The Impact of Mortgage Loans on Housing Affordability in Kazakhstan

Akbota G. Anessova, [1]*, Ainagul A. Adambekova [1], Bizhamal A. Abdullaeva [1]

[1] NARXOZ University, 55 Zhandosov str., 050035, Almaty, Kazakhstan

Abstract

According to the Bureau of National Statistics of the Republic of Kazakhstan, there are 287 premises per thousand inhabitants in Kazakhstan regarding the number of residential premises and the average annual population. The problem of urgent housing need in Kazakhstan is being solved by the accelerated development of housing construction and by state programs for concessional lending. Housing affordability is one of the pressing issues of the socio-economic policy of any state. One of these programs is "NurlyZher". The main measures of state support are aimed at the construction of affordable housing for the general population. To solve housing affordability issues, the "7-20-25" program was developed in 2018, which has the most significant demand. Therefore, it is essential to understand whether the population can take out a mortgage. This study builds on research by the Center for Applied Economics Research (AERC) on housing affordability in the country. This study uses two indicators, HPI and HPA, calculated for significant cities and regions. For the calculations, the official statistics of the BNS between 2015 – 2020 were used. According to results based on the HPI indicator, residents cannot save for housing with an average salary without taking into account expenses. The HPA indicator for four mortgage programs, "7-20-25" was more accessible. However, calculations were made on average data, but in practice individually. The programs developed by the state are effective since the situation with the affordability of housing has improved over the past five years.

Keywords: Housing Affordability Index, Mortgage, Housing Availability, State Program, Practice

* Corresponding author: Anessova A.G. – PhD student, NARXOZ University, 55 Zhandosov str., 050035, Almaty, Kazakhstan, 87071999935, e-mail: anesova.akbota@narxoz.kz

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Қазақстандағы тұрғын үйдің қолжетімділігіне ипотекалық несиелеудің әсері

Анесова А.Г. ¹*, Адамбекова А.А.¹, Абдуллаева Б.А.¹

¹ Нархоз университеті, Жандосов 55, 050035, Алматы, Қазақстан

Түйін

ҚР Ұлттық статистика бюросының деректері бойынша Қазақстанда тұрғын үй-жайлардың саны және халықтың орташа жылдық саны бойынша мың тұрғынға барлығы 287 үй-жай келеді. ҚР-да тұрғын үйге шұғыл қажеттілік мәселесі тұрғын үй құрылысын жедел дамытумен, сондай-ақ жеңілдікті несиелеу жөніндегі мемлекеттік бағдарламалармен шешілуде. Тұрғын үйге қолжетімділік кез келген мемлекеттің әлеуметтік-экономикалық саясатының өзекті мәселелерінің бірі болып табылады. Осындай бағдарламалардың бірі «Нұрлы жер». Мемлекеттік қолдаудың негізгі шаралары жалпы халық үшін қолжетімді тұрғын үй салуға бағытталған. Тұрғын үйге қолжетімділік мәселелерін шешу үшін 2018 жылы ең көп сұранысқа ие «7-20-25» бағдарламасы әзірленді.Сондықтан, тұрғын үйге қолжетімділік мәселелерін шешу үшін 2018 жылы «7-20-25» бағдарламасы әзірленді, ол басқа ипотекалар арасында үлкен сұранысқа ие. Сондықтан халыққа ипотека қолжетімділігін анықтау қажет. Бұл зерттеу қолданбалы экономиканы зерттеу орталығының (AERC) елдегі тұрғын үйдің қол жетімділігі туралы зерттеулеріне негізделген. Бұл зерттеулерде елдің ірі қалалары мен өңірлері үшін есептелген екі HPI және HPA индикаторлары қолданылады. Есептеулер үшін 2015 жылдан 2020 жылға дейінгі ҰСБ ресми статистикалық мәліметтері пайдаланылды. HPI индикаторы бойынша нәтижелерге сәйкес, тұрғындар шығындарды есепке алмай, орташа жалақымен тұрғын үйге ақша жинай алмайды. HPA индикаторы бойынша 4 ипотекалық бағдарлама бойынша «7-20-25» бағдарламасы ғана қолжетімді болды. Дегенмен, есептеулер орташа деректер бойынша жүргізілді, бірақ іс жүзінде жеке. Мемлекет әзірлеген бағдарламалар тиімді, өйткені соңғы 5 жылда тұрғын үйге қол жетімділік жағдайы жақсарды.

Түйін сөздер: тұрғын үй қолжетімділігі индексі, ипотека, тұрғын үй қолжетімділігі, мемлекеттік бағдарлама, практика

* Хат-хабаршы авторы: Анесова А.Г. – PhD докторанты, Нархоз Университеті, Жандосов 55, 050035, Алматы, Қазақстан, 87071999935, e-mail: anesova.akbota@narxoz.kz

Мүдделер қақтығысы: авторлар мүдделер қақтығысының жоқтығын мәлімдейді.

