REPUBLIC OF AZERBAIJAN

On the rights of the manuscript

ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

DIRECTIONS OF MANAGEMENT AND IMPROVEMENT OF INVESTMENT-INNOVATION ACTIVITY IN INCREASE OF THE COMPETITIVENESS OF CONSTRUCTION INSTITUTIONS IN THE REPUBLIC OF AZERBAIJAN

Speciality:	5312.01 - "Field economy"
Field of science:	Economic sciences
Applicant:	**Orkhan Ajam Nagdiyev**

Baku – 2024

Dissertation work was performed at Azerbaijan University of Architecture and Construction.

Scientific supervisor: doctor of economic sciences, professor,
Mahabbat Ashir Mammadov

Official opponents: doctor of economic sciences, professor
Elshan Mahmud Hajizade

PhD in economics, associated professor
Tabriz Abdulla Yadigarov

PhD in economics
Fuad Hidayet Bashirov

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

Chairman of the Joint Dissertation Board: Full member of ANAS, doctor of economic sciences, professor
Ziyad Aliabbas Samadzadeh

Scientific Secretary of the Joint Dissertation Board: doctor of philosophy in economic sciences, associate professor
Samira Yashar Mammadova

Chairman of the scientific seminar: doctor of economic sciences, professor, Honored agricultural worker **Islam Haji Ibrahimov**

GENERAL CHARACTERISTICS OF THE RESEARCH

The actuality and the degree of problem development of the research. In the conditions of the digital transformation of the economy, the presence of competition between commodity producers in the globalized world economy is one of the conditions for the functioning of the market economy. The success achieved in the conditions of mutual competition among commodity producers depends fundamentally on the innovative activity of enterprises, along with many factors. As in all areas of economic activity, increasing the competitiveness of construction enterprises is organically related to the optimal management of innovation-investment activity.

The use of new technologies and materials in the investment-construction complex allows to successfully compete in global and national markets due to the improvement of its quality by saving production resources, reducing the time spent on the production of products and services.

The results of innovative activity in construction are understood as the process of using the results of scientific, research or scientific-technical activity in various fields directly related to the development of innovations and its promotion, aimed at improving human life. Currently, there are a number of problems in the development and implementation of innovations by enterprises and organizations in the investment and construction sector. In addition to economic factors such as the lack of funds for the innovation activity of construction enterprises, the high cost of innovations, high economic risk, long payback periods for new products, low innovative potential, lack of qualified personnel, weak cooperative relations with other scientific institutions production and other factors such as the presence and so on had a negative impact. In addition to all this, the level of development of local design organizations operating in the field of construction is not high. The US, UK, Canada, Australia, Netherlands and Chinese companies, which are the world's largest and well-known design organizations, have achieved wide success mainly due to the application of innovative design technologies, working with prospective clients, raising the level of professionalism

of employees, creating interest in the company's success among employees, and so on. A significant part of the technologies is developed and implemented by the investment and construction organizations themselves.

Studies show that today, greater attention should be paid to "smart" construction, that is, to the use of digital modeling of buildings, to the ease of use of projects, and to issues of public and personal safety. Since the main priorities of construction in modern conditions are defined in four groups, including efficient use of land, manufacturing of construction products, transactions with real estate, housing management and maximum use of innovations and opportunities of the digital economy everywhere, investment-innovation activity in increasing the competitiveness of construction enterprises management and improvement in accordance with world standards is of great importance. Design and construction of intelligent buildings, creation of additional production is the main technology that can provide enterprises in the investment and construction sector with a sustainable competitive advantage. All these are the basis of socio-economic reforms in our country by raising the standard of living of the population in the direction of increasing the competitiveness of construction and serving to increase the competitiveness of the national economy as a whole.

It should be noted that the successful continuation of socio-economic reforms in our republic aimed at raising the standard of living of the population, along with increasing the competitiveness of the national economy, further strengthened the reputation of Azerbaijan among the countries of the world.

According to the Decree on the approval of "Azerbaijan 2030: National Priorities for socio-economic development" signed on 02.02.2021 in connection with the restoration of our occupied territories after the 44-days national war under the leadership of the Commander-in-Chief of the Victorious Azerbaijan Army Ilham Aliyev implementation of the Great Return to the liberated areas program is of great importance in this regard, as one of the areas defined for the realization of the 5 main National Priorities for the socio-economic development of the country in the next decade.

