STATISTICAL EVALUATION OF THE COVID-19 CRISIS IMPACT ON THE ECONOMY OF THE RUSSIAN ARCTIC

[a]TATIANA SKUFINA, [b]SERGEY BARANOV, [c]VERA SAMARINA

[a, b, c]Luzin Institute for Economic Studies – Subdivision of the Federal Research Center "Kola Science Center of the Russian Academy of Sciences" Fersmana str., 24A, Apatity, Russia, 184209

email: [a]skufina@gmail.com, [b]bars.vl@gmail.com, [c]samarina_vp@mail.ru

The paper incorporates findings of the research performed at the expense of the grant provided by the Russian Science Foundation No. 19-18-00025 (theoretical analysis of problems of the development of the Arctic) and the state assignment of the Federal Research Center "Kola Science Center of the Russian Academy of Sciences" No. AAAA-A18-118051590118-0 (statistical evaluation)

Abstract: The objective of the paper is to evaluate the impact of crisis caused by the COVID-19 pandemic on the economy of regions of the Russian Arctic as compared to the general Russian situation. Based on statistical analysis (calculation of ratios of basic (monthly) indicators for 2019 and 2020 to similar periods of previous years), the authors have considered trends of industrial production and retail trade turnover over time and explored the unemployment situation in regions of the Russian Arctic as compared to the general Russian situation. The hypothesis has been confirmed that regions of the Russian Arctic demonstrate greater stability of their economy to the crisis as compared to the general Russian situation. This is explained by low diversification of the said economy based on exploiting natural resources, poorly developed small business, and services sector.

Keywords: the Russian Arctic, economy, impact of the crisis, COVID-19, statistical evaluation.

1 Introduction

The relevance of elaborating the scientific topic dedicated to diagnosing the impact of the COVID-19 crisis has had on the economy of the Russian Arctic is associated with numerous factors. Let the most significant of them be described. First, social and economic space of the Russian Arctic is considered to be a highly troubled area due to aggravation of a number of issues in its environmental sphere, social and economic development, including migration outflow of the population, lower life expectancy as compared to the general Russian situation, unemployment, and so on (Baranov et al., 2020; Samarina et al., 2020; Korchak et al., 2019). Second, the Russian Arctic is a special management zone: for Russia, it is one of the primary sources of mineral resources and raw materials which are the backbone of exports in the national economy (Kudryashova et al., 2019; Leksin & Porfiryev, 2015; Samarina et al., 2019). Third, the economy of the Russian Arctic is mainly oriented to exploiting natural resources, which creates clear specific features of the economy. The latter is characterized by low diversification, poorly developed small business and services sector, which allows expecting a specific response to the crisis (Larchenko & Kolesnikov, 2018; Skufina & Mitroshina, 2020; Suopajärvi et al., 2017). Fourth, although the Russian Arctic features special importance and pronounced specific circumstances of its social and economic processes, so far, there have been very few studies of the response demonstrated by social and economic space of the Russian Arctic to the present-day deepest crisis caused by COVID-19.

The scientific novelty of this research is determined by finding out new facts about the development of regions of the Russian Arctic in fundamentally new conditions generated by the non-economic origin crisis. Its practical significance is associated with diagnosing the situation, which can be used in practice of managing the social and economic development of regions of the Russian Arctic.

2 Literature Review

Conventionally, studies of social and economic processes taking place in the Northern areas of Russia and the world have been one of the relevant and important domains of basic science. As demonstrated by numerous research works, including those of the authors, there is a controversy between the significance of efforts made within policies and management practices to resolve the issue of providing a high quality of life for the population of the Northern areas (including medical service, infrastructure development, equal access to goods and services), to tackle environmental problems, to ensure diversification of the economy, and their little effectiveness in relation to the extent of attention and efforts (Tolvanen et al., 2019; Skufina & Baranov, 2017; Samarina et al., 2020; Healy, 2017; Heleniak & Bogoyavlenskiy, 2014). Meanwhile, in many countries, issues of social and economic development in the Arctic become the subject of debate not only for scientists, but also for the broad public. As a rule, principal subjects of scientific debate which get broad coverage in the general public discussion as well are environmental issues, questions of life activity of indigenous peoples of the North, including consideration of their interests in exploiting natural resources of the Arctic. Still, the main one is especial vulnerability of social and economic space of the Arctic to external impacts (Suopajärvi et al., 2017; Heininen et al., 2019; Markkula et al., 2019; Baranov et al., 2020; Korchak et al., 2019; Tolvanen et al., 2019).