Влияние ипотечного кредитования на доступность жилья в Казахстане

Анесова А.Г.[1]*, Адамбекова А.А.[1], Абдуллаева Б.А.[1]

[1] *Университет «Нархоз», ул. Жандосова 55, 050035, Алматы, Казахстан*

Аннотация

По данным Бюро национальной статистики РК, в Казахстане на тысячу жителей приходится всего 287 помещений, по количеству жилых помещений и по среднегодовой численности населения. Проблема острой потребности в жилье в РК решается ускоренным развитием жилищного строительства, а также государственными программами по льготному кредитованию. Доступность жилья является одним из актуальных вопросов социально-экономической политики любого государства. Одна из таких программ «Нурлы жер». Основные меры государственной поддержки направлены на строительство доступного жилья для широких слоев населения. Также чтобы решить вопросы доступности жилья была разработана программа «7-20-25» в 2018 году, который имеет наибольший спрос среди других ипотек. Поэтому важно понять, способно ли население брать ипотеку. Это исследование опирается на исследования Центра исследований прикладной экономики (AERC) о доступность жилья в стране. В данном исследований используются два индикатора HPI и HPA, которые были рассчитаны для крупных городов и регионов страны. Для расчетов использовались официальные статистические данные БНС с 2015 года по 2020 год. По результатам исследование, по индикатору HPI жители не могут накопить себе на жилье самостоятельно, при средней заработной плате и без учета, и с учетом расходов. По индикатору HPA по 4 ипотечным программам, лишь программа «7-20-25» была более доступна. Однако расчеты производились по средним данным, а на практике они рассчитываются индивидуально. Программы, разработанные государством, являются эффективными, поскольку ситуация с доступностью жилья улучшилась за последние 5 лет.

Ключевые слова: индекс доступности жилья, ипотека, доступность жилья, государственная программа, практика

* Корреспондирующий автор: Анесова А.Г. – PhD докторант, университет Нархоз, ул. Жандосова 55, 050035, Алматы, Казахстан, 87071999935, e-mail: anesova.akbota@narxoz.kz

Introduction

One of the main tasks of any state is the housing issue of citizens. The task of increasing the affordability and diversity of housing is on the agenda of socio-economic and housing policies in both developed and developing countries. This is because even in the most prosperous countries it is impossible to create conditions for solving the housing problems of the entire population only through market mechanisms. The current problem has a direct relationship with financial issues of the population and state regulation of socio-economic aspects.

Demand in the residential real estate market is supported by implementing government mortgage programs, limiting rental payments for housing, protecting tenants from eviction, as well as increasing the real incomes of citizens and the population. At the moment, next state programs are being successfully implemented to solve housing problems, these are: Nurly Zher until 2025; 7-20-25; Baqytty otbasy; Askeri Baspana. However, there are other programs, which are focused on different categories of citizens.

There has been an increase in mortgage lending since 2015 by more than 2 times. The volume of the mortgage portfolio of the banking sector reached 524.1 billion KZT in 2018. The total volume of mortgage loans issued in 2018 amounted to 12.6% of the value of newly built housing. In the total loan portfolio of STBs, the share of mortgage loans at the beginning of 2019 was 10%, in 2017 this figure was 8.3%. The main demand for mortgage products is concentrated in the cities of Nur-Sultan and Almaty (more than 50% in total).

One of the catalysts for the growth of mortgage lending was the 7-20-25 mortgage program launched in July 2018. Since the beginning of the implementation of this program, 9 thousand families have improved their living conditions, of which 64% are in the cities of Nur-Sultan and Almaty. Each resident of Kazakhstan has an average of 25 square meters of housing. This is almost five "squares" more than a decade ago. Nevertheless, less than in other CIS countries, and in comparison with Eastern European countries, it is much lower.

According to the Chairman of the Union of Builders of Kazakhstan Talgat Ergaliev, about two million citizens need housing [1]. Of these, more than 548 thousand citizens are in the queue in the Unified national system of registration of people on the waiting list in the republic [2]. This means that almost 20% of the population is not provided with housing.

People's need for housing is one of the basic needs. Therefore, providing citizens with comfortable and affordable housing has always been one of the important tasks of the state. In the annual messages of the President of the country, they cover this problem. Therefore, in his 2021 message "Unity of the People and System Reforms - a Firm Basis for the Country's Prosperity",

K. Tokayev instructed the government to develop a comprehensive housing program [3]. Naturally, all government programs are carried out through mortgage lending. The operators of which are the Sustainability Fund of Kazakhstan (7-20-25), the Kazakhstan Mortgage Company (Orda), and the main operator "Otbasy" bank. The role of this bank is expanding every year and from 2021, it is planned to transform it into a development institution. The task of the bank is to record and distribute housing among citizens on the principle of "one window". Nowadays the single operator of house construction – Kazakhstani housing company has recently combined the functions of three former branch organizations: 1) Baiterek Development JSC 2) Housing Construction Guarantee Fund JSC 3) Kazakhstan Mortgage Company JSC.

Moreover, the housing affordability issue is one of the reasons for migration from towns and rural settlements to big cities. Such development leads to the low development of the industry, the decline in the income of the private sector. As a result, there increase in unemployment. Based on the developed conditions people must move to big cities in search of work and earning for living.

The determining factors for the affordability of housing for citizens are real estate prices and the corresponding purchasing power. To accelerate the acquisition of housing, most families borrow money from second-tier banks, applying for mortgage loans, so it is important to assess the affordability of housing for the population receiving loans called mortgages.