Within the framework of that program, the reconstruction works carried out in these areas are aimed at further improving the socio-economic condition of the population, influencing the increase of the economic potential of the areas freed from occupation.

On the other hand, increasing the competitiveness of construction enterprises in the Republic of Azerbaijan has become an objective necessity due to the optimal management of innovation-investment activities in construction enterprises. From this point of view, it is theoretically and practically relevant to examine the important aspects of determining the directions for improvement of innovation-investment activities in construction enterprises in this direction. From the point of view of the mentioned factors, the issues of improvement of innovation-investment activities in construction enterprises require maximum careful approach and continuous measures, in-depth study of the problems in this field, conducting fundamental researches. All this shows the relevance of the topic of the dissertation.

Regarding the degree of development of the topic of the research, it is possible to note that the application of innovation and its improvement directions in enterprises covering various fields of economic activity, including the construction sector, related to the investment-innovation activity of construction enterprises to increase the competitiveness of local and foreign scientists. From Azerbaijani economist-scientists academician Z.A.Samadzade, A.F.Musayev, M.A.Mammadov, T.N.Aliyev, M.J.Atakishiyev, T.Huseynov, I.H. Ibrahimov, E.M.Hajizadeh, G.A.Azizova, A.H.Taghiyev, A.B. Abbasov, F.H.Gasimov, I.A.Aslanzadeh, S.H.Abbasova, I.J. Hasanov, Z.Najafov and others' scientific researches in these directions are noteworthy. A group of foreign researchers-scientists - Kılıch M., Kaya I., Александрова Е.Н., Воронов А.А., Ершова И.В., Ефромов В.С., Игольников Г., Крылов Э.И., Кунниева З.А., Фатхутдинов Р.А., Щербакова Л.В., Тугушева В.Р., Porter M.E. and others in their scientific works, the innovation-investment factors in increasing the competitiveness of enterprises are widely has been studied. In their researchs, the authors broadly interpreted the essence of the concept of innovation-investment and explained the theoretical-methodological

principles of innovation-investment factors. The researches of the authors mentioned in the study in this direction have played a positive role in the direction of the connection of innovation with production in various areas of the economy.

Along with these, we believe that in the modern stage of Azerbaijan's economy, the optimal management of innovation and investment activity in the improvement of the competitiveness of construction enterprises in the Republic of Azerbaijan with the aim of restoring the territories freed from occupation, successfully continuing projects on international transport corridors, and further improving the socio-economic condition of the population and certain issues of scientific methods of its improvement directions are of great theoretical and practical importance. It was determined in the research work that the main directions of innovation-investment activity management and its improvement in increasing the competitiveness of the construction enterprises of the Republic of Azerbaijan have not been comprehensively studied. From this point of view, conducting a research work on identifying and solving problems related to the subject of the dissertation is a requirement of the time.

The object and subject of the research is the construction site and its enterprises in Azerbaijan. The economic processes and relations taking place in this field are the main directions of innovation-investment activity management and its improvement in increasing competitiveness.

The subject of the research - innovation resulting from the application of the results of scientific and technical progress and aimed at improving the existing process or the organization of activities to achieve economic achievements, taking into account the social, scientific, technical or other types of effects on specific changes in the activity of the construction enterprise. It is the management of innovation-investment activity and determination of directions for its improvement in increasing the competitiveness of construction enterprises of the Republic of Azerbaijan.

Research goals and objectives. In connection with the modern and perspective development of the construction sector in the economy of Azerbaijan, it consists in determining the theoretical basis of the

management of innovation-investment activity in increasing the competitiveness of construction enterprises, evaluating the current state of the efficiency of investment and innovation, and putting forward proposals and recommendations on the improvement of management directions. The main tasks for achieving the goals set in the dissertation are defined:

- investigating the essence and theoretical methodological principles of investment activity management;
- the mechanism of formation of competitive strategy of construction enterprises;
- investigating simulation modeling in improving competitive processes;
- investigating the characteristics of the dynamics of investments directed to fixed capital;
- evaluation of investment projects in the construction sector under conditions of uncertainty;
- economic evaluation of design decisions in the construction sector;
- evaluation of the innovation-investment factor in increasing the competitiveness of construction enterprises;
- modeling of factors affecting the activity of construction enterprises in Azerbaijan;
- development of ways to improve innovation-investment activity in construction enterprises of the Republic of Azerbaijan;
- based on the results obtained in the research work, giving suggestions and recommendations on the management of innovation-investment activity and the main directions of its improvement in increasing the competitiveness of the construction enterprises of the Republic of Azerbaijan.