It is on the situation in the Russian Arctic that the scientific and public debate are particularly heated. This is associated with the fact that for Russia, the area of the Russian Arctic is a zone of strategic importance. Legal and statutory documents pertaining to development prospects of the Russian Arctic substantiate essential growth of the contribution its economy makes to the country's economic growth. So, according to the Strategy of development of the Arctic Zone of the Russian Federation and provision of national security for the period of up to 2035 (as approved by Decree of the President of the Russian Federation No. 645 of 26/10/2020), growth of the percentage of the Arctic in principal macro-economic indicators is planned. For example, the share of GRP produced in the Russian Arctic in the total GRP of subjects of the Russian Federation, in %, will go from 6,2% (basic value in the Strategy, 2018) up to 7,2% (in 2024), up to 8,4% (in 2030), and up to 9,65% (in 2035). Another example is increase of the share of capital investment made within the Russian Arctic, in the total capital investment of the Russian Federation, in %, from 9,3% (basic value in the Strategy, 2019), up to 11% (in 2024), up to 12% (in 2030), and up to 14% (in 2035).

This is why in legal and statutory documents pertaining to development of the Russian Arctic, in particular, in the current Strategy of the development of the Arctic Zone of the Russian Federation and provision of national security for the period of up to 2035, they outline hazards, challenges, and threats to achievement of the set goals. Numerous research works, including those of the authors, point to significant issues preventing from meeting the set objectives (Baranov et al., 2020; Korchak et al., 2019; Skufina & Baranov, 2017; Larchenko & Kolesnikov, 2018).

Obviously, development prospects of the AZRF are associated with two factors. First of all, they depend on how successfully the practice of management, legislation included, aimed at improving the level of social and economic development of the Arctic, will cope with the said objective issues. This question is a conventional subject in research of the situation in the Russian Arctic (Suopajärvi et al., 2017; Kudryashova et al., 2019; Leksin & Porfiryev, 2015; Samarina et al., 2020). Secondly, they depend on how seriously the crisis caused by COVID-19 will distort the current AZRF development forecasts and plans. The answer to this question is not known yet, which once again emphasizes the relevance and practical importance of studying the response of regions of the Russian Arctic to the crisis caused by restrictive measures due to the COVID-19 pandemic.

3 Research Methodological Framework

Considerable politicization of questions associated with development of the Russian Arctic and the unique nature of impact of the persisting crisis lead to controversial judgments and conclusions. This has determined specific features of this study – relying on official statistics data and the quantitative research methodology.

Let it be noted that in their previous research completed in August 2020 and dealing with diagnosing the impact of the COVID-19 crisis on the economy of regions of the Russian Arctic (Skufina & Baranov, 2021), the authors obtained calculation data demonstrating that the first three months of the crisis affected regions of the Russian Arctic in a less devastating way than on Russia's economy in general. It was substantiated that this fact is associated with specific circumstances of the economy of the Russian Arctic. Namely, it relies on mining natural resources, with its small business and other sectors worst hit by the crisis (trade, tourism, and services) poorly developed anyway; meanwhile, mining and smelting production – the basis of its economy – continued operation throughout the restrictive measures period. By the present moment, more data have already been accumulated, and it is now possible to check the suggested hypothesis about the resource-based nature of the economy of the Russian Arctic (relying on exploiting natural resources) determining its greater stability under the impact of the crisis caused by the first and second wave of COVID-19, as compared to the general Russian situation.

The objective of the research is to evaluate the impact of the COVID-19 crisis on the economy of regions of the Russian Arctic as compared to the general Russian situation.

For verifying the hypothesis about greater stability of the economy of the Russian Arctic to the impact of the crisis caused by COVID-19, the following tasks are going to be completed:

1. considering the trends of industrial production over time in regions of the Russian Arctic as compared to the general Russian situation;
2. considering the behavior of retail trade turnover in regions of the Russian Arctic as compared to the general Russian situation;
3. finding out the unemployment situation development in regions of the Russian Arctic as compared to the general Russian situation.

The data used are the monthly operational data on social and economic situation of Russia's regions provided by the Federal State Statistics Service of the Russian Federation (n.a.).