The purpose of this research is to study the impact of mortgages on housing affordability and the role of public housing programs in this process, using the example of Kazakhstan. To achieve the objectives there was used the methodology of the Center for Applied Economics Research (AERC) on housing affordability in the country [4]. The novelty of the research is that from the perspective of housing availability in Kazakhstan scientific studies are comparatively rare and are almost not conducted. Typically, the problems of mortgage lending are considered as a financial instrument problem, within the analysis and performance characteristics of second-tier banks and as country population social welfare instruments.

Literature review

A great number of studies are devoted to mortgage loan affordability in different countries. Some studies provide research on housing affordability by regions within a country. Others provide the selection of big cities in a country, which make up the basis of the economic structure of the country.

There are housing affordability indices that measure the amount of time it takes to acquire standard housing, the HPI (Housing price-to-income ratio) index, and the ability of the population to acquire standard housing with a mortgage, the HAI index (Housing Affordability Index), which measures a family's ability to acquire standard housing using a mortgage. The higher the index value (should be more than 100), the more affordable housing for a family with its income level under the existing mortgage conditions. According to UN standards, housing is considered affordable if it takes less than 3 years to purchase an apartment with an average size and cost, averagely affordable - from 3 to 4 years, unavailable - more than 5 years.

A great deal in Housing Affordability development was done through state programs. For example, mortgage state policy development in the United States. Early studies of government programs on the promotion of housing affordability led to unfavorable development of the economy. First, Public Policy, to increase the housing affordability for citizens, enforced banks to lower the requirements for mortgage approval as decrease of down pay %, capital requirements, etc. Second, such policy when not controlled developed discrimination against vulnerable groups as with low income, inability to cover required down pay % (usually 20%/30%). Third, hardening the policy on housing affordability by reducing the target recipients was followed by the easing of tax expectation and waving of financial penalties. However, initially, this policy of available property for vulnerable population did not take into account the inability to cover in full their debts. Thus, developing more comfortable conditions one of the crucial factors which led to the economy downturn [5,6]. However, excessive government interference with mortgage market regulation hurts on the development of secondary mortgage markets [7].

Government attempt and actions in the regulation of mortgage market reflects in the change of the set requirements for the population or borrowers. For instance, in the study of Ozdemir et al. (2011) they investigated the housing affordability in big cities rather than region wise. Such indicators as household income, mortgage interest rate and the GDP share of a single city are the components for the Household Affordability Index [8]. Additionally, Suhaida et al. (2011) argued that such Housing Affordability calculation, which includes housing cost ratio with analysis of households' income, is not as accurate as expected. Therefore, their attention was given to the Price-Income Ratio. Moreover, they identify other factors, which affect housing affordability: level of education, income and occupation, number of children, households in one housing area who have income, expenses on the household and other costs [9]. Yusoff et al. (2014) identified transportation as one of the crucial factors in housing affordability identification. Furthermore, they studied transportation as a separate single factor by analyzing living habits of the population in Malaysia, which included commuting to work, school and additional curriculum [10].

Such non-housing expenses are reflected in the living standards (as urban conveniences) of people, social habits and needs (education, curriculum, basic needs etc.) [11,12,13]. Non-housing expenses are omitted in most of the cases of Housing affordability calculations. It is worth mentioning, as housing affordability reflects economical capabilities of the population, then non- housing expenses is the component of the economic structure of a country. Thus, reduction on non-housing expenses is the result and, at the same time, the outcome of unemployment. This is followed by income reduction and arising of housing affordability issue [12]. Another major factor is the type of a settlement, which considers following factors: family size and composition, income of households, possibility to get the mortgage and mortgage size, non-housing expenses. Depending on the settlement, type the possibility of mortgage obtaining and the dynamics changes. For example, in big cities one of the important factors of mortgage approval is the size of the house and family compositions. Thus, figures of mortgage approval, affordability and housing affordability issues differ by regions within a country [14]. Nevertheless, such difference in regions can be partly explained by failure of state housing programs. Even though, state policies are aimed at supporting vulnerable parts of the society, they still omit such factors as residual income and the size of the down payment. Moreover, requirements for mortgage affordability do not take into account the economic situation in depressed regions. Economically vulnerable regions usually have high rate of unemployment therefore the size of the residual income usually does not meet the size of monthly mortgage payments [15]. Both approaches mortgage – income and price – income ratio do not regard residual income,

mortgage period, and the possibility of a long-term income, which affords monthly mortgage payments [16].

The importance of the mortgage industry development lies in the fact that it triggers the development of other sectors of the economy and contributes to the overall country's GDP growth. The participants of the mortgage development industry are investors, population, business, and credit institutions. Apart from the development of the economy, social issues are improved as well, l.g. demographic increase [17]. Some studies regard the development of housing affordability as a positive trend for preventing migrations from regions and rural settlements to big cities [18].

The latest studies focus their attention on the promotion of the mortgage industry with better conditions of the citizens to get the mortgage approval. Studies show the importance of housing affordability calculations, which is crucial as it helps identify the appropriate down payment for the entity, usually 10% or 20%. There is also taken into account non-housing expenses and residual income. This is firstly important for mortgage lenders and banks to analyze the potential and capability of the borrower to pay off the mortgage. However, Housing Affordability Index calculations are not always enough [19]. Next, studies investigate the disadvantages of purely public and private housing provision, underlying the advantages of public-private partnerships (PPP). PPP housing provision increases the possibility of mortgage approval and housing affordability [20]. Other factors, which affect the mortgage industry of housing affordability, are the interest rate of bank loans and mortgages, construction materials cost, demographic development, the income of households, employment rate, construction rates, and involvement of construction organizations in the provision of the state policy of housing affordability [21].

