Housing Affordability as the Most Significant Socio-Economic Indicator

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Shaping the housing system in the Russian Federation based on market mechanisms of housing provision made the issue of determining overall trends in housing affordability urgent. The article offers new approaches to analyzing the population's ability to repay (service) the loan and the down payment for the Novosibirsk region of the Russian Federation. The obtained results of affordability indices calculations showed that mortgage lending had become an actual way to purchase housing, especially economy class one by a significant part of the population, even by those who do not have adequate earnings.

Keywords: housing affordability, mortgage arrears, mortgage

INTRODUCTION

Housing is known to be vital in the facilities system of social infrastructure. The need for it is considered a basic one along with the need for food and clothing. Analysis of the housing system as a holistic socio-economic system involves the consideration of three aspects housing: as a result of production activities, as an object of distribution and exchange, as a commodity. As a commodity, housing is a multifunctional good, i.e. good that can satisfy the needs of various levels. In this regard, the issue of its affordability becomes very urgent. Without going into the discussion regarding this term, we note that the affordability of housing in general terms means the opportunity to use it as a commodity, without taking into consideration the ways to obtain it. As an economic category, "housing affordability" tends to be the complex of relations between people to satisfy housing needs as a multifunctional socio-economic good based on existing types of housing property. It manifests itself differently in various types of housing systems and has a different quantification.

Shaping a market-type housing system the Russian Federation altered the meaning of the "housing affordability" concept that it used to have. Housing need turns into housing demand, and housing affordability can be determined primarily by the financial ability of the population to purchase it. Accordingly, it necessitated the establishment of particular market institutions. These institutions should provide such accessibility for citizens for whom the state cannot be obliged by law to provide housing for free under a social contract of employment (Articles 49–59 of the Civil Code of the Russian Federation). The state through the development of the legislative framework and other conditions should provide these citizens with access to the housing market so that they can purchase or build housing in the foreseeable future using their own or borrowed money.

THE ANALYSIS OF POPULATION HOUSING AFFORDABILITY IN RUSSIAN FEDERATION

We started such analysis in the mid-1990s taking the Novosibirsk Region as an example, we initially used the simplest method of comparing the average market price of housing (C) and the average market income of a family per a year **(I)** (Rudi, 1997). Thus the housing affordability index (I_a) recommended in the UN-HABITAT (United Nations Settlements Program) was calculated (GUO Human Settlements Statistics, n.d.). There are available statistics to calculate this indicator. The calculation enables one to obtain general information about housing markets and find out their weak points, but without showing the complex structure of housing markets and their current situation.

Subsequently, the range of methodological approaches was expanded (Rudi, &Tropnikova, 2006; Rudi, & Tropnikova; 2012; Rudi, & Tropnikova, 2014). This allowed us to identify the general trends in housing affordability in a more substantiated way and take them into account when conducting public housing policy. For example, the calculations of the housing affordability index of the Agency for Housing Mortgage Lending (AHML) for the Russian Federation and the Novosibirsk Region show a rather favorable picture presented in Figure 1.

FIGURE 1
THE DYNAMICS OF THR HOUSING AFFORDABILITY INDEX (PRICE AND INCOME RATIO) IN THE RUSSIAN FEDERATION AND THE NOVOSIBIRSK REGION IN 2005-20017
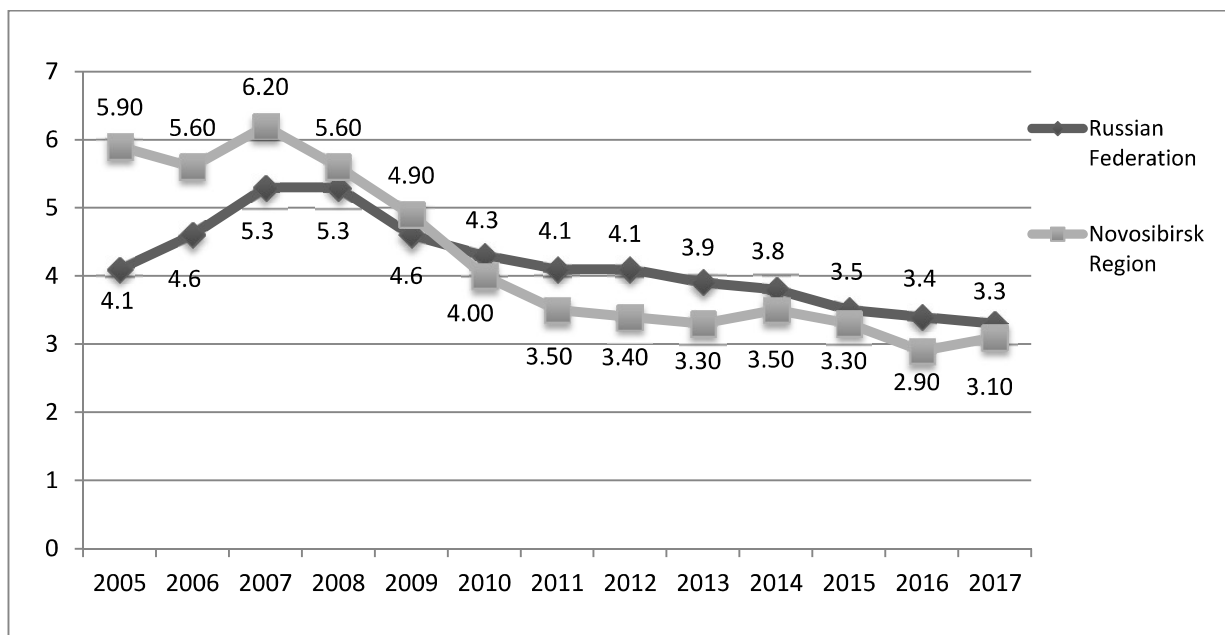
There had been a steady decrease in the housing affordability index in both the Russian Federation and the Novosibirsk Region since 2007 ("Pokazateli Dostupnosti Zhil'ya," 2018). It had reached almost normative value by 2018. The dynamics of the housing affordability index by type of apartment, presented in Figure 2 can be considered also as a favorable one. So, in the Novosibirsk Region, the affordability index had been decreasing for almost all types of apartments since 2007 and reached the following values in 2017: for 1-room apartments - 3.1 years; 2-room - 2.8 years; for 3-room apartments - 2.4 years ("Monitoring I Otsenka," 2018; "Monitoring Predlozhenia Kvartir," 2014; "Dinamika Sredney Stoimosri," 2019; Sredniye Tseny," 2019).