Regions of the Russian Arctic include Murmansk Region, Nenets Autonomous District, Yamal-Nenets Autonomous District, and Chukotka Autonomous District.

The indicators under analysis are: the index of industrial production, retail trade turnover, and the number of the officially registered unemployed.

The standard statistical analysis method is used which relies on building a system of basic indices and comparing the current level of an indicator to the basic one (Shorokhova et al., 2015, pp. 133-134). In statistics, this method is multi-purpose, easy to reproduce and verify, which renders continuation of this research possible in the future for finding out any steady trends. The limitation of using this method is associated with the short temporal series of observations, which does not allow identifying steady trends at present. However, as soon as the data are accumulated, this disadvantage of the method will be leveled out.

The technique is as follows: for eliminating seasonal variations, as well as for getting the opportunity of comparing with the "pre-Covid" 2019, the authors calculated (monthly) ratios of the 2019 and 2020 indicators to the similar time spans of previous years (in %) (see Tables 1, 2, 3).

4 Results and Discussion

The principal specific features of the impact the non-economic origin crisis has had on the economy are determined not only by its unpredictable nature having disrupted valid forecasts and plans of all economic agents, but also by the fact that the duration and intensity of its action on the economy depended on the pandemic lockdown duration and scale.

In Russia, the pandemic lockdown was introduced in all the country's regions simultaneously, at the end of March 2020. Particularities of restrictive measures varied depending on regions, but they were not essentially different throughout Russia (Zimovets et al., 2020). So, as compared to the general Russian situation, specific circumstances of the Arctic regions were only manifested in restrictions imposed for citizens on traveling between settlements in the greater part of residential settlements of the Arctic. Studies of social and economic differentiation of towns and districts of the Arctic allow suggesting this was a consequence of poor provision with medical personnel, institutions, and equipment, both in regions of the Arctic as a whole, and in individual residential settlements (Skufina & Baranov, 2017; Skufina & Mitroshina, 2020). Let it be noted that conventionally in the world research works, insufficient development of the social sphere in the Arctic, medicine included, is highlighted as the principal life quality issue for the population of the Arctic, which has to be resolved by joint efforts of the state and corporations operating in the Arctic (Suopajärvi et al., 2017; Korchak et al., 2019; The Antivirus, 2020; Economy of the Contemporary Arctic.., 2020).

There are grounds to expect the pandemic lockdown which was in during the first and second Coronavirus wave to be less pronounced during the third and probable later waves of COVID-19. Recommendations of the WHO about prolonged pandemic lockdown were issued when neither Russia nor the world had any vaccines. So, the task was to isolate people for preventing proliferation of the virus, which provided time for developing the vaccines. It is this circumstance that triggered the global crisis which, according to analysts, has proved to be the greatest shock for the world market, the energy one included, for the latest 70 years (The Perfect Storm, 2020). At present, both Russia and the entire world has elaborated other principal tactics – vaccination for creating immunity among people. From this standpoint, this study of the response demonstrated by the economy of regions of the Arctic is in fact the study of consequences of the most difficult for the economy stage of the COVID-19 crisis caused by the pandemic lockdown of the first and second waves.

Analysis of behavior of the industrial production indices gives evidence that consequences of the pandemic started to bear on Russia's economy as early as in April 2020 (see Table 1). So, in April 2020, the industrial production index was 93,4% as compared to that of April 2019, with further shrinkage observed next, and the unsteady growth showing up in July. For Murmansk Region, Yamal-Nenets and Chukotka Autonomous Districts, behavior of the indices in 2020 is similar to the general Russian trends on balance. However, a distinction can be seen, too: smaller cutback in production (it is tracked down according to most points of the dynamic series). The fact that production was scaled back less in these regions is explained by two reasons: poorly developed sector of small business, services, and trade were the worst hit ones during the pandemic (Skufina et al., 2019); mining and processing of natural resources were continued throughout the crisis, in spite of some contraction in production volumes (Skufina & Baranov, 2021). Nenets Autonomous District not only exhibits more significant shrinkage of the industrial production index as compared to the general Russian situation and other regions of the Russian Arctic, but it also shows no improvement trend in the indicators. Numerous studies of the economy of Nenets Autonomous District argue that it is mining of carbohydrates that is the basis of industrial production of this region (Economy of the Contemporary Arctic.., 2020, pp. 76-89). During the crisis, the industry to have shrunk most of all was exactly mining of

carbohydrates, which explains the more significant cutback in production in Nenets Autonomous District as compared to the situation in other regions of the Arctic and Russia in general.