There is no unique approach to house affordability analysis and the impact of mortgages. Therefore, every country develops its index calculation based on conditions related to particular economic and social issues.

Iskendirova and Kusainova (2015), in their study, concluded that mortgage lending in Kazakhstan is gathering momentum because a minimum of the country's population has the luxury to purchase a hosing on their own money, so the demand for mortgages in the country is increasing [22]. Tazabekova and others (2021), in their study, came to the same conclusion. Thus in their research, most of the population in need of housing are insolvent [23]. According to the results

of the study of Azhiguzhayeva and others (2019), it is clear that the policy of affordable housing promotion in Kazakhstan is carried out according to international standards and covers general population in the country, but is mainly aimed at socially weak layer, which is not the best indicator [24].

There are many simple and more complex indicators of housing affordability. Most of them determine the amount of time (years) required to purchase a standard home using their funds or by borrowing funds. In this paper, the conditions for obtaining free housing were not considered since only a narrow circle of socially vulnerable residents of the country has such an opportunity. In the market economy, the rest of the country's residents must buy their own homes.

Methodology

The majority of the studies, based on the provided literature review, conducted calculations of the Housing Affordability Index. This article presents the results of calculations based on the use of different indicators of housing affordability for the population at different income levels of the population and households and under other conditions for obtaining a mortgage for cities and regions of Kazakhstan during the period from 2015 to 2020. These calculations include such indicators as housing affordability index, housing affordability index and the size of families who have the opportunity to purchase housing that meets the standards of housing provision with their own and borrowed funds.

Housing prices on the primary market since 2015 have increased from 257,644 KZT to 307,600 KZT by 2020. The highest prices are noted in Nur-Sultan 392687 KZT / sq.m, Almaty 360101 KZT, Shymkent 336374, and Atyrau 326107, the lowest - in Petropavlovsk, Kyzylorda and Taraz about 140,000 KZT. The rising growth is 67%, which is because Shymkent has become a city of republican significance. The lowest price on the secondary market is observed in Kyzylorda city (150 501 KZT).

The average salary in 2020 in the republic amounted to 213,003 KZT. The highest income level is in Mangistau region, Nur-Sultan city, Almaty city and Atyrau region. The lowest income is noted in Shymkent city, Zhambyl region and North Kazakhstan region.

The Housing price to income ratio (HPI) is calculated as the ratio of the average market value of an apartment with a total area of 54 sq. m to the average income of a family of three per year. The value of this indicator corresponds to the number of years during which a family can save up for an apartment on the assumption that all the monetary

income received will be saved for the purchase of an apartment. This coefficient is widely used in Kazakhstani and foreign statistics. To assess housing affordability for this indicator, the prices were taken for 1 square meter in the country's main cities and the average monthly nominal wage in the context of country regions. This indicator was calculated for primary and secondary housing separately since the conditions of

government programs are different. Further, the calculations for HPI are given in Tables 1 and 2.

In prices for primary housing is associated with an increase in construction costs. In the secondary housing market, prices have increased from 189,998 KZT in 2015 to 228,218 KZT in 2020. The highest prices are in Nur-Sultan 383 626 KZT, Almaty 371 368 KZT, in Shymkent there is an increase in prices from 162 047 in 2015 to 279 103 in 2020.

Table 1. Housing affordability for one worker with an average monthly salary for new housing (primary)

	Housing area, sq.m						Availability of an apartment for a salary, year					
Year	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
TheRepublicof Kazakhstan	0,49	0,58	0,60	0,61	0,64	0,69	9,2	7,8	7,6	7,4	7,1	6,5
Nur-Sultan	0,57	0,63	0,70	0,71	0,71	0,77	7,9	7,2	6,4	6,4	6,3	5,8
Almaty	0,53	0,59	0,59	0,61	0,63	0,69	8,5	7,7	7,6	7,3	7,2	6,5
Shymkent	-	-	-	0,36	0,41	0,48	-	-	-	12,4	10,9	9,4
Aktau	0,76	0,84	0,87	0,97	1,03	1,30	6,0	5,3	5,1	4,6	4,4	3,5
Aktobe	0,64	0,81	0,84	0,89	0,99	0,99	7,0	5,5	5,3	5,1	4,6	4,5
Atyrau	0,64	0,82	0,81	0,90	1,08	1,13	7,1	5,5	5,5	5,0	4,2	4,0
Kokshetau	0,39	0,52	0,56	0,63	0,71	0,73	11,6	8,7	8,1	7,1	6,4	6,2
Karaganda	0,61	0,67	0,67	0,74	0,85	0,83	7,4	6,7	6,7	6,1	5,3	5,5
Kostanay	0,49	0,56	0,62	0,64	0,63	0,72	9,1	8,0	7,2	7,0	7,1	6,3
Kyzylorda	0,89	0,99	0,88	0,92	1,08	1,26	5,1	4,5	5,1	4,9	4,2	3,6
Uralsk	0,77	0,95	1,00	1,04	1,11	1,03	5,9	4,8	4,5	4,3	4,1	4,4
Ust- Kameno-gorsk	0,53	0,52	0,55	0,61	0,74	0,87	8,4	8,7	8,3	7,4	6,1	5,2
Pavlodar	0,40	0,53	0,69	0,97	0,87	0,77	11,3	8,6	6,5	4,6	5,2	5,8
Petropavlovsk	0,53	0,61	0,56	0,79	0,93	1,12	8,5	7,3	8,0	5,7	4,8	4,0
Semey	0,63	0,84	0,81	0,81	0,76	0,87	7,2	5,3	5,5	5,5	5,9	5,2
Taldykorgan	1,00	1,17	0,78	0,82	-	1,13	4,5	3,9	5,8	5,5	-	4,0
Taraz	0,74	0,83	0,87	0,95	0,91	1,12	6,1	5,4	5,2	4,8	5,0	4,0
Turkestan	-	-	-	-	-	-	9,2	7,8	7,6	7,4	7,1	6,5

