

Assessing the Regional Housing Market Development in the Northern and Arctic Regions of the Russian Federation*



Elena E.

EMELYANOVA

Luzin Institute for Economic Studies of the Kola Science Centre of the Russian Academy of Sciences

Apatity, Murmansk Oblast, Russian Federation, 24A, Fersman Street, 184209

E-mail: emelya@iep.kolasc.net.ru

ORCID: 0000-0003-4737-8265; ResearcherID: K-9654-2018



Anastasiya N.

CHAPARGINA

Luzin Institute for Economic Studies of the Kola Science Centre of the Russian Academy of Sciences

Apatity, Murmansk Oblast, Russian Federation, 24A, Fersman Street, 184209

E-mail: achapargina@yandex.ru

ORCID: 0000-0002-4399-4063; ResearcherID: I-9170-2018

Abstract. The purpose of the study is a comprehensive assessment of housing market development based on a new system of indicators reflecting the population's solvency and demand in the housing market, the economic development of the housing market, in order to identify trends in the housing market over a long period and reveal key problems hindering the housing market development in the Northern and Arctic regions of Russia. In this paper we propose a methodology to assess the regional housing markets, analyze the indicators of economic development in the North and the Arctic, estimate people's financial capacity and demand in the housing market, indicate major changes in the regions' housing sector that can occur on the background of the measures applied by the state due to the coronavirus pandemic.

* The work is performed within the state assignments of FRS KSCRAS no. 0226-2020-0005_IEP "Integrated interdisciplinary study and mathematical modeling of socio-economic transformation and management of regions and municipalities of the North-Arctic territories of the Russian Federation" and no. 0226-2020-0002_IEP "Scientific bases of formation and realization of financial and investment potential of the regions of the North and the Arctic".

For citation: Emelyanova E.E., Chapargina A.N. Assessing the regional housing market development in the Northern and Arctic regions of the Russian Federation. *Economic and Social Changes: Facts, Trends, Forecast*, 2020, vol. 13, no. 5, p. 105–120. DOI: 10.15838/esc.2020.5.71.6

The scientific novelty of the work is determined by a comprehensive study of regional housing markets in the Northern and Arctic regions using the indices proposed by the authors, which made it possible to formulate a number of proposals for developing the housing market in the Arctic and Northern regions of the Russian Federation. The study results can be used by the government and administrative authorities in developing policies in the field of providing the population with comfortable housing and improving the regions' housing stock, in working out the programs aimed at housing construction, as well as by specialists in the field of finance, researchers. In the future, based on a comparative analysis of the regions' housing development, the authors plan to predict the regional housing markets development taking into account the changing parameters of population solvency and construction industry, considering the specifics of the Federation subject's development and the effectiveness of government measures in this sector of the economy during the crisis period of the pandemic.

Key words: housing market, housing conditions, regions of the North and the Arctic, population solvency, regions ranking.

Introduction

The Russian construction industry is a complex related sector of the economy that determines the development of the industrial and social spheres of the country and its regions. Construction industry development largely depends on the development of the residential real estate market and the population's effective demand for it. Currently, the development of the housing market and consideration of its peculiarities in different regions are becoming more and more relevant. At the government level, the problem of providing the population with affordable quality housing in the country is at the forefront.

The purpose of our research is a comprehensive assessment of the regional housing market with indices based on a new system of indicators, which reflect the population's solvency and demand in the housing market and the economic development of the housing market, to reveal trends in the development of the housing market over a long period and identify key problems hindering its development in the Northern and Arctic regions of Russia.

To achieve this goal, we need to solve the following tasks:

1. Develop a comprehensive methodology for assessing the housing market development,

select indicators for calculating the index of population solvency and the index of economic development in the housing market.

2. Rank the Northern and Arctic regions of the Russian Federation according to the final housing market development index and carry out their clustering, i.e. identify homogeneous groups of subjects with high, medium, and minimum index values.

3. Analyze the dynamics of the final housing market development index, calculated separately for each studied subject, for each year of the analyzed time period (2005–2018), focusing on the current state of housing development.

The scientific novelty consists in the development of the author's methodological tools for assessing the development of regional housing markets; identifying trends in the development of the housing market in the Northern and Arctic regions of the Russian Federation for the period of 2005–2018; and identifying key problems hindering its development.

Housing market development in the regions is not only related to housing prices, monetary policy, and financial stability in the country [1] but also largely depends on regional economic

conditions and has a pronounced local nature [2, p. 41–51]. For example, environmental events that have occurred in a region may devalue the nearby property units due to the actual pollution caused by imposing a “quasi-stigma” (negative perception) on these houses. The effect of stigmatization can be quite persistent, and it will be difficult to reverse it later in order to attract buyers to the regional real estate market [3]. In this regard, for example, China actively promotes the transition to environmentally friendly housing construction [4].

Studying the impact of heterogeneity of home buyers on prices, scientists concluded that non-local residents pay more than the local ones. So-called “anchoring effect” is manifested in case of people coming from places with higher housing prices [5]. At the same time, housing prices, mortgage interest rates, and insurance rates are mutually independent and equal to the prices in isolated markets, which is proved by researchers when analyzing agents with conflicting interests by mathematical describing a complex (three-agent) system of interactions – the housing market, mortgage market, and insurance market [6].

In addition, the housing market is related to the development of transport, engineering and social infrastructure in the regional context [7]. City authorities more often use the concept of “smart city” for direct interaction with community and infrastructure to see what happens in a city and how it develops. S. Maalsen first introduced the concept of “smart housing” with modern technologies to achieve environmental, economic and sociocultural sustainability, which is a new type of housing market, which is formed due to the growth of cities’ “smartness” [8, p. 1–7]. Research by K. Butryn et al. is devoted to the assessment of the current trends in the housing market development that affect the

socio-economic development of cities [9]. The works of M. Tomal [10] reflect modern trends in the development of real estate market, including innovative models and types of housing construction such as the concept of “smart housing” and “smart city” based on such indicators as demand, income level, unemployment, etc.

In Russia, despite the appearance of so-called “smart homes” in some cities of the country, where smart devices and technologies are used for the functioning of things inside the house [11; 12], the traditional housing market still prevails.

Regions and municipalities of the North and the Arctic of the Russian Federation, characterized by the specifics of functioning, social and economic development [13], determine the features of their housing market development. The specifics of the housing market development in the Northern region are studied by O.S. Favstritskaya, E.I. Gavrilova, and E.A. Shirokova [14; 15; 16]. Raising the issue of northern location and its impact on all spheres of life, including housing, they say that it is necessary to take into account the adverse impact of northern conditions when making management decisions regarding the standards of living, providing the population with comfortable housing, and use proactive, rather than catch-up measures in solving the housing issue in the North.

