

# Methodological aspects in the assessment of financial security of a region

**Irina S. Ferova** (0000-0002-3359-7822)<sup>1</sup>, **Svetlana A. Kozlova** (0000-0003-0858-201X)<sup>1(\*1)</sup>, **Svetlana N. Grib** (0000-0003-2369-0676)<sup>1</sup>

<sup>1</sup> Siberian Federal University, Krasnoyarsk, Russia

**Abstract.** The paper is devoted to the development of tools for assessing the financial security of a region in order to form a strategy for the territorial development in the context of the interaction between the goals of sustainable socio-economic development and economic security. The paper considers the features of financial security assessment. The assessment was carried out by centralized and decentralized finance of a region. Taking into account the existing limitations of statistical observation at the level of municipalities, the composition of indicators and their threshold values used in assessing the financial security of a region was specified. The measurement was carried out in the context of six macro-districts according to three indicators: the average level of subsidization of local budgets of the macro-district; tax and non-tax revenues of local budgets per capita (coefficient of development of own revenues in local budgets); business efficiency ratio. An analysis of the dynamics and structure of subsidies for the period 2015 – 2020 shows that the main increase in subsidies falls on the Western and Southern macro-districts, the growth rate exceeds the average for the territory over the same period. There is a clear dynamics of development and improvement of the own revenues of local budgets of most macro-districts of the territory. There is a decrease in the business efficiency ratio in general in Krasnoyarsk Territory in 2020, due to the impact of the pandemic and lockdown.

**Keywords:** Economic security · Strategic development · Regional development · Macro-districts · Investments · Subsidies · Budget revenues

## 1. Introduction

In the context of the instability of the current economic situation, the concept of regional financial security is one of the core ones: for example, at the end of 2021, the debt burden on regional budgets was 20.8%, and in 15 constituent entities of the Russian Federation the amount of public debt increased compared to 2020 (Bogodvid, 2022). Under these conditions, when strategizing the socio-economic development of the region, researchers give preference to considering financial and economic security.

In the academic literature, both Russian and foreign authors most often consider the concept of economic security, while some authors associate the regional financial security with the risks of threats at strategically important enterprises (Korableva et al., 2020), in other studies, financial security is presented as a component of the economic security of the state/region (Borsch and Gerasimova, 2018, Anofrikov et al., 2018, Dankiewicz et al., 2021, Haber et al., 2018, Han, 2018,

---

<sup>1</sup> Corresponding author: [s.a.kozlova@inbox.ru](mailto:s.a.kozlova@inbox.ru)

Grikietytė-Čebatavičienė, 2021, Prado, 2018, Rasdi et al., 2021, Rodica et al., 2014, Vaitkus and Vasiliauskaite, 2022). Table 1 presents the most common approaches to the definition of the concept of “financial security”.

**Table 1.** The concept of financial security.

SIDDA	Content of the concept
Nurymova, Yessentay (Nurymova and Yessentay, 2018)	Practically, in the economic literature there is no systematic definition of “financial security”, which makes it necessary to solve this problem. Thus, one of the most important aspects of the problem of economic security of the state – the state of its financial system (the state budget and other institutions), the ability of this system to provide state financial resources sufficient to fulfill its internal and external functions
Chichkanov, Chuvashova, Chistova (Chichkanov et al., 2018)	This state of the financial system of the region (including the banking, budgetary, tax, currency, insurance, investment, debt systems), which ensures protection of the financial interests of the subjects (population and business) of the region from external and internal threats

At the same time, the issue on a systematic approach to identify the content of region’s financial security remains open, as defined by the systemic notion.

Within the framework of these components, the debt burden ratios, level of budget deficit, budget coverage, budget autonomy are proposed for assessment (Sannikova and Prikhodko, 2019), in addition, the authors systematize the indicators developed earlier, by groups: macrofinancial, banking, savings and investments, financial market, price-related (Vorobeva and Denenberg, 2021).

## 2. Materials and Methods

In this paper, the authors assessed the financial security of a region and macro-districts in terms of the budget, debt and tax components according to state statistics and reports on the execution of the budgets of municipalities.

Taking into account the existing limitations of statistical observation at the level of municipalities, the composition of indicators and their threshold values used in assessing the region’s financial security was specified.

The assessment of economic security in centralized and decentralized finance of Krasnoyarsk Territory (in the context of six macro-districts) was carried out according to three indicators: the average level of subsidization of local budgets of the macro-district; tax and non-tax revenues of local budgets per capita (coefficient of development of own revenues of local budgets); business efficiency ratio (Table 2).

