

**REPUBLIC OF AZERBAIJAN**

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**ABSTRACT**

of the dissertation for the degree of Doctor of Science

**ECONOMIC PROBLEMS OF THE FORMATION AND  
DEVELOPMENT OF THE HOUSING MARKET IN  
AZERBAIJAN**

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Applicant: **Ahmadov Miragha Maharram**

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The work was performed at Department of “Industrial Policy and Investment Problems” of the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

Official opponents:            Doctor of Economic Sciences, Professor  
**Hasanova Pari Amirahmad**

Doctor of Economic Sciences, Professor  
**Purhani Safar Hasan**

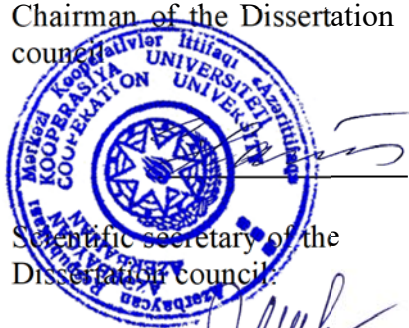
Doctor of Economic Sciences, Professor  
**Mammadov Fizuli Aziz**

Doctor of Economic Sciences, Professor  
**Aslanzadeh Ilham Alici**

Joint Dissertation Council ED 2.46 of Supreme Attestation Commission under the President of the Republic of Azerbaijan operating at Azerbaijan Cooperation University and Baku Business University.

Chairman of the Dissertation

council



Full member of ANAS,  
Doctor of Economic Sciences,  
Professor,  
**Samadzade Ziyad Aliabbas**

Scientific secretary of the  
Dissertation council:

Doctor of Philosophy in  
Economics, Associate Professor  
**Mammadova Samira Yashar**

Chairman of the scientific  
seminar:

Doctor of Economic Sciences  
**Ibrahimov Elshan Ali**

## GENERAL CHARACTERISTICS OF THE WORK

**Relevance of the topic and the level of study.** One of the parameters determining the level of socio-economic development of the country is the improvement of the living standards of the population, as well as the provision of housing. The successful solution of these issues largely depends on the state's housing policy. The housing fund is considered an integral element of national wealth in each country. It is distinguished by its unique characteristics. Thus, the housing fund acts as a set of consumer goods with a fairly high price and, at the same time, a long-term production cycle. This good is the most important stimulating factor in the accumulation and use of financial resources that perform the functions of population savings in modern economic conditions. Thus, housing appears as a factor in the formation of investment resources. At the same time, housing construction significantly affects the investment climate, promotes the development of related sectors (building materials industry, infrastructure, road construction, etc.) that are participants in the construction complex.

In the near future, the main priorities of the country's economy were established in the "Main directions of the Strategic Roadmap for the National Economy and Key Sectors of the Economy" approved by the Decree of the President of the Republic of Azerbaijan Ilham Aliyev dated December 6, 2016, one of which is the issue of providing <sup>1</sup>*the population with affordable* housing. The State Housing Construction Agency, established under the President of the Republic of Azerbaijan, <sup>2</sup>is implementing the provision of certain low-income categories of the population with "social housing". The fourth direction of "Azerbaijan 2030: National Priorities for Socio-Economic Development", approved by the Presidential Decree dated February 2, 2021, <sup>3</sup>is dedicated to the great return to the liberated territories. Another presidential decree dated November 16, 2022 was on the approval of the "First State Program for the Great Return to the Liberated

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<sup>1</sup> <https://e-ganun.az/framework/34254>

<sup>2</sup> <https://mida.gov.az/>

<sup>3</sup> <https://president.az/az/articles/view/50474>

Territories of the Republic of Azerbaijan" <sup>4</sup>. All this, as the basis of the state's housing policy, is to improve the well-being of the population as a whole by ensuring the living conditions of the population. Improving housing conditions, which affects the social well-being of the population, can be assessed as a socio-economic problem facing society in general. From this aspect, it is important to regulate housing construction by accelerating construction work and offering new apartments to the market, and to insure the apartments being built, as well as to properly manage the housing and communal services system. Taking into account the above, as well as the economic essence of the housing concept, the expansion of housing market activity can also be assessed as a general economic problem of the DMS.

During the period of independence, the housing market was formed in accordance with the peculiarities of the new economic system. Currently, the primary housing market is developing mainly at the expense of private investments. Until 2017, a trend of decreasing state investments in the field of housing construction was observed. Overall, the analysis shows that the current state of the residential real estate market still does not meet modern requirements. This is manifested in the concentration of the primary housing market mainly in Baku, the weak development of the regional housing market, the presentation of apartments in the primary market in an incomplete state, that is, unfit for living, very high prices, and other forms. Thus, the existing mechanism for the construction and sale of apartments in our republic partially meets the population's access to quality housing, and this cannot be considered acceptable. In this regard, one of the main issues facing the state should be the creation of an effective mechanism for regulating the functioning of a developed housing - market. It should also be noted that the housing market has different characteristics from other goods (services) markets. First of all, it should be noted that since housing is a real estate object, the housing market is formed in a specific area (it is local), and the fact that the price of apartments is very high compared to the products of other

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<sup>4</sup><https://e-ganun.az/framework/52757>

sectors causes low liquidity in this market. The incomes of the population living in the region and the demographic situation also have a serious impact on the housing market. All this should be taken into account when developing the mechanisms and legislative framework regulating its development.

Also, solving the housing problems of the country's citizens acts as an important condition for achieving stability in any country. The need to solve important social problems such as the continuous improvement of the living standards of the country's population, their physical and moral condition, the effective use of labor capacity, the increase in the level of economic activity, and the need to ensure business interests further increase the relevance of this issue.

From the above, it is clear that the study of the formation and development trends of the housing market, the assessment of the current situation in this area, and the development of practically significant proposals and recommendations based on the results of the conducted analyses require extensive theoretical knowledge, methodological approaches, and experience. This also proves the relevance of the topic of the presented dissertation.

The housing market and its regulation problems have been studied and studied from various aspects in the works of many local and foreign scholars. Thus, academician Z.A. Samadzadeh noting that the implementation of real estate insurance, including apartments, in Azerbaijan could lead to a significant increase in collections, he stated that there is a need to improve the real estate insurance system. Thus, he proposed that a comprehensive system for the modernization, valuation and insurance of real estate, including apartments, should be developed and implemented.

In August 2021, the General Plan of the city was presented at an event held in Shusha with the participation of the President of Azerbaijan Ilham Aliyev and First Vice-President Mehriban Aliyeva. The General Plan takes the preservation of the historical grandeur, construction and architectural style and traditions of Shusha as the main condition, and one of the noteworthy points is the planning of the construction of residential buildings with medium, high and mixed density. In addition, the General Plan establishes the issue of reflecting

historical buildings and monuments, restoring them with all their parameters , and preserving them as they are. This issue was considered by us as a “time dimension” in Chapter V of the research work. It is no coincidence that the well-known economist, academician Z.A. Samadzadeh devotes a special place to this issue in his book “The Economy of Karabakh in 100 Years”.

One of the Azerbaijani economists, Prof. M.I. Mehdiyev, defended his research paper entitled “Economic Problems of the Development of Housing Construction in Market Conditions” in Moscow in 2001. The author touched upon the issue of investment problems in housing construction in his research work and indicated the directions for its solution. Currently, the research work remains relevant. In the monograph “Development of the Housing Market in Azerbaijan” published in 2005 by Prof. V.M. Shiraliyev and Assoc. Prof. A.M. Novruzova, theoretical and methodological aspects of housing reform in Azerbaijan, housing policy in the country and abroad, the characteristics of housing as a commodity, methodological aspects of the analysis of supply and demand in the housing market are studied. In the monograph “Financing and Lending of Investments” published in Baku in 2003 by Prof. M.A. Mammadov, together with N.A. Novruzov and R.M. Aliyev, sources of financing and lending of investment directed to the country's construction sector and opportunities for attracting them are investigated. Prof. I.A. Mehdiyev's monograph "The Investment Structure of Azerbaijan and Its Impact on Economic Development" published in Moscow in 2004 examines the current problems of investment in the real estate, including housing, market of Azerbaijan, and the formation of its advanced structure. Prof. Kh.H. Kazimli's book "Fundamentals of Valuation" discusses the importance and role of the correct implementation of pricing policy in the formation of the housing market of our republic. Here, the impact of the market value (price) of apartments and its dynamics on the supply-demand ratio in the housing market is examined.

Assoc. Prof. M.I. Ismayilov's monograph "Valuation of privatized property in the context of transition to a market economy" examines the issues of valuation of privatized property, including housing, in

Azerbaijan. In this scientific work, special attention is paid to the rules for registration and transfer of rights to property objects, including privatized housing. It should be noted that these rules are of great importance in the management of the housing stock.

In the monograph "Analysis and valuation of income-generating real estate" by foreign scientists J.Friedman and N. Orduay, translated from English into Russian in 1995, the theoretical and methodological foundations of price formation in the housing market were investigated, and the theoretical and practical directions of housing valuation methods were determined.

P.Samuelson also gave extensive space in his research to the features of the formation and development of the residential real estate market on the example of income-generating real estate. He emphasizes that any real estate object that generates income is not or cannot be useful for living, and notes that residential real estate objects within the rental market are more socially significant in that they fulfill both functions. In the book "Economy of Real Estate" published by Y. Tarasevich in 2007, as well as in the monograph "Problems and Trends of Low-Rise Housing Construction in Russia" by S. Baroni, extensive space is given to the study of the scientific and theoretical foundations of real estate, including housing economics, as well as the problems of housing construction development.

Without diminishing the importance of the research conducted by Azerbaijani and foreign scientists on the housing market, our research shows that there is a need to deeply study the economic problems of the formation and development of the housing market in Azerbaijan in modern times. It is obvious that the research works of the above-mentioned and other scientists have an important role in the formation of the housing market in Azerbaijan. However, the relevance of the problem and its insufficient study have created the need to choose a new research topic. The dissertation comprehensively examines methodological and practical issues of housing market development. Thus, the above-mentioned facts determine that the dissertation is a scientifically based research work.

**Object of research and subject.** The object of the study is the housing market of Azerbaijan and its participants. The study of

scientific views on the economic problems of the formation and development of the housing market in Azerbaijan, the economic relations, regularities, methods and means emerging in this direction were chosen as the subject of the study.