FIGURE 2
DYNAMICS OF HOUSING AFFORDABILITY INDEX BY TYPE OF APARTMENT IN THE NOVOSIBIRSK REGION
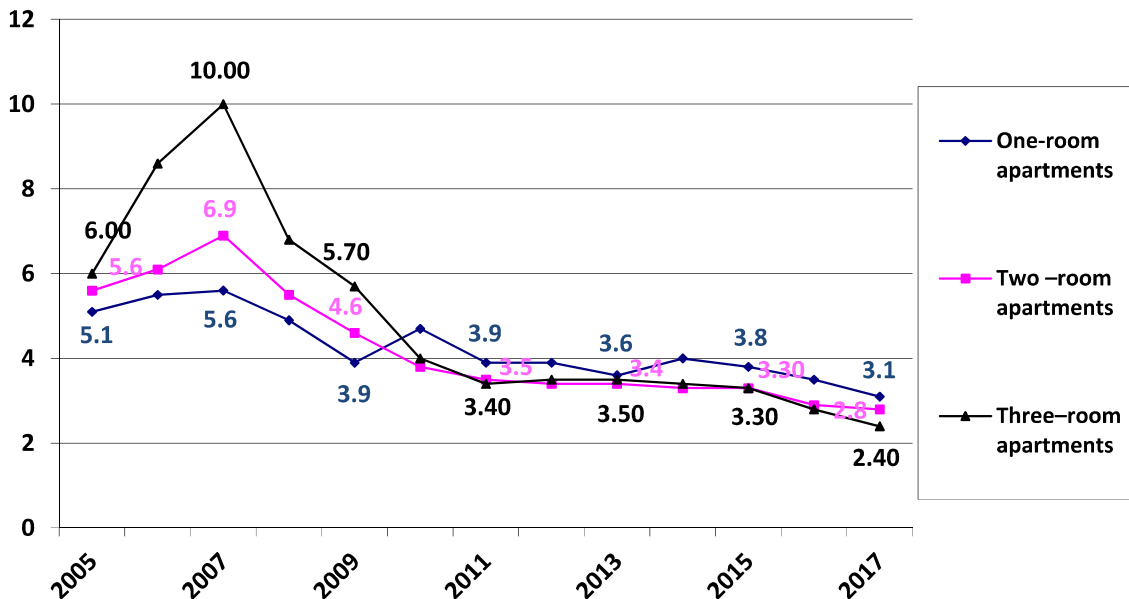
This is due to the fact that there had been an increase in the supply of apartments in the Novosibirsk Region until 2016. Specialists tend to think that providing maternity capital for the second childbirth within the framework of federal and regional programs to support young families and particular categories of the employed resulted in promoting mortgage loans. This, of course, increased the demand for small and economy class apartments and led to high rates of apartment sales in new buildings and high activity in the secondary housing market in 2011-2013. But did housing affordability increase over the analyzed period significantly? Housing affordability indices are known to be calculated in various ways depending on the purpose of the study.