**Table 2.** Indicators of the economic security of a region and macro-districts in the field of finance and their threshold values.

Indicator	Calculation	Threshold value	Rationalizing threshold value
Average level of subsidization of local budgets of the macro-district	$LD = \frac{D}{R-S} \times 100\%$ <p>where <math>LD</math> – average level of subsidization of local budgets of the macro-district, %;  <math>D</math> – subsidies to the local budget of the macro-district, RUR;</p>	1%-19% low level (safe); 20-49% medium level; ≥50% high level (dangerous);	The higher this indicator, the less independent the municipalities in the macro-district, the higher their dependence on the assistance of the region

Indicator	Calculation	Threshold value	Rationalizing threshold value
	$R$ – total budget revenues, RUR; $S$ – subventions, RUR		
Coefficient of development of own revenues of local budgets	$K_{OR} = \frac{TR+OT}{P},$ where $K_{OR}$ – coefficient of development of own revenues of local budgets; $TR$ – tax revenues of local budgets of the macro-district, rub.; $OT$ – non-tax revenues of local budgets of the macro-district, RUR; $P$ – population in the macro-district, persons	$K_{OR} \geq 1$ (growth rate, inflation-adjusted)	Reflects the development of the base of own revenue sources of municipalities (at $K_{OR} \geq 1$ (inflation-adjusted) there is a return on investment in the development of the macro-district's economy)
Business efficiency factor	$K_{eff} = \frac{FR}{\bar{N}},$ where $K_{eff}$ – business efficiency factor; $FR$ – balanced financial result of organizations, RUR; $\bar{N}$ – average number of employees on the payroll of organizations in the macro-district (excluding small businesses), persons	$K_{eff} \geq 1$ (growth rate, inflation-adjusted)	Allows identifying the efficiency of business in the macro-district. Employed generate profits at growth rates that outpace inflation.

Further, based on the results of calculating the coefficients presented in Table 2, for at least a period of 5 years, an integral indicator of the level of financial security of the macro-district of the region is calculated.

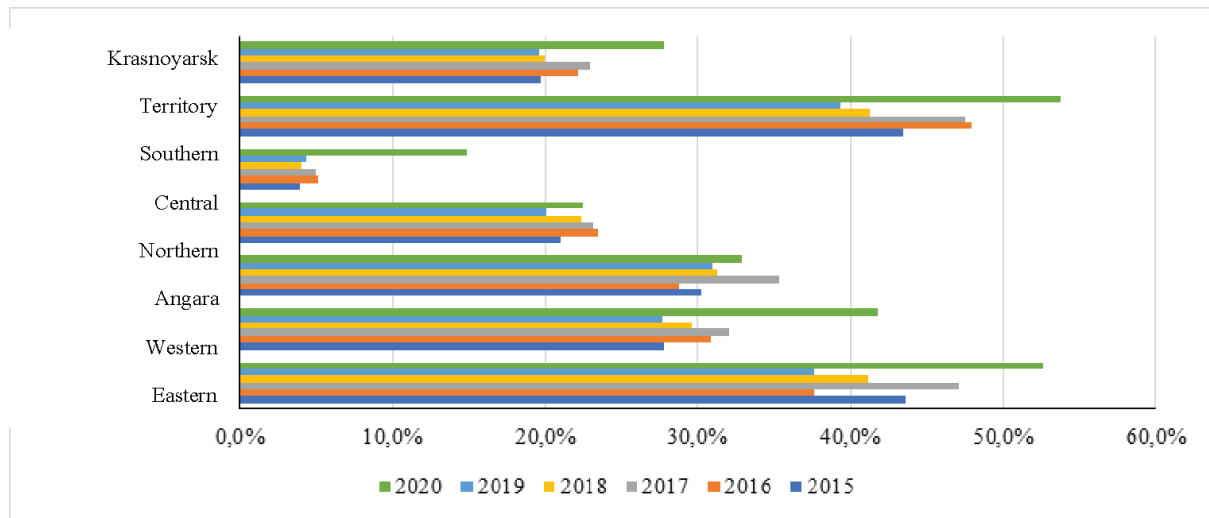
### 3. Results

To assess the state and development of the sphere of centralized finance in Krasnoyarsk Territory at the municipal level, two indicators are proposed that characterize the financial independence of the territories – their independence from financial support of higher budgets and the development of own revenue sources.

The study assessed the level of financial security of macro-districts of Krasnoyarsk Territory by the factors presented in Table 2.

**Average level of subsidization of local budgets of the macro-district.** Under the dangerous level for the municipality (and the macro-district as a whole) the authors will understand the excess of the subsidization threshold of 50% (or 0.5).