Note - Compiled by the authors according to the Bureau of National Statistics [26]

As is clear from the table, the whole country, there is a decrease in the time to buy new housing, if in 2015 a working resident needed 9.2 years to buy a home in 2020, this figure dropped to 6.5 years. This trend is observed in all regions of the country. However, the residents of Shymkent c. need the most time to purchase housing; this is 9.4 years in 2020, which is 2.9 years more, due to low incomes and an increase in housing prices. Next, the least time is needed for residents of Aktau - 3.5 years and Kyzylorda - 3.6 years.

According to international standards, housing is considered affordable if you can save money within three years. Not a single city matches this criterion in the country. Among not very accessible (3-4 years) are such cities as Atyrau, Kyzylorda, Petropavlovsk, Taldykorgan, Taraz. The rest of the towns and regions belong to the categories "housing acquisition is seriously complicated" (4 to 5 years) and "housing is mostly unavailable" (more than five years). This data applies to new buildings.

Table 2. Affordability of housing for 1 worker with an average monthly wage for secondary   housing

Period	Housing area, sq.m						Availability of an apartment for a salary, year					
	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
TheRepublic of Kazakhstan	0,66	0,76	0,81	0,87	0,93	0,93	6,8	5,9	5,5	5,1	4,8	4,8
Nur-Sultan	0,56	0,69	0,71	0,69	0,73	0,79	8,1	6,5	6,4	6,5	6,1	5,7
Almaty	0,46	0,53	0,56	0,58	0,61	0,67	9,7	8,5	8,0	7,7	7,4	6,7
Shymkent	-	-	-	0,68	0,63	0,58	-	-	-	6,6	7,2	7,8
Aktau	0,68	0,77	1,00	1,11	1,18	1,24	6,6	5,8	4,5	4,1	3,8	3,6
Aktobe	0,62	0,77	0,84	0,92	1,04	1,08	7,2	5,9	5,4	4,9	4,3	4,2
Atyrau	0,97	1,02	1,01	1,12	1,33	1,39	4,7	4,4	4,5	4,0	3,4	3,2
Kokshetau	0,45	0,60	0,63	0,67	0,75	0,81	10,0	7,5	7,1	6,7	6,0	5,6
Karaganda	0,68	0,72	0,75	0,84	0,89	0,84	6,6	6,3	6,0	5,4	5,1	5,3
Kostanay	0,51	0,62	0,67	0,69	0,74	0,73	8,8	7,3	6,8	6,5	6,1	6,2
Kyzylorda	0,92	0,96	1,00	0,99	1,05	1,18	4,9	4,7	4,5	4,6	4,3	3,8
Uralsk	0,75	0,88	0,92	0,97	1,15	0,98	6,0	5,1	4,9	4,6	3,9	4,6
Ust-Kamenogorsk	0,58	0,68	0,75	0,83	0,91	0,86	7,8	6,6	6,0	5,4	4,9	5,2
Pavlodar	0,61	0,74	0,87	0,94	0,98	0,83	7,4	6,1	5,2	4,8	4,6	5,4
Petropavlovsk	0,48	0,54	0,57	0,60	0,69	0,72	9,5	8,4	7,9	7,5	6,6	6,2
Semey	0,66	0,77	0,83	0,91	0,98	0,97	6,8	5,9	5,4	4,9	4,6	4,7
Taldykorgan	0,49	0,57	0,60	0,62	0,68	0,73	9,3	7,9	7,5	7,2	6,6	6,1
Taraz	0,46	0,51	0,54	0,61	0,70	0,81	9,9	8,8	8,4	7,3	6,5	5,6
Turkestan	-	-	-	0,65	0,73	0,88	-	-	-	6,9	6,2	5,1

Note - Compiled by the author according to the Bureau of National Statistics [26]

The situation in the secondary housing market is more optimistic, here the average time to purchase a home in the country in 2020 was 4.8 years, which is 2 years less than in 2015. In cities such as Nur-Sultan, Almaty, Taldykorgan, Petropavlovsk, and Taraz, it takes more time to purchase secondary housing than to purchase primary housing, this is because the price of secondary accommodation is higher than that of primary housing. Notwithstanding, there is a decrease in time in the rest of the regions, which means that housing is becoming more affordable every year. Based on the average cost of an apartment of 54 sq. meters and an average wage, a working person needs 6,5 years to buy a new home and 4.8t years to buy a secondary home, excluding expenses.