**The goals and objectives of the study.** Based on the study of the housing market of Azerbaijan, it is to identify economic problems and develop scientifically substantiated proposals and recommendations for their solution. In order to achieve the goal of the study, the following tasks are planned to be sequentially implemented :

- theoretical and conceptual approaches to the formation and development of the housing market in accordance with the specific conditions in the country;
- research into the socio-economic nature of the housing market and the factors influencing it;
- determining the mechanism for socio-economic regulation of the development of the housing market in the country;
- generalization of existing methodological approaches to housing market research;
- assessment of the country's population's demand for housing and the level of its payment;
- forecasting prices in the housing market using the correlation-regression method;
- analysis of financial opportunities and resources for the sustainable economic development of the housing market in Azerbaijan;
- determining directions for improving the organization and management of the mortgage housing lending system;
- improving housing policy in large cities of Azerbaijan, as well as identifying opportunities for the implementation of construction clusters;
- identifying institutional problems related to granting ownership rights to housing and justifying ways to solve them.

**Research methods.** In carrying out the research work, observation, comparison, correlation, regression, induction and deduction, program-oriented approach, economic-mathematical and statistical



analysis methods were used.

The methodological basis of the research work consists of scientific research works of classical and modern well-known economists on the impact of real estate, or rather, its ownership, on the well-being of the population, as well as the mechanisms for the formation, development and regulation of the housing market. In the context of its implementation, reference was made to the provisions of relevant laws, decisions of the Cabinet of Ministers, reports of the State Statistical Committee, the Central Bank, as well as the Mortgage and Credit Guarantee Fund, and materials from the Strategic Roadmap for the development of the housing market in Azerbaijan and other socio-economic development programs were used.

**The main provisions defended:**

1. Theoretical and methodological study of the development characteristics and trends of the housing market shows that there is a need to study the impact of the legal framework of state regulation on economic development.

2. There is a need to determine the development directions of the housing market in Azerbaijan in accordance with the state housing policy and to apply the results of international experience, including regulatory and legal acts, in the development of the housing and construction sector.

3. As a component of national wealth, regardless of the form of ownership, it is a requirement of the time to determine and compare important indicators such as activity in the primary and secondary sales markets of apartments, differences in their exposure periods and liquidity.

4. Considering that the conjuncture changes in the housing market may expose buyers and also construction companies (investors) to various risks, long-term forecasting of prices in the primary and secondary housing markets using econometric models and correlation-regression methods is of particular importance in order to determine development trends.

5. Due to the incompleteness of the statistical information base characterizing the activity of the Azerbaijani housing market, it would be useful to develop a methodology for determining the accessibility of

housing to the population, taking into account local characteristics, based on international experience, in order to accurately determine market indicators.

6. Analyzing the volume and structure of financial sources based on transactions in the Azerbaijani housing market, assessing the level of use of borrowed funds and opportunities of housing buyers in the country can have a positive impact on the development of this sector and the expansion of mortgage lending.

7. Accelerating the application of digital technologies in regulating the development of the housing market can make a significant contribution to the effective use of the opportunities created by digitalization in the construction sector, as well as in the process of restoring and reconstructing the territories liberated from occupation.

8. Since consumers have different tastes in construction and industrial products and technologies introduced to the housing market, the application of a compensation model for the hedonic assessment of consumer behavior, taking into account their sensitivity to market changes, is of particular importance.

9. The possibilities of applying a five-dimensional spatial model (human factor, determination of conditions, functional, geometric and time dimensions) in the management of buildings in the housing stock of Azerbaijan that have reached the end of their service life and are physically and functionally obsolete, as well as the creation of clusters in the process of housing construction and operation, their future prospects and application possibilities will create a solid foundation for solving problems in this area.

**Scientific novelty of the research:** The scientific innovations obtained as a result of the research work can be summarized and presented as follows:

- the possibilities of using international experience based on conceptual and theoretical provisions in the study of the housing market of Azerbaijan were identified;
- forecasting prices in the housing market was carried out using the correlation-regression method in the real estate services market;
- taking into account the current state and development trends of the housing market in the republic, an author's methodological

approach to determining housing accessibility based on a comprehensive approach was developed;

- the main institutional problems related to the implementation of housing mortgages in the country were identified and substantiated proposals were made for their effective solution;

- effective proposals and recommendations were developed to increase the housing supply in order to increase the level of housing provision for the country's population;

- economic-mathematical modeling of the development trend of mortgage lending in Azerbaijan was carried out;

- a compensation model was applied based on the hedonic assessment of the behavioral strategy in the housing construction sector;

- the application and effectiveness of the five-dimensional model in large cities of Azerbaijan were substantiated based on international experience;

- the possibilities of creating housing construction clusters in Azerbaijan were investigated and its application and development directions were determined.

**Theoretical and practical significance of the research.** The theoretical provisions and methodological approaches presented in the dissertation allow expanding the existing scientific knowledge in the field of real estate, including the development of the housing market, understanding the features of the process of real estate valuation and mortgage-housing lending in Azerbaijan, and solving theoretical and practical issues of state regulation of the processes of attracting financial resources to the housing market. The results of the research work, the proposals and recommendations given can be used to ensure the sustainable development of the real estate market, including the housing market, in Azerbaijan, to provide the population with affordable housing, to improve the methodology for evaluating apartments in various transactions, and the mechanism of state regulation of mortgage and financial markets.

**Approval and application.** 37 scientific articles, conference materials and theses with a volume of more than 23 printed sheets have been published on the research in our republic and abroad in

authoritative scientific journals recommended by the Higher Attestation Commission under the President of the Republic of Azerbaijan, as well as in materials of republican and international scientific and practical conferences. Among the main scientific works reflecting the results of the research are “Daşınmaz əmlak bazarının idarə edilməsinin nəzəri-metodoloji aspektləri” (Baku, 2012), “Prediction of prices in housing market with the correlation-regression methods” (Ukraine, 2017), “Оценка поведенческой стратегии пользователей строительной отрасли на рынке жилья Азербайджана” (Ottawa, Canada, 2021), “Hedonic adaptation and conscious consumption in the civil engineering market: corporate reputation and user behavior strategies for sustainable development” (England, 2022, database Web of Science), etc. In addition, the results of the scientific research work are applied at the “Center for Economic and Social Development” (see p. 271 in the dissertation), “BINA MTK” company (Reference No. 31, 12.10.2018), “MBA LTD” Consulting company (Reference No. MBA11/963, 24.10.2018), Azerbaijan Insurers Association (ASA) (see p. 273 in the dissertation), as well as used in lectures and training courses in the Business Administration, Industrial Organization and Management and Management specialties of the Azerbaijan University of Architecture and Construction (Reference No. 31/942, 16.11.2018).

**Name of the organization where the dissertation work was carried out:** Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

**The total volume of the dissertation, with a mark indicating the volume of the structural sections of the dissertation separately.** The total volume of the dissertation in characters, indicating the volume of the structural sections of the dissertation separately. The dissertation consists of a table of contents, introduction (19207 characters), 5 chapters (Chapter I - 62476 characters, Chapter II - 63600 characters, Chapter III - 41426 characters, Chapter IV - 66348 characters, Chapter V - 134260 characters), conclusion (18509) and a list of 264 references. The total volume of the work, excluding tables, figures, schemes, diagrams, graphs, and the list of references, is 405826 characters.

# TABLE OF CONTENTS

## INTRODUCTION

### **CHAPTER I. THEORETICAL AND CONCEPTUAL ISSUES OF THE FORMATION AND DEVELOPMENT OF THE HOUSING MARKET**

1.1. Theoretical and methodological views on the housing market and its development directions

1.2. Regulatory and legal framework for regulating the housing market in Azerbaijan

1.3. Opportunities for applying international experience in housing market regulation in Azerbaijan

### **CHAPTER II. ANALYSIS AND ASSESSMENT OF THE CURRENT STATE OF THE HOUSING MARKET OF AZERBAIJAN**

2.1. State social housing policy in Azerbaijan and its socio-economic consequences

2.2. Analysis of the volume of supply in the Azerbaijani housing market and the factors determining it

2.2.1. Assessment of the impact of the COVID-19 pandemic on the construction sector of Azerbaijan

2.3. Analysis of the characteristics of price formation in the housing market of Azerbaijan

### **CHAPTER III. METHODOLOGICAL APPROACHES TO THE PRIVATIZATION OF APARTMENTS AND THE DEVELOPMENT OF THE HOUSING MARKET IN AZERBAIJAN**

3.1. The impact of housing stock on the development of the Azerbaijani housing market

3.2. Econometric analysis and forecasting of housing market prices using the correlation-regression method

*3.2.1. Methodology for determining housing accessibility*

## **IV . OPPORTUNITIES FOR INCREASING FINANCIAL RESOURCES IN THE HOUSING MARKET OF AZERBAIJAN AND IMPROVING ITS MANAGEMENT**

4.1. The necessity and socio-economic importance of attracting financial resources to housing construction

4.2. The impact of the expansion of mortgage lending on the housing market

4.3. Improving the management of the mortgage housing lending system

4.4. Economic and mathematical modeling of mortgage lending development trends in Azerbaijan

## **CHAPTER V. DIRECTIONS FOR THE DEVELOPMENT AND REGULATION OF THE HOUSING MARKET OF AZERBAIJAN**

5.1. Modern marketing approaches to increasing supply in the housing market

*5.1.1. Possibilities of applying the digitalization system in the construction sector in the liberated economic regions*

5.2. Author's approach to the compensation model for assessing the behavioral strategy of apartment buyers (users)

5.3. Directions for improving housing policy in large cities of Azerbaijan

5.4. Prospects for the creation and development of clusters in the process of housing construction and operation

5.5. Ways to solve institutional problems in granting ownership rights to residential real estate

## **CONCLUSION**

## **LIST OF REFERENCES**

## **APPENDICES**

## **LIST OF ABBREVIATIONS AND SYMBOLS**

## **MAIN PROVISIONS PROVIDED FOR**

**The main provisions defended:**

**Provision 1. Theoretical and methodological study of the development characteristics and trends of the housing market shows that there is a need to study the impact of the legal framework of state regulation on economic development.**

In accordance with the trends in the social and economic development of the country, there are certain theoretical concepts that discuss the characteristics of the housing market formation, as well as its future prospects. Institutional theories show that improving the housing conditions of the population directly affects living conditions and improves social well-being. Improving housing provision and living conditions is a very important issue for all segments of the population, especially young people (young families). In solving this issue, the correct formation of the mechanism of interaction of housing market entities can lead to the development of the housing market. The study shows that when determining the characteristics of the housing market and the degree of liquidity, special importance should be given to consumer behavior. Thus, when examining the characteristics of the housing market, the following factors were identified as characteristic:

- a) low elasticity of supply;
- b) information on transactions is not completely reliable;
- c) the dependence of the product's competitiveness on the environment and the individual tastes of buyers;
- d) the value of the object reflects the value of the land and the rights over it;
- e) the special nature of the transactions.