Table 1 Industrial production indices in % of the respective period of the previous year, for Russia and for regions of the Russian Arctic

Time span	Russia	Murmansk Region	Yamal-Nenets Autonomous District	Nenets Autonomous District	Chukotka Autonomous District
January-2019	101.1	103.8	117.0	96.4	82.2
February-2019	104.1	101.3	121.0	101.6	89.3
March-2019	101.2	103.0	123.4	100.3	131.8
April-2019	104.6	104.4	137.8	97.2	110.8
May-2019	100.9	111.1	128.9	99.4	97.1
June-2019	103.3	103.2	124.8	98.2	105.5
July-2019	102.8	113.7	117.1	96.9	109.5
August-2019	102.9	107.4	112.8	84.2	111.4
September-2019	103.0	106.3	107.6	108.5	87.6
October-2019	102.6	103.2	106.3	93.5	98.6
November-2019	100.3	95.0	109.9	94.0	115.9
December-2019	102.1	97.9	112.5	96.0	98.8
January-2020	101.1	98.5	101.2	98.0	115.9
February-2020	103.3	102.5	103.1	101.0	120.6
March-2020	100.3	99.3	96.6	98.0	71.0
April-2020	93.4	90.5	97.5	101.0	111.4
May-2020	90.4	95.1	93.1	81.9	112.9
June-2020	90.6	98.4	90.1	79.3	93.0
July-2020	92	103.2	90.2	83.2	96.7
August-2020	92.8	102.6	98.0	98.6	99.9
September-2020	95.0	94.4	98.5	69.6	84.7
October-2020	94.1	94.6	102.5	90.3	99.9
November-2020	97.4	107.1	103.8	88.8	100.3

Source: Calculated by the authors according to the data of the Federal State Statistics Service of the Russian Federation (n.a.)

Although shrinking down to 76,8% in April, Russia's retail trade turnover headed off to grow so early as in May; anyway, it failed to achieve its 2019 values in November 2020 (see Table 2). For Murmansk Region, within the April-July time span, a smaller decrease of the said index is characteristic, and a slightly higher one – within the August-November 2020, as compared to the general Russian situation. For Yamal-Nenets and Nenets Autonomous Districts, a smaller shrinkage of the index than for Russia in general is characteristic. In particular, for Yamal-Nenets Autonomous District, the index of over 100% has been observed since September 2020. Chukotka Autonomous District has demonstrated the same (January and April 2020) and higher retail trade turnover (the remainder of 2020 under study) for the entire covered period of 2020, including the COVID-19 pandemic time span, as compared to the "pre-Covid" 2019.

Table 2 Retail trade turnover for Russia and for regions of the Russian Arctic, in % of the respective period of the previous year

Time span	Russia	Murmansk Region	Yamal-Nenets Autonomous District	Nenets Autonomous District	Chukotka Autonomous District
January-2019	102.2	99.3	100.8	103.1	104.3
February-2019	102.3	99.5	99.3	102.3	103.5
March-2019	102.4	99.6	100.0	100.5	101.8
April-2019	102.0	99.2	103.6	97.9	103.1
May-2019	101.9	101.4	105.2	95.0	101.1
June-2019	101.8	102.9	104.4	97.0	104.0
July-2019	101.0	99.3	104.3	99.8	100.1
August-2019	100.8	98.6	102.5	97.9	100.7
September-2019	100.7	100.6	102.1	99.3	102.6
October-2019	101.6	101.2	100.1	99.5	103.9
November-2019	102.3	99.7	100.3	101.0	100.7
December-2019	101.9	100.8	97.9	100.6	101.5
January-2020	102.7	99.2	101.6	101.7	100.4
February-2020	104.7	99.3	102.1	104.7	102.4
March-2020	105.7	100.9	100.1	101.5	101.2
April-2020	76.8	89.1	83.0	90.4	100.0
May-2020	80.8	91.9	88.2	92.1	100.2
June-2020	92.3	104.6	97.8	98.2	100.3
July-2020	97.4	97.9	99.4	100.5	101.4
August-2020	97.3	96.4	99.6	97.5	102.4
September-2020	97	93.4	101.9	94.3	102.8
October-2020	97.6	95.4	101.9	95.2	102.9
November-2020	96.9	92.9	101.6	92.5	100.2

Source: Calculated by the authors according to the data of the Federal State Statistics Service of the Russian Federation (n.a.)