CALCULATING THE OF POPULATION AFFORDABILITY INDEX OF LOAN MAINTENANCE

The extensive use of mortgage programs also necessitates changes in the methods for calculating the affordability index. The affordability index is determined by taking into *account the ability to repay (service) the loan over a specific period and the ability to pay the down payment*, concerning any commercial scheme for purchasing accommodation using mortgage products. Using the method of S.R. Khachatryan, E.Yu. Faerman, R.L. Fedorova, and A.N. Kirillova, we will make calculations for the Novosibirsk Region for the period from 2011 to 2018 (Khachatryan, Fayerman, Fedorova, & Kirillova, pp.112–135; Khachatryan, 2001, pp. 95-105).

The calculation algorithm for all commercial patterns implemented in the Novosibirsk Region includes a number of stages: The first stage is *calculating the population affordability index to repay (service) a loan.*

Firstly, we take the term of 7 years as the one for the family to save the sum of money being equal to the down payment for the purchased housing; the average area and average value of flat, the average price of 1 square meter as constants for all lending patterns.

Secondly, we take r - interest rate per annum; $D_{вн}$ - down payment, percentage of the flat value; T - loan term, years; K - loan amount (value of the flat with the down payment subtracted) as variables for all lending schemes.

Mortgage rates in the Novosibirsk Region in 2011 - 2013 ranged from 7.00-17.75% per annum for ruble loans and 5.98 - 15.00% per annum for foreign currency loans, down payment for mortgages, ranged 5-20%, mortgage loan term ranged 1-50 years.

We take the standard conditions of the AHML for Novosibirsk Region particularly: r = 11% per annum; $D_{вн}$ = 30% of the apartment price, T = 15 years for calculations.

"Dom.RF.Ipotechnyi agent" CJSC succeeded operations of AHML in 2018. The standard requirements for mortgage lending remained the same: the initial payment for an apartment equals 30% of the apartment price, the loan term is 15 years, but the interest rate equals 9.66% per annum. A down payment being available, an individual citizen needs a loan amount for the apartment purchase. Using the data of Table 1, we calculate its value.

TABLE 1
AVERAGE APARTMENT AREA, AVERAGE PRICE AND AVERAGE APARTMENT PRICE IN 2011-2018 IN THE NOVOSIBIRSK REGION (9; 10)

Apartment	Average area, sq.m.			Average price of 1 sq.m, thousand. rub.			Average apartment price, thousand. rub.		
	2011	2013	2018	2011	2013	2018	2011	2013	2018
1-room	31	33.4	33.7	53.2	64	63.66	1649.2	2137.6	2143.32
2-room	55	51.6	52.7	50.2	60.5	59,61	2761.0	3121.8	3141.44
3-room	67	76.2	74.3	50.5	60.2	58.29	3383.5	4587.24	4330.94

Taking into account the average apartment price, the amount of the loan to purchase a 1-room apartment in 2011 equaled to 1154.4 thousand rub.; a 2-room - 1932.7 thousand rub. 3-room - 2368.5 thousand rub.

We give an example of calculating the affordability index for 2011, and we will make similar calculations for 2013 and 2018.

We find the minimum income of the borrower necessary for obtaining a loan, having previously determined the amount of the monthly payment of the borrower for the loan according to the formula:

$$P(t)_{month} = \frac{K}{12 \cdot T}(1 + r\frac{T+1}{2}),$$ (1)

where $P(t)_{month}$- the amount of the monthly loan payment of the borrower, K- loan amount, T –loan term, r-interest rate.

So:
- for 1-room apartment

$$P(t)_{month} = \frac{1154440}{12 \cdot 15}(1 + 0,11\frac{15+1}{2}) = 12057.5 \text{ rub.};$$

- for 2-room apartment

$$P(t) \text{ month} = \frac{1932700}{12 \cdot 15}(1 + 0,11\frac{15+1}{2}) = 20186 \text{ rub.},$$

-for a 3-room apartment:

$$P(t)_{month} = \frac{2368450}{12 \cdot 15} (1 + 0.11 \frac{15 + 1}{2}) = 24737 \text{ rub.},$$

A monthly minimum income of the borrower is calculated by the formula:

$$V_{min} = \frac{P(t)_{month}}{0,3}, \tag{2}$$

where V_{min} – minimum income of the borrower.

For 1- room apartment - $V_{min} = \frac{12057,5}{0,3} = 40192 rub.$;

-for 2-room apartment - $V_{min} = \frac{20186}{0,3} = 67286,6 rub.$;

-for 3-room apartment $V_{min} = \frac{24737}{0,3} = 82456,6 rub.$.