As a continuation of the above, the difference between the housing market and other goods and services markets stems from the specific characteristics of housing, which is regulated by the Constitution of the Republic of Azerbaijan, the Civil Code, the Housing Code, and other relevant regulatory and legal documents.

Proper study of the specific nature of the Azerbaijani housing market will pave the way for rapid development prospects of the real estate market. On the other hand, the formation of a unified information base will also ensure transparency in purchase and sale

relations among housing market participants.

Given that housing is a fairly expensive commodity, we can see that income efficiency has a very large impact on housing purchases. The sharp increase in the cost of housing, as well as the decrease in the income level of buyers, has actually reduced the demand for housing .

The analysis shows that one of the main indicators affecting supply and demand in the housing market is the taste of buyers. Here, the quality of apartments comes to the fore from the customer. Thus, high-quality apartments always have an impact on the housing market with their high prices. *However, the lack of necessary information to buyers about the quality of the apartment to be purchased leads to the emergence of a problem such as "deteriorated selection" in the primary and secondary markets. In other words, good housing either leaves the market quickly, or is not sold, or is sold through personal connections, while bad properties return to the market .*<sup>5</sup>This trend is most evident in the primary housing market.

Experience shows that demand in the housing market is also significantly affected by seasonal changes throughout the year. Thus, the cost of housing in the suburbs (gardens) usually increases in the spring, and the cost of city houses in the fall. Currently, various levels of regulation and management of the housing market are divided between state, private and municipal institutions. However, there is a need for legal coordination between these institutions. The main law regulating the activities of housing construction cooperatives (HCCs), which construct the majority of multi-storey buildings in Azerbaijan, is the *Housing Code*.<sup>6</sup>

It has been determined that ensuring the development of the housing market depends on a number of organizational and economic structural mechanisms. Thus, improved competition, equality of rights of housing market participants, conjuncture results, etc. should be

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<sup>5</sup> Malkina M.Yu., Shchulepnikova E.A. special features of demand formation. Proposals and equilibria in the residential real estate market in Russia // economic analysis: theory and practice. – 2013, - No. 16 (319). - C. 2-14.

<sup>6</sup> Housing Code of the Republic of Azerbaijan (This Code is adopted by the 30th June 2009 year dated, 845-IIIQ (Approved by Law No. 194 of the Republic of Azerbaijan) "Azerbaijan" newspaper, dated September 2, 2009, No. 194 .



brought to the fore. It can also be noted that *the period of development of the real estate market may not coincide with the period of development of other sectors of the economy. Thus, the weakening of the real estate market coincides with the weakening of the general economy, but the period of development of the real estate market begins earlier than the development of the general economy. In short, the real estate market reacts to the value of money faster than other assets.*<sup>7</sup>

In order to regulate and develop the housing market, priority should be given to the establishment of tax breaks, regulation of the interest rate by the Central Bank, provision of preferential loans to certain categories of the population for purchasing housing, depreciation policy, development of large cities of Azerbaijan, and privatization of state property.

There are numerous regulatory and legal documents regulating the housing market in Azerbaijan. However, there are still problems and gaps in four areas in the housing market.

1) Documentation and management of private houses built on agricultural lands;

2) Due to the lack of documentation in the apartment rental market, there are cases of unjustified possession of apartments, tax evasion, etc.

Therefore, in order to prevent additional problems in the future, relevant agencies should monitor the use of land in accordance with its intended purpose. In addition, measures to conclude rental agreements should be carried out systematically, thereby determining the development status and trends of the housing rental market.

3) Deficiencies in the mechanism for mutual management of property objects belonging to state and municipal ownership. In order to eliminate them, coordination work should be strictly monitored by the relevant institutions.

4) Expanding the application possibilities of the insurance system in the housing market. To ensure this, rules for insuring construction companies should be developed, the population should be encouraged

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<sup>7</sup> Akhmadov M. M. Assessment of factors influencing the formation of real estate relations// News of the Azerbaijan National Academy of Sciences, "Economy" series, No. 2, Baku-2013, pp. 131-138

to insure their apartments, and their implementation mechanism should be formed.

**Provision 2. There is a need to determine the development directions of the housing market in Azerbaijan in accordance with the state housing policy and to apply the results of international experience, including regulatory and legal acts, in the development of the housing and construction sector.**

Society's need for housing is determined by property rights, and the state's housing policy creates access to it through relevant laws. Housing is the basis of general social security in society, as well as shaping welfare and social interest groups in the country.

In the first years of our republic's independence, the state's housing policy was not implemented properly, which had a negative impact on the housing market. Thus, as the demand for housing increased, the state could not implement any stimulating reforms for the population. This led to a sharp increase in prices in the housing market. It should also be noted that the proper implementation of the state housing policy should ensure the well-being of the population as well as security. Because, in addition, natural disasters, especially the consequences resulting from earthquakes, show that gaps in this direction can lead to serious consequences.

Secondly, in developing housing policy at the macro level, important factors such as continuous control over the effective allocation of resources, the current state of the infrastructure necessary to ensure the sustainability of affordable living conditions, and minimizing the environmental damage caused by housing construction should be taken into account.

Analysis of statistical data shows that in recent years, as a result of the increase in the flow from rural to urban areas, the real population growth rate in Baku city and Absheron region has even exceeded the corresponding average indicators for the republic. We believe that in this direction, the requirements should be strengthened in accordance with the state regional socio-economic development program. In this case, a demographic balance of the population between cities and regions will be created.

Based on official permits received from state administration bodies,

all private construction organizations, taking responsibility for themselves, carry out construction work at their own expense within the framework of the existing legislation. However, research shows that the high cost of land in large cities reduces the profits of private companies. From this aspect, state intervention and support are inevitable. Comprehensive research conducted on the housing market of Azerbaijan shows that the housing market should be determined by housing policy, and in addition, the Constitution of the Republic of Azerbaijan, the Civil Code, the Housing Code, the Urban Planning and Construction Code should be taken as a basis, and international experience should be used within the framework of legislation. Thus,-

1. Construction of affordable social housing on lands acquired from the municipality and the state (Turkish experience). Application of tax breaks.

2. Involving vacant but usable land in densely populated large cities of the country into circulation (Singapore, China, Philippines experience). Otherwise, it is subject to tax according to its value for two years. The following year, it may be confiscated by the state.

3. The “land consolidation” method. If we look at this problem, building companies build housing by combining land plots in neighboring areas (the experience of India, South Korea and Japan). The land plots are compensated.

4. Construction of railway lines to connect newly built residential areas with the nearest major commercial urban centers (the main experience of Hong Kong and also the city of Denver in the USA).

5. The principle of energy saving. Here, by saving energy and applying the necessary measures, it is possible to minimize the costs of residential apartments to the necessary extent (the experience of the USA and Great Britain). As a result, the electricity energy saving applied during that period can significantly reduce the housing utility costs.

6. The possibility of optimizing construction companies through insurance or industrialization (the experience of the CAR and the UK). During this period, most of the construction work is carried out outside the boundaries of the construction site and in advance. Using this method, it is possible to reduce costs by about 20 percent and reduce the

completion time of project work by half .

7. Expanding the financing opportunities of the population (US and Indian experience). Here, mainly, the possibilities of applying the level of use of mortgage loans in accordance with the income level of the social population. In order to partially reduce the risk levels of these opportunities, mortgage loans are insured by the state.

8. Expanding access to the main financial resources of very large credit institutions offering mortgage loans (the experience of Malaysia, the USA and the UK). In accordance with the experience of the Malaysian state, national mortgage institutions, as a result of almost getting rid of a number of major restrictive problems, offer low-interest mortgage loans to the socially vulnerable population. According to the experience of the USA and the UK, they provide low-interest loans or tax breaks in order to sufficiently reduce housing costs.

9. Access to social rental housing for a population segment that meets a system of indicators based on specific criteria (experience of the Kingdom of the Netherlands and the United States).

We believe that the opportunities to apply the results of international experience in Azerbaijan will lead to the formation and development of the housing market.

**Provision 3. As a component of national wealth, regardless of the form of ownership, it is a requirement of the time to determine and compare important indicators such as activity in the primary and secondary sales markets of apartments, differences in their exposure periods and liquidity.**

The demand in the housing market is always high, because the population wants to buy property to improve their living standards in the future. Since people feel that their savings are increasingly losing their purchasing power, they direct part of their capital to real estate types, especially apartments. On the other hand, since people cannot live everywhere, they try to have opportunities that meet their social requirements by giving preference to high infrastructure, proximity to the workplace, and the environment. At the same time, construction companies, due to the limited area, try to maximize the use of land suitable for living, build high-rise apartments, and achieve efficient use of non-residential areas . Residential buildings tend to concentrate

in a certain area. We believe that it is unacceptable to take this into account in many areas of the city. Because excessive concentration of residential buildings in a certain area can lead to population density there and also to the paralysis of infrastructure areas. From this aspect, by taking into account the ecosystem appropriate for city planning, the correct strategy for city management can be determined by applying the five-dimensional spatial model.

The secondary housing market, due to changes in the composition of the offer portfolio, can become a factor with different impact on the market environment compared to the primary housing market. Analyses show that the reason for this is that over time the share of old buildings in the portfolio decreases, while the share of new buildings increases. Therefore, we observe a “stable” and “fluctuating” structure of price changes. In the current situation, the housing market of Azerbaijan is developing as a result of the influence of two opposing market objects. The decline in prices here is due to the negative macroeconomic situation in the world, the possibility of a fall in prices for oil, gas and other energy resources, and a decrease in purchasing power. These, in turn, create risks in the housing market. *Risks in the primary and secondary real estate markets differ in their types: if there is a technological and economic risk for the primary market, then there are legal risks for the secondary market.*<sup>8</sup>

We consider it appropriate to pay special attention to one issue. This is related to the observance of the rules for measuring areas by construction companies in Azerbaijan when selling apartments. *These rules were approved by the decision of the Board of the Committee on Urban Planning and Architecture of the Republic of Azerbaijan dated December 4, 2012. In paragraph 2 of that decision,*<sup>9</sup> the essence of general concepts (balcony, veranda, glass wall, etc.) was explained. Consistently, in paragraph 3, the rules for calculating the living area, its components, construction area and volume were reflected.

