

# Financial potential as a basis for ensuring environmental and economic security of the Arctic regions

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**Abstract.** Large-scale industrial development of the Arctic territories is a steady course of development that the world economy has been following for several decades. This development is facilitated by global warming, which creates prerequisites for the freeing more and more territories from ice, depletion of resources, especially hydrocarbons, as well as the emergence of new technologies that allow extraction of minerals in difficult conditions for economic activity in the Arctic. Given the vulnerability of the Arctic natural systems, the issues of environmental and economic security, as a result of such development, come to the fore. The study, analyzes the financial capabilities of the Arctic regions and concludes that they have significant financial potential, which, if used rationally, should contribute to ensuring economic and environmental security. The paper proposes the authors' interpretation of the concept of financial potential of the region. The review of domestic and foreign scientific literature showed that many works are devoted to topical issues of ensuring environmental and economic security of the Arctic regions, but the impact of financial potential on these categories is currently undefined. The paper also analyzes the financial potential of economic entities operating in the Arctic zone of the Russian Federation. It has been revealed that of the nine regions of the Russian Federation classified as Arctic, only one - the Krasnoyarsk Territory - has the value of the indicator characterizing the share of break-even enterprises, which exceeds the average Russian values. At the same time, when assessing the coefficient of provision with tax payments, in seven out of nine regions the value of this coefficient exceeds the average Russian values.

## 1 Introduction

The financial potential of a region is the key to ensuring sustainable economic development, which means the creation of conditions under which all modern needs of the population are met without compromising the needs of future generations. Obviously, the greater the financial potential of the region, the higher the probability of ensuring its environmental and economic security. At the same time, the issues of economic and environmental security, which are among the components of the concept of "national security", are not only inextricably linked, but are also decisive in the development of the Arctic spaces [1]. The active development of the Arctic, observed in the past few decades, is due to several reasons. Firstly, the exhaustion of finite natural resources in more southern climatic zones. Secondly, the emergence and development of new technologies that allow exploration and extraction of minerals in the difficult natural and climatic conditions of the Arctic [2, 3]. Thirdly, the emergence of a more favorable conditions for economic activity, due to the release of ever larger spaces from snow and ice cover.

And the presence of huge proven reserves of hydrocarbons - oil and natural gas, as well as non-ferrous metals - gold, platinum, aluminum, copper and other minerals, only fuels interest in this macro-region from not only the Arctic states [4, 5]. At the same time, the vulnerability of natural systems of the Arctic, not resistant to external influences and characterized by an extremely low rate of self-purification, suggests that the development of these territories and water areas will be carried out in compliance with environmental safety requirements [6].

## 2 Overview of the main sources of research and publications

Despite the large number of scientific studies devoted to the study of environmental and economic security, the issues related to its financial component, if considered, then quite superficially. At the same time, finances in the modern economic world are a key component of the success of the development of any system. The lack of financial resources nullifies all the efforts of state

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authorities aimed at creating conditions conducive to sustainable economic development of territories. However, not only the success of economic development of the country and/or regions depends on the availability of financial resources, the lack of funds challenges other types of security, such as military, medical, social, energy, food, environmental, which is especially important for the regions of the Russian North and the Arctic [1, 7, 8].

The issues related to the financial security of the regions as a key component of economic security are considered in sufficient detail in the work of R.V. Badylevich *Assessment of state financial support for the development of the Arctic zone of the Russian Federation* [7]. The article, based on official statistics, analyzes the main sources of replenishment of the budget of the Russian Arctic regions. Based on the analysis, two groups of regions were identified, depending on the level of financial independence of replenishment of the regional budget. The study also concludes that the state policy with regard to the Russian Arctic regions is gradually shifting from direct financing to creating favorable conditions for potential investors. We draw attention to the article by I.V. Nikulkina - *Strategic approach to the formation and implementation of state financial policy in the Arctic zone of the Russian Federation: methodological aspect* [9]. The main attention is paid to the study of the state financial policy in relation to the Russian Arctic territories. According to the author, the allocation of these regions into a separate category and the implementation of a special financial policy in relation to them by the state is a reasonable position of the federal authorities. The high importance of financial security and financial potential of the regions in ensuring economic and environmental security is also noted by Sh. Tabata in his article *Financial flows between the federal budget and the Arctic regions of Russia* [10]. The author notes a fairly high financial potential and financial sustainability of the Arctic regions, believing that most of them can be economically independent from the federal center. At the same time, the creation and maintenance of conditions characterized as attractive for private investors is a mandatory function of the state. The issues of environmental security in the Arctic regions of Russia are considered in sufficient detail in a joint article by I.A. Rodionova and S.A. Lipina *Ensuring environmental safety: public administration of the Arctic region* [3]. As part of this work, the authors identified the main sources of environmental pollution among the Arctic regions and concluded that the highest level of pollution is observed in those places where industrial enterprises that develop and process extracted minerals are located.