We calculate the monthly minimum required income of the borrower ($V_{min\,KP}$) according to formula (3), taking into account the family coefficient ($K_{сем}$), which is 2.8 for the Novosibirsk region and the coefficient taking into account tax payment and payment of housing and utility services (K_p) equals to 1.126 (13):

$$V_{minKp} = \frac{V_{min} \cdot K_P}{K_{сем}}, \tag{3}$$

for a one-room apartment $V_{minKp} = \frac{40192*1.126}{2.8} = 16163 rub.$;

for a two-room apartment - $V_{minKp} = \frac{67286.6*1.126}{2.8} = 27058,8 rub.$;

for a three-room apartment - $V_{minKp} = \frac{82456.6*1.126}{2.8} = 33159.4 rub.$

An important point for calculating affordability indices is that the population of the Novosibirsk Region, like that of the Russian Federation as a whole, is significantly differentiated by income level, as evidenced by the consolidated data of table 2 ("Uroven' Zhizni Naseleniya," 2014; "Sotsialno-Ekonomicheskoye Polozheniye Novosibirskoy Oblasti," 2014).

TABLE 2
THE DISTRIBUTION OF THE NOVOSIBIRSK REGION POPULATION BY THE AMOUNT OF THE AVERAGE PER CAPITA CASH INCOME FOR THE 2011-2013 PERIOD

Number of income group		000` People	as a percentage of total
	Population at large	273.2	100
1	including monthly per capita cash income, rubles up to 3500.0 (v_0-v_1)	103.8	3.8
2	3500.1-5000.0 (v_1-v_2)	152.9	5.6
3	5000.1-7000.0 (v_2-v_3)	256.73	9.4
4	7000.1-10000.0 (v_3-v_4)	398.75	14.6
5	10000.1-15000 (v_4-v_5)	551.7	20.2
6	15000.1-25000.0 (v_5-v_6)	641.8	23.5
7	25000.1-35000.0 (v_6-v_7)	294.97	10.8
8	over 35000.0 (35000.1-70000.0) (v_7-v_8)	330.55	12.1

Basing on the data given in table 2, we determine which income group with the (v_0-v_1); interval corresponds to the minimum income required to obtain a loan. The first income group has the (v_0-v_1); interval, respectively; the last income group is closed by the (v_7-v_8) interval, the interval of the last income group is increased arbitrarily to 70.0 thousand rub. due to a significant part of the population included in this income group - 12.1%.

When calculating, we mark the income group number in the desired interval as n_{min}, so $v_{i-1} < V_{min\ KP} < V_i$. Consequently, the 6-1 income group (n_{min} = 6) can afford purchasing a 1-room apartment, the 7th (n_{min} = 7) can afford buying a 2-room apartment, and also the 7th income group (n_{min} = 7) can afford purchasing a 3-room apartment.

So the population affordability index for the Novosibirsk Region to repay (service) the loan (d_{KR}) can be calculated by the formula (11; 12):

$$d_{KP} = \left(\sum_{k=i+1}^{n} d_k + \frac{v_i - V_{minKP}}{v_i - v_{i-1}} \cdot d_i\right) \times 100\%, \tag{4}$$

where n is the number of income group; i- is the number of the income group with the (v_{i-1}; v_i) income interval, including the income $V_{min\ KP}$; k - numbers of income groups with income more than v_i; d_i - a percentage of the population in income group i; d_k is the percentage of the population in the income group k.

The accessibility index calculated this way shows how many percents of the population can afford servicing this loan pattern. It can be calculated not only in percent but also in shares. So, it can be calculated for a one-room apartment:

$$d_{KP} = \left(0.108 + 0.121 + \frac{25000 - 16163}{25000 - 15000.1} \cdot 0.235\right) \times 100\% = 43.66\%$$

for a two-room apartment:

$$d_{KP} = \left(0.121 + \frac{35000 - 27058.8}{35000 - 25000.1} \cdot 0.108\right) \times 100\% = 20.67\%$$

,

for a three-room apartment:

$$d_{KP} = (0.121 + \frac{35000 - 33159.4}{35000 - 25000.1} \cdot 0.108) \times 100\% = 14.1\%$$

We consolidated the calculated data for 2011 in Table 3 for convenience.

TABLE 3
LOAN REPAYMENT AFFORDABILITY INDEX (d_{KP}) IN THE NOVOSIBIRSK REGION IN 2011, %

Apartment	Monthly payment $P_{(t)}$, rub.	Minimum monthly payment (V_{min}), rub.	Minimum monthly payment ($V_{min\,KP}$), rub.	Number of income group, (n_{min})	Affordability index of loan repayment (d_{KP}), %
1-room	12057.5	40192	16163	6	43.6
2-room	20186	67287	27059	7	20.7
3-room	24737	82457	33160	7	14.1

CALCULATION OF THE AFFORDABILITY INDEX ACCUMULATE A DOWN PAYMENT

The next step is to determine the population affordability indicator to accumulate the down payment (d_{BH}).