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<sup>8</sup> Akhmadov M. M. Organizational and economic issues of the formation and regulation of the real estate market in Azerbaijan. Azerbaijan University of Cooperatives, Scientific and Theoretical Journal "Cooperatives" No. 2(29), Baku, 2013, - pp. 143-151.

<sup>9</sup><https://e-ganun.az/framework/25005>

Therefore, one of the important steps in the formation of a price regulation mechanism in the housing market is to control the correct calculation of the area of apartments sold and given on credit. On the other hand, it is necessary to determine which segment of the country's population has the greatest demand for housing.

**Table 1**

**Dynamics of key indicators of the housing construction sector in Azerbaijan in 2000-2023**

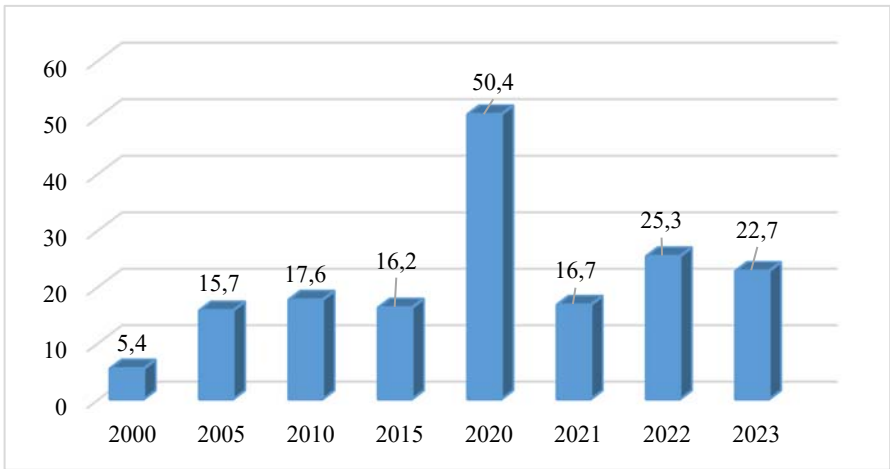
Row number	Name of indicators	2000	2005	2010	2015	2020	2021	2022	2023	2023/2000
1.	Number of apartments commissioned per 1000 people by population	0.8	1.9	2.1	1.8	5.0	1.7	2.5	2.1	2.6 times
2.	Total area of apartments put into use per 1000 people by population, m <sup>2</sup>	61	190	229	203	522	207	279	218	3.6 times

*Source: Construction in Azerbaijan. Statistical Bulletin, 2024.*

<https://www.stat.gov.az/news/index.php?lang=az&id=5987>

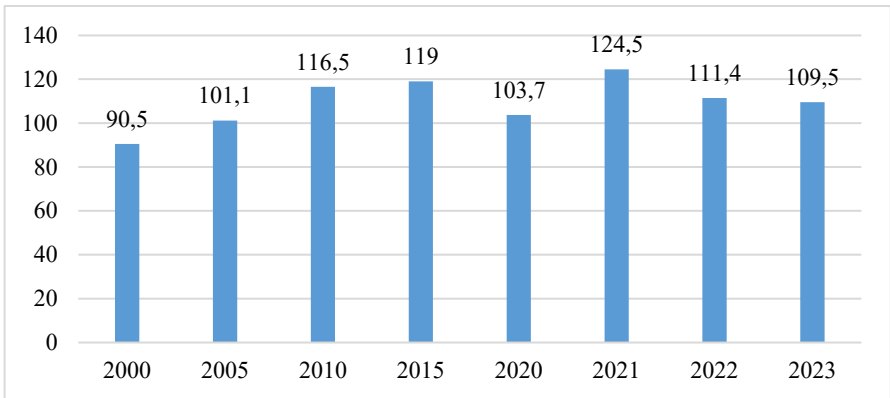
Statistics show that in 2023, compared to 2000, the number of apartments put into use per thousand people and the total area of apartments put into use per thousand people (sq.m.) increased by 2.6 and 3.6 times, respectively.

When we look at the number of apartments in residential buildings put into operation in Azerbaijan, we see that the number of residential buildings put into operation in 2023 decreased by 2.2 times compared to 2020. Analyses show that this is due to the fact that construction companies are more involved in social construction projects in Karabakh, the shortage of land plots in central cities, and also the fairly high prices of land. On the other hand, the analyses also show that the fairly high average size of apartments in residential buildings put into operation in Azerbaijan has had a negative impact on demand in the housing market (Diagram 2).



**Diagram 1. Number of apartments in residential buildings commissioned in Azerbaijan, thousand apartments .**

*Source: Azerbaijan Construction. Statistical Bulletin, 2024.*  
<https://www.stat.gov.az/news/index.php?lang=az&id=5987>



**Diagram 2. Average size of apartments in residential buildings commissioned in Azerbaijan, total area, sq. meters.**

*Source: Azerbaijan Construction. Statistical Bulletin, 2024.*  
<https://www.stat.gov.az/news/index.php?lang=az&id=5987>

In our opinion, the above diagram shows that the high average size of newly commissioned apartments does not match the population's

demand for housing. This limits the ability of young and middle-aged newly married citizens aged 25-35 to own a home. The study shows that in order to meet the housing needs of young families, in accordance with the demographic situation, HCCs prefer to build and commission small one- or two-room apartments.

The study shows that the delay in the ownership of apartments also has a negative impact on the insurance market. On the other hand, residents of buildings whose apartments have not been privatized cannot benefit from the services provided to them. In order to eliminate this problem, the provisions of the Housing Code must be followed. Also, according to the relevant provisions of the Housing Code, residents living in new apartments must create an Apartment Ownership Joint Society (AOMS). This society must provide services for the management of the housing and communal services system of the building. However, since the majority of residential buildings have not been privatized, this process seems difficult to implement, and MTAs are not interested in it. This creates obstacles in the management of the utility system of multi-apartment buildings. In addition, studies show that certain shortcomings are also allowed when designing housing construction. Thus, the ratio of residential and common areas in apartments and the rules for measuring the area of apartments are far from reality. If we look at the rules for calculating the areas of balconies, verandas, and glass enclosures by construction companies, we will see that the regulatory acts do not comply with the requirements. Overcalculation of areas contrary to the rules increases the price of housing, which reduces demand in the primary housing market. It also reduces the level of accessibility of these apartments for the middle-income and low-income population. Therefore, the calculation of the areas of apartments put up for sale by construction companies in accordance with the rules should be monitored by the relevant institutions. Also, the terms and conditions should be clearly stated in the contracts concluded between construction companies and residents. This will have a positive effect by preventing litigation between shareholders and HCCs in the future.

**Provision 4. Considering that the conjuncture changes in the housing market may expose buyers and also construction**



**companies (investors) to various risks, long-term forecasting of prices in the primary and secondary housing markets using econometric models and correlation-regression methods is of particular importance in order to determine development trends.**

The real estate services market acts as a functional subsystem both in terms of the real estate market as a whole and in terms of the macroeconomic system of the country. Like all economic-cybernetic systems, there are numerous direct and inverse relationships between the elements that form the housing market, and therefore any changes in the real estate services market cause changes in the housing market. In the system of indicators of the development trend of the real estate services market in Azerbaijan in the real estate market (see the dissertation, table 3.2.1),  $Y_1$  and  $Y_2$  characterize the price of 1 sq.m. of housing in the primary and secondary housing markets, and  $X_1$ ,  $X_2$ ,  $X_3$ ,  $X_4$ ,  $X_5$  characterize the nominal wage (in manats), the number of population as of 01.01. year (thousand people), the number of newly commissioned apartments (thousand sq.m. total area), the total area per resident (on average) (1 sq.m. at the end of the year) and the number of apartments built and offered to the market.

*Research shows that The development of the real estate services subsystem within the real estate market is mainly determined by the following factors*<sup>10</sup>:

- Development of the residential real estate market;
- Rapid construction and commissioning of residential houses;
- Affordable supply and demand in the housing market;
- Dynamics of prices of objects in the housing market.

The study shows that, like all other economic systems, there are no functional dependencies between economic indicators in the real estate market and its real estate services market subsystem, that is, economic activity in these systems does not have a strictly deterministic character. There are various reasons. Therefore, we should accept and study the dependencies in the real estate services market as correlation-type or statistical dependencies. Thus, the

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<sup>10</sup> Akhmadov M. M. Prediction of prices in the housing market with the correlation-regression methods. *Ukrainian Journal of Ecology*, 2017, 7(4), - p. 399-406.

dependencies between indicators in the real estate services market subsystem of the real estate market are statistical (correlation) dependencies, and a change in one of the indicators changes the distribution (average value) of the other indicator.

Conducted systematic studies show that it is possible to use both mechanisms of econometric modeling in the analysis of dependencies in the real estate services market - correlation and regression analysis. Thus, in correlation analysis, the indicators of the real estate services market are considered equally valuable, rather, they are not given the status of independent and dependent (explanatory and explained) variables. During regression analysis, one indicator of the market is considered a dependent variable, and the other indicator (indicators) is considered an independent variable, and how the independent variable affects the dependent variable on average (as a mathematical expectation) is determined.

As with regression models of all economic systems, the regression models of the market we are studying are also

$$y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m + \varepsilon_i$$

in the form of, and will include random deviations as a necessary element  $\varepsilon_i$ . Let us note that there are various reasons for the occurrence of this random deviation, which reflects the deviation of the real value of the factor you have chosen as the result indicator from its model value. The most important is the lack of direction of (explanatory) variables related to the real estate services market and clear from the developed econometric models, and the second is aggressions that express variables. The third is errors in calculation (measurement), the lack of statistical indicators, as well as the absence of the human factor, that is, the impossibility of determining the degree of influence.