### 3 Assessment of the financial potential of the Arctic regions

The financial potential of a region takes into account all the resources that the subject has - these are the financial resources that are potentially possible to attract, and those resources that the regional authorities actually have

today to ensure the sustainable development of the subordinate territory.

In the context of the sanctions policy of Western countries, as well as the spread of Sars-Cov-2 infection, the capabilities of almost all Russian regions, in terms of raising funds from outside sources, are seriously limited. That is why the issues of assessing the financial potential of the Arctic regions are of particular relevance and allow us to judge their ability to independently attract domestic financial resources.

disproportions in the development of the regions of the Russian Federation, observed for several decades, are primarily due to a significant difference in the level of financial provision of territorial systems with financial resources. At the same time, the state policy towards "needy" regions, which is commonly called the policy of equalization, has led to two extremely negative trends: firstly, it contributed to the growing dependence of the regions, in terms of financial assistance, from the federal authorities; secondly, it discouraged them from searching for new mechanisms for attracting financial resources within the regions. As a result, the problem of strengthening the financial potential of the regions, which existed before, remains unresolved at the present time.

In such conditions, one of the key tasks of the regional authorities is to create conditions under which the regions will become financially independent. In order to understand how achievable such a condition is, it is necessary to analyze the financial potential of a group of regions and/or an individual region.

When assessing the financial potential of several regions, it is possible not only to correlate their financial capabilities, but also to obtain data on their competitiveness, as well as reactions to certain management decisions made earlier.

Since the objects of research are the Arctic regions of the Russian Federation, it is necessary to determine which territorial systems can be attributed to the Arctic. Guided by the legal act of the President of the Russian Federation No. 296 of May 2, 2014 (edited on May 13, 2019 and June 27, 2017), the following regions are assigned to the Arctic zone of the Russian Federation: Arkhangelsk Region - partially, Krasnoyarsk Territory - partially, Murmansk Region - completely, Nenets Autonomous District - completely, Republic of Karelia - partially, Komi Republic - partially, Sakha Republic - partially, Chukotka Autonomous District - completely, Yamalo-Nenets Autonomous District - completely [11, 12, 13].

**Table 1.** Budget and tax potential of the regions of the Arctic zone of the Russian Federation [14]

| Regions                           | Expense coverage ratio | The coefficient of concentration of own income | The coefficient of provision of the population with tax payments | The ratio of the deficit/surplus of the consolidated budget to the amount of expenditures |
|-----------------------------------|------------------------|------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Arkhangelsk Region                | 0.76                   | 0.73                                           | 68.3                                                             | 0.04                                                                                      |
| Krasnoyarsk Territory             | 1.01                   | 0.89                                           | 97.7                                                             | 0.13                                                                                      |
| Murmansk Region                   | 0.89                   | 0.86                                           | 113.3                                                            | 0.03                                                                                      |
| Nenets Autonomous Okrug           | 0.85                   | 0.85                                           | 292.2                                                            | 0.01                                                                                      |
| Republic of Karelia               | 0.61                   | 0.6                                            | 51.7                                                             | 0.02                                                                                      |
| Komi Republic                     | 0.94                   | 0.91                                           | 104.6                                                            | 0.04                                                                                      |
| Sakha Republic                    | 0.64                   | 0.64                                           | 136.1                                                            | -0.01                                                                                     |
| Chukotka Autonomous District      | 0.28                   | 0.28                                           | 307.5                                                            | 0.006                                                                                     |
| Yamalo-Nenets Autonomous District | 1.1                    | 0.96                                           | 437.2                                                            | 0.14                                                                                      |
| Russian Federation                | 0.81                   | 0.81                                           | 69.2                                                             | 0.0003                                                                                    |

Despite the common features characteristic of the Arctic regions - low population density, unfavorable climatic conditions for living and working, significant reserves of natural resources, vulnerability of the environment, they all have different financial potential. Some of these regions need to attract financial resources from higher-level budgets, others do not. Tables 1-2 present data reflecting individual elements of the financial potential of the Arctic regions. Thus, Table 1 presents the data determining the tax and budget potential of the analyzed territorial systems of the Arctic.

The analysis showed that five of the nine Arctic regions have the cost coverage ratio exceeding the national average (0.81) - the clear leaders are the Yamalo-Nenets Autonomous District with a ratio value of 1.1 and the Krasnoyarsk Territory - 1.01. More modest ratio values were recorded in the Komi Republic, the Murmansk Region and the Nenets Autonomous District - 0.94, 0.89 and 0.85, respectively. In fact, we can say that the designated territorial systems have a greater share of their own funds (revenues) in total expenditures than the national average. The remaining regions can be characterized as territorial systems, which are characterized by low budget occupancy due to their own revenues.