At the same time, real estate prices formed by general demand, which reflects the population solvency, and supply, which characterizes economic activity, are an important indicator of the population’s income and prospects for the cities and regions development [17].

In addition, the analysis of the problems of housing market development and providing comfortable housing conditions to the population can be carried out through the prism of various factors that directly characterize

the life and activity of a person [18], for example, from the position of influence on demographic indicators in the region [19–23]. The researchers [24] proved that high rates on mortgage and housing loans in conditions of limited rental markets create prerequisites under which housing conditions limit the formation of independent households and, accordingly, restrain the birth rate.

A number of scientists associate the trends and prospects of housing market development with the quality of life, population migration and human potential [25; 26; 27]. It is believed that the problems of housing market development are reflected in the labor market, hindering the mobility of households [28]. Based on practical research, the relationship between housing and population indicators is proved [29]. In addition, poor housing conditions can affect the health of the population [30; 31], increasing the likelihood of mental disorders due to unsatisfactory living conditions [32; 33; 34].

Housing problems solution is usually complicated by the lack of available funds among the population in the regions, as well as differences in the level of socio-economic development of the constituent entities of the Russian Federation [35].

In contrast to Russia, in foreign Nordic countries (especially in the Scandinavian ones), social housing funds are used to solve housing problems; that is providing housing to needy citizens on preferential terms, and the rental market active developing [36]. The policy of housing sector socialization in Scandinavia is designed to provide the population with comfortable living conditions, regardless of social status, without allowing society stratification [37].

A problem analysis of the literature and other sources on the stated topic showed that one part of the research is devoted directly to the analysis of the housing market and its

relations with the external environment, and the second – to the analysis of the population's housing conditions and their impact on health, including in individual regions. At the same time, it is practically impossible to find a comprehensive analysis of the features and trends in the development of regional housing markets, which would take into account the behavior and solvency of the population living in this territory.

Research methods. Rationale for indicators selection

Our research analyzes the traditional housing market, which is understood as a set of participants (buyers, sellers, government regulators, etc.) and transactions (purchase, sale, lease, etc.) made with a specific product – real estate. The leaseholders market is not considered.

The housing market of the Russian Federation and its regions is usually studied using statistical data in the following areas: analysis of the state of the market and its development, dynamics of real estate prices, assessment of housing conditions, mortgage housing market, etc. Currently, there are no generally recognized universal methods for assessing the regional housing market that would provide a comprehensive description of its development from the perspective of the population's solvency and economic factors in the region's real estate market. Most of the developed methods (see, for example, [38]) include a significant number of indicators and parameters for evaluation, which complicates the possibility of their application in practice, and the indicators used for evaluation do not allow fully and qualitatively assessing the state of the regional housing market in the aggregate in two specified areas.

In this regard, we have developed and applied a scoring method (*Fig. 1*) based on the analysis of parameters that depend on the income of the population and characterize

its solvency, and economic indicators of the development of the housing market in the regions.

To assess the indicators of housing market development, we used a scale from 0 to 1, where 1 is the maximum value; 0.5 is the average; 0 is the minimum. We also applied intermediate values of 0.25 and 0.75, which were assigned if the value of the indicator was significantly higher (or lower) than the average value, which made it possible to reflect their level in more detail. The indicators comparison was carried out by scaling relative to the average values for the Russian Federation, after which each indicator was assigned an index in the specified

numerical intervals (i_{ϑ} and i_{Π}). We should take into account that the indicators of the housing market development can be both “positive” (e.g., investment level) and “negative” (for example, the proportion of emergency housing); according to this, the indices were assigned (Tab. 1).

For a comprehensive analysis of the regional housing market in Northern and Arctic regions of the Russian Federation we have selected a number of indicators in two areas: economic, characterizing the activity of housing construction development, a number and quality of offers on the real estate market and indicators defined by the level of solvency of