As a result of regression analysis conducted on the basis of Excel and EVIEWS software packages, the following regression equations were established for the existing dependencies in the real estate services market (table 2)

**Table 2.**

**Pairwise linear regression equations of dependencies between indicators in the real estate services market**

Content of regression analysis	Regression equation of dependence	Coefficient of determination	Correlation coefficient	Elasticity coefficient
$M(Y_1/X_1)$	$Y_1 = 465,51 + 0,97X_1$	$R^2 = 0,71$	$r = 0,84$	$E = 0,34$
$M(Y_1/X_2)$	$Y_1 = -2124,04 + 0,312X_2$	$R^2 = 0,60$	$r = 0,77$	$E = 4,03$
$M(Y_1/X_3)$	$Y_1 = 147,71 + 0,292X_3$	$R^2 = 0,41$	$r = 0,64$	$E = 0,79$
$M(Y_1/X_4)$	$Y_1 = -172,82 + 140,40X_4$	$R^2 = 0,37$	$r = 0,61$	$E = 3,46$
$M(Y_1/X_5)$	$Y_1 = 230,01 + 0,03X_5$	$R^2 = 0,24$	$r = 0,49$	$E = 0,71$
$M(Y_2/X_1)$	$Y_2 = 879,68 + 0,93X_1$	$R^2 = 0,30$	$r = 0,55$	$E = 0,20$
$M(Y_2/X_2)$	$Y_2 = 1831,83 + 0,324X_2$	$R^2 = 0,28$	$r = 0,53$	$E = 0,28$
$M(Y_2/X_3)$	$Y_2 = 588,70 + 0,274X_3$	$R^2 = 0,26$	$r = 0,51$	$E = 0,47$
$M(Y_2/X_4)$	$Y_2 = 2518,8 + 209,63X_4$	$R^2 = 0,37$	$r = 0,61$	$E = 3,27$
$M(Y_2/X_5)$	$Y_2 = 604,84 + 0,03X_5$	$R^2 = 0,12$	$r = 0,34$	$E = 1,81$

*Source: prepared by the author.*

The analyses conducted show that the linear multiple regression equation of the joint effect of the explanatory variables we selected on the price of one square meter of housing in the primary market is obtained as follows:

$$Y_1 = 7376,51 + 3,64X_1 - 0,79X_2 - 0,22X_3 + 2,41X_4 \quad R^2 = 0,87$$

$\begin{matrix} P & (0,12) & (0,05) & (0,25) & (0,25) & (0,98) \end{matrix}$

According to the regression equation, an increase in monthly income (average), i.e.  $x_1$ , by 1 manat, increases the price of one square meter of housing ( $Y_1$ ) by 3.64 manat, while an increase in the total area of housing per resident ( $X_4$ ) by 1 sq.m. increases the price of  $Y_1$  by 2.41 manat. The regressors  $X_2$  (number of population) and  $X_3$  (number of newly commissioned apartments) have a decreasing effect on the dependent variable  $Y_1$ . Thus, a one-unit increase in  $X_2$  decreases the dependent variable  $Y_1$  by 0.79 manat, and a one-unit increase in  $X_3$  decreases  $Y_1$  by 0.22 manat.

Thus, the factors that have a significant impact on the price of 1 sq.m. residential real estate in the primary market and actively participate in its formation are the average monthly income of the population per capita, the number of newly commissioned apartments and the average living area per resident. According to the economic

interpretation of this regression model, with a 1% increase in the average monthly income of the population, the price of 1 sq.m. residential real estate increases by 0.99%, as a result of a 1% increase in the number of newly commissioned apartments, the price of 1 sq.m. residential real estate decreases by 0.79%, and a 1% increase in the total area of residential apartments per resident reduces the price of 1 sq.m. apartment by 8.58%.

The econometric equation for the dependence of 1 sq.m. residential area ( $Y_2$ ) on the average monthly income of the population per capita and the demographic situation in the secondary market will be as follows:

$$\ln Y_2 = 149,82 + 1,34 \ln X_1 - 16,46 \ln X_2 \quad R^2 = 0,75$$

$\underset{P}{\phantom{\ln Y_2}} \quad \underset{(0,01)}{\phantom{149,82}} \quad \underset{(0,00)}{\phantom{1,34}} \ln X_1 \quad \underset{(0,01)}{\phantom{-16,46}} \ln X_2$

It is clear that all the coefficients of the model are statistically significant and the model as a whole reflects the real conditions quite correctly. For the model,  $DW=1.98$  is equal to. If we apply the "rough rule" of estimation, then we get  $1.5 < 1.98 < 2.5$ . Thus, there is no autocorrelation in the model. According to this model, a 1% increase in the average monthly income of the population increases the price of 1 sq.m. of living space by 1.34%, and a 1% increase in the population increases the price by 16.4%.

Based on the established econometric models, the forecast price of 1 sq.m. of residential real estate in the real estate market was determined using the trend analysis method. (Table 3.2.3, see in the dissertation)

Thus, based on the forecast of prices in the developed housing market in 2020, in 2025 the price of 1 sq.m. of residential real estate in the primary market was expected to be 1556.73 manats per sq.m. and in the secondary market to be 1634.28 manats. In 2026, these indicators were projected to increase by 7.6% and 6.8%, respectively, to 1674.65 manats and 1745.35 manats.

**Provision 5. Due to the incompleteness of the statistical information base characterizing the activity of the Azerbaijani housing market, it would be useful to develop a methodology for determining the accessibility of housing to the population, taking into account local characteristics, based on international experience, in order to accurately determine market indicators.**

Before proceeding to the methodological support for determining housing accessibility, we would like to pay attention to the prospects for housing provision in the city of Baku, which is already crowded today. As is known, *on December 30, 2023, the Cabinet of Ministers approved the General Plan for the development of Baku until 2040. This document identified an area of 125 ha suitable for housing construction in Baku*<sup>11</sup>. It is expected that housing construction in this area will increase the housing area per person from 20.8 sq.m. to 25 sq.m. The main argument here is that the gradual relocation of housing construction from the center to the outskirts of the city will create a basis for relatively affordable prices and the elimination of congestion in the center.

One of the factors determining the availability of housing and the demand for housing is the amount, duration and form of payments for the purchased apartments. *In accordance with the Decree signed by the Head of State Ilham Aliyev on May 25, 2022, the approval of the rules and conditions for the refund of part of the VAT paid for residential and non-residential premises purchased with non-cash payments also serves this purpose.*<sup>12</sup> According to these rules, a citizen who purchases an apartment can refund 30% of the VAT paid during non-cash payments. It is noteworthy that this condition applies only to apartments purchased from HCC. Thus, the increase in demand for apartments offered by HCCs may have an impact on the demographic environment. Thus, the relative stability that will arise in the prices of apartments built around the city will result in increasing their accessibility.

According to international practice, in order to calculate the activity in the housing market as a whole, it is necessary to divide the number of transactions conducted in a certain period of time by the number of offers. It is possible to measure this indicator in countries with open statistics on the real estate market. Unfortunately, in our country, since information on transactions conducted is completely confidential, it is impossible to accurately measure this important market indicator.

According to the UN methodology, the housing affordability index is calculated as the ratio of the average price of a house (in dollars) to

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<sup>11</sup><https://e-ganun.az/framework/55991>

<sup>12</sup><https://e-ganun.az/framework/49676>

the average income of one family member (in dollars per year). The value of these indicators is close to the number of years that can be saved for a house, assuming that the money saved will be saved for the purchase of a house.

Lack of data on median income and median housing prices in Azerbaijan, it seems difficult to calculate the housing affordability coefficient based on this formula. A possible way out of this situation is to involve unofficial data sources. However, this does not provide a fundamental guarantee of the accuracy of the research results.

**Housing accessibility** We propose the following methodology as a more advanced indicator for determining the accessibility of housing. According to this methodology, the accessibility coefficient ( $M_{ech}$ ) of the apartment is calculated using the following formula:

$$H_{ac} = H_{ap} \times H_a / P_i \times P_n$$

Here:  $H_{ar}$  is housing accessibility coefficient;

$H_{ap}$  – average price per 1 sq.m. of total area of the apartment, manat;

$H_a$  – conventional housing area, sq. meters;

$P_i$  – nominal income per capita, manat (annual);

$P_n$  – number of people in the family, people is determined.

According to international practice,  $H_a = 54$  sq. meters;  $P_n = 3$  people are accepted. However, in Azerbaijan, the average family size is 4 people (see table 3.2.5 in the dissertation).

From the results of the developed methodology, as well as the given conditions, it can be seen that the criterion indicator of the housing affordability coefficient according to the nominal income level of the population was more effective in 2017.

Studies also show that as the calculated accessibility coefficient in the housing market approaches unity, the housing market becomes adequate in terms of the income of the population and the purchasing power according to the given formula. We can express this proposition as follows.

$$(H_{ap} \times H_a / P_i \times P_n) \rightarrow 1$$

It can also be noted that the approach of the obtained result (affordability coefficient) to unity is considered an indicator of high purchasing power in the housing market.

**Provision 6. Analyzing the volume and structure of financial**

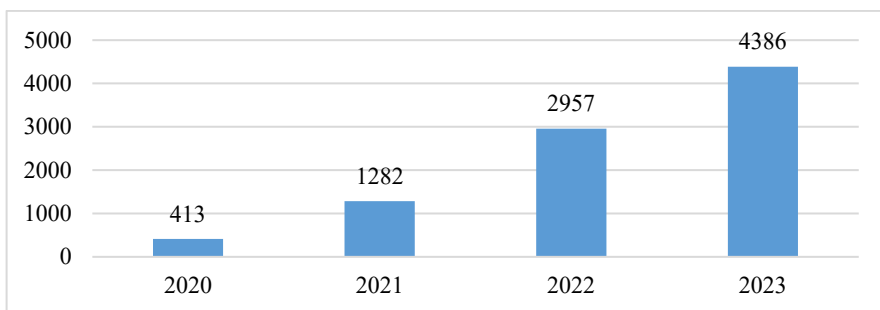
**sources based on transactions in the Azerbaijani housing market, assessing the level of use of borrowed funds and opportunities of housing buyers in the country can have a positive impact on the development of this sector and the expansion of mortgage lending.**

At the beginning of the period of independence in the Republic of Azerbaijan, the formation of the real estate market, as well as its prospective opportunities, required a long-term period, so there was a problem in crediting the activities of construction companies. In the current situation, it was necessary to improve the legal framework for pledging real estate and the emerging banking system, regulate inflation, and create favorable conditions for investment.