Consumer spending depends on the needs of an individual or family. In actual practice, someone can consume more and save less, or vice versa spend less and save more. Nevertheless, there are basic costs that must be considered when calculating. Therefore, changes must be made to the calculations and the costs (as non-housing expenses) must be taken into account. However, it should be considered that the measures are not suitable for every person because they are made according to the statistical data of the National Bureau of Statistics of the Republic of Kazakhstan. The revised housing affordability indicator shows

the number of years over which a citizen of Kazakhstan can save money to purchase a home by setting aside all income that exceeds consumer spending. At the same time, the lower the value of this indicator, the more affordable housing is considered to be for the population.

In general, it can be seen from Table 3 if to consider the costs, then in all regions more time is needed to save up for housing. However, the general tendency leads to the reduction of the accumulation time. It should be regarded that the calculations used the minimum costs and average incomes of the population. For accurate estimates, it needs to use the median income and exact prices individually.

Figure 1 clearly shows that from 2015 to 2020, the affordability of housing according to the given indicators tended to improve both with and without considering costs. Therefore, for example, it took 9.5 years in 2015 and 6,5 years in 2020 to buy secondary housing and in the primary market from 9.2 to 6.5 years, respectively. The calculated indicators reflect the affordability of housing. They are applicable for a comparative analysis of the effectiveness of the   housing policy pursued if residents purchase housing at their own expense. The calculations show that the housing policy pursued in the country is effective, especially the preferential programs.

Table 3. Affordability of housing for the average citizen of Kazakhstan excluding average consumer spending, years

Housing Type	Primary housing					Secondary housing						
	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
Republic of Kazakhstan	12,8	10,7	10,6	10,4	9,8	8,8	9,5	8,2	7,7	7,3	6,7	6,5
Kokshetau	17,9	13,0	12,6	11,4	9,8	9,2	15,5	11,3	11,0	10,7	9,2	8,3
Aktobe	10,2	7,9	7,5	7,2	6,4	6,2	10,5	8,4	7,6	6,9	6,1	5,7
Taldykorgan	7,8	6,6	9,7	9,6	-	6,1	16,1	13,5	12,7	12,6	11,1	9,4
Atyrau	8,2	6,3	6,5	5,8	4,8	4,6	5,4	5,1	5,2	4,7	3,9	3,7
Uralsk	8,0	6,3	6,0	5,8	5,3	5,7	8,2	6,8	6,6	6,2	5,1	6,0
Taraz	8,9	7,6	7,6	7,1	7,2	5,6	14,4	12,3	12,3	10,9	9,4	7,8
Karaganda	11,2	10,1	10,5	9,4	8,0	8,0	10,0	9,5	9,3	8,4	7,7	7,8
Kostanay	13,5	11,4	10,6	10,1	10,1	8,9	13,1	10,5	9,9	9,4	8,7	8,8
Kyzylorda	6,7	5,9	6,9	6,8	5,6	4,7	6,5	6,1	6,1	6,3	5,8	5,0
Aktau	7,1	6,3	6,1	5,6	5,2	4,1	7,8	6,9	5,3	4,9	4,6	4,3
Pavlodar	16,8	12,6	9,9	7,1	7,7	8,6	11,0	8,9	7,8	7,3	6,8	7,9
Petropavlovsk	13,4	11,7	13,3	10,2	8,0	6,4	15,1	12,2	10,9	11,0	9,4	10,2
East Kazakhstan	12,2	10,7	11,1	10,5	9,3	7,7	12,1	10,5	10,4	9,6	8,2	7,7
Nur-Sultan	10,5	9,4	8,5	8,4	8,2	7,3	5,2	4,6	4,2	4,0	3,7	3,9
Almaty	13,4	11,8	11,8	11,7	11,5	9,8	14,9	11,9	11,8	12,3	11,7	10,4
Shymkent	-	-	-	20,6	16,2	12,9	-	-	-	22,4	17,9	14,2

Note - Compiled by the authors according to the Bureau of National Statistics [26]
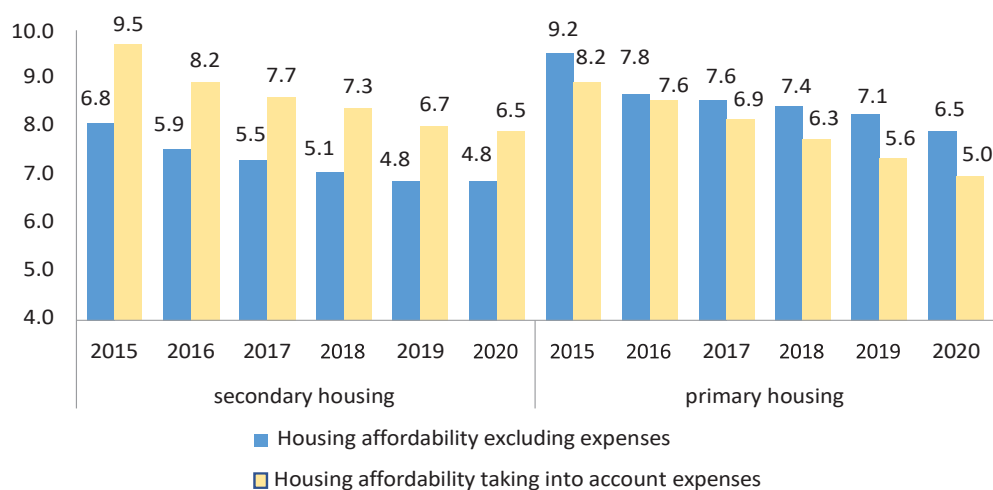
Figure 1 - Affordability of housing with and without taking into account the costs of primary and secondary housing in Kazakhstan, years