It is calculated similarly to the (d_{KP}) index but without taking into account K_p. Since the apartment is not owned yet, housing and utility services and taxes are not paid for it.

Using the data of table.2 on the population distribution of the Novosibirsk Region by income groups, we identify the groups being able to accumulate a down payment of a new apartment within seven years.

The affordability index to accumulate the down payment d_{BH} was calculated as follows: the down payment for the purchased apartment(D_{BH}) equals D_{BH} = 1649200x 0.3= 494760 rubles for 1-room apartment; for 2-room apartment- D_{BH} = 2761000x 0.3 = 828300 rubles.; for 3-room flat- D_{BH} = 3383500x 0.3= 1015050 rubles, according to this pattern.

Therefore, taking into account the introduced period of accumulation (7 years), the family has to save monthly:

$$D_{min} = \frac{D_{BH}}{7 \times 12} \qquad (5)$$

So, for a one-room apartment this sum will make 5,890 rub.; for a two-room apartment– 9,860.70 rub.; for three-room apartment -12,083.93 rub. The monthly income of the borrower based on the 30% share of payments should be calculated by the formula:

$$V_{Dmin} = \frac{D_{min}}{0,3} \qquad (6)$$

So, the income enabling to purchase a one-room apartment should be not less than 19,633.3 rub; two-room apartment– 32,869 rub; three-room apartment-40,279.76 rub. The minimum monthly required income of the borrower should be calculated by the formula, taking into account the family ratio:

$$V_{\text{Dmin}} = \frac{D_{\text{min}}}{0,3} \tag{7}$$

For a one-room apartment, it comes to 7,011.9 rub., for a two-room apartment– 11,738.92 rub., for three-room flat-14,385.62 rub.. We calculate d_{BH} using the following formula:

$$d_{\text{BH}} = \sum_{k=i+1}^{n} d_k + \frac{v_i - V_{\text{minBH}}}{v_i - v_{i-1}} \cdot d_i \tag{8}$$

This implies that the affordability index to accumulate the down payment of one-room apartment should come to 81.14%; two-room apartment-59.57%; three-room apartment-48.88%.

This index shows the population percentage being able to accumulate a down payment within 7 years. To clarify this, the obtained calculations are summarized in table 4.

TABLE 4
THE CALCULATION OF THE AFFORDABILITY INDEX OF NOVOSIBIRSK REGION
POPULATION TO ACCUMULATE THE DOWNPAYMENT IN 2011

Purchased apartment	Required initial payment-(D_{BH}), rub.	Minimum monthly savings- D_{min}), rub.	Minimum monthly income (V-D_{min}), rub.	The minimum monthly income, including $K_{\text{сем}}$, per person (V_{minBH}), rub.	Down payment affordability index (d_{BH}), %
one-room	494760	5890	19633.3	7011.9	81.14
two-room	828300	9860.7	32869	11738.92	59.57
three-room	1015050	12083.93	40279.76	14385.62	48.88

Table 5 consolidates the calculations of affordability indices for various population groups of the Novosibirsk Region to repay (service) the loan and make a down payment in 2011-2018.

TABLE 5
DYNAMICS OF HOUSING AFFORDABILITY INDICES FOR VARIOUS GROUPS OF THE
POPULATION OF THE NOVOSIBIRSK REGION TO REPAY (SERVICE) A LOAN AND
MAKE A DOWNPAYMENT, %

| Year	2011			2013			2018		
Apartment	1-room	2-room	3-room	1-room	2-room	3-room	1- room	2- room	3- room
P(t), rub.	12057.5	20186	24737	15628	22824	33537	14776	21657	29857
V_{min}, rub.	40192	67287	82457	52094	76079	111793	19890.86	29030.69	40022.58
V_{minKP}, rub.	16163	27059	33160	20949	30595	44957	49253,3	72190.0	99523.3
n_{min}	6	7	7	6	7	8	5	6	6
d_{KP}, %	**43.6**	**20.7**	**14.1**	**32.4**	**16.9**	**9.1**	**62.2**	**62.2**	**28.5**
V_{minBH}, rub.	7011.9	11739	14386	9088.4	13273	19504	9112.6	13356.4	18413.8
n_{miBH}	4	5	5	4	5	6	3	3	4
d_{BH}, %	**81.1**	**59.6**	**48.9**	**71**	**53.4**	**35.8**	**95.6**	**63.7**	**60.4**

The proportion of the population able to accumulate a down payment for the purchase of various types of apartments (d_{BH}) and service a mortgage loan (d_{KR}) in 2018 is obvious to increase compared to

2011. Although in 2013 it even decreased despite being awarded a maternal capital. So, for the purchase of a 1-room apartment, the availability of down payment (d_{BH}) increased from 81.1% in 2011 to 95.8% in 2018. For 2-room apartments, the growth of the affordability index was 4.1% for the same period, for a 3-room apartment - 11.5%. To make the down payment could afford the population starting from the 4th income group in 2011-2013 with an average per capita cash income of 7000-10000 rubles. per month. And those starting from the 3d income group in 2018. But it should be noted that the income level for this group is even higher: 10,000-14,000 rub. per month. Obtaining a loan and its further servicing could be allowed in 2011-2013 by groups of the population starting from the 6th income group and having an official average per capita income of 15,000-25,000 rubles. per month. In 2018, this is the 5th revenue group, but the monthly income level for it is higher - 19000-27000 rubles. per month.