The pace of growth in the construction sector of the housing market in Azerbaijan began to accelerate in the late 20th century. Since then, investment in housing construction has steadily increased every year, and the profitability of the economic sector has also increased. However, since 2020, there has been a decrease in the amount of investment in housing construction. Thus, the amount of investment in housing construction amounted to 1342 million manat in 2001-2005, and increased to 5844 million manat in 2016-2020. However, the volume of investment in 2021-2023 decreased to 3192 million manat. This is 1.8 times less than in 2016-2020. Analyses show that an effective mechanism for financing housing construction, in addition to being an integral element of social policy, has become a key factor in economic growth and a new financial instrument that accelerates the inflow of investments into the country's economy. Recent research shows that in order to meet the population's demand for housing, the Decree of the President of the Republic of Azerbaijan “*On the establishment of a mechanism for renting out residential areas with the obligation to sell them*” was issued.<sup>13</sup> The main target group of the mechanism arising from the decree is individuals who are solvent. However, although their access to mortgage loans is partially limited, we can observe a high trend in the level of utilization. It can be seen from Diagram 3 that while the number of contracts concluded by the MCGF with the population in 2020 was 413, this indicator increased to 4386 in 2023.

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<sup>13</sup><https://e-ganun.az/framework/41284>



**Diagram 3. Dynamics of contracts for the lease of residential premises with an obligation to sell (31.12.2023)**

*Source: <https://mcgf.gov.az/menu/120>*

Another study shows that by the end of 2023, the regular mortgage loan provided by the MCGF for the purchase of “social houses” in the republic amounted to 2.03 million manat, while the preferential mortgage loan amounted to 8865 million manat. The share of preferential mortgage loan amounted to 30% in 2023. (Table 3).

**Table 3  
Dynamics and structure of mortgage loans issued by the Fund**

Criteria \ Years	Years										2023 compared to 2015, times
	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Ordinary mortgage (million manat)	489	508	571	854	951	1,096	1,349	1,663	2,013	4.1	
Soft mortgage (million manat)	182	196	247	356	435	545	647	753	865	4.8	
Share of - preferentia mortgage - loans in total mortgages (in %)	27.5	27.8	3.02	29.4	29.3	33.2	30.8	31.2	30.0	X	

*Source: The table was compiled by the author based on data from the Mortgage and Credit Guarantee Fund of the Republic of Azerbaijan.*

*<https://mcgf.gov.az/menu/120>*



Research shows that there are great opportunities in Azerbaijan to influence the development of the mortgage market by offering loans to families of different income levels. In order to ensure the development of the mortgage market in Azerbaijan, the cost of real estate, interest rates and administrative process Determining the criteria for grouping is an important condition.

It is clear from the analysis that currently no country's housing market is static. Therefore, the conjuncture changes and problems occurring in this market increase the risk level of mortgage loans. In order to reduce this type of risk level, there is a need to expand the activities of SHCA LLC, which builds social housing in Azerbaijan and offers it to the market. On the other hand, in order to determine the potential for expanding mortgage lending by applying economic-mathematical methods of determining the level of population utilization of mortgage loans in the housing market, an identification system should first be used in the compilation of model data (see table 4.4.1 in the dissertation). Thus, as a dependent variable, the volume of mortgage loans (in million manats) ( $K_v$ ), and as explanatory factors, the weighted average interest rate on mortgage housing loans ( $K_{wap}$ ); weighted average term on issued mortgage housing loans ( $K_{wat}$ ); average price of 1 sq. meter of the total area of the apartment ( $Q_{ap}$ ); total area of the apartment put into use (TAA), thousand sq. meters ( $A_{ap}$ ); average monthly nominal wage, manat ( $Q_{am}$ ).

Using the Eviews program, we construct a regression model of the effect of the explanatory variables on the dependent variable ( $K_v$ ).

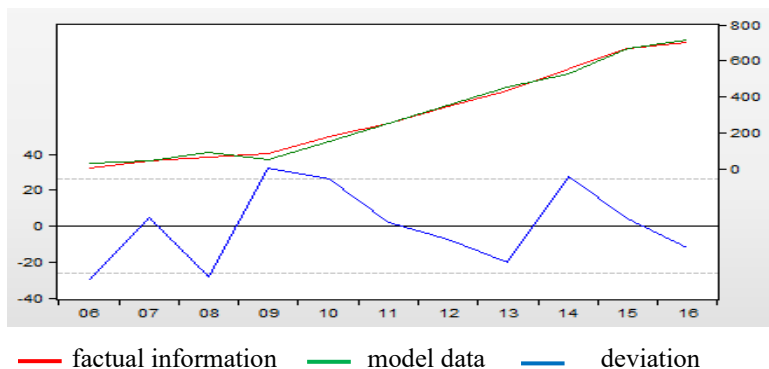
$$K_v = -1020,010 - 94,60\dot{I}PF + 8,32\dot{I}PM + 0,16\dot{I}MS \quad (1)$$

$$K \quad (0,04) \quad (0,03) \quad (0,00) \quad (0,00)$$

the value of the coefficient of determination of equation (1)  $R^2 = 0.99$  is quite close to 1, its quality can be considered high. It is clear from the regression equation that the upper level of reliability of the value of the coefficients  $K$  probability ( $\alpha$ ) is considered significant at the value of  $\alpha=0.05$ . Of course, in such cases there is no multicollinearity between the indicators (parameters).

demonstrate that the regression model is of high quality and meets all the conditions of the MRR, and that it can be used in future analysis and forecasting of the mortgage market.

To conduct a visual analysis of the quality of the constructed regression model, use the EViews software package. A visual representation of the quality of the regression model can be given: actual data (Actual), model data (Fitted), and residuals (Residual) (Figure 1).



**Figure 1. Visual representation of regression model quality**

*Source: The diagram was prepared by the author.*

The visual representation of the quality of the regression model shows the good explanatory power of the model. The actual and model data are consistent with each other, and the built model fully and completely expresses the activity of the mortgage fund in the housing market. However, the residuals do not behave adequately in relation to the indicators. This may also be due to the small number of model observations. Since the mortgage housing lending system is one of the new areas for the territory of Azerbaijan, its statistics begin in 2006 (the analysis was conducted on the basis of annual indicators). The analysis showed that during this period the statistics of providing the population with housing with the help of mortgages increased.

**Provision 7. Accelerating the application of digital technologies in regulating the development of the housing market can make a significant contribution to the effective use of the opportunities created by digitalization in the construction sector, as well as in the process of restoring and reconstructing the territories liberated from occupation.**

One of the main priority areas of sustainable economic

development of Azerbaijan is the construction sector. The research work examined the multifaceted directions of housing construction works. Determining the characteristics of construction works and assessing their efficiency was accepted as the main condition. Based on the general conditions, methodological approaches were implemented in the system of multi-criteria indicators and control over digital information systems. The study shows that the effective activity of construction works in the direction of construction technologies can be based on the decision-making process in the context of sustainable development. The priorities of consumers of construction industry products directly depend on the geographical location of the facilities, and people's lives on the quality technologies used in construction. Thus, the high-quality and rapid implementation of construction works and the completion of residential buildings directly affect the satisfaction of the population's demand for housing.

People's demand for building structures is also constantly improving. Thus, the development of "smart" building structures has already become a modern trend.

In the modern era, the use of Internet marketing technologies can be considered as the main tool influencing the behavior of consumers of construction industry products. From this aspect, separate schemes should be created, as a result of classical and modern Internet marketing technologies, forms of marketing combinations. For example, participation in electronic platforms, online advertising and newsletters, affiliate marketing, etc. Research shows that the construction industry process should be gradually digitized. This will help to solve potential problems at the direct procurement stage.

*A number of technologies envisaged in smart city programs can be applied, which are also designed to solve new infrastructure problems associated with increasing demand.*<sup>14</sup>

Here, "smart materials" should play a decisive role in construction technology.

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<sup>14</sup> Berglund, EZ, Monroe, JG, Ahmed, I., Noghabaei, M., Do, J., Pesantez, JE, ... & Levis, J. (2020). *Smart Infrastructure: A Vision for the Role of the Civil Engineering Profession in Smart Cities*. *Journal of Infrastructure Systems*, 26(2), 03120001. [https://doi.org/10.1061/\(ASCE\)IS.1943-555X.0000549](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000549)

*Smart contracts are one of the main complementary concepts of building information modeling (BIM). This allows for the purposeful use of materials during construction and minimizing design risks.* <sup>15</sup>*In this direction, on April 19, 2021, the President of the Republic of Azerbaijan Ilham Aliyev signed an Order on the development of the “Smart City” and “Smart Village” concepts.* <sup>16</sup>*During his visit to the liberated Fuzuli, Zangilan, Lachin and Jabrayil regions in February, President Ilham Aliyev noted that “smart villages” will be built in these areas based on the most modern technologies. The most leading companies will be involved in construction to implement these. He will also develop agrarian and agricultural sectors using renewable energy. He also announced that the liberated regions will become “green energy” zones. Currently, the tasks set are being implemented at a very high level. Hundreds of families have returned to their native lands and improved their housing and living conditions.*

The reality is that in the first half of 2024, more than 400 families returned to the Lachin region. It should also be noted that after the liberation of Karabakh from occupation, the village of Aghali, built in the “Aghali-1”, “Aghali-2”, “Aghali-3” villages of the Zangilan region, was built based on a new concept. Although this concept is an expensive idea. However, the welfare and comfort of the people were considered the main priority for our state. Research shows that the application of digital technologies in newly built residential areas in the liberated territories will accelerate the flow of young families from the city to the countryside. This will also be reflected in a positive change in the demographic factors between cities and villages.

Some of the internally displaced persons have been provided with completely new apartments. Also, all the necessary infrastructure, schools, kindergartens have been built and put into operation in the village. In the future, in order to provide employment to local residents,

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<sup>15</sup> Ye, Z., Yin, M., Tang, L., & Jiang, H. (2018). *Cup-of-Water theory: A review on the interaction of BIM, IoT and blockchain during the whole building lifecycle*. In ISARC. *Proceedings of the International Symposium on Automation and Robotics in Construction* (Vol. 35, pp. 1-9). IAARC Publications. <https://doi.org/10.22260/ISARC2018/0066>

<sup>16</sup><https://president.az/az/articles/view/51179>

new production and service areas are being created by developing small and medium-sized entrepreneurship. The construction of a new railway line to Nakhchivan will lead to economic development in the region.