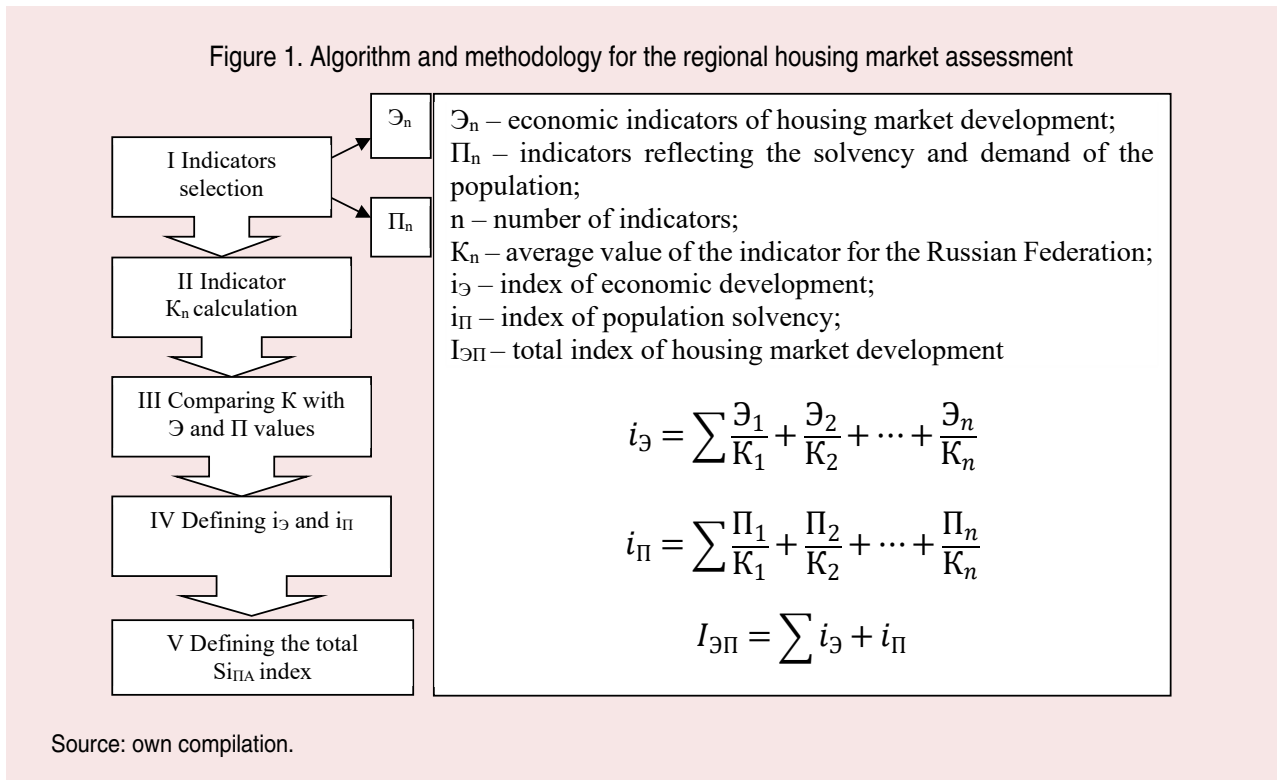


Table 1. Numerical intervals and indices of indicators assignment

Index	“Positive” indicators	“Negative” indicators
1	$i_{\vartheta}; i_{\Pi} \geq 1.6$	$i_{\vartheta}; i_{\Pi} < 0.4$
0.75	$1.2 \leq i_{\vartheta}; i_{\Pi} < 1.6$	$0.4 \leq i_{\vartheta}; i_{\Pi} < 0.8$
0.5	$0.8 \leq i_{\vartheta}; i_{\Pi} < 1.2$	$0.8 \leq i_{\vartheta}; i_{\Pi} < 1.2$
0.25	$0.4 \leq i_{\vartheta}; i_{\Pi} < 0.8$	$1.2 \leq i_{\vartheta}; i_{\Pi} < 1.6$
0	$i_{\vartheta}; i_{\Pi} < 0.4$	$i_{\vartheta}; i_{\Pi} \geq 1.6$

Source: own compilation.

Table 2. Indicators for assessing the housing market development

Economic indicators	Indicators of the population's solvency
Commissioning of housing, sq. m / person	Proportion of families registered as needing better housing conditions in a total number of families in the region, %
Share of dilapidated housing in a total area of the housing stock, %	Proportion of families having improved housing conditions in a total number of families registered as needing to improve housing conditions, %
Investments in fixed capital by 'housing' fixed assets type (in actual prices), rub./person	Share of housing and utilities expenses in household consumer spending, %
Volume of public services per 1 person, rub.	Housing affordability index in the regions**
Share of comfortable housing in the total housing stock of the region, %*	Volume of housing and mortgage loans to individuals, rub./person
	Average annual level of the population's debt load on housing and mortgage loans***
<p>* Calculated on average in terms of housing stock equipment with water supply, sewerage, central heating, gas, bathrooms (showers), hot water, electric floor stoves.</p> <p>** The ratio of cost of 1 sq. m to the per capita income of the population. The lower the index, the greater the purchasing power of the population to housing purchase.</p> <p>*** The ratio of debt on housing and mortgage loans to the average per capita income of the population.</p> <p>Source: own compilation.</p>	

the population in the region and reflecting the population's demand for housing (*Tab. 2*).

The research area includes 24 constituent entities of the Russian Federation belonging to the Far North or equated to them, and 9 of them are also included in the Arctic zone of the Russian Federation. The time interval of the study was 14 years (from 2005 to 2018). Thus, the sample of indicators included 4032 values (12 indicators for 24 constituent entities of the Russian Federation over 14 years).

The methodological study of the regions is based on the study of open sources: state statistics and reporting data, data from the Central Bank of Russia, data from the Federal State Statistics Service, and databases developed by the authors¹. The information basis of the study was made up by the theoretical and practical research of foreign and domestic specialists, information sites of government agencies, and publications in the media.

¹ Emelyanova E.E., Chapargina A.N. Database "Housing Market in the Northern and Arctic Regions of Russia". Certificate of state registration no. 2019621181, dated July 4, 2019; Emelyanova E.E., Chapargina A.N. Database "Most Important Indicators Characterizing the State of Municipal Budgets, Living Standards and Income Levels of the Urban Districts of AZ RF by Main Social Areas". Certificate of state registration no. 2018621190, dated August 6, 2018.

Research results

The specifics of the Northern and Arctic regions' socio-economic development consisting in the elevated costs for the provision of production, works, services, non-diversified economy, low density of population and its migration loss, as well as the harsh climatic conditions, determine the peculiarities of the housing market development in the North and the Arctic (*Tab. 3*), namely:

- high cost of construction and housing improvements;
- increased level of expenses for housing and communal services in people's spending;
- relationship between the place of production (mining) and the level of prices,
- minimum share of the elite and suburban housing,
- housing demand is formed mainly by the local working population,
- reduced demand for property due to relocation from the North within the resettlement programs,
- high proportion of dilapidated housing, low rates of housing commissioning,
- lack of demand for housing in remote areas related to the closure of production facilities.

Table 3. Housing market development trends in the Northern and Arctic regions of the Russian Federation

Indicator		2005	2010	2014	2015	2016	2017	2018
Commissioning of residential buildings per 1000 people, sq. m	RF	304	409	576	583	547	540	515
	N&A*	213.2	294.6	417.6	435.9	391.3	375.0	330.4
Share of condemned buildings in a total area of a total housing stock, %	RF	0.4	0.6	0.7	0.5	0.6	0.7	0.7
	N&A	0.8	1.7	1.9	1.7	2.0	2.2	2.6
Total area of residential premises per inhabitant on average, sq. m	RF	20.8	22.6	23.7	24.4	24.9	25.2	25.8
	N&A	20.5	22.3	23.0	23.4	23.7	23.9	24.2
Proportion of families registered as needing housing in a total number of families, %	RF	6.5	5.5	4.9	4.7	4.6	4.4	4.3
	N&A	9.3	8.3	7.6	7.2	7.1	7.4	6.9
Proportion of families who received housing, including families registered as needing housing, %	RF	3.6	8.6	5.0	5.0	4.9	4.8	4.0
	N&A	7.9	10.2	8.0	7.4	7.4	7.6	6.0
Share of household expenditures on housing and utilities, % of total consumer spending	RF	8.3	9.2	8.9	9.5	10.1	9.7	9.6
	N&A	8.5	10.1	9.4	10.2	10.8	10.9	10.8
Cost of 1 sq. m of total area of apartments in primary and secondary housing markets, rub.	RF	23780	54071	54899	53906	53635	54616	57155
	N&A	18334	41038	56181	56196	55878	54477	56028

* N&A – average values of indicators for the Northern and Arctic regions of the Russian Federation.
Source: own calculation and compilation on the basis of Database “Housing Market of the Northern and Arctic Regions of Russia”, Certificate of state registration no. 2019621181, dated July 4, 2019.

Based on the previously proposed estimation method, we calculated total indices of housing market development for all the years included in the sample to determine the dynamics and trends of the housing market development in the regions of the North and the Arctic. The results show a definite downward trend in housing market development in most of the Northern and Arctic regions relative to the national average in the period of 2005–2018. We should draw attention to the fact that, by 2018, none of the studied territories has shown an increase in the total index above 7. While the stability of the downward trend since 2010 is typical for almost all regions. Only the Yamalo-Nenets and Khanty-Mansi autonomous districts did not change their positions in 2018 compared to 2010, while the total housing market development index slightly improved in the republics of Sakha, Karelia, and Komi. The maximum decrease in the total index during the studied period occurred in the Krasnoyarsk Krai (from 7.25 in 2005 to 5.75 in 2018; *Fig. 2*).