Research methods. Research methods such as scientific abstraction, analysis and synthesis, comparative and economic-statistical analysis, induction and deduction, economic-mathematical modeling, econometric analysis and evaluations were used during the research.

Main clauses defended.

- in accordance with the research topic, there is a need to systematize statements of attitude to the existing scientific-theoretical

provisions and conceptual ideas on the theoretical-conceptual bases and principles of the competitiveness of construction enterprises, organization and development trends.

- it is necessary to analyze the main factors determining the directions of investment in construction enterprises and to establish the scheme of the main stages of strategic management of investments in the construction field.

- the mechanism of forming the competitive strategy of construction enterprises should be developed and the role of simulation modeling in improving the competitive processes should be increased.

- It is interesting to determine the relationship between the share of construction and the degree of openness of the economy in the investments directed to the construction capital in the Republic of Azerbaijan, as well as to establish a trend model of the dependence of the added value on the time factor in the construction sector and predict the growth dynamics of the added value created by the construction sector according to this model.

- in terms of the accuracy of the results of the forecasts, in the Eviews-12 application software package, the value of research and services in the construction sector in Azerbaijan, the construction of the confidence ellipse for the diagnosis of the factors expressing the value of the investments directed to the fixed capital and the value of the main funds put into use, and the residual diagnostics of the model by Q-statistics, histogram normality tests it is necessary to conduct and verify that it is an adequate model based on the statistical characteristics of the model.

The scientific novelty of the research consists of the following:

- by proposing a reproductive-evolutionary approach to achieve the strategic goal of increasing the competitiveness of construction enterprises, a model of the formation of a competitive strategy was developed, which determines the real opportunities to increase the competitive advantages of construction products.

- it was determined that a 1% increase in capital investments in the construction sector in Azerbaijan results in a 0.26% increase in the value of works in the construction sector, a 1% increase in the

value of capital funds put into use, and a 0.48% increase in the value of works in the construction sector;

- in the research, it was determined that there is a very high correlation between the forecast prices of construction works and the time factor in the total output of the construction sector in the Republic of Azerbaijan, expressed by the regression equation $y = -25{,}608x^2 + 2146{,}3x - 17483$ based on the trend model, and according to the forecasts, Azerbaijan it is predicted that the cost of construction works in the construction sector in the republic will grow with increasing dynamics until 2030 and will be 14155,41 million manats;
- in the study, the independent development capacity of the construction sector was evaluated by establishing a linear relationship according to the acceleration coefficient and the free limit on the growth of investments directed to fixed capital due to the growth of total production in the construction sector in the Republic of Azerbaijan for the period 2008-2023 and it was determined that the construction sector since the foreign investment factor in its development is high, the ability of independent development due to internal capabilities is low in construction enterprises.
- a set of measures aimed at activating the innovative activity of construction organizations, which ensures the integration of institutional and production conditions for the development of advanced technologies and the production of high-tech construction products, has been developed.
- the application of social responsibility standards of business was proposed, taking into account compliance with the requirements of international quality standards as an important condition for increasing the competitive advantages of construction products, which is manifested in the increase of the positive image of construction enterprises in the market.

Based on the research on the management of innovation-investment activity and the main directions of its improvement in increasing the competitiveness of the construction enterprises of the Republic of Azerbaijan, relevant proposals and recommendations have been developed for the research conducted in the dissertation.

Theoretical and practical significance of research. The results of the study are of great importance in terms of optimal management of innovation-investment activity in increasing the competitiveness of the construction enterprises of the Republic of Azerbaijan and development of proposals and recommendations on the main directions of its improvement, as well as in determining the scientific and practical basis of the innovative development of the construction sector at the level of modern requirements. Also, the results of the research will contribute to the more efficient organization of the management of the country's construction enterprises on an innovative basis, and to the preparation of important programs and complex measures in this field. At the same time, the materials of the dissertation can be used in the preparation of methodological documents related to the improvement of the management of the activities of construction enterprises, and in the compilation of methodological tools for the organization and regulation of the activities of national enterprises and subjects in this field.

Approval and application. The main content of the research is reflected in 5 articles (including 1 abroad) and 4 theses (including 2 abroad) published in prestigious local and foreign journals, international and republican important scientific-practical conference materials recommended by the applicant. Among the published scientific works are "Evaluation of the innovation-investment factor in increasing the competitiveness of construction enterprises" (Baku, 2023), "Essence and formation principles of investment activity" (Baku, 2023), "The main directions of reintegration of the economy of the territories liberated from the occupation into the country's economy (part 1; 2)" (Ukraine, 2023) conference materials can be shown.

