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International Scientific Conference**ELASTICITY ASSESSMENT FOR GRANTS TARGETING FISCAL  
EQUALIZATION IN THE FAR EAST REGIONS**Elena B. Veprikova (a)\*, Aleksei A. Novitskii (b)  
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**Abstract**

The development opportunities of the RF Far Eastern regions are often restricted by relatively low fiscal capacities of regional budgets. The low potential incomes make transfers from the federal budget a key funding source for the Far East regions. The most important transfer is the fiscal equalization grant for the regions of Russia, which increases budget revenue without any restrictions for expenditure items. The distribution of equalization grants is based on a complex system of parameters with the one characterizing the features and conditions of regional development and reflecting the budget expense appreciation factors. The Far East regions have a high cost of budget expenses due to the low population density, weak connections between settlements, high prices for products and services, the seasonal nature of many transport channels, and other factors. Due to this, the Far Eastern regions produce numerous suggestions to adjust the distribution methods for equalization grants to better reflect their specifics. However, it was impossible to assess the impact of possible grant distribution method adjustments (effect per grant amount) when preparing and rationalizing the suggestions. To perform a pre-assessment of the impact of grant distribution method adjustment, a model was constructed reproducing the distribution of grants based on the methods used. For each of the regions of the Far East, we obtained grant amount elasticity assessments changing the parameters involved in the calculations. The model application helps assess the effects of method adjustments while preparing suggestions rationalizing interactions between regions and federal authorities on fiscal equalization.

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*Keywords:* Region, grant, inter-budget transfers, elasticity, fiscal capacity, Far Eastern Federal District

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## 1. Introduction

The availability of budget resources largely determines regional opportunities for social development, the construction of necessary life infrastructure, and the provision of guaranteed state and municipal services to the required extent and quality. The regions of the Russian Far East lag behind the national averages of the key indicators of social and economic development, including those that determine if people select the territory for their residence (Analiticheskiy otchet..., 2018). The struggling development of the Far East can be explained by a number of factors including its remoteness from central Russia, low transport accessibility, harsh natural and climate conditions, and relatively short reclamation history of this macroregion. The necessity to overcome the existing lags in the development of the Far Eastern territories of the country is documented in the Spatial Development Strategy of the Russian Federation for up to 2025<sup>1</sup>. Regions themselves must play a key role in achieving this goal, and regional budgets remain their main management tools for regional development. Besides, the majority of the Far Eastern regions face the problem of low fiscal capacity (Table 01).

**Table 1.** The availability of budget incomes for the consolidated budgets of the Far Eastern regions of the Russian Federation in 2019

Region	Budget expenses index <sup>2</sup>	Per capita budget incomes taking into account the budget expenses index	
		Incomes, thousands of rubles	% of the all-Russian average
Republic of Buryatia	1.264	64.4	69.7
Republic of Sakha (Yakutia)	4.520	57.1	61.8
Zabaykalsky territory	1.195	70.0	75.7
Kamchatka territory	5.160	57.0	61.6
Primorsky territory	1.179	72.2	78.2
Khabarovsk territory	1.426	70.1	75.8
Amur Oblast	1.311	79.7	86.3
Magadan Oblast	4.636	65.1	70.5
Sakhalin Oblast	2.035	205.8	222.8
Jewish Autonomous Oblast	1.322	70.0	75.8
Chukotka Autonomous District	14.716	78.1	84.5
Average across the regions of Russia	1.0	92.4	100.0

*Sources:* authors' calculations; data from the Russian Federal Treasury (2020); budget expenses indexes for 2019 from the Ministry of Finance of Russia (The Ministry of Finance of Russia, 2020).

Except for Sakhalin Oblast, all the Far Eastern regions have per capita budget incomes (taking into account the cost differences) significantly lower than the national average. The insufficient regional incomes make inter-budget transfers from the federal budget an important source of funding for the regions of the Far East (Veprikova et al., 2019). The fiscal equalization grant for the regions of the Russian

<sup>1</sup> Approved by Decision No. 207-r of the Government of Russia of 13.02.2019.

<sup>2</sup> To account for the differences in the cost of the same set of budget expenses between regions, we used the budget expenses index calculated by the Ministry of Finance of Russia. See Decree of the Government of Russia No 670 of 22.11.2004 on the Distribution of Fiscal Equalization Grants among the Regions of the Russian Federation.

Federation (hereinafter the equalization grant) is the most significant federal transfer that aims to reduce the differentiation of regions with different tax capacities (Derjugin, 2016; Mikhailova et al., 2018).