The identified move of the Arctic and Northern regions into groups with minimum and average value of the total index of housing market development, the lack of areas with a high index value, on the one hand, provide the preconditions for reducing differentiation in the levels of housing market development in the North and in the Arctic, but, on the other hand, they indicate the worsening situation in the housing sector of the studied subjects.

To explain the reasons for the regions' movement from groups with a higher total index of housing market development to the groups with a lower one, it is necessary to disaggregate this index into two: the population solvency index and the housing market economic development index (*Tab. 4*).

The performed calculations showed that, when assessing the population solvency index, the greatest change is produced by such indicators as “housing affordability index in the region”, “volume of housing and mortgage loans to individuals”, “average annual level

Figure 2. Ranking and clustering of the Northern and Arctic regions of the Russian Federation according to the total housing market development index in 2005, 2010, and 2018

2005	2010	2018
<p>High index (≥ 7) <i>Chukotka AO (7.50)</i> <i>Krasnoyarsk Krai (7.25)</i> <i>Zabaikalsk Krai (7.25)</i> <i>Nenets AO (7.0)</i></p>	<p>High index (≥ 7) <i>Krasnoyarsk Krai (7.25)</i> <i>Khabarovsk Krai (7.0)</i></p>	<p>High index (≥ 7)</p>
<p>Average index (5-7) <i>Khanty-Mansi AO (6.75)</i> <i>Magadan Oblast (6.75)</i> <i>Tyumen Oblast (6.75)</i> <i>Khabarovsk Krai (6.5)</i> <i>Republic of Sakha (6.5)</i> <i>Kamchatka Krai (6.5)</i> <i>Tomsk Oblast (6.25)</i> <i>Murmansk Oblast (6.0)</i> <i>Republic of Karelia (6.0)</i> <i>Amur Oblast (6.0)</i> <i>Perm Krai (5.75)</i> <i>Yamalo-Nenets AO (5.75)</i> <i>Primorsk Krai (5.75)</i> <i>Republic of Tyva (5.5)</i> <i>Irkutsk Oblast (5.5)</i> <i>Komi Republic (5.25)</i> <i>Sakhalin Oblast (5.25)</i></p>	<p>Average index (5-7) <i>Tyumen Oblast (6.75)</i> <i>Magadan Oblast (6.75)</i> <i>Nenets AO (6.5)</i> <i>Republic of Altai (6.25)</i> <i>Kamchatka Krai (6.25)</i> <i>Primorsk Krai (6.25)</i> <i>Chukotka AO (6.0)</i> <i>Murmansk Oblast (6.0)</i> <i>Zabaikalsk Krai (5.75)</i> <i>Perm Krai (5.75)</i> <i>Khanty-Mansi AO (5.75)</i> <i>Irkutsk Oblast (5.75)</i> <i>Tomsk Oblast (5.75)</i> <i>Republic of Sakha (5.75)</i> <i>Sakhalin Oblast (5.75)</i> <i>Amur Oblast (5.25)</i></p>	<p>Average index (5-7) <i>Tyumen Oblast (6.75)</i> <i>Republic of Sakha (6.0)</i> <i>Khanty-Mansi AO (5.75)</i> <i>Nenets AO (5.75)</i> <i>Perm Krai (5.25)</i> <i>Krasnoyarsk Krai (5.75)</i> <i>Magadan Oblast (5.75)</i> <i>Khabarovsk Krai (5.5)</i> <i>Irkutsk Oblast (5.25)</i> <i>Tomsk Oblast (5.25)</i> <i>Zabaikalsk Krai (5.25)</i> <i>Sakhalin Oblast (5.25)</i> <i>Republic of Altai (5.25)</i> <i>Chukotka AO (5.0)</i></p>
<p>Low index (≤ 5) <i>Republic of Altai (4.75)</i> <i>Republic of Buryatia (4.75)</i> <i>Arkhangelsk Oblast (4.5)</i></p>	<p>Low index (≤ 5) <i>Republic of Buryatia (5.0)</i> <i>Arkhangelsk Oblast (4.75)</i> <i>Yamalo-Nenets AO (4.5)</i> <i>Republic of Karelia (4.25)</i> <i>Komi Republic (4.25)</i> <i>Republic of Tyva (3.75)</i></p>	<p>Low index (≤ 5) <i>Kamchatka Krai (5.0)</i> <i>Primorsk Krai (5.0)</i> <i>Republic of Karelia (4.5)</i> <i>Amur Oblast (4.5)</i> <i>Komi Republic (4.5)</i> <i>Murmansk Oblast (4.5)</i> <i>Yamalo-Nenets AO (4.5)</i> <i>Arkhangelsk Oblast (4.0)</i> <i>Republic of Buryatia (3.75)</i> <i>Republic of Tyva (3.25)</i></p>

Source: own compilation.

of the population's debt load on housing and mortgage loans".

When assessing the index of economic development of the housing market, the most significant indicator was "investment in fixed assets by "housing" type of fixed assets". The points added for this index decreased in almost all regions, which was reflected to a greater extent in the total index. The scores for the indices of "total area of residential premises per inhabitant on average" and "improvement of the housing stock" remained almost unchanged in the dynamics for the regions.

The advancement of the republics of Sakha, Komi, and Karelia according to the

outcome index is associated with an increase of the economic development index of the housing market, namely, accrual of points in terms of "dwelling houses". In the Yamalo-Nenets and Khanty-Mansi autonomous okrugs, the housing market economic development index declined sharply due to changes in the indicators "commissioning of residential buildings", "investment in fixed assets by type of fixed assets "housing", and "the share of emergency housing stock in the total area of the entire housing stock", but, for the final index, this trend in these subjects was offset by a noticeable change in the population's solvency index.