Analysis of the dynamics and structure of subsidies for 2015–2020 shows that the main increase in subsidies falls on the Western and Southern macro-districts, where the growth rate exceeds the region's average over the same period (Fig. 1). The Northern and Angara macro-districts are no longer the main recipients of subsidies: their share in the total amount of subsidies is decreasing, due to the return on previously launched investment projects.



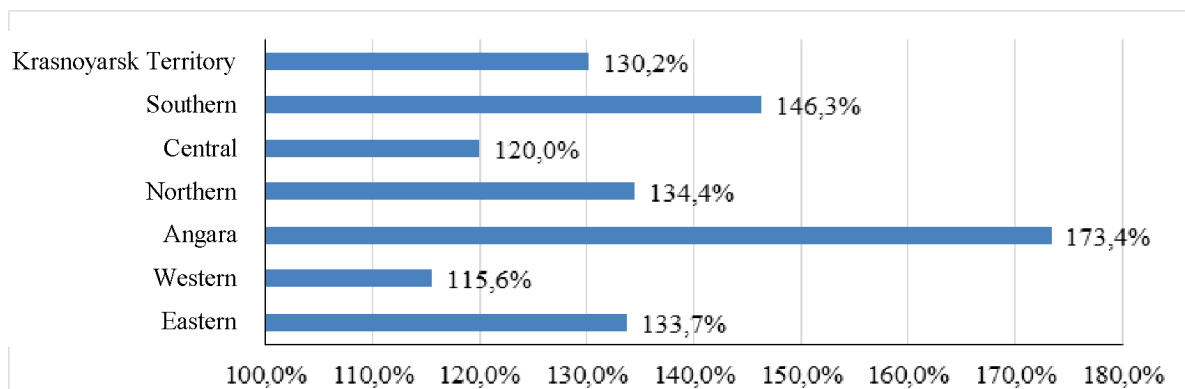
**Fig. 1.** Dynamics of the level of subsidization of local budgets by macro-districts and Krasnoyarsk Territory for 2015–2020, %. *Source:* compiled by the authors.

The results of assessing the level of economic security by the *LD* factor are presented in Table 3.

**Table 3.** Assessment of the level of economic security by the indicator “level of subsidization of local budgets” for macro-districts and Krasnoyarsk Territory.

Macro-district	2015	2016	2017	2018	2019	2020
Eastern	1.146	1.330	1.061	1.214	1.331	0.949
Western	1.802	1.624	1.557	1.688	1.807	1.197
Angara	1.652	1.737	1.414	1.598	1.615	1.519
Northern	2.377	2.131	2.159	2.232	2.486	2.229
Central	12.775	9.663	10.050	12.484	11.478	3.357
Southern	1.152	1.044	1.051	1.211	1.272	0.930
Average for Krasnoyarsk Territory	2.540	2.254	2.177	2.505	3.554	2.800

**Coefficient of development of own revenues of local budgets.** During the study period, there is a fairly confident increase in tax and non-tax revenues of municipalities in all macro-districts of Krasnoyarsk Territory, the average growth rate for the region was 130.2% (Fig. 2).



**Fig. 2.** Growth rate of tax and non-tax revenues of local budgets by macro-districts and Krasnoyarsk Territory, %. *Source:* compiled by the authors.

In the analyzed period, tax and non-tax revenues grew at a faster pace in Angara and Southern macro-districts (above the average for the territory), in Northern and Eastern macro-districts the growth rate practically corresponds to the territory's average. Lagging behind the average along the edge are Western and Central macro-districts.

The results of assessing the level of economic security in terms of the coefficient of development of own revenues of local budgets for macro-districts and Krasnoyarsk Territory are provided in Table 4.

**Table 4.** Level of economic security by coefficient of development of own revenues of local budgets by macro-districts and Krasnoyarsk Territory.

Macro-district	2016	2017	2018	2019	2020
Inflation	1.054	1.025	1.043	1.03	1.0491
Eastern	0.955	1.052	1.046	1.053	1.039
Western	0.953	1.015	0.998	1.068	0.952
Angara	1.006	0.962	1.025	0.997	1.507
Northern	0.785	1.013	1.014	1.150	1.181
Central	0.928	0.967	1.007	1.027	1.020
Southern	0.992	0.987	1.153	1.024	1.071
Average for Krasnoyarsk Territory	0.892	0.988	1.017	1.069	1.112

**Business efficiency factor.** Table 5 provides an assessment of business efficiency factors for macro-districts and Krasnoyarsk Territory for 2015–2020, Table 6 – the estimated level of economic security by this particular indicator for macro-districts and the territory.