**Provision 8. Since consumers have different tastes in construction and industrial products and technologies introduced to the housing market, the application of a compensation model for the hedonic assessment of consumer behavior, taking into account their sensitivity to market changes, is of particular importance.**

Studies show that consumer taste can be considered as a key component of the hedonic approach. The measures to be taken in this direction include creating a basis for using the hedonic model. One of these factors is the price set for apartments. Here, one of the main factors affecting prices is consumer behavior. From this aspect, determining and choosing a behavioral strategy is one of the main issues. A multi-component approach is used in characterizing the product. Such ideas are tried to be justified by such components, where consumers evaluate the final result of construction as a product. Since consumers have different views on new technologies, differences in behavioral strategies are formed. The hedonic system provides a basis for assessing this. Its essence can be expressed using the following<sup>17</sup>

$$PI_{ij} = \sum_{k=1}^n RI_{jk} \times PDP_{ijk}^a,$$

where,  $PI_{ij}$ —  $j$  is the position of the  $i$ th individual regarding construction industry technology;

$RI_{jk}$ — relative importance of technological feature  $k$  for individual  $i$ ;

$PDP_{ijk}^a$ — the level of technological development in the construction industry project, perceived through the  $i$ -th individual (score);

$n$  is the number of components (features).

technologies used in the construction sector.

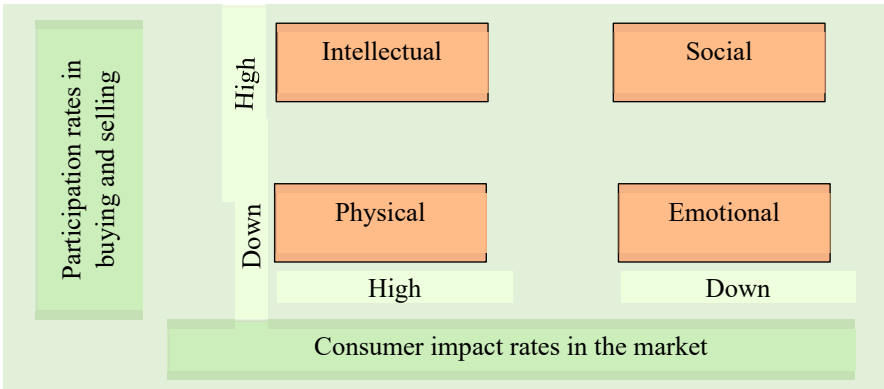
Housing construction and construction work are considered the locomotive of the economy after oil. In the near future, this activity can become an engine of economic growth dynamics. The expansion of housing construction, while having a positive impact on the well-being of the population, also creates many difficulties. Thus, new infrastructure and communication lines must be laid in connection

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<sup>17</sup> <https://academic.oup.com/ijlct/article/doi/10.1093/ijlct/ctab078/6433055>

with the construction of apartments. Here, the presence of interests within the framework of public-private-business partnership is of particular importance. Private business should prioritize public interests along with personal interests. The consumer compensation model should be taken as a priority in the implementation of construction work.

In all regions, the main direction is revealed by the preferences of buyers in areas with intellectual content and social content. The analysis conducted around the hedonic model shows that the priorities of consumers in the housing and construction industry should be determined. We have constructed a matrix to determine the place of hedonic adaptation in the consumption process of industrial products (scheme 1).



**Scheme 1. Factors stimulating marketing in the construction industry forms of influence on consumers**

*Source: The matrix was prepared by the author.*

The forms of influence of marketing stimulating factors on the consumer are determined horizontally, and vertically according to the degree of participation in the purchase and sale. Four possible options for consumer behavior are identified.

The presented matrix determines the place of hedonic adaptation in the process of consumption of construction products.

Modern marketing strategies should be changed to effectively stimulate consumption in the construction sector in accordance with

the main priorities of buyers indicated in the matrix and also determined. Currently, the population segment needs visualization of the stages of the construction project, new relevant feelings and emotions for better understanding and perception. At the same time, the main priorities of consumers should be focused on the relative preservation of landscape features, as well as the full intellectual component of the construction industry equipment, which is most relevant for the necessary efficient use of resources.

The dynamics of the full socio-economic development of society is subject to conscious management, which is essential. Naturally, the planned construction of smart villages and green ecological cities in the housing and construction sector should be the main condition. Consumers should give more preference to environmentally conscious and modern smart construction technologies in line with the requirements of the time. This will mainly arise from the desire to preserve the basic characteristics of consumers, such as the abundance of information, as well as the beneficial use of relevant resources.

**Provision 9. The possibilities of applying a five-dimensional spatial model (human factor, determination of conditions, functional, geometric and time dimensions) in the management of buildings in the housing stock of Azerbaijan that have reached the end of their service life and are physically and functionally obsolete, as well as the creation of clusters in the process of housing construction and operation, their future prospects and application possibilities will create a solid foundation for solving problems in this area.**

It is clear from the research that, along with the successful construction process carried out in our republic, there are many problems in the future prospects of the housing market. The difficulties in managing large cities in terms of improving the housing and living conditions of the population attract attention.

When talking about the current situation and problems of the housing market in Azerbaijan, the infrastructure condition of housing in the post-Soviet states is first of all characterized as a situation that can cause social problems. The obsolescence of the communication system, the threat of actual collapse of communication lines, and the

low level of energy efficiency of old outdated buildings are mainly manifested in the fact that.

We have examined the possibilities of applying the five-dimensional spatial model in world practice for the effective implementation of housing policy. Thus, as a result of the application of the five-dimensional spatial model, many European and other developed countries use it effectively.

Analyzing and summarizing the state housing policy and international experience, we come to the conclusion that in order to effectively implement housing policy in large cities of Azerbaijan, theoretical issues must first be resolved. For this purpose, a five-dimensional spatial model is proposed. In this model, conditions should be created for the implementation of various spatial planning works and optimal management of the city, provided that the human factor, the dimension of conditions, the functional dimension, the geometric dimension and the time dimension are mutually systematic and hierarchical. In the five-dimensional model, in addition to the measurable nature of each factor, functional resources should also be available. Modernity and antiquity intersect in housing construction. The construction of modern and new buildings should not harm the architecture of the city. That is, all dimensions in the state housing policy should be sequentially coordinated in time. This also determines the correct management strategy in large cities. It is clear that the issue here can be resolved by consisting of appropriate conditions and goals. Research shows that the conditions are intended for the territory, and the goal is formed by the segment of the population living in large cities. Thus,

1. Human factor. Here the main factor is the population segment. The number of families, the class of people (wealth), the composition of the family, as well as the growth rate are demonstrated. The social status of the population and the ecosystem should also be taken into account here.

2. The size of the conditions. Here legal and political issues come to the fore. The construction of residential buildings in a more favorable position away from the highway but in terms of infrastructure, as well as the suitability of the environment for the



living space in terms of the ecosystem, are important conditions. First of all, the improvement of urban planning work, the regulation of relations with the environment and the formation of a new environment are also the main conditions.

3. The functional dimension includes the economic factor and spatial component of the construction industry carried out in the state housing policy. The activity of the primary housing market accelerates the process of reproduction and increases the volume of investment growth. In this regard, the state housing policy is more based on the economic factor, and also leads to the development of economic regions (regions). The expansion of construction work in large cities creates conditions for the implementation of other road, transport, industrial, and engineering works.

4. Geometric dimension - this mainly includes the structure of large cities and the function of the city. With the new relevant decision of the Cabinet of Ministers, the process of approving the "Master Plan of Baku City" will strengthen the implementation of new projects. Thus, new engineering and transport projects will be implemented to eliminate traffic jams in the city. It would be appropriate to prepare master plans for other large cities.

5. Time dimension - in large cities, it mainly determines the past, current situation and future. The construction of modern and new buildings should not harm the architecture of the city. That is, all dimensions in the state housing policy should be sequentially coordinated in time. This also determines the correct management strategy in large cities.

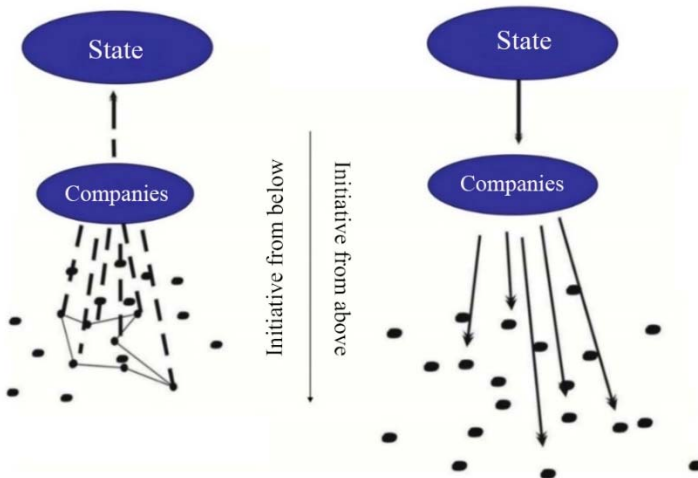
Based on the above, it can be noted that the basis of the state housing policy should consist of the following approaches.

- Increasing responsibility in the housing construction sector in large cities and reducing the negative impact of companies on the environment during construction;
- Increasing financial resources for the construction of housing construction, increasing attention to social housing policy;
- Carrying out housing design work in accordance with the relief;
- Correctly formulating housing policy in the secondary housing market.

The implementation of management decisions and the application of regulatory methods in any area of the economy are carried out by the relevant state and municipal authorities within the framework of their functions and powers. The need for consistent use of these methods can be associated with the creation of new construction companies, the expansion of existing construction areas, changes in urban planning and construction legislation, and the formation of construction clusters.

The transformation of efficiently operating clusters into large investment objects causes the state to take a special interest in them, and therefore the state itself participates in the creation of clusters. There are certain differences between a cluster and other economic associations or groups. It can be shown that, unlike a cartel and a financial group, a cluster unites several strong companies that are in competition with each other. An interesting point is that, despite the fact that some experience has been accumulated in the countries of the world on the creation of clusters, there is no unambiguous approach to their essence.

It can be concluded that it is advisable to implement the formation of housing clusters with direct state guarantees.



**Figure 1. Clustering initiatives**

*Source: Prepared by the author*

It should also be taken into account that clusters can operate on the basis of coordination of various development directions. In the creation of clusters, the development of scientific and technical, design and construction works and innovation, which are mainly directed at them, is considered an absolute step.

From the conducted studies, it can be concluded that the first step or stage in the creation of construction clusters is the formation of initiative groups.