In addition, the applicant's "National priorities are the basis of the prospective development of the economic region freed from occupation" (Baku, 2021), "Development tendencies of the Azerbaijani economy and directions of state regulation of innovative development" (Baku, 2021), "Organizational and economic mechanism and development strategy for the restoration of the liberated territories of Azerbaijan in the post-conflict period" (Kharkiv, 2021), "Organization and management of the modern state

and prospective development of the gas industry infrastructure in Azerbaijan" (Baku, 2022), "Organization and management mechanism of construction in the market economy" (Baku, 2022) articles were published.

Name of the organization where the research is carried on. Azerbaijan Architecture and Construction University.

The total volume of the dissertation with a sign indicating the volume of the structural sections of the dissertation separately. The structural composition of the dissertation consists of an introduction, three chapters, a conclusion, and a list of references. The total volume of the introduction (18529 characters), chapter I (96052 characters), chapter II (49474 characters), chapter III (44218 characters), conclusion (7157 characters) and references (19951 characters) is 250454 characters. The number of marks of the dissertation is 215430 characters, excluding tables, diagrams, pictures, and the list of references.

MAIN CONTENTS OF THE RESEARCH

In the **Introductory** part of the study, the relevance of the topic is justified, the goals and purposes, the object and subject of the research, the main clauses defended, research methods, the scientific innovation, theoretical and practical importance of the research, approval and application issues are reflected.

In the first chapter of the dissertation called **"Organization of investment-innovation activity in the competitiveness of construction enterprises and its theoretical-conceptual foundations"**, the essence and theoretical methodological principles of investment activity management, the modern state of modeling of competition processes and issues of improvement were studied.

For the purpose of directing investments to the non-oil sector, four State programs on socio-economic development of the regions covering the years 2004-2023 have been adopted and implemented. In addition to these, state programs, development concepts and strategies aimed at the development of non-oil sector areas, the implementation of the development priorities of the national economy, and the

attraction of domestic and foreign investments are ensured. As a result of these measures, the continuous and sustainable development of the country's general economy is ensured.

As a result of the analysis, it was determined that while GDP was 40 billion in 2016, this indicator will be 133.8 billion in 2022, or 4.6% more than in 2021, and the added value in the oil and gas sector is decreased by 2.7%, but a 9.1% increase was observed in the non-oil and gas sector. The study shows that in the total volume of GDP production in 2022, the industrial sector will account for 51.1%, trade 8.2%, transport and warehousing 6.0%, agriculture, forestry, fishing 4.8%, tourist accommodation and public catering 1.6%, information and communication sectors 1.4%, the share of other sectors 14.7%, net taxes on products and imports made 7.4% of GDP (diagram 1).

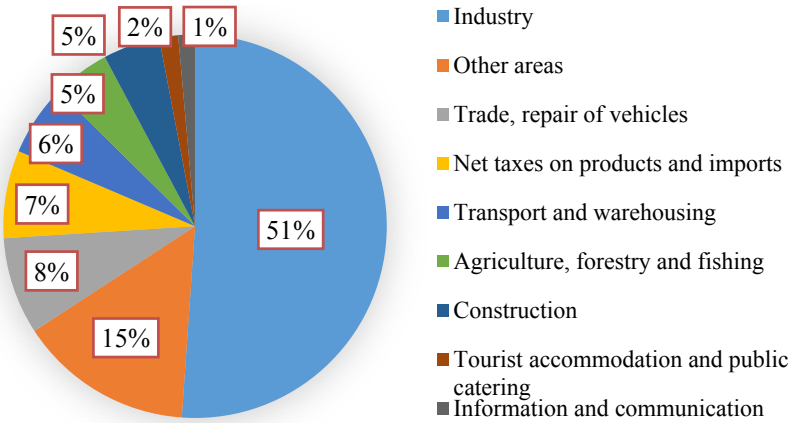


Chart 1. Structure of Gross Domestic Product

Source: *compiled by the author.*

It was determined in the study that the integration of the country's economy into the world economy requires the application of innovative technologies in the construction sector, the improvement of the efficiency and competitiveness of the construction sphere, and the further optimization of business processes.