Similar results were obtained when calculating the coefficient reflecting the share of own revenues of the Russian Arctic territorial systems in the total budget revenues - the coefficient of concentration of own revenues. The clear leaders here also remained the Yamalo-Nenets Autonomous District - 0.96 and the Komi Republic - 0.91. More modest, but above the national average values were recorded in the Krasnoyarsk Territory, Murmansk Region and Nenets Autonomous District - 0.89, 0.86 and 0.85, respectively. At the same time, the Chukotka Autonomous District became the most dependent on federal aid - 0.28. From the data in Table 1, it also becomes evident that in 7 out of 9 Arctic regions the coefficient of tax payments provision exceeds the average Russian values (69.2). The lowest values of the coefficient, according to the analysis, are noted in the Republic of Karelia and the Arkhangelsk region - 51.7 and 68.3, respectively. The clear leaders are the Yamalo-Nenets Autonomous District, Chukotka Autonomous District and Nenets

Autonomous District - 437.2, 307.5 and 292.2, respectively.

**Table 2.** Financial potential of the population of the regions of the Arctic zone of the Russian Federation [14]

| Regions                           | The number of people with monetary incomes above the subsistence minimum, % | The ratio of deposits of individuals to total income | The ratio of per capita income to the subsistence minimum in the region | Decrease or increase in financial assets, rubles / person |
|-----------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------|
| Arkhangelsk Region                | 87.3                                                                        | 0.35                                                 | 2.75                                                                    | -305                                                      |
| Krasnoyarsk Territory             | 82.7                                                                        | 0.28                                                 | 2.58                                                                    | 857                                                       |
| Murmansk Region                   | 89.4                                                                        | 0.39                                                 | 2.65                                                                    | 3937                                                      |
| Nenets Autonomous District        | 90.6                                                                        | 0.20                                                 | 3.96                                                                    | 37198                                                     |
| Republic of Karelia               | 84.3                                                                        | 0.33                                                 | 2.32                                                                    | 648                                                       |
| Komi Republic                     | 84.5                                                                        | 0.35                                                 | 2.56                                                                    | 4526                                                      |
| Sakha Republic                    | 82.2                                                                        | 0.20                                                 | 2.63                                                                    | 21002                                                     |
| Chukotka Autonomous District      | 91.5                                                                        | 0.25                                                 | 3.77                                                                    | 3919                                                      |
| Yamalo-Nenets Autonomous District | 94.4                                                                        | 0.20                                                 | 5.28                                                                    | 29413                                                     |
| Russian Federation                | 87.7                                                                        | 0.36                                                 | 3.32                                                                    | 529                                                       |

The second table contains data that reflect the financial potential of the population living in the regions assigned to the Arctic zone of the Russian Federation. It is quite remarkable that when estimating such an indicator as "the ratio of deposits of individuals to the total income of the population", the value exceeding the national average (0.36) was achieved only in the Murmansk region - 0.39. This indicates that the population of the Arctic regions of Russia is either poorly interested in accumulating financial resources, or, more likely, simply does not have free funds that can be used for these purposes. At the same time, the value of this indicator in 3 out of 9 regions is close to the national average - the Arkhangelsk Region - 0.35, the Komi Republic - 0.35 and the Republic of Karelia - 0.33.

When assessing regions by such indicator as "the number of population with monetary income above the minimum subsistence level", 4 out of 9 regions have values that exceed the national average (87.7). So, the clear leaders are Yamalo-Nenets Autonomous District, Chukotka Autonomous District and Nenets Autonomous District - 94.4, 91.5 and 90.6, respectively. The Murmansk region, albeit slightly, exceeds the average Russian value for this indicator - 89,4873. In other regions, the values of this indicator are lower than the national average.

**Table 3.** Financial potential of economic entities of the Arctic zone of the Russian Federation [14]

| Regions                           | The coefficient characterizing the net financial result of enterprises, million rubles per 1 enterprise | The coefficient reflecting the share of break-even economic entities | A coefficient reflecting the average level of profitability of goods, services, and works sold by economic entities |
|-----------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Arkhangelsk Region                | 2.10                                                                                                    | 0.64                                                                 | 5.2                                                                                                                 |
| Krasnoyarsk Territory             | 16.5                                                                                                    | 0.7                                                                  | 15.2                                                                                                                |
| Murmansk Region                   | 5.3                                                                                                     | 0.62                                                                 | 8.7                                                                                                                 |
| Nenets Autonomous District        | 5.01                                                                                                    | 0.4                                                                  | 4.7                                                                                                                 |
| Republic of Karelia               | 3.14                                                                                                    | 0.57                                                                 | 20.1                                                                                                                |
| Komi Republic                     | 6.27                                                                                                    | 0.6                                                                  | 9.6                                                                                                                 |
| Sakha Republic                    | 7.77                                                                                                    | 0.65                                                                 | 5.6                                                                                                                 |
| Chukotka Autonomous District      | 20.8                                                                                                    | 0.57                                                                 | 21.1                                                                                                                |
| Yamalo-Nenets Autonomous District | 117.4                                                                                                   | 0.61                                                                 | 17.1                                                                                                                |
| Russian Federation                | 4.35                                                                                                    | 0.68                                                                 | 10.8                                                                                                                |