Note - Compiled by the authors according to the Bureau of National Statistics [26]

Among the preferential programs in the Republic of Kazakhstan, there are also available to all citizens, for example, "7-20-25". As for various categories of socially vulnerable segments of the population, special lending instruments are provided in the Republic of Kazakhstan within the framework of the NurlyZher state program. In addition, interest rates on soft loans in the Republic of Kazakhstan are fixed and are not subject to change during the loan term. In particular, under the "7-20-25" program, the nominal rate is 7%, under "Bakhytty

otbasy" - 2%, under the "Shanyrak" program - 5% per annum, etc.

In Kazakhstan, rates on preferential mortgages are significantly lower than the base rate of the National Bank of the Republic of Kazakhstan (9%). Also , preferential mortgage programs do not have a fixed expiration date in Kazakhstan. For example, the "7-20-25" program is unlimited and will end after the total disbursement of funds for 1 trillion KZT. As of June 3 of this year, 35.5 thousand applications for 429.9 billion KZT were approved under the program, of which 27.9 thousand loans were issued for 333.3 billion KZT. Accordingly, at the current moment, 33% of the planned funding has been mastered, and the program will operate until the target indicator is reached.

In general, the programs of preferential mortgage lending have significantly influenced the provision of housing to the population of the Republic of Kazakhstan. Thus, in 2020, the indicator increased to 22.6 sq. m per person (for comparison: in 2011, there were only 18.7 sq. m.). In cities in 2020, the indicator increased to 25 sq. m, in villages - up to 19.3 sq. m per person. The positive dynamics have been steadily maintained from year to year, including periods of crisis.

The following indicator was developed by the US National Association of Realtors and is called the Housing Affordability Index (HAI), and is calculated using the following formula:

$$HAI = (Median\ Family\ Income\ /\ Qualifying\ Income) * 100 \quad (1)$$

Qualifying Income is calculated from the monthly payment for an existing home at the average price at the effective interest rate on the mortgage. A higher HAI indicates relatively greater availability. A coefficient of 100 indicates that the average household income is sufficient only to buy a house at an average price. When the coefficient falls below 100, it means that families do not have enough income to buy a home. Additionally, if the coefficient is higher than 100, it indicates that the household has more revenue than it needs to buy a house. This formula was adapted for Kazakhstan. Since there is no data on median income, this study used the nominal cash income of the population, and Qualifying Income was calculated as cash income minus consumer spending and minus monthly mortgage payments. For this purpose, information about mortgage requirements was used for 4 mortgage programs (Table 4) and conducted calculations for housing costs based on the HAI indicator.

Table 4 - Mortgage approval requirements for four programs, 2020

Mortgage program	Interest rate	Initial payment	Period/years	Mortgage monthly payment (KZT, average)
"Orda"	13%	30%	20	115600
"NurlyZher"	7%	30%	10	58000
"7-20-25"	7%	20%	25	50888 (for cities Atyrau, Almaty, Nur-Sultan, Aktau); 39579 (for the res regions)
Standard mortgage of second-tier banks	16%	20%	15	100000

Note - Compiled by the authors according to the source [26]

Using the data from Table 4, there were provided calculations for identifying HAI indicator rates among cities and regions of Kazakhstan (Table 5).

According to the calculated indicator, it can be said that in 2020 the state programs "NurlyZher" and "7-20-25" were more accessible than the "Orda" program provided by the KMC and standard mortgages of banks. All 4 programs can be afforded only by residents of Atyrau city. Next comes the city of Nur-Sultan, which can afford all the programs, except for "Orda". Some regions cannot even afford the NurlyZher and 7-20-25 programs: Shymkent, East Kazakhstan region, Turkestan region, Zhambyl, and Almaty regions, since these regions, have low incomes.