**Table 5.** Business efficiency factor by macro-districts and Krasnoyarsk Territory.

Macro-district	2015	2016	2017	2018	2019	2020
Eastern	33.86	36.03	35.40	50.90	42.46	55.83
Western	205.82	141.82	86.16	108.16	138.31	126.19
Angara	496.22	3358.49	1758.67	672.99	2,005.58	8,028.54
Northern	1,854.04	1,972.63	1989.55	2,525.79	5,836.09	2,068.16
Central	927.20	649.46	168.17	625.59	847.24	836.53
Southern	-18.35	20.79	6.94	26.67	35.22	63.62
Krasnoyarsk Territory	805.92	972.37	596.65	798.36	1,606.86	1,549.05

**Table 6.** Assessment of the level of economic security by the business efficiency factor for macro-districts and Krasnoyarsk Territory.

Macro-district	2016	2017	2018	2019	2020
Eastern	1.009	0.959	1.379	0.810	1.253
Western	0.654	0.593	1.204	1.241	0.870
Angara	6.421	0.511	0.367	2.893	3.816

Macro-district	2016	2017	2018	2019	2020
Northern	1.009	0.984	1.217	2.243	0.338
Central	0.665	0.253	3.567	1.315	0.941
Southern	1.075	0.326	3.684	1.282	1.722
Krasnoyarsk Territory	1.145	0.599	1.283	1.954	0.919

The assessment shows that the results of 2017, which was difficult for business development in most macro-districts of the territory, were offset by the growth in profitability in 2018–2019.

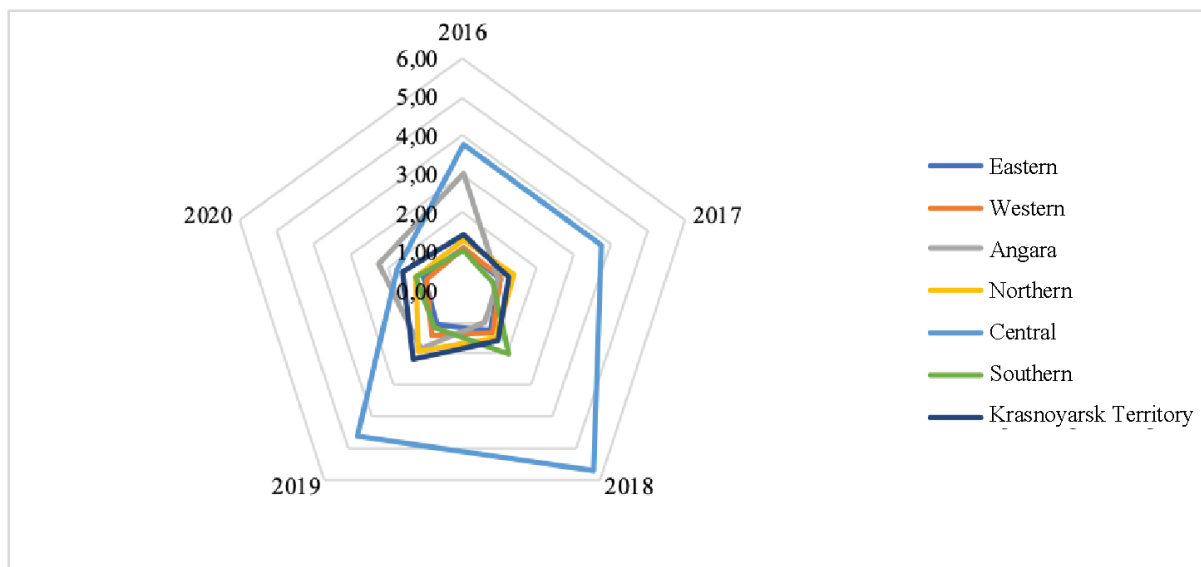
#### 4. Discussion

This study contains an assessment of the level of financial security of Krasnoyarsk Territory and its macro-districts. It should be noted that in this paper, the financial security of a region is considered as such a state of the budget and economy of macro-districts, which ensures a low level of dependence on subsidies, as the level of business development ensures tax revenues.

The authors support the current practice of assessing the level of financial security in the context of indicators of budgetary security, while supplementing the calculations with the indicator “business efficiency ratio”, which will account for the impact of the level of business activity on the level of financial security, and, when interpreted with the indicator “coefficient of development of own revenues of local budgets” with the level of tax revenues.

#### 5. Conclusion

Based on the results of the study, an assessment of the integral index of financial security of the region and its macro-districts was given (Fig. 3).