The availability index to service a loan for a one-room apartment increased from 43.6% in 2011 to 62.2% in 2018. In 2011, representatives of the 7th income group with a monthly average income of 25,000-35,000 rub could keep servicing a mortgage of a two-room apartment and the representatives of the 6th income group with a monthly average per capita income of 27,000-45,000 rub were able to manage it in 2018. The affordability index has grown significantly for them. Concerning three-room apartments, only representatives of 7-8 income groups with an average per capita cash income of 25,000-70000 rub were able to undergo mortgage burden in 2011-2013. But representatives the 6th income group were able to do it in 2018. Their affordability index rose from 4.1% in to 28.5% in 2011.

Thus, the housing affordability index for the population of the Novosibirsk Region calculated according to the method of S.R. Khachatryana, E.Yu. Faerman, R.L. Fedorova and A.N. Kirillova, taking into account the population's ability to repay (service) the loan and the population's ability to accumulate a down payment, differs from the indices calculated according to the UN "HABITAT" method. Mostly those who use maternity capital or receive grants can pay the down payment. However, not everyone has the opportunity to further repay the loan received. It is proved by the debt growth of the population of the Novosibirsk Region on mortgage housing loans (Fig. 3).

FIGURE 3
MORTGAGE DEBT DYNAMICS OF HOUSING LOANS OF THE NOVOSIBIRSK REGION POPULATION, BILLION RUB
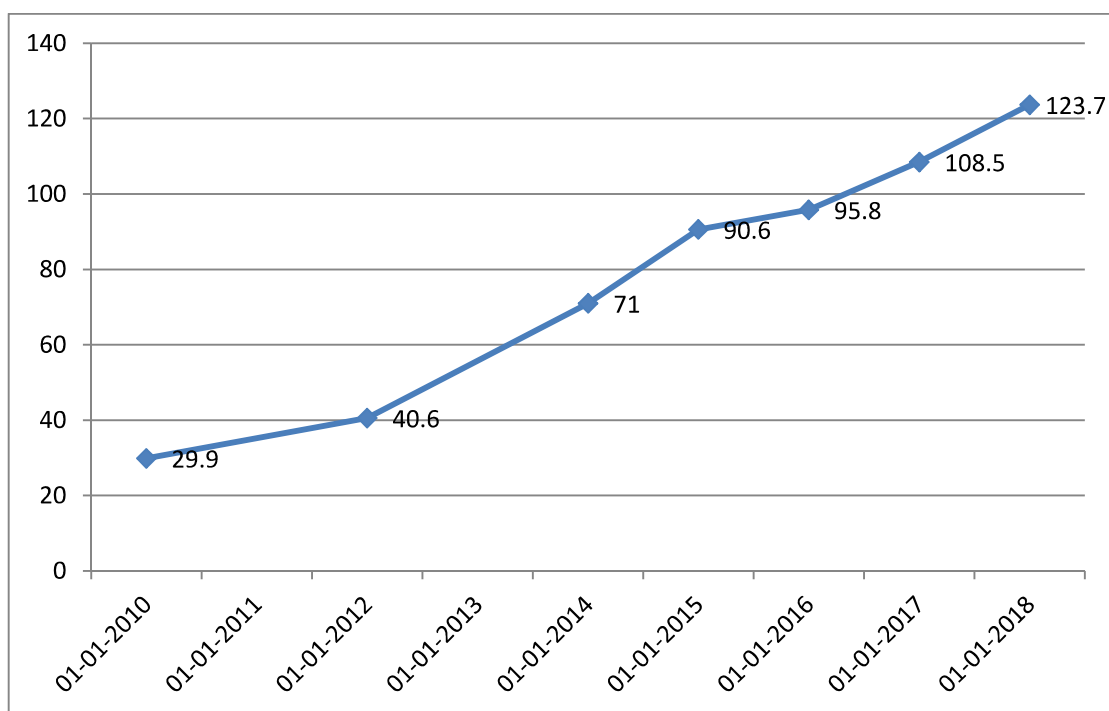
It is worth mentioning that despite the rapid growth of mortgage lending, the amount of housing commissioned over the past three years has been declining both in the Russian Federation as a whole and in the Novosibirsk Region being caused by the decrease in the commissioning of apartment buildings both by developers and the population. In 2018 75.3 million square meters were commissioned in the Russian Federation, being 4.9% less than in 2017 and 6.1% less than in 2016 (Akhmetov, Karlova, Morozov, & Chernyad'yev, 2019). The situation is similar in the NSO, but the fall is more significant. If in 2015 2587.9 thousand square meters were introduced into the NSO, then in 2016 - 2216.2 thousand square meters, or 85.6% of the 2015 level (https://novo-sibirsk.ru/about/numbers/).