Table 4. Dynamics of the housing market economic development index and the population solvency index

Region	Housing market economic development index			Population solvency index		
	2005	2010	2018	2005	2010	2018
Republic of Karelia	3	2	2.25	3	2.25	2.25
Komi Republic	1.75	1.25	1.5	3.5	3	3
Nenets AO	4.5	3.75	2.75	2.5	2.75	3
Arkhangelsk Oblast	1.75	1.75	1.75	2.75	3	2.25
Murmansk Oblast	2	2	1	4	4	3.5
Perm Krai	2.5	2.5	2.5	3.25	3.25	2.75
Khanty-Mansi AO	3.25	3.25	2.5	3.5	2.5	3.25
Yamalo-Nenets AO	2.75	1.75	1.5	3	2.75	3
Tyumen Oblast	3.5	3.5	4.25	3.25	3.25	2.5
Republic of Altai	2.5	2.75	3.25	2.25	3.5	2
Republic of Tyva	3	2.25	1.75	2.5	1.5	1.5
Krasnoyarsk Krai	3.25	3.5	2.5	4	3.75	3.25
Irkutsk Oblast	2.5	2.75	2.25	3	3	3
Tomsk Oblast	3	3	2.5	3.25	2.75	2.75
Republic of Buryatia	2.5	2.5	1.75	2.25	2.5	2
Republic of Sakha (Yakutia)	2.5	2.5	2.75	4.25	3.25	3.25
Zabaykalsky Krai	3	2.5	2	4.25	3.25	3.25
Kamchatka Krai	3	2.5	1.25	3.5	3.75	3.75
Primorsky Krai	3	3.25	2.25	2.75	3	2.75
Khabarovsk Krai	3.25	3.25	2	3.25	3.75	3.5
Amur Oblast	2.5	2.5	1.5	3.5	2.75	3
Magadan Oblast	2.5	2.5	1.25	4.25	4.25	4.5
Sakhalin Oblast	2	2.5	2.25	3.25	3.25	3
Chukotka AO	4.25	2.5	1.5	3.25	3.5	3.5

Source: own calculation.

For a detailed analysis of the current state of the housing sector and the specifics of the development of the housing market in the regions of the North and Arctic, the matrix regions were built (Fig. 3), where the population's solvency and demand reflected in the Y-axis, and economic parameters for the housing market development are on the X-axis. The aggregate housing market development index is characterized by the size of circles.

Square A shows a low level of the housing market development in all the specified areas and indicators;

Square B – high level of population's solvency in the region with low indicators of economic indicators of housing market development;

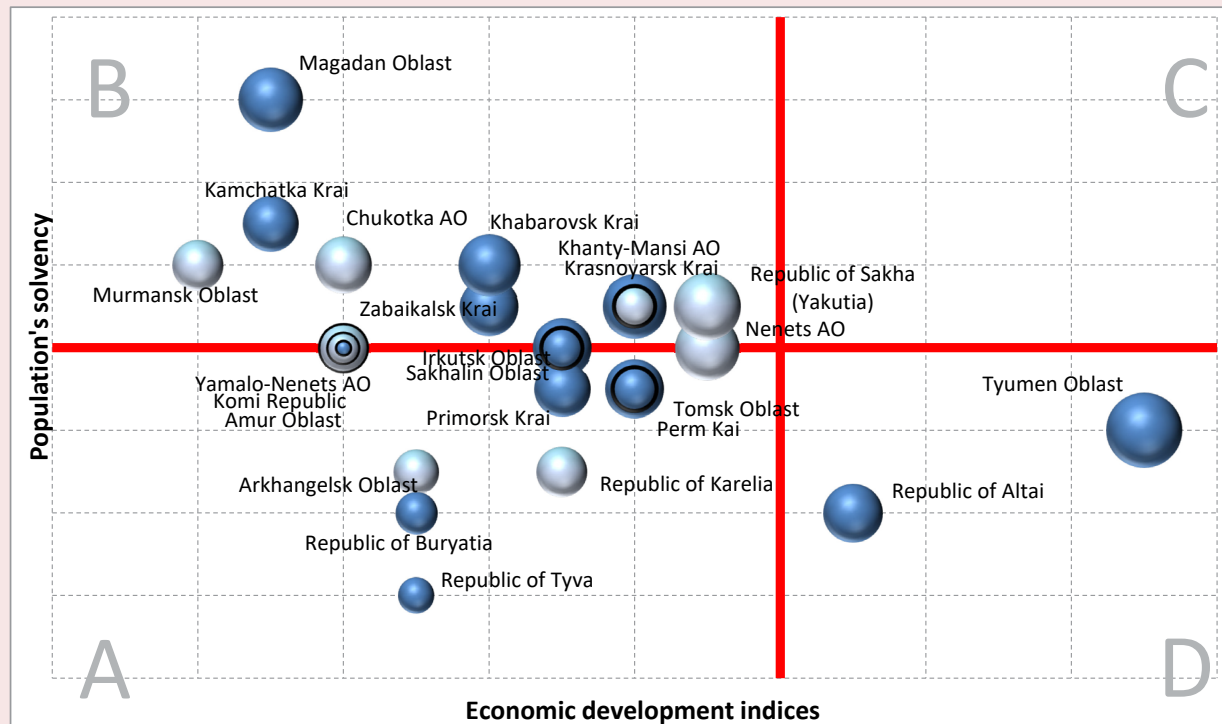
Square C – high level of housing market development in the region in the specified areas;

Square D – high level of development of economic indicators of the housing market with a low population's solvency level.

The information presented in the form of the Matrix for 2018 clearly shows that almost all regions (except the Republic of Altai and the Tyumen Oblast) lag behind the average Russian level in terms of economic indicators of housing market development. The outsider regions for this type of indicators include the Murmansk and Magadan oblasts and the Kamchatka Krai, where there is practically no housing development, and the investment level in the housing sector is one of the lowest among the Northern regions.

The leading regions, caught at square D, in the direction of economic development indicators (Tyumen Oblast and Republic of Altai), where housing construction is active (Tyumen Oblast takes the first place among the studied

Figure 3. Housing market assessment Matrix in the Northern and Arctic regions (2018)



The regions included in the Arctic zone of the Russian Federation are highlighted in a lighter tone.

Source: own calculation.

entities at the putting into housing operation), and the level of emergency and dilapidated housing is insignificant (in the Republic of Altai – the lowest specific weight of dilapidated housing), indicators of population's solvency are significantly behind the average numbers in the country and other regions of the North and Arctic. In this regard, their housing market is unbalanced in terms of purchasing power and population's solvency demand. The lag in the Republic of Altai is primarily due to the high proportion of families who are in need of housing (this is the anti-leader region after the Nenets Autonomous Okrug, where this indicator is 4 times higher than the national average), and the low level of per person income (19.503 rubles/person in 2018). According to the housing affordability index, the region also occupies one of the last positions among all regions of the North and Arctic.

Unlike the Republic of Altai, the Tyumen Oblast, with rather medium values (for the worse) from the national ones by the above indicators, takes one of the last places among the regions in the share of household expenditures for housing and utility services (12.1%), which is more than 25% higher than the average for the country. With a fairly low level of average per person income and a relatively high cost of housing in the region, there is a significant level of population's creditworthiness. The average annual level of the population's debt burden on housing and mortgage loans in the Tyumen Oblast (excluding AO) is about 4.4 which is 1.7 times worse than in the whole country. This is the worst result among the regions of the North and Arctic after the Khanty-Mansi Autonomous Okrug.