Based on statistical data, the growth dynamics of the non-oil industry for the period 2015-2022 can be determined from diagram 2.

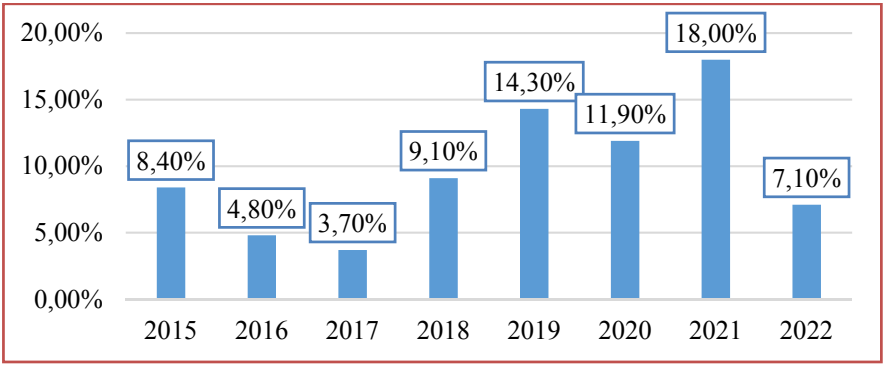


Chart 2. Growth rate of non-oil industry

Source: *compiled by the author.*

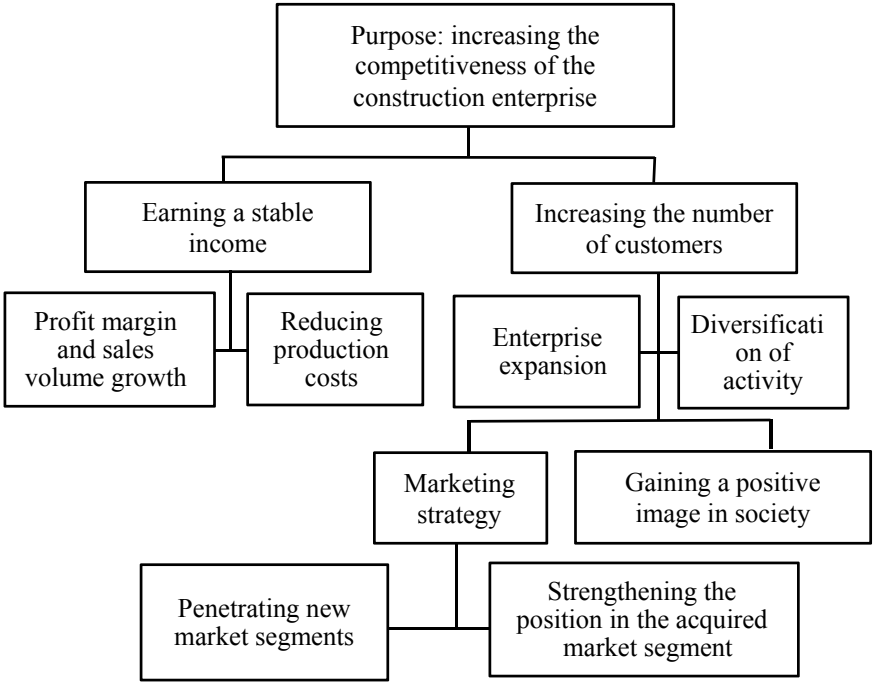
Strengthening of competitive advantages is achieved by developing a competitive strategy that enables the construction enterprise to operate more efficiently in comparison with competitors in the future. Construction enterprises take into account the study of market conditions as a whole, as a necessary measure of the strategic directions of their activities.

It was determined that focusing the management apparatus only on internal problems can reduce sensitivity to changes in the external environment and consumer demand. The solution of the indicated problems requires an objective assessment of the possibilities of increasing the competitiveness of construction products, taking into account the specific characteristics of the competitive environment of the developing market:

1. Assess the stabilization and/or decrease of demand (supply) in the market;
2. To determine the increase of intensity and aggressiveness of competition;
3. Organizing the merger and/or acquisition of small enterprises by large enterprises (insolvency and high concentration of production);
4. To stabilize the level of price increase.

The competitive strategy of construction enterprises is significantly influenced by the economic situation of the region. In

this regard, it is necessary to provide a general approach and demand for the development of a competitive strategy within the framework of strategic management and development of the construction industry. In accordance with the above requirements for the activity of construction enterprises, the objectives of their competitive strategy change significantly (scheme 1).