For Russia, a surge in the number of the officially registered unemployed index was seen in April 2020, which also interrupted the 4-month trend (December-March 2020) of reduction of this indicator (see Table 3). Almost the same behavior, including 3-4-month "pre-Covid" period of decreasing number of the officially registered unemployed, is characteristic for regions of the Russian Arctic, too. Meanwhile, it is in the growth level of this indicator that the significant difference is observed – it is much lower for all regions of the Russian Arctic as compared to the general Russian figures.

Table 3 The number of the officially registered unemployed in Russia and in regions of the Russian Arctic, in % of the respective period of the previous year

Time span	Russia	Murmansk Region	Yamal-Nenets Autonomous District	Nenets Autonomous District	Chukotka Autonomous District
January-2019	94.2	100.0	90.5	83.3	100.0
February-2019	99.9	102.9	91.3	100.0	87.5
March-2019	104.4	105.8	95.7	100.0	100.0
April-2019	107.8	109.0	100.0	100.0	87.5
May-2019	106.3	108.1	100.0	100.0	100.0
June-2019	105.7	105.1	100.0	100.0	100.0
July-2019	105.3	105.4	100.0	80.0	100.0
August-2019	104.8	98.3	100.0	100.0	120.0
September-2019	102.5	96.6	100.0	75.0	120.0
October-2019	102.2	95.2	93.8	100.0	100.0
November-2019	100.5	98.5	106.3	75.0	100.0
December-2019	99.7	97.1	100.0	60.0	85.7
January-2020	95.4	94.2	94.7	60.0	85.7
February-2020	91.4	91.7	95.2	66.7	100.0
March-2020	88.8	89.0	95.5	57.1	87.5
April-2020	160.5	116.4	163.6	71.4	100.0
May-2020	276.2	159.7	263.2	116.7	100.0
June-2020	373.7	177.4	368.8	160.0	116.7
July-2020	455.4	194.9	478.6	200.0	116.7
August-2020	511.6	203.4	507.1	225.0	116.7
September-2020	553.9	210.5	480.0	300.0	116.7
October-2020	537.6	191.7	473.3	200.0	116.7
November-2020	471.5	165.6	394.1	200.0	116.7

Source: Calculated by the authors according to the data of the Federal State Statistics Service of the Russian Federation (n.a.)

In regions of the Arctic, greater stability of retail trade and lower unemployment growth rate are explained by the fact that resource-mining sector and industry of regions of the Russian Arctic continued functioning in the crisis period too, keeping the jobs, and maintaining the population's level of life (The Antivirus, 2020).

Thus, analysis of the statistical data over time gives convincing evidence about regions of the Russian Arctic demonstrating greater stability of their economy under the impact of the COVID-19 crisis, as compared to the general Russian situation (see Tables 1-3).

Bringing in the data of other studies of the Arctic allows stating that the said fact is associated with fundamental causes rooted in the resource-based nature of the economy of regions of the Russian Arctic. In particular, they are:

1. relative simplicity of the economy of the Arctic, which is the direct consequence of specializing on mining and primary processing (Larchenko & Kolesnikov, 2018; Leksin & Porfiryev, 2015);
2. higher incomes, therefore, higher purchasing capacity and larger savings of the population of the Arctic (Skufina & Baranov, 2017; Economy of the Contemporary Arctic, 2020, pp. 153-185),
3. poor development level of small and medium-scale businesses, including ones in the sectors especially hit by the consequences of restrictive measures (Skufina & Mitroshina, 2020; Skufina & Baranov, 2021).

The obtained results are in line with findings of studies identifying the consequences of crises for the economy of the Russian Arctic: they also note greater stability of the economy of the Russian Arctic to the impact of crises as compared to the general Russian situation (Pavlov & Selin, 2018).

5 Conclusion

Summing up, let it be emphasized once again that analysis of the statistical data over time gives convincing evidence about regions of the Russian Arctic demonstrating greater stability of their economy as compared to the general Russian situation while undergoing numerous challenges and changes triggered by the impact of the COVID-19 pandemic crisis. This is associated with the known properties of the economy of regions of the Russian Arctic relying on exploiting natural resources: relative simplicity of the economy of the Arctic, higher incomes and higher purchasing capacity of its population, and the poor development level of small and medium-scale entrepreneurship.

