C_b = E_i / R_i$ E _i – expenditures of i-region; R _i – revenues of i-region	<1
Share of the regional	$BD = E_i - R_i / R_i - GA_i$	0.1–0.15

budget deficit in tax and non-tax revenues	GA_i – grant assistance to i-region	
Financial dependence coefficient	$C_{fd} = GA_i/R_i$	The higher the value, the higher the financial dependence
Coefficient of the ratio of the region's public debt to tax and non-tax revenues	<i>Group 3 – debt burden</i>	
	$C_{pd/r} = VD_i - VC_i/R_i - GA_i$ VD_i – volume of public debt of i-region; VC_i – volume of budget credits of i-region	<0.5 – moderate 0.5–1 – crisis
Level of debt burden	$DB = PD_i/R_i - GA_i$	Moderate – 0.3–0.5 Unsatisfactory – 0.5–0.8 Crisis – >0.8
Share of social expenditures in the regional budget Доля соц расходов в региональном бюджете	<i>Group 4 – focus of the budget</i>	
	$SE = HE_i + SPE_i + EE_i/E_i$ HE_i – health expenditures of i-region; SPE_i – social policy expenditures of i-region; EE_i – educational expenditures of i-region;	The higher the value, the higher the role of subsidies in the social security of the region
Share of regional (tax and non-tax) revenues in GRP	<i>Group 5 – influence of the budget on the regional economy</i>	
	$RR_{grp} = PIT_i + CIT_i + PT_i + NR_i/GRP_i$ PIT_i – personal income tax of i-region; CIT_i – corporate income tax of i-region; PT_i – property taxes of i-region; NR_i – non-tax revenues of i-region; GRP_i – gross regional product of i-region;	The higher the value, the lower the financial stability in the region
Per capita budget financing coefficient	$C_{bf} = E_i/PS_i$	The higher the value, the higher the provision of the regional population with budgetary funds
Final summary indicator	$\overline{FSI} = \sqrt[n]{\prod_{i=1}^n X_i}$	Moderate – 0.2–0.3 Unsatisfactory – 0.3–0.4 Crisis – >0.4

7. Conclusion

Analysis of budgetary indicators using this methodology will make it possible to objectively assess the state of subsidized budgets of constituent entities. The obtained quantitative assessment, in contrast to the qualitative one, will help to more correctly determine the capabilities of the regional budget and rank the territories depending on the state of their budgetary sphere. Normative values are indicated taking into account the specifics of the formation and use of regional budgets with an average and high degree of subsidy dependence, which indicates their underestimation in comparison with regions with a higher financial autonomy. The application of this approach to assessing the fiscal and financial and economic state of subsidized regions will make it possible to carry out their typologization according to the degree of dependence and the impact of the subsidies provided on the formation and execution of the category of subsidized regional budgets. In further studies, this methodology will be applied to the assessment of the Russian regions with the aim of grading them according to the level of subsidization and budgetary

sustainability, which will determine the directions of transformation of the methodology for equalizing the budgetary security of depressed territories.

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References

- Akindinova, N., Cherniavskii, A., & Chepel, A. (2016). Regional budgets in a crisis: can a balance be achieved? *Econ. Issues*, 10, 31–48.
- Dombrovskii, E. A. (2016). Ten Steps to Balancing the Budgets of the Subjects of the Russian Federation. *Finance and Credit*, 37, 52–64.
- Ermakova, E. A. (2014). Methodological approaches to assessing the effectiveness of the debt policy of a constituent entity of the Russian Federation. *Finance and Credit*, 28(604), 32–39.
- Grebennikov, V. G., & Magomedov, R. S. (2018). On the analysis of the factors of budgetary subsidization in Russian regions. In S. N. Vasilyev & A. D. Tsvirkun (Eds.), *Management of Large-Scale Systems Development (MLSD'2018). Proc. of the Eleventh Int. Conf. In 2 volumes* (pp. 169–172). Moscow.
- Grigorieva, E. E., & Sentizova, N. R. (2019). Classification of municipal districts of Yakutia by the level of subsidization and coverage of local budgets expenditures. *Eurasian Sci. Associat.*, 7-3(53), 161–165.
- Hill, E. W., & Wial, H. (2008). *Wolman H. Exploring regional economic resilience. Working Paper, no. 2008-04*. Inst. of Urban and Reg. Development; Univer. of California.
- Iushkov, A. O., Oding, N. I., & Savulkin, L. I. (2018). Subsidized regions of Russia: scenarios for increasing budget revenues. *Econ. Issues*, 12, 46–65.
- Kazakova, S. M., & Mikhailova, A. A. (2018). Subsidization as a factor of sustainability of regional economic systems. *Russ. Econ. J.*, 2, 29–37.
- Kozlov, S. N. (2010). Classification of municipalities by the level of subsidization. *Reg. econ.: theory and pract.*, 46(181), 40–46.
- Kuklin, A. A., & Chichkanov, V. P. (2017). “Crafty” data and real dynamics of the socio-economic development of the subjects of the Russian Federation. Inst. of Econ., Ural Branch of the Russ. Acad. of Sci.
- Mikhailova, A. A. (2019). Budgetary sustainability of Russian regions: problems and solutions. *Finance*, 7, 19–24.
- Mikhailova, A. A., Klimanov, V. V., & Safina, A. I. (2019). The impact of interbudgetary transfers on economic growth and the structure of the regional economy. *Econ. Issues*, 1, 91–103.
- Milchakov, M. V. (2017). Highly subsidized regions of Russia: conditions for the formation of budgets and mechanisms of state support. *Financial Rese. Inst. Financial J.*, 1, 22–38.
- Sugarova, I. V. (2019). Interbudgetary relations and alternative possibilities for solving the problems of budget subsidization. *Univer. Bull.*, 12, 87–91.
- Tashtamirov, M. R. (2020). Identification of subsidization of territorial budgets and their typologization. *Finance and Credit*, 5(797), 1099–1117.
- Tashtamirov, M. R. (2020). Trends in the formation of highly subsidized budgets in Russia. In *National economic systems in the context of the formation of a global economic space. Collection of scientific papers* (pp. 641–645). Simferopol.
- Tavbulatova, Z. K., & Kulakova, N. V. (2019). Territorial budgets own revenues: contemporary definitions and approaches. *Bull. of the Chechen State Univer.*, 4, 24–29.
- Tavbulatova, Z. K., Tashtamirov, M. R., Frolova, I. V. (2019). Defining approaches to determining nature of subsidized regional budgets and its typology. *The Europ. Proc. of Soc. & Behavioural Sci. EpSBS. Conf. Social and Cultural Transformations in the Context of Modern Globalism*, 58, 1663–1668.