The third table contains data that determine the financial potential of economic entities operating in the Arctic regions of Russia. Thus, the Yamalo-Nenets Autonomous District is a clear leader among all the territorial systems of the Arctic by such an indicator as

the coefficient reflecting the net financial performance of enterprises – 117.405 million rubles. In general, in seven of nine regions, the values of this indicator exceed the average Russian value (4.35): Chukotka Autonomous District - 20.8, Krasnoyarsk Territory - 16.5, Republic of Sakha (Yakutia) - 7.77, Nenets Autonomous District - 5.01, Murmansk Region - 5.3, Komi Republic - 6.27. Among the regions that can be considered lagging behind are the Republic of Karelia - 3.14 and the Arkhangelsk Region - 2.1. Also noteworthy is the indicator characterizing the share of break-even economic entities. It is interesting that only one of the nine Arctic regions, the Krasnoyarsk Territory, has a value of 0.701, exceeding the Russian average of 0.68.

## 4 Conclusion

The following conclusions were obtained in the framework of the study:

1. The analysis of works by domestic and foreign authors showed that many scientific studies are devoted to the topical issues of environmental and economic security of the Arctic regions, but the impact of financial potential on these categories has not been defined.

2. the study proved that the value of financial potential directly affects the capabilities of regional authorities to create conditions for ensuring environmental and economic security of subordinate territories.

3. The analysis of the indicators characterizing the financial and budgetary potential carried out in the work confirmed that most of the Arctic regions have significant financial capabilities to ensure the environmental and economic security of their territories.

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## References

1. M. Ulchenko, et al., Specific features of ensuring economic security of coastal Arctic regions, *IOP Conf. Series: Earth and Environmental Science*, **302(1)**, 012104 (2019)
2. E.A. Samylovskaya, et al., Digital Technologies in Arctic Oil and Gas Resources Extraction: Global Trends and Russian Experience, *Resources*, **11(3)**, 29, doi: 10.3390/resources11030029 (2022)
3. V.S. Litvinenko, The Role of Hydrocarbons in the Global Energy Agenda: The Focus on Liquefied Natural Gas., *Resources*, **9(5)**, 59. (2020)
4. N.V. Govorova, et al., Russian Arctic: problems of international cooperation, *Contemporary Europe-Sovremennaya Evropa*, **1**, pp. 156-159 (2018)
5. K. V. Matrokhina., V.Y. Trofimets, E.B. Mazakov, A.B. Makhovikov and M.M. Khaykin, Development

of methodology for scenario analysis of investment projects of enterprises of the mineral resource complex, *Journal of Mining Institute*, **259**, pp. 112-124. doi: 10.31897/PMI.2023.3 (2023)

6. I.A. Rodionova, et al., Ensuring environmental safety: public administration of the Arctic region, *Modern Problems of Science and Education*, **1(1)** (2015)
7. R.V. Badylevich, Assessment of the state financial support for the development of the Arctic zone of the Russian Federation, *Fundamental research*, **9**, pp.11-19 (2020)
8. P.S. Tsvetkov, et al., The Changing Role of CO<sub>2</sub> in the Transition to a Circular Economy: Review of Carbon Sequestration Projects, *Sustainability*, **11(20)**, 5834; doi: 10.3390/su11205834 (2019)
9. I.V. Nikulkina, Strategic approach to the formation and implementation of state financial policy in the Arctic zone of the Russian Federation: methodological aspect, *Economics and entrepreneurship*, **9(74)**, pp. 205-210 (2016)
10. Tabata Sh 2019 Financial flows between the federal budget and the Arctic regions of Russia, *Region: Economics and Sociology* **3(103)** 3-25
11. Decree of the President of the Russian Federation №296 dated 02.05.2014 "On land territories of the Arctic zone of the Russian Federation. Available online: <http://www.kremlin.ru/acts/bank/38377> (2014)
12. Decree of the President of the Russian Federation №287 dated 27.06.2017 "On amendments to the Decree of the President of the Russian Federation dated may 2, 2014 №296". Available online: <http://www.kremlin.ru/acts/bank/42021> (2014)
13. Decree of the President of the Russian Federation №220 dated 13.05.2019 "On amendments to the Decree of the President of the Russian Federation dated may 2, 2014 №296". Available online: <http://www.kremlin.ru/acts/bank/44231> (2014)
14. Federal state statistics service. Available online: <http://www.gks.ru> (2021)