The most unbalanced housing market is represented by six North and Arctic regions in

square A. Despite the fact that the Perm Oblast, Primorsky Krai, and the Tomsk Oblast fall into this square, they occupy quite high positions in the aggregate housing market development index, associated with minor deviations for the worse from the average values in Russia in both assessment areas. The remaining four regions of square A (the Republic of Tyva, Buryatia, Karelia, and the Arkhangelsk Oblast) are clear outsiders in terms of housing market development (the lowest aggregate index and a significant lag in economic parameters of development and population's solvency).

The most numerous in terms of representation (15 regions) square B which includes the regions with medium indicators, signals a fairly good population's solvency and housing affordability. This is primarily due to the high population's incomes. This group includes seven Far East regions (the Republic of Sakha (Yakutia), Khabarovsk, Zabaikalsky and Kamchatka krajs, Amur and Magadan oblasts and the Chukotka Autonomous Okrug), where the federal program for subsidizing mortgage loans operates: thanks to it, the regions are characterized by a low debt burden on the population for paying housing and mortgage loans.

None of the Northern and Arctic regions was included in square C which serves as a reference point for the balanced housing market development in terms of the population's ability to pay and economic indicators at or above the national average. The housing markets in the Nenets Autonomous Okrug and the Republic of Sakha (Yakutia) are the closest to this indicator, where the population's solvency and housing quality are higher or at the average level, and economic parameters are slightly lower than the national average.

Discussion

The housing market is a kind of indicator of the social and economic situation in the country and region; it determines the level and prospects

of the territory's development. The housing market of the Northern and Arctic regions is characterized, on the one hand, by a fairly high degree of population's solvency due to the high income level in most subjects, on the other – by low rates of housing development and a high level of emergency housing due to increased depreciation of fixed assets in extreme climatic conditions of the Far North. In addition, in the Northern regions with a characteristic predominance of the extractive sector in the economy, there is a growing trend of shift work at large city-forming enterprises. Attracting employees from other regions and neighboring countries in order to save on the salary payroll causes an imbalance in the real estate market in favor of rental housing and refusal to purchase it as property, leads to the depopulation of the territories, especially small single-industry cities and peripheral settlements, and, accordingly, affects the indicators of housing construction activity [39].

Migration outflows from the regions of the North and Arctic affect both demand and supply in the housing market. On the one hand, a decrease in the population leads to a lack of demand for housing in localities in the Northern and Arctic regions; on the other hand, it increases its availability due to a decrease in demand for real estate. The largest population's outflow to other regions is observed in the Murmansk Oblast and Yamalo-Nenets Autonomous Okrug. In 2018, the coefficients of migration growth (loss) per 10,000 people there were -59 and -32, respectively; therefore, a number of departures is not compensated by arrivals².

The problem of attracting and securing human resources in the vast Northern territories (although only in the Far East) was partly solved by the state through the development and

² *Russia's Regions. Socio-Economic Indicators, 2019: Stat. Coll.* Rosstat. Moscow, 2019. P. 1204.

implementation of Federal programs (“Far Eastern Hectare”) and subsidizing part of mortgage rates for these regions. However, these measures do not cover the problems of other entities of the North and Arctic in addressing issues of human resource development. In addition, during the implementation of the national projects in housing sector in the Northern and Arctic regions of the Russian Federation, characterized by a significant amount of dilapidated housing stock, more than 20% of the funding will be directed not at solving the problem of housing construction (due to high cost) but at emergency demolition of dilapidated shelters. It is proposed to solve the issues of replacement of the emergency fund and its resettlement by resettling people to other regions of the country³ which will not contribute to the housing market development in the North and Arctic.

The housing market is sensitive to changes in macroeconomic indicators due to its close connection with such sectors of the economy as construction, investment, household income and effective demand [7]. Not having time to recover after the global financial crisis of 2014, the housing market in subsequent years will even more feel the negative trends in the economy caused by another decline in oil prices, complicated epidemiological situation of coronavirus and the government measures that have already led to the suspension of many branches of production and economic activity, services, small and medium businesses, increased unemployment and a significant loss of income and population’s solvency. In the forecast period, this is bound to affect (and is already affecting) the housing market.

³ The specifics of the Arctic regions can be taken into account when resettling emergency housing, *Official website of the Ministry of Construction, Housing, and Utilities of the Russian Federation*. Available at: <https://www.minstroyrf.ru/press/spetsifika-arkticheskikh-regionov-mozhet-byt-uchtena-pri-rasselenii-avariynogo-zhilya-/> (accessed: September 5, 2020).

The period of the crisis beginning in 2020 was characterized by a high demand for residential real estate due to the population’s attempts to save their savings. However, non-working days announced in April by the President of the Russian Federation have already led to a decline in real incomes of citizens due to mass layoffs and “vacations at their own expense” which caused a reduction in effective demand for housing. Now, after a surge in demand for real estate, sales are declining, people are not confident in the economic situation and their own income, they are not ready to take on long-term liabilities for the housing and mortgage loans which are common when buying real estate. We can also predict the growth of debt on previously issued housing loans. According to the Bank of Russia⁴, the household debt level of the population has a stable positive trend with an average annual growth of about 15%.

However, the impact and consequences of these processes can be fully assessed only in 2021–2023, and the housing market recovery can be expected no earlier than in 2022, given the increased volatility of the national currency and oil prices, the depreciation of household incomes and increasing unemployment.

To date, a package of measures has been adopted at the state level to support the housing market; for example: a program of subsidized mortgage lending for housing in new buildings with a rate of 6.5% (similar to the 2014–2016 program, but with a lower rate); housing purchase by the state company “DOM.RF” in projects where 30–80% of the total number of apartments is sold (in the future, it is planned to provide it to beneficiaries who are waiting in line for housing or sell it after the market demand has recovered). The construction industry was one of the first to get out of the

⁴ Debt on mortgage and housing loans. *Official website of the Bank of Russia*. Available at: <https://cbr.ru/statistics/pdko/Mortgage/ML/> (accessed: May 2, 2020).

long “non-working days”, and the companies themselves in the real estate market provoke demand by providing discounts, benefits for paying interest on mortgage loans for a certain period, etc.

The ongoing support measures are among the largest in the history of the housing sector. However, all the adopted legislative initiatives are primarily aimed at supporting the primary housing market, usually in the capital regions, and regional housing markets for the most part remain without support.

The significance of the research consists in the formation of scientific provisions for stimulating regional housing markets, and the development of methodological tools for their assessment which allows determining the level and trends of development in different regions. The results of the research can be used by government and administrative authorities in developing policies for providing the population with comfortable housing and improving the housing stock of regions, in creating programs aimed at housing construction, as well as by specialists in the field of finance and researchers. In the future, through a comparative analysis of the housing sector development in the regions, we are planning to present the forecast for the development of the regional housing markets based on changing parameters of the population’s solvency and the construction industry taking into account the specifics of the development of the federation and the effectiveness during the crisis period of the pandemic, government measures against this sector of the economy.