Thus, the hypothesis has been confirmed that the resource-based nature of the economy of the Russian Arctic determines its greater stability to the impact of the crisis brought about by the first and second waves of COVID-19, as compared to the general Russian situation.

However, this hypothesis might be fair for the 2020 stage only. Further continuation of the crisis could change both the demand for principal export products of the economy of the Arctic and the policy of social and economic development of this specific area of Russia. In this case, the resource-based nature of the economy of regions of the Russian Arctic will even become an undermining factor. So, uncertainty of the situation demands further studies of this problem range.

Let it be noted that the suggested technique of tracking down the development of the situation and the indicators used in evaluation have enabled the authors to provide a clear insight into the essence of economic processes in regions of the Russian Arctic as compared to the general Russian situation. This confirms the expedience of using this technique for further research: with data accumulation, there is an opportunity to discover more long-term trends, perhaps, regularities of the way economic processes unfold in the Arctic.

Literature:

1. Baranov, S. V., Skufina, T. P., Gushchina, I. A.: *The Impact of the Retirement Age Increase on the Economy and Attitudes of the Population of the Murmansk Oblast*. Economic and Social Changes: Facts, Trends, Forecast, 13(1), 2020. 160-173 pp. DOI: 10.15838/esc.2020.1.67.9
2. *Economy of the Contemporary Arctic: Success Relying on Efficient Interaction and Integral Risk Management:* a Multi-Authored Monograph. In V. A. Kryukov, T. P. Skufina, E. A. Korchak (Eds.). Apatity: KSC of the RAS, 2020. 245 p. DOI: 10.37614/978.5.91137.416.7
3. *Federal State Statistics Service of the Russian Federation*. Official website. n.a. Available from https://www.gks.ru/
4. Healy, A.: *Innovation in Circumpolar Regions: New Challenges for Smart Specialization.* The Northern Review, 45, 2017. 11-32 pp. DOI: 10.22584/nr45.2017.002
5. Heininen, L., Everett, K., Padrtova, B., Reissell, A.: *Arctic Policies and Strategies-Analysis, Synthesis, and Trends*. Austria, Laxenburg: IIASA, 2019. 263 p. DOI: 10.22022/AFI/11-2019.16175
6. Heleniak, T., Bogoyavlenskiy, D.: *Arctic Populations and Migration. Arctic Human Development Report. Regional Processes and Global Linkages*. Copenhagen: Nordic Council of Ministers, 2014. 53-104 pp. DOI: 10.6027/TN2014-567
7. Korchak, E. A., Serova, N. A., Emelyanova, E. E., Yakovchuk, A. A.: *Human Capital of the Arctic: Problems and Development Prospects.* IOP Conf. Series: Earth and Environmental Science, 302, 2019. 1-7 pp. DOI: 10.1088/1755-1315/302/1/012078
8. Kudryashova, E. V., Lipina, S. A., Zaikov, K. S., Bocharova, L. K.: *Arctic Zone of the Russian Federation: Development Problems and New Management Philosophy*. The Polar Journal, 9(2), Latin America and Antarctica, 2019. 445-458 pp. DOI: 10.1080/2154896X.2019.1685173
9. Larchenko, L. V., Kolesnikov, R. A.: *Regions of the Russian Arctic Zone: State and Problems at the Be-Ginning of the New Development Stage*. International Journal of Engineering and Technology, 7(3.14), 2018. 369-375 pp. DOI: 10.14419/ijet.v7i3.14.17028
10. Leksin, V. N., Porfiryev, B. N.: *Redevelopment of the Russian Arctic Region as a Subject of System Study and State Program and Target-Oriented Management: Issues of Methodology*. REconomy, 1(4), 2015. 515-524 pp. DOI: 10.15826/recon.2015.4.015
11. Markkula, I., Turunen, M., Rasmus, S.: *A Review of Climate Change Impacts on the Ecosystem Services in the Saami Homeland in Finland*. Science of The Total Environment, 692, 2019. 1070-1085 pp. DOI: 10.1016/j.scitotenv.2019.07.272