Table 5 - Housing affordability index, considering mortgages for 2020

Mortgagetype	HAI Orda	HAI NurlyZher	HAI 7-20-25	HAI Standard
TheRepublicofKazakhstan	52,5	104,6	134,2	60,7
Akmola	44,9	89,5	131,2	51,9
Aktobe	43,0	85,6	125,5	49,7
Almaty	24,3	48,4	70,9	28,1
Atyrau	144,8	288,5	328,8	167,3
WestKazakhstan	57,7	114,9	168,4	66,6
Zhambyl	31,2	62,2	91,1	36,1
Karaganda	57,2	114,0	167,1	66,1
Kostanay	47,5	94,8	138,9	55,0
Kyzylordinskaya	36,1	71,9	105,4	41,7
Mangystau	78,0	155,4	177,1	90,1
Pavlodar	51,4	102,5	150,3	59,5
NorthKazakhstan	38,8	77,2	113,2	44,8
Turkestan	22,1	44,1	64,6	25,6
EastKazakhstan	42,6	84,9	96,8	49,3
Nur-Sultan c.	97,2	193,7	220,7	112,3
Almaty c.	71,0	141,5	207,4	82,1
Shymkent c.	27,6	55,1	80,7	31,9

Note - Compiled by the authors according to the Bureau of National Statistics [26]

Summing up the results of the calculations, it can be concluded that the housing policy, in general, is being implemented successfully, particularly the preferential programs. Still, the incomes of the population are meager compared to housing prices and consumer spending. Therefore, the average family does not always manage to meet all the mortgage lending requirements and not everyone has a down payment.

Conclusions

The current research aimed to evaluate the impact of mortgages on housing affordability in the Republic of Kazakhstan. To conduct calculations, there were used HPI and HAI indexes were. The analysis included estimates of housing affordability to purchase standard housing based on the current income of the population with additional expenses and expenses (when total revenue is saved for a property purchase). According to the research results, the level of housing affordability in Kazakhstan does not meet global standards, so it is too early to talk about housing affordability in Kazakhstan. This is because the time required for housing purchasing takes more than five years for a household with an average income, even if all revenue is saved for housing. Therefore, there is a used standard mortgage program provided by second-tier banks and state mortgage programs to purchase housing.

There were analyzed four mortgage state programs, out of which there are two state programs: "NurlyZher" and "7-20-25" and "Orda" developed and presented by Kazakhstan Mortgage Company (KMC) and a standard mortgage program. These programs were analyzed with HAI index. To conclude, "7-20-25" turned out to be more available and affordable for the population, conditioned to the requirements for mortgage approval.

The provided analysis allowed identifying low-income regions and where not all four programs are affordable to the majority of the population; they are Shymkent city, East Kazakhstan region, Turkestan region, Zhambyl and Almaty regions. Moreover, the results of the analyses revealed that in Kazakhstan, there is the scarce number of people who can afford mortgages based on the international system of HAI calculation for standard housing. At the same time, there were identified areas where almost all four state mortgage programs are affordable for the population; they are Nur-Sultan and Atyrau. To sum up, the research demonstrated that purchasing an apartment is highly expensive as the income rate in Kazakhstan varies significantly from region to region.

The research results confirmed existing studies on housing affordability that t h e mortgage approval system mostly favors the part of the population for whom mortgage for housing is not needed. At the same time, vulnerable populations with lower incomes do not fit the requirements for mortgage approval.

Therefore, it is recommended to develop state housing programs considering the

opportunities and goals for developing regions with low income. When developing housing programs, it is necessary to consider the country not as a whole but break it down into areas and develop regional programs considering housing needs, income, employment, and other factors. Also using experience of Russia and Germany in terms of the use of maternity capital to reduce mortgage loans with each birth of a child would help increase the birth rate and makes housing more affordable. The use of this experience could positively affect Kazakhstan, which is another issue of research in the future.

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Information about the authors

* Akbota G. Anessova - PhD student, "NARXOZ" University, Kazakhstan, e-mail: anesova.akbota@narxoz.kz, ORCID ID: https://orcid.org/0000-0003-1102-1803

Ainagul A. Adambekova - Doctor of Economics, professor, "NARXOZ" University, Kazakhstan, e-mail: ainagul.adambekova@narxoz.kz, ORCID ID: https://orcid.org/0000-0003-2026-4321

Bizhamal A. Abdullaeva – c.e.s, associate professor, "NARXOZ" University, Kazakhstan, e-mail: bizhamal.abdullaeva@narxoz.kz, ORCID ID: https://orcid.org/0000-0002-5392-0594

Авторлар туралы мәліметтер

* Анесова А.Г. – PhD докторанты, «Нархоз» университеті, Қазақстан, e-mail: anesova.akbota@narxoz.kz, ORCID ID: https://orcid.org/0000-0003-1102-1803

Адамбекова А.А. - Экономика ғылымдарының докторы, профессор, «Нархоз» университеті, Қазақстан, e-mail: ainagul.adambekova@narxoz.kz, ORCID ID: https://orcid.org/0000-0003-2026-4321

Абдуллаева Б.А. - Экономика ғылымдарының кандидаты, профессор, «Нархоз» университеті, Қазақстан, e-mail: bizhamal.abdullaeva@narxoz.kz, ORCID ID: https://orcid.org/0000-0002-5392-0594

Сведения об авторах

* Анесова А.Г. – PhD докторант, университет «Нархоз», Казахстан, email: anesova.akbota@narxoz.kz, ORCID ID: https://orcid.org/0000-0003-1102-1803

Адамбекова А.А. - доктор экономических наук, профессор, университет «Нархоз», Казахстан, e-mail: ainagul.adambekova@narxoz.kz, ORCID ID: https://orcid.org/0000-0003-2026-4321

Абдуллаева Б.А. - кандидат экономических наук, профессор, университет «Нархоз», Казахстан, e-mail: bizhamal.abdullaeva@narxoz.kz, ORCID ID: https://orcid.org/0000-0002-5392-0594