Summarizing the results of the studies, it can be noted that there is no complete and unambiguous description of the essence of the cluster, as well as a standard scheme and strategy of activities. Nevertheless, in the context of the author's research, we offer the following subjective approach to the essence of housing construction and operation clusters: a cluster is a complex of enterprises with a unified strategy, geographically localized, having mutual financial and economic relations and synergistic effects, aimed at the construction and operation of apartments. From the description of the essence, it can be seen that in order to group companies in the sphere of housing construction and operation, they must be geographically localized. Such an approach is not typical for other areas.

It is also worth noting that enterprises included in the cluster can regulate their activities based on the cluster strategies indicated by us earlier. In our opinion, the synergistic effect is also a source of ensuring the advantage of the product (service) and the company included in the cluster. Taking this into account, we believe that the implementation of the following measures to create construction clusters will be effective:

- ✓ Creation of associations uniting cluster companies;
- ✓ Creation of a construction cluster based on ensuring “state-business-research-innovation” mutual relations;
- ✓ Location of construction cluster elements within a maximum radius of 40-50 km;
- ✓ Creation of an accreditation organization that assesses the effectiveness of clustering.
- ✓ Application of a cluster approach to housing construction and operation in their territories can create the basis for municipalities

to obtain the following advantages. Thus, it can stimulate the development of the municipal economy by companies, contractors and service enterprises engaged in housing construction. This can be achieved through the introduction of innovations aimed at expanding the application of innovations in order to further improve the quality of services provided.

The results obtained during the research work, new scientific approaches were summarized, and relevant proposals and recommendations were put forward.

1. One of the important steps in determining the level of formation and development of the housing market is an objective assessment of activity in the market. In international practice, this indicator is determined by dividing the number of transactions registered in a certain time interval by the number of offers. It should be noted that the relevant calculation is based on open and advanced statistics. Although the housing market in Azerbaijan, especially in large cities, has reached a certain level of development, keeping information about concluded transactions confidential does not allow for an accurate measurement of the market indicator in question. In this regard, we believe that an advanced information base should be formed within the framework of the digitalization program of the housing market in the country. If this is achieved -

a) relevant state bodies, researchers and experts can accurately determine the real state of the housing market in the country;

b) notarizing the inclusion of apartments sold in newly constructed buildings into a single information base would eliminate resales, which currently cause numerous lawsuits.

It should also be noted that the sale of one apartment to several people in new buildings leads to the population losing confidence in them, revitalizing the market for old apartments and individual courtyard houses.

2. Among the problems associated with increasing the housing stock in Azerbaijan is the demolition of apartments whose service life has expired and the provision of new apartments to the population. Although this often creates the basis for the implementation of new infrastructure projects in cities, it sometimes causes dissatisfaction

among the institutions related to the population whose apartments are demolished. An important subject of dispute here is the valuation of apartments. Two important points come to the fore here:

a) the biased valuation of apartments to be demolished and the land plots belonging to them;

b) the insufficiency of compensation for the plots of apartments to be demolished, i.e. the insufficient provision of new apartments to them.

We believe that the second issue is largely due to the first. Therefore, the methodology for conducting mass valuation in the country should be reviewed, and approaches to the valuation of land plots, auxiliary facilities, etc. should be improved.

3. Although ready-made apartments in Azerbaijan are included in the compulsory insurance system, construction companies carry out building construction without insurance. Therefore, shareholders face a great risk if the construction of buildings under construction remains incomplete. Delays in housing construction for years lead to inadequate conditions, such as construction companies selling one apartment to several people to get out of the situation and obtaining financial opportunities for a temporary period. In this regard, the mandatory pre-insurance of new buildings intended to be built on the basis of design and estimate documents approved by the relevant executive authorities should be established by a conditional law.

4. No matter how liberal the housing market is, there is always a need for a state control system here. Such control is especially necessary in the housing construction sector, which is carried out with the financial support of the state. In addition, a mechanism should be formed to monitor whether housing construction works carried out in any part of the country or city harm the health and safety of the population, as well as the property interests and interests of those living in the neighborhood:

Considering the above, we believe that during the organization and implementation of housing construction works, it is necessary to consistently monitor the implementation of the rights of the parties determined by the Constitution and Civil Code of the Republic of Azerbaijan, as well as the application of restrictions. Thus, the

presence of dissatisfaction and disputes in the housing construction sector reduces the interest of the population in the housing market.

5. According to paragraph 4.0.2 of Article 4 of the Housing Code of the Republic of Azerbaijan, municipalities have the right to rent out their residential premises (areas) to citizens of the country on the basis of a rental agreement (social). However, the creation of a municipal housing fund (social) remains a problem. In this regard, it would be appropriate to create and expand the municipal housing fund, taking into account the socially vulnerable groups of the population.

6. The conducted research shows that, taking into account the problems in the proper management of funds for monthly utility services received by owners in housing exploitation areas operating under the Housing and Utilities Commission, control over the fulfillment of the requirements for the establishment of a Joint Housing Owners' Association (JHA) in newly constructed and commissioned buildings should be strengthened. In our opinion, this will lead to the proper management of the housing and utilities system.

7. There is no doubt that the conjuncture changes taking place in the housing market expose potential buyers and construction companies (investors) to certain risks. Therefore, measures should be taken to ensure that they exit the relevant process with the least losses. For this purpose, the direction and degree of influence of each factor affecting the housing market should be determined by applying econometric models and mathematical-statistical methods. We believe that the result obtained here can be a forecast of apartment prices that are in the interest of the parties.

8. In order to ensure the future development of the housing market in Azerbaijan, it is necessary to increase the volume of investments made by construction companies and improve the financing mechanism in general. In our opinion, in order to solve this issue, it is necessary to increase the number of authorized banks participating in mortgage lending, and to provide special privileges to banks that provide housing loans at the expense of their own funds, especially to the privileged strata of the population. As a result, the banking system will also contribute to the development of the housing market.

9. A comprehensive analysis of the number, duration, sources of

financing, etc. of transactions in the housing market has been conducted. Because only in this direction can a real idea be obtained about the development of the housing market and the possibilities of housing buyers to use borrowed funds. Taking this into account, the interaction and dependencies between the factors that determine the availability of affordable housing, financing the construction and purchase of housing should be determined on the basis of official statistical indicators. We believe that this issue can be resolved on the basis of economic and mathematical modeling of the development trends of housing construction and sales, as well as mortgage lending in Azerbaijan.

10. One of the elements of the development of the housing market is to increase the volume of supply, align it with demand in terms of volume and structure. In this regard, it is inevitable to explore the possibilities of increasing supply and implement a marketing segmentation strategy in the housing market to achieve this. We believe that the “Pressure and Influence Strategy in the Housing Market” developed by us in this direction may be important. In that strategy, the general scheme of relations between the construction company, realtor and buyers is selected as the main line for identifying consumer needs and promoting housing sales. Naturally, this is also one of the issues of importance in terms of the development of the housing market.

11. In order to fully resolve institutional issues in the housing market of Azerbaijan, specific standards for operations carried out in the banking system should be developed, and lending procedures should be simplified. The specified procedures should include the volume of sales of credit products; credit transactions and underwriting of borrowers; servicing of overdue and defaulted loans, loan portfolio; accounting of mortgage transactions; formation of reserves; conclusion of mortgage transactions; sale of credit products, risk management.

In accordance with the above, the following objectives should be taken as a basis:

- commercial banks should adapt the mortgage loans they offer to the population segment to the procedure carried out by authorized banks and thus optimize their credit policy.

- the volume of mortgage loans issued by banks should be increased and the population segment should be expanded.

In general, regardless of their purpose, the application of an insurance system to reduce the risks of the services (mortgage) that other credit organizations will provide to the population.

In order to achieve the goal set as one of the requirements of the modern era:

- mortgage housing lending standards and an improved credit policy should be developed;
- the number of housing lending institutions should be increased.

12. As is known, the mission of the State Agency for Housing Construction is to improve the housing and living conditions of the low-income segment of the population. One of the general results of its activities should be the formation of a social housing construction sector in the country. The aforementioned agency is currently playing an important role in increasing the activity of the housing market by implementing affordable housing construction projects in various cities and regions of Azerbaijan. In order for its successful activities to be sustainable, in our opinion, it is necessary to increase the share of financial resources in the market and expand the opportunities for involving the private business sector as a partner in housing construction.

13. Attracting local and foreign investors to the housing market, as well as creating a favorable operating environment for them, is also an important issue. To solve it, it is considered appropriate to take the following measures:

- Ensuring control over the implementation of intensive housing construction in accordance with the master plan of cities, the urban planning and construction code;
- Determining the optimal financing system for construction processes carried out in accordance with the aforementioned documents;
- Expanding measures to attract credit institutions to the housing market;
- Increasing investor confidence by ensuring transparency in the application of digitalization in the field of housing construction.

14. The hedonic behavior of end consumers in the construction complex should be investigated, and for this purpose, important factors such as aesthetics and social well-being should be taken into



account. In accordance with the challenges of the modern era, one of the main tasks in the housing construction sector is currently increasing the efficiency of the implementation of “green infrastructure” projects. Thus, factors such as thermal insulation of newly commissioned apartments in the housing market, environmental aspects, have a specific impact on the volume of demand for apartments. The implementation of housing construction in “green areas”, the use of environmentally friendly and high-quality construction materials encourage potential buyers to pay more for housing. Thus, the determination of the hedonic behavior of housing buyers should be taken seriously.

15. In order to effectively implement housing policy in large cities of Azerbaijan, in addition to existing theoretical and methodological approaches, we propose a five-dimensional spatial model. We believe that this model determines the impact of human, conditions, functional, geometric and time factors on the housing market separately and in a complex manner. Although there is a human factor in the construction of the apartment and the person living in the apartment, it is undeniable that the construction process is carried out in a certain space and in accordance with geometric dimensions. The directions and degrees of influence of the listed factors can be correlated as follows:

- a) Human factor: number of family members, people's mindset, social status and ecosystem;
- b) Existing conditions and conditions: political situation, legal framework, restrictions, suitability of the environment for living space;
- v) Functional dimension: urban planning norms, investment factor, level of infrastructure development;
- d) Geometric dimension: city area, population density, construction resources and number and area of completed buildings (apartments);
- c) Time dimension - mainly covers construction and architectural traditions and methods of the past, present and future. In this regard, all factors and dimensions in housing policy should be coordinated in accordance with time.

16. In Azerbaijan, it would be expedient to establish housing construction clusters with state support in order to carry out housing construction works and also regulate prices in the housing market.

**The applicant's scientific conference materials and theses and scientific articles published in reputable journals related to his dissertation work are as follows:**

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