This makes the problems of improving the equalization mechanisms for the regional budget incomes highly relevant to the regions of the Far East. Regional authorities are constantly preparing suggestions to adjust the methods of grant distribution. However, the complex nature of the methods makes it difficult to assess the effects associated with the suggestions, so that the assessment is usually not performed.

The authors suggest an assessment mechanism for the effects of method adjustment based on measuring the elasticity of grant amounts using specific parameter changes. This helps increase the transparency of the fiscal equalization mechanism at the regional management level and provides an opportunity to perform a preliminary assessment of the effects of equalization grant distribution method adjustment.

## **2. Problem Statement**

The academic literature represents a large amount of data on building efficient equalizing transfer (Bioadway & Shah, 2007; Bird & Smart, 2002; Derjugin et al., 2016; Martinez-Vazquez & Boex, 1999; Nazarov, 2013, etc.). The Russian Federation uses a complex system of calculations for the amounts of equalization grants. The initial set of indicators and their respective formulas are public information. Nevertheless, it is impossible to assess the impact of specific indicators on the resulting grant amounts because the calculations are multistage and they have a lot of complex relations. We can only judge the direction of the impact at best. This is a restriction to the public analysis and understanding of equalization grant distribution methods as a mechanism that takes into account the actual specifics of regional development and ensures the equalization of budget capacities.

Although grants play an important role in financing government obligations and authorities in regions, the difficulty of forecasting the effects of changes prevents the understanding of regions' actual opportunities to improve the equalization mechanism and the objective assessment of region's specific features using the methods, and the improvement opportunities based on fiscal capacity grants. This problem is especially relevant for the regions of the Far East because the existing equalization mechanism does not take into consideration the features of development and budget expenses appreciation factors of these territories well enough (Afanasjev et al., 2019; Klimanov et al., 2018; Sodnomova & Chikicheva, 2018).

## **3. Research Questions**

This research focuses on the system of parameters used in the fiscal equalization grant distribution methods, as well as the relationships between them and the resulting grant amounts. The system is established based on the following components:

- parameters (and their assessment methods) that characterize the region's tax capacity;
- parameters that characterize the formation conditions and factors for the cost of budget expenses in these regions (and their assessment methods);

- parameters of the equalization mechanism that determine the methods and degree of tax capacity equalization.

In this research, we set and solve the following problems:

- constructing a simulation model based on the complete set of initial data for grant distribution in 2019;
- identifying the parameters that characterize tax capacities and the cost of budget expenses, and assessing the elasticity of grant amounts for the regions of the Far East based on the changes in these parameters;
- determining and analyzing the parameters that significantly impact the resulting grant amounts.

#### **4. Purpose of the Study**

The goal of this research work is to determine the response of grant amounts for the regions of the Far East to the changes in specific parameters and indexes of equalization methods.

#### **5. Research Methods**

To perform calculations the authors constructed a simulation model that reproduced the distribution of equalization grants in 2019 according to the methods (based on the public data from the Russian Ministry of Finance).

This model was used to perform an elasticity coefficient assessment for the changes in grant amounts depending on the changes in specific parameters. To do this, the model parameters were adjusted and then the resulting distribution was compared to the initial one (the basic model). The constructed model allowed us to compare the initial grant distribution and the adjusted model distribution for any region of Russia at any stage of grant calculations. The obtained elasticity coefficients show how much the grant amount will change when one of the parameters changes by 1% (for parameters measured as percentages the increments equaled 1%).

#### **6. Findings**

We obtained the assessments of elasticity coefficients of the grant amount for the Far Eastern regions on the key tax type capacities and the calculation components for the budget expenses index. This allows us to see which of the method parameters have a significant impact on the grant amounts and which areas or problems can be influenced by the method adjustment suggestions the most (or the least). The obtained elasticity coefficient assessments are presented in Tables 02 and 03.

**Table 2.** The impact of tax capacity parameters on grant amounts (in the order of impact decreasing), %

Parameter	Average elasticity coefficient, %
<i>High impact on grant amounts</i>	
Tax capacity for the personal impact tax (PIT)	1.04
<i>Low impact on grant amounts</i>	
Tax capacity for the corporate income tax	0.52
Tax capacity for the corporate property tax	0.24
Tax capacity for other tax returns	0.23
Tax capacity for the mineral extraction tax	0.14
Tax capacity for excise taxes	0.13

*Sources:* authors' calculations; data from the Russian Ministry of Finance on the distribution of fiscal equalization grants among the regions of the Russian Federation in 2019, [https://minfin.gov.ru/ru/performance/regions/mb/mb2019\\_2021/](https://minfin.gov.ru/ru/performance/regions/mb/mb2019_2021/)

Of all tax capacities, the changes in PIT tax capacity and corporate income tax capacity have the highest impact on the amounts of grants for the Far Eastern regions with the elasticities of 1.04% and 0.52% respectively, which is explained by the large shares these taxes have in regional incomes.