There were 1,729.1 thousand square meters commissioned in 2017 or 78% of the 2016 level. All these processes were caused by the downturns in housing construction such as low demand for housing, expensive loans to developers; the rise in the price of constructional materials decreased pace of commissioning of new apartment buildings within the period of 2014-2015. Specifically, these processes were accompanied by the rapid development of mortgage lending. Therefore, it can be assumed that in subsequent years, mortgage lending is assumed not to be able to ensure the growth of housing commissioning and thus guarantee its affordability.

CONCLUSIONS

Calculations of housing affordability indices for the Novosibirsk Region population and their analysis confirm that housing mortgage lending has become a real way to purchase housing, especially an economy class, by a population having a particular income level. However, this financial tool does not provide an adequate calculation of affordability of housing to the population majority of the Russian Federation and the Novosibirsk Region.

There is a need for new financial tools to ensure investment in housing and the increase of housing affordability. Being new for the Russian Federation housing leasing, based on a long-term lease of housing that guarantees the right to purchase is one of these tools. To a certain extent, it can be considered as an alternative to mortgage lending. In this regard, I would like to note the I.V. Salagor dissertation research "Housing leasing as a tool of a financial mechanism for the residential real estate market", containing a comprehensive justification of this financial instrument (Salagor, 2014). A financial model of housing leasing, methodological foundations for the creation and functioning of specialized financial institutions such as housing leasing companies, a methodology for creating their investment portfolio, a methodology for calculating lease payments, etc. were developed.

However, housing leasing, as well as mortgage lending, contributes to the growth of the private housing sector, which, in our opinion, has already reached its natural limits. Since the beginning of housing privatization, its share in the Novosibirsk Region had been continuously growing and in 2018 amounted to 93.3%. This trend was following the one that was taking place in the Siberian Federal District and the Russian Federation. In Russia, this indicator is one of the highest. It is hardly expedient to expand it by creating conditions for the purchase of housing for low-income groups of the population. They will not be able to maintain it. The solution to their housing problem tends to be from a different perspective: first, the municipal housing fund should be preserved and expanded: second, the social rental of housing or rental in apartment buildings supported by regional and municipal authorities should be introduced.

Countries of developed market economies have gained an interesting experience. A number of recent research can be useful to study (Anderson-Baron, & Jalene, 2019; Collins, 2010; Deverteuil, 2005).

REFERENCES

Akhmetov, A., Karlova, N., Morozov, A., & Chernyad'yev, D. (2019). *Problemy i riski kreditnogo finansirovaniya zhilishchnogo stroitel'stva. Tsentral'nyy bank Rossiyskoy Federatsii*. Retrieved September 26, 2019, from http://www.cbr.ru/content/document/file/73070/analytic_note_20190711_dip.pdf

Anderson-Baron, J.T. (2019, September 14). 'Take whatever you can get': practicing Housing First in Alberta. *Housing Studies, 34*(8), 1286-1306.

Collins, D. (2010, October/November). Homelessness in Canada and New Zealand: A Comparative perspective on numbers and policy responses. *Urban Geography*, 31(7), 932-952.

Deverteuil, G. (2005, May). The relationship between government assistance and housing outcomes among extremely low-income individuals: A qualitative inquiry in Los Angeles. *Housing Studies, 20*(3), 383-399.

Dinamika sredney stoimosti prodazhi kv. metra kvartir v Novosibirske. (2019). Mir Kvartir. Retrieved September 20, 2019, from, https://novosibirsk.mirkvartir.ru/prodazha-kvartir/?monthsOffset=6

GUO Human Settlements Statistics. UN-HABITAT. (n.d.). Retrieved September 24, 2019, from http://www. unhabitat.org/programmes/guo/guo_hsdb4.asp

Khachatryan, S.R. (2001). Metody izmereniya i modelirovaniya protsessov rasshireniya sotsial'noy dostupnosti uluchsheniya zhilishchnykh usloviy naseleniya. *Audit i finansovyy analiz*, 3, 95–105.

Khachatryan, S., Fayerman, Ye., Fedorova, R., & Kirillova, A. (2000). Sovremennyye aspekty analiza i model'nogo obosnovaniya regional'noy zhilishchnoy politiki na baze ipoteki. *Audit i finansovyy analiz, 4*, 112–135.