Conclusion

We started preparing the article at the very beginning of the height of the sanitary and epidemiological situation related to COVID-19, and, unfortunately, statistics regarding economic indicators and the population’s solvency do not allow assessing the current state of the real estate market and its impact on the

epidemiological factor of the economic crisis expansion which aggravated the next drop in oil prices.

At this stage of the research, we evaluated the regional housing market of the Northern and Arctic regions of the Russian Federation on the basis of a system of indices reflecting economic indicators of housing market development and population’s solvency in order to determine the dynamics and key problems that hinder the housing market development in the Northern and Arctic regions of the country in the pre-crisis period. According to the tasks set, a methodology for assessing the regional housing market has been developed based on data analysis and determining the most significant indicators for it, reflecting the level of its development in macro-regions. In assessing the state of the housing market dynamics of the selected regions with the subsequent ranking of the results revealed, on the one hand, the preconditions for the reduction of differentiation in levels of housing market development between the actors of the Northern and Arctic entities, and, on the other hand, worsening situation in the housing sector of the studied area in connection with a decrease in the final index housing market development in most of the Northern and Arctic regions. It was revealed that, by 2018, against the background of a steady decline in the aggregate index since 2010, none of the studied entities reached high indicators of housing market development relative to the national average.

The housing markets of the Republic of Sakha (Yakutia) and the Nenets Autonomous Okrug are the most balanced in two areas of research – the population’s solvency and economic development indicators – despite the fact that they “fall short” of the national average. The Khanty-Mansi Autonomous Okrug, the Krasnoyarsk Krai, the Perm Krai, and the Tomsk Oblast can be included into

the same group with slightly worse results. The Arkhangelsk Oblast (except the Nenets AO), the Republic of Tyva and Buryatia became clear outsiders in terms of market balance and the total development index.

Based on the research results, projecting the economic situation in the country, complicated by the epidemiological situation, to change the current situation and maintain the regional housing market in the Northern and Arctic regions of the country, it is necessary to develop the following main directions:

- creating favorable economic, social and labor conditions for attracting permanent residents to the regions of the North and the Arctic which implies a significant increase in the population's income level in comparison with the more southern regions of Russia, as it was during the years of industrial development of the North, as well as providing guarantees of benefits and compensation to employees of the Far North not only in the public sector. Only with the growth in a number of permanent residents in the Northern regions, it is worth talking about the prospects for the housing construction development and the real estate market;

- increasing the solvency and reducing the debt burden on the population by reducing interest rates on housing and mortgage loans.

In addition, in the context of the pandemic, it is necessary to provide state subsidies for the income of employees who are in a state of temporary downtime, and state support for organizations and enterprises in the most affected sectors of the economy (transport, culture, leisure and entertainment, tourism and hotel business, public catering, etc.). This will reduce or prevent a significant growth in overdue payments of housing loans;

- supporting regional housing markets and effectively distributing financial assistance from the state that stimulate the development and coverage of all the entities of the Russian Federation, it is necessary to implement special federal and regional housing programs (similar to the Far East), extended to all regions of the North and Arctic, and state subsidization of the interest rate on the purchase of real estate not only in new buildings, but also in the secondary housing market.

It is impossible to implement all three areas without an active participation of the state as a regulator of the real estate market, guarantor of stability, which increases income, compensation, and benefits for employees of the Far North, and the main developer of targeted development programs and plans for economic recovery in the post-pandemic period.

References

1. Pandey R., Jessica V.M. Determinants of Indian housing market: Effects and counter-effects. *Property Management*, 2019, vol. 38, no. 2, pp. 199–218. DOI: 10.1108/PM-06-2018-0038
2. Łaszek J., Olszewski K. Regional development of residential and commercial real estate in Poland and the risk of real estate cycles. *Barometr Regionalny*, 2018, no. 51, pp. 41–51.
3. Wenze Yu., Chaoran N., Chuanhao T., Haizhen W., Li F. Impacts of an urban environmental event on housing prices: Evidence from the Hangzhou pesticide plant incident. *Journal of Urban Planning and Development*, 2020, vol. 146, no. 2. DOI: 10.1061/(ASCE)UP.1943-5444.0000564
4. Jiang H., Payne S. Green housing transition in the Chinese housing market: A behavioural analysis of real estate enterprises. *Journal of Cleaner Production*, 2019, vol. 241. DOI: 10.1016/j.jclepro.2019.118381
5. Qiu L., Tu Y., Zhao D. Information asymmetry and anchoring in the housing market: A stochastic frontier approach. *Journal of Housing and the Built Environment*, 2019, vol. 35, pp. 573–591. DOI: 10.1007/s10901-019-09701-y
6. Geraskin M. Pricing analysis of interconnected markets of housing, mortgage lending and insurance. *Kybernetes*, 2020, vol. 1, no.2. DOI: 10.1108/K-12-2019-0849