The elasticity coefficients of other tax capacities are low, so the adjustments to the grant distribution methods related to the improvement of their calculation will have a significantly smaller effect.

**Table 3.** The impact of budget expenses index calculation parameters on grant amounts (in the order of impact decreasing), %

Parameter	Aggregate factor containing the parameter	Average elasticity ratio, %
<i>Aggregate factors that comprise the budget expenses index</i>		
Salary factor	-	1.58
Price factor	-	1.08
Housing and utility cost factor	-	0.43
<i>Calculation parameters for aggregate factors of budget expenses index</i>		
<i>High impact on grant amounts</i>		
Displacement factor	Salary factor	2.7
	Price factor	
The proportion of residents living in settlements of up to 500 people	Salary factor	2.56
	Price factor	
The proportion of residents aged below 17 and those older than the working-age	Price factor	2.48
	Price factor	
The proportion of residents living in areas with limited delivery periods	Price factor,	1.5
	Housing and utility cost factor	
<i>Medium impact on grant amounts</i>		
Regional salary factor	Salary factor	1.1
The ratio of the actual price for a standard selection of consumer products and services and the national average	Price factor	1.08
<i>Low impact on grant amounts</i>		
Transport accessibility factor	Price factor,	0.66
	Housing and utility cost factor	
The proportion of residents living in mountain areas	Price factor,	0.64
	Housing and utility cost factor	
The cost of housing and utility services per 1 square meter of living space	Housing and utility cost factor	0.45

Regional salary allowance for the Far North and areas equated with those; transport cost compensation allowance	Salary factor	0.45
The density of permanent transport channels (railroads and motorways)	Price factor	0.06
Average per capita monetary incomes	Housing and utility cost factor	-0.05
The cover ratio for the housing and utility costs and residents' monetary incomes	Housing and utility cost factor	0.05

*Sources:* authors' calculations; data from the Russian Ministry of Finance on the distribution of fiscal equalization grants among the regions of the Russian Federation in 2019, [https://minfin.gov.ru/ru/performance/regions/mb/mb2019\\_2021/](https://minfin.gov.ru/ru/performance/regions/mb/mb2019_2021/)

Of the three components of the budget expenses index (see aggregate factors in Table 03), the salary factor has the highest impact on grant amounts with an elasticity of 1.58%. Overall, the degree of factor impacts corresponds with their shares in the budget expenses index (0.55 for the salary factor, 0.35 for the price factor, and 0.1 for the housing and utility cost factor).

The displacement factor within the structure of the budget expenses index, as well as the parameter it is based on (the proportion of residents living in settlements of up to 500 people), have the highest impact on grant amounts. We must note that the existing approach to accounting for the population displacement across the territory based on this factor often comes into question among the academic community (Derjugin et al., 2016; Mironov, 2018).

The proportion of residents aged below 17 and those older than the working age and the proportion of residents living in areas with limited delivery periods are also factors that impact the calculation of grants relatively hard.

The adjustment of such parameters as the transport accessibility factor (and the embedded density of permanent transport routes) and the housing and utility costs have a relatively small impact on grant amounts. The adjustment of these parameters of the grant distribution methods will have smaller effects on the regions' grant amounts.

## 7. Conclusion

This research has produced the following findings:

The fiscal equalization mechanism has been created in Russia in 2005, and it cannot take into account all of the relevant differences between regions due to the significant disproportions in their development. The adjustment (fine-tuning) of the existing mechanism and its parameters can be carried out following the assessment of their elasticity, i.e., the impact of changing specific parameters and factors on the grant amounts for a specific region or a group of regions.

The model research conducted showed that personal and corporate income taxes have relatively high elasticity in terms of tax capacity. At the budget expenses level, the most elastic parameters include population displacement across the region, population structure (the proportion of dependent residents), and the proportion of residents living in areas with limited delivery periods. When preparing suggestions on the adjustment of grant methods, these indicators must be taken into account in the first place.

Due to the high heterogeneity of the regions in the Far Eastern macroregion of Russia in terms of their economy types, population density, infrastructure availability, prices, etc., it is practically impossible

to increase the amounts of grants received by all of the regions (that receive grants) through the adjustment of specific parameters. When competing for a standardized grant amount, significant differences between regions result in grants being redirected from the regions that do not have a relative ‘advantage’ in the parameter in question to the regions that have that.

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