**Fig. 3.** Integral index for assessing the financial security of macro-districts of Krasnoyarsk Territory for 2016-2020. *Source:* compiled by the authors.

The following factors of financial security of Krasnoyarsk Territory and its macro-districts should be noted:

- the region and its macro-districts demonstrate a high level of financial security, which, nevertheless, is volatile and subject to a significant decrease in crisis periods;

- the main contribution to ensuring financial security is made by the factors of business profitability and the development of own revenues of local budgets, the factor of subsidization of local budgets is decreasing;

- the greatest contribution to the financial security of the region is made by the areas of concentration of large business – Central, Northern and Angara macro-districts.

The main threats to reduce the level of financial security lie in the growth of subsidization of local budgets and uneven development of business, which creates disproportions in the concentration of financially stable companies being the largest taxpayers in particular industrialized areas.

### Acknowledgments

The research was funded by RFBR, Krasnoyarsk Territory and Krasnoyarsk Regional Fund of Science, project number 20-410-242912.

### References

1. S.P. Anofrikov, V.A. Afonchikova, S.A. Dukart, Vectors Well-being: Econ. Soc. **4(31)**, 219-229 (2018). Accessed on: November 04, 2022. [Online]. Available: <https://jwt.su/journal/article/view/850>
2. M. Bogodvid, Dolgovaya nagruzka na regionalnye byudzhety v 2021 godu snizilas [Debt burden on regional budgets decreased in 2021] (2022). Accessed on: November 04, 2022. [Online]. Available: <https://riarating.ru/regions/20220303/630218045.html>
3. L.M. Borsch, S.V. Gerasimova, Rus. Entrep. **19(10)**, 2815-2834 (2018). <https://doi.org/10.18334/rp.19.10.39400>
4. E.I. Vorobieva, Yu.M. Denenberg, Sci. Bul.: Fin., Banks, Invest. **1(54)**, 5-15 (2021). Accessed on: November 04, 2022. [Online]. Available: <https://cyberleninka.ru/article/n/finansovaya-bezopasnost-natsionalnoy-ekonomiki>
5. R. Dankiewicz, A. Ostrowska-Dankiewicz, T. Tomczyk, M. Leszczyński, J. Sec. Sustain. Iss. **11(1)**, 547-560 (2021). <https://doi.org/10.47459/jssi.2021.11.50>
6. J.A. Haber, A. Bukhtiarova, S. Chorna, O. Iastremska, T. Bolgar, Invest. Manag. Fin. Innov. **15(3)**, 304-317 (2018). [https://doi.org/10.21511/imfi.15\(3\).2018.25](https://doi.org/10.21511/imfi.15(3).2018.25)
7. R. Han, Open Access Libr. J. **5**, 1-7 (2018). <https://doi.org/10.4236/oalib.1104874>
8. J. Grikietytė-Čebatavičienė, Vilnius Univ. Open Ser. 13-19 (2021). <https://doi.org/10.15388/VGISC.2021.2>
9. A.A. Korableva, M.S. Kharlamova, M.Yu. Yakovina, Human Sci.: Human. Stud. **14(4)**, 205-213 (2020). <https://doi.org/10.17238/issn1998-5320.2020.14.4.25>
10. S. Nurymova, A. Yessentay, Int. J. Innov. Techn. Econ. **8(20)**, 43-51 (2018). [https://doi.org/10.31435/rsglobal\\_ijite/30112018/6214](https://doi.org/10.31435/rsglobal_ijite/30112018/6214)
11. R.P. Prado, Asia Eur. J. **16**, 237-250 (2018). <https://doi.org/10.1007/s10308-018-0511-z>
12. R.M. Rasdi, Z. Zaremohzzabieh, S. Ahrari, Front. Psychol. **12**, 610138 (2021). <https://doi.org/10.3389/fpsyg.2021.610138>
13. P. Rodica, S. Alexandru, T. Angela, Procedia Econ. Fin. **15**, 383-392 (2014). [https://doi.org/10.1016/S2212-5671\(14\)00461-4](https://doi.org/10.1016/S2212-5671(14)00461-4)
14. I.N. Sannikova, E.A. Prikhodko, Econ. Prof. Bus. **1**, 48-55 (2019). <https://doi.org/10.14258/201906>
15. R. Vaitkus, A. Vasiliauskaite, J. Risk Fin. Manag. **15**, 86 (2022). <https://doi.org/10.3390/jrfm15020086>
16. V.P. Chichkanov, A.A. Chuvashova, E.V. Chistova, Fin. Credit **24(9)**, 2105-2119 (2018). <https://doi.org/10.24891/fc.24.9.2105>