Monitoring i otsenka situatsii na rynke zhil'ya i ipotechnogo zhilishchnogo kreditovaniya, postroyeniye tselevykh prognoznykh pokazateley razvitiya zhilishchnoy sfery. (2018). Fond «Institut ekonomiki goroda». Moskva. Retrieved September 25, 2019, from http://www.urbaneconomics.ru/sites/default/files/dostupnost_zhilya_i_zhilishchnye_balansy.pdf

Monitoring predlozheniya kvartir i komnat na vtorichnom rynke g. Novosibirska. 2003–2013 gg. (2014). Analiticheskiy tsentr kompanii «Sibakademstroy-Nedvizhimost'». Retrieved October 9, 2019, from http://www.realtymarket.ru/docs./novosib

Novosibirsk v tsifrakh. Ofitsial'nyy sayt merii g.Novosibirska. (n.d.). Retrieved September 26, 2019, from https://novo-sibirsk.ru/about/numbers/

Pokazateli dostupnosti zhil'ya po Rossiyskoy Federatsii i v razreze sub"yektov RF s 1998 goda po 2017 god vklyuchitel'no. (2018). Institut ekonomiki goroda. Retrieved September 25, 2019, from http://www.urbaneconomics.ru/research/analytics/DostupnostHomeIUE1998po2017

Raspredeleniye naseleniya po velichine srednedushevykh denezhnykh dokhodov. (2019). YEMISS. Gosudarstvennaya statistika. Retrieved September 24, 2019, from https://fedstat.ru/indicator/31399

Reyting regionov po demografii – 2019. (2019). Rossiya-segodnya. RIAREYTING ot 26.09.2019. Polucheno September 26, 2019, from https://riarating.ru/infografika/20190423/630123908.html

Rudi, L., & Tropnikova, T. (2006). Metodologicheskiye podkhody k opredeleniyu pokazatelya dostupnosti zhil'ya i ikh primeneniya. Aval'. *Sibirskaya Finansovaya Shkola, 4*(S), 27–33.

Rudi, L., & Tropnikova, T. (2012). Dostupnost' zhil'ya dlya naseleniya Novosibirskoy oblasti: metodicheskiye podkhody. *Vestnik NGUEU, 2*, 158–168.

Rudi, L., & Tropnikova, T. (2014). Otsenka dostupnosti zhil'ya dlya naseleniya Novosibirskoy oblasti. *Vestnik Tomskogo Gosudarstvennogo Universiteta., 388*, 188-193.

Rudi, L. (1997). *Formirovaniye rynka zhil'ya: tendentsii i perspektivy* (regional'nyy aspekt).

Russia Today. (n.d.). Retrieved from https://riarating.ru/infografika/20190423/630123908.html

Salagor, I.V. (2014). *Housing leasing as a tool of a financial mechanism for the residential real estate market* (doctoral dissertation). Tomsk: Salagor I.

Sotsial'no-ekonomicheskoye polozheniye Novosibirskoy oblasti na 2011-2013gg. (2014). Stat. sb. –
Territorial'nyy organ Federal'noy sluzhby gosudarstvennoy statistiki po Novosibirskoy oblasti.
Retrieved September 20, 2019, from https://novosibstat.gks.ru/

Sredniye tseny i izmeneniye tsen kvadratnogo metra obshchey ploshchadi. (2019). Novosibirskstat.
Retrieved September 20, 2019, from
https://novosibstat.gks.ru/storage/mediabank/%D0%A1%D1%80%D0%B5%D0%B4%D0%BD
%D0%B8%D0%B5%20%D1%86%D0%B5%D0%BD%D1%8B%20%D0%B8%20%D0%B8%
D0%B7%D0%BC%D0%B5%D0%BD%D0%B5%D0%BD%D0%B8%D0%B5%20%D1%86%
D0%B5%D0%BD%20%D0%BA%D0%B2%D0%B0%D0%B4%D1%80%D0%B0%D1%82%D
0%BD%D0%BE%D0%B3%D0%BE%20%D0%BC%D0%B5%D1%82%D1%80%D0%B0.pdf

Statistics of the Russian Federation. (n.d.). Retrieved from https://fedstat.ru/indicator/31399

Uroven' zhizni naseleniya Novosibirskoy oblasti za 2011–2013 gg: stat. sb. Novosibirsk: Novosibirskiy
oblastnoy komitet gosudarstvennoy statistiki. (2014). Retrieved September 20, 2019, from
http://novosibstat.gks.ru

Zadolzhennost' po kreditam, predostavlennym fizicheskim litsam-rezidentam. (2019). Tsentral'nyy bank
Rossiyskoy Federatsii. Retrieved September 26, 2019, from
https://www.cbr.ru/statistics/UDStat.aspx?Month=01&Year=2017&TblID=4-5