7. Vanina T., Obolonkova A. State influence on the housing market. *Belgorodskii ekonomicheskii vestnik=Belgorod Economic Bulletin*, 2013, no. 3(71), pp. 29–35 (in Russian).
8. Maalsen S. Smart housing: The political and market responses of the intersections between housing, new sharing economies and smart cities. *Cities*, 2019, no. 84, pp. 1–7.
9. Butryn K., Jasin'ska E., Kovalyshyn O., Preweda E. Sustainable formation of urban development on the example of the primary real estate market in Krakow. *E3S Web of Conferences*, 2019, no. 86. DOI: 10.1051/e3sconf/20198600010
10. Tomal M. Moving towards a smarter housing market: The example of Poland. *Sustainability*, 2020, vol. 683, no. 12, pp. 2–25. DOI: 10.3390/su12020683
11. Imran J., Ahmad S., Kim D. Design and implementation of thermal comfort system based on tasks allocation mechanism in smart homes. *Sustainability*, 2019, vol. 11, DOI: 10.3390/su11205849
12. Gu W., Bao P., Hao W., Kim J. Empirical examination of intention to continue to use smart home services. *Sustainability*, 2019, vol. 11. DOI: 10.3390/su11195213
13. Emelyanova E.E., Chapargina A.N. Expenditure of municipalities budget and population incomes in the Russian Arctic. *EKO=ECO*, 2019, no. 7(541), pp. 80–98 (in Russian).
14. Favstritskaya O.S. Formation of the investment mechanism of the housing markets in the conditions of depressive northern economy (on the example of the Magadan region). *Upravlenie ekonomicheskimi sistemami=Management of Economic Systems*, 2016, no. 4, pp. 80–87 (in Russian).
15. Shirokova E.A. *Formirovanie regional'noi strategii obespecheniya zhil'em naseleniya severnoi territorii: monografiya* [Formation of a Regional Strategy for Providing Housing for the Population of the Northern Territory: Monograph]. Magadan: Izd-vo SVGU, 2013. 152 p.
16. Gavrilova E.I. Housing development management in the northern regions of Russia. *Rossiiskii ekonomicheskii internet-zhurnal=Russian Economic Journal*, 2009, no. 1, pp. 145–154 (in Russian).
17. Kolomak E.A., Kukushkin R.G. Estimating the impact of agglomeration on housing market. *Mir ekonomiki i upravleniya=World of Economics and Management*, 2019, vol. 19, no. 1, pp. 55–63 (in Russian).
18. Zainakova S.R. Housing market in Russia: current state, problems and forecasts. *Sotsial'no-ekonomicheskie nauki i gumanitarnye issledovaniya=Socio-Economic Sciences and Humanities research*, 2014, no. 1, pp. 58–62 (in Russian).
19. Asaul A. N. The status and prospects of investment and construction activities in the Russian Federation. *Ekonomicheskoe vozrozhdenie Rossii=The Economic Revival of Russia*, 2008, no. 2, pp. 3–9 (in Russian).
20. Sternik G.M., Sternik S.G., Apal'kov A.A. New methodology for assessing housing affordability for the population. *Urbanistika i rynek nedvizhimosti=Urban Studies and the Real Estate Market*, 2014, no. 2, pp. 31–49 (in Russian).
21. Buzyrev V.V., Vladimirov S.A., Buzyrev A.V. Accelerating the solution of housing problem in regions of the Russian federation on the basis of implementation of innovations in construction. *Zhilishchnoe stroitel'stvo=Zhilishchnoe Stroitel'stvo (Housing Construction)*, 2017, no. 10, pp. 6–10 (in Russian).
22. Kuznetsova I.G., Molyavko A.V. Securing young professionals in rural areas is as a priority area of regional personnel policy. *Ekonomika sel'skogo khozyaistva Rossii=Agricultural Economics of Russia*, 2020, no. 5, pp. 30–37 (in Russian).
23. Zeng S., Zhang X., Wang X. Population Aging, household savings and asset prices: A study based on urban commercial housing prices. *Sustainability*, 2019, vol. 11, no. 11. DOI: 10.3390/su11113194
24. Makszin K., Bohle D. Housing as a fertility trap: The inability of states, markets, or families to provide adequate housing in East Central Europe. *East European Politics and Societies: and Cultures*, 2020. DOI: 10.1177/0888325419897748
25. Kinder T. Social innovation in services: Technologically assisted new care models for people with dementia and their usability. *International Journal of Technology Management*, 2010, vol. 51, no.1, pp. 106–120. DOI: 10.1504/IJTM.2010.033131
26. Grishanov V.I., Nozdrina N.N., Schneiderman I.M. The role of housing in migration processes in Russia. *Narodonaselenie=Population*, 2017, no. 4 (78), pp. 91–104 (in Russian).
27. Korolkova D.I. The increase of housing accessibility as a factor of human potential development of the region. *Upravlenie gorodom: teoriya i praktika=City Governance: Theory and Practice*, 2018, no. 3 (30), pp. 65–70 (in Russian).

28. Brown J., Matsa D. Locked in by leverage: Job search during the housing crisis. *Journal of Financial Economics*, 2020, vol. 136, no. 3, pp. 623–648.
29. Mulder C.H. Population and housing: A two-sided relationship. *Demographic Research*, 2006, vol. 15, pp. 401–412. DOI: 10.4054/DemRes.2006.15.13
30. Pevalin D.J., Reeves A., Baker E., Bentley R. The impact of persistent poor housing conditions on mental health: A longitudinal population-based study. *Preventive Medicine*, 2017, vol. 105, pp. 304–310.
31. Braubach M., Ferrand A. Energy efficiency, housing, equity and health. *International Journal Of Public Health*, 2013, vol. 58, pp. 331–332. DOI: 10.1007/s00038-012-0441-2
32. Chung RY, Chung GK, Gordon D, et al. Housing affordability effects on physical and mental health: Household survey in a population with the world's greatest housing affordability stress. *Journal of epidemiology and community health*, 2020, vol. 74, pp. 164–172. DOI:10.1136/jech-2019-212286
33. Curl A., Kearn A., Mason P., Egan M., Tannahill C., Ellaway A. Physical and mental health outcomes following housing improvements: Evidence from the GoWell study. *Journal of Epidemiol. Community Health*, 2015, vol. 69, pp. 12–19. DOI: 10.1136/jech-2014-204064
34. Willand N., Ridley I., Maller, C. Towards explaining the health impacts of residential energy efficiency interventions – a realist review. Part 1: Pathways. *Social Science and Medicine*, 2015, vol. 61, pp. 191–201. DOI: 10.1016/j.socscimed.2015.02.005
35. Favstritskaya O.S. Features of housing market in the northern depressive regions of the Far East. *Ekonomika i upravlenie=Economics and Management*, 2014, no. 8 (106), pp. 55–61 (in Russian).
36. Torstensen K.N., Roszbach K. Housing markets in Scandinavia: Supply, demand and regulation. In: Nijskens R., Lohuis M., Hilbers P., Heeringa W. (eds) *Hot Property*. Springer, Cham, 2019. DOI: https://doi.org/10.1007/978-3-030-11674-3_11
37. Nordahl B.I. Convergences and discrepancies between the policy of inclusionary housing and Norway's liberal housing and planning policy: an institutional perspective. *J Hous and the Built Environ*, 2014, no. 29, pp. 489–506. DOI: <https://doi.org/10.1007/s10901-013-9357-2>
38. Bredikhin V.V., Volkova A.V. Methodological aspects of evaluating the efficiency of development of the regional housing market. *Region: sistemy, ekonomika, upravlenie=Region: Systems, Economics, Management*, 2019, no. 3(46), pp. 94–99 (in Russian).
39. Kolodina E.A. Study of the trends in local self-government development in contemporary Russia. *Izvestiya Baikal'skogo gosudarstvennogo universiteta=Bulletin of Baikal State University*, 2017, vol. 27, no. 2, pp. 162–170 (in Russian).

Information about the Authors

Elena E. Emelyanova – Candidate of Sciences (Economics), Senior Researcher, Kola Science Centre of the Russian Academy of Sciences, Luzin Institute for Economic Studies (24A, Fersman Street, Apatity, Murmansk Oblast, 184209, Russian Federation; e-mail: emelya@iep.kolasc.net.ru)

Anastasiya N. Chapargina – Candidate of Sciences (Economics), Senior Researcher, Kola Science Centre of the Russian Academy of Sciences, Luzin Institute for Economic Studies (24A, Fersman Street, Apatity, Murmansk Oblast, 184209, Russian Federation; e-mail: achapargina@yandex.ru)

Received June 5, 2020.