12. Pavlov, K., Selin, V.: *The Industry of Russia's Northern Regions after Anti-Russian Sanctions*. Social Sciences, 49(3), 2018. 57-68 pp. DOI: 10.31857/S013454860004
13. Samarina, V., Skufina, T., Skufin, P., Samarin, A.: *The Influence of the Theory of Cyclical Endogenous Activity of the Earth on the Prospects for Oil Production in the Arctic Zone of the Russian Federation*. In 34th International-Business-Information-Management-Association (IBIMA) Conference. Vision 2025: Education Excellence and Management of Innovation through Sustainabile Economic Competitive Advantage. Madrid, Spain, 13-14 November 2019. 2315-2322 pp. Available from https://ibima.org/accepted-paper/concerning-experience-and-prospects-of-alternative-energy-sources-use-for-the-development-of-remote-human-settlements-of-the-murmansk-region/
14. Samarina, V. P., Skufina, T. P., Kostyukhin, Yu. Yu., Savon, D. Yu.: *Relationship between Iron ore Deposits and Spread of Heavy Metals in Shallow Water Rivers: Natural and Man-Caused Factors*. CIS Iron and Steel Review, 19, 2020. 75-80 pp. DOI: 10.17580/cisisr.2020.01.15
15. Shorokhova, I. S., Kislyak, N. V., Mariev, O. S.: *Statistical Methods of Analysis: a Study Guide*. Yekaterinburg: Publishing House of Ural University, 2015. 300 p. Available from http://hdl.handle.net/10995/36122
16. Skufina, T., Baranov, S.: *The Impact of the Covid-19 Crisis on the Economies of the Russian Arctic Regions*. IOP Conf. Series: Earth and Environmental Science, 678, 012045, 2021. DOI: 10.1088/1755-1315/678/1/012045
17. Skufina, T., Mitroshina, M.: *Statistical Evaluation of Social and Economic Differentiation in Urban Settlements and Areas of Russia's European North*. AD ALTA: Journal of Interdisciplinary Research, 1(10), Special Issue 11, 2020. 18-21 pp. Available from http://www.magnanimitas.cz/ADALTA/100111/papers/A_04.pdf
18. Skufina, T. P., Baranov, S. V.: *The Phenomenon of Unevenness of Socio-Economic Development of Cities and Districts in the Murmansk Oblast: Specifics, Trends, Forecast, Regulation*. Economic and Social Changes: Facts, Trends, Forecast, 10(5), 2017. 66-82 pp. DOI: 10.15838/esc.2017.5.53.5
19. Skufina, T. P., Bazhutova, E. A., Samarina, V. P.: *Entrepreneurial Activity in the Russian Arctic Terri-Tories Compared to the all-Russian Situation*. Arctic and North, 37, 2019. 51-68 pp. DOI: 10.17238/issn2221-2698.2019.37.51
20. Suopajärvi, L., Ejdemo, T., Klyuchnikova, E., Korchak, E., Nygaard, V., Poelzer, G. A.: *Social Impacts of the "Glocal" Mining Business: Case Studies from Northern Europe.* Mineral Economics, 30(1), 2017. 31-39 pp. DOI: 10.1007/s13563-016-0092-5
21. *The Antivirus. Fulfillment of Corporate Program to Counter COVID-19*. Siberian Oil (Sibirskaya Neft) corporate magazine, 177, 2020. 46-49 pp. Available from https://www.gazprom-neft.ru/press-center/sibneft-online/archive/2020-december/51 65120/
22. *The Perfect Storm. How the World Oil and Gas Market Fought Numerous Issues of 2020.* Siberian Oil (Sibirskaya Neft) corporate magazine, 177, 2020. 24-29 pp. Available from https://www.gazprom-neft.ru/press-center/sibneft-online/archive/2020-december/5165115/
23. Tolvanen, A., Eilu, P., Juutinen, A., Kangas, K., Kivinen, M., Markovaara-Koivisto, M., Naskali, A., Simila, J.: *Mining in the Arctic Environment – A Review from Ecological, Socioeconomic and Legal Per-spectives.* Journal of Environmental Management, 233, 2019. 832-844 pp. DOI: 10.1016/j.jenvman.2018.11.124

24. Zimovets, A. V., Sorokina, Yu. V., Khanina, A. V.: *Analysis of the COVID-19 Pandemic Impact on the Development of Enterprises in the Russian Federation*. Journal of Economics, Entrepreneurship, and Law, 10(5), 2020. 1337-1350 pp. DOI: 10.18334/epp.10.5.110126

Primary Paper Section: A

Secondary Paper Section: AH, AO