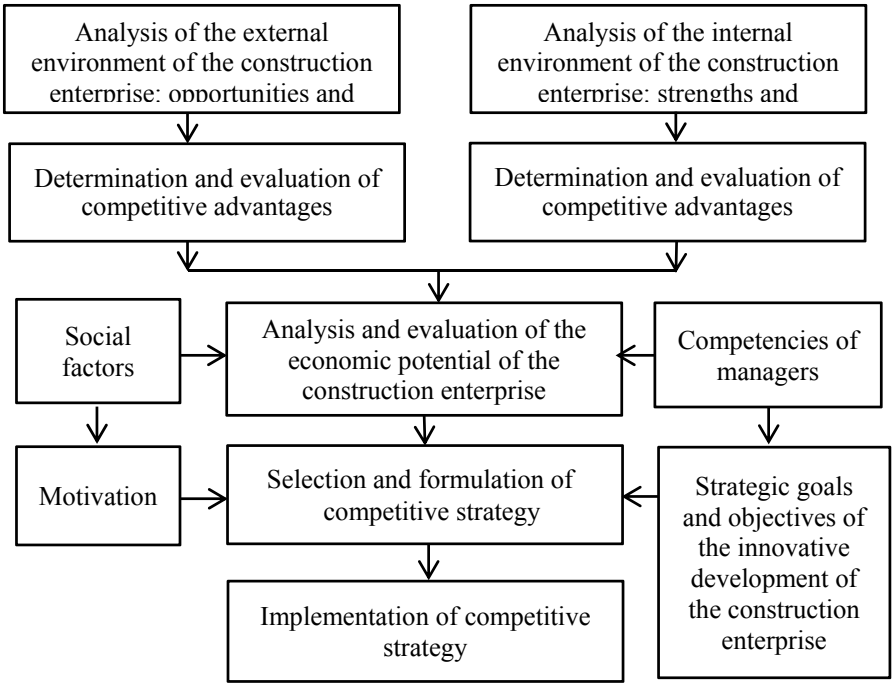
Scheme 1. Objective model of the competitive strategy of the construction enterprise

Source: *Compiled by author*

The construction company's competitive strategy involves the implementation of general goals:

- to ensure a stable position in the domestic market and access to the foreign market;
- improvement of the financial situation;
- ensuring the reliability of the activity;
- gaining a positive reputation in society.

An alternative strategy for the development of competition in construction is to ensure the stability of the competitive advantages of the construction enterprise formed within the framework of the developed competitive strategy. This scheme is reflected in 2.



Scheme 2. The sequence of formation of the competitive strategy of the construction enterprise in the conditions of innovative development of the field.
Source: *Compiled by author*

Thus, all types of competitive strategy can lead to long-term competitive strategic advantage of construction enterprises.

At the modern stage of economic development, simulation modeling is more efficient and usually the only correct method for making complex management decisions. A simulation model is a research method in which the processes are described according to the processes occurring in reality. A kind of realistic approach is used. In the simulated model, the studied object is characterized with sufficient accuracy.

In this work, the application of the simulation model at the "Akkord Industry Construction" enterprise was studied and the following conclusions were reached:

- The increase in indicators of rhythmic and uninterrupted continuation of the production activity ensured a 21.1% reduction of idle stops in the structures;
- The distribution of the company's labor resources has become more efficient;
- The level of construction materials reserves decreased by 40.8%, which led to a 14.4% decrease in non-production costs in enterprises.
- the overall productivity of the company's activity - the volume of orders fulfilled within a month increased by 20%.

The study shows that the indicators led to a reduction in the duration of the mentioned construction works and a 19% increase in the company's profit within a month.

In the second chapter of the study called "Dynamics of investments in fixed capital in the construction sector of Azerbaijan and directions for increasing the efficiency of innovation-oriented investments", the characteristics of the dynamics of investments directed to fixed capital were investigated, economic evaluation of investment projects and design decisions in the construction sector under conditions of uncertain risk was carried out.

In the research, the influence of factors from the conditions of the level of effectiveness of investments to the formation of macroeconomic efficiency of investments in fixed capital under the conditions of system transformations was reviewed in detail.

The data of Table 1, which reflects the structure of investments directed to fixed capital during the studied period, allows us to say that there was an investment crisis in Azerbaijan in the first half of the 1990s. The investment crisis was part of the crisis that covered the entire economy of our country during the transition period. Our republic, which experienced economic recession in 1991-1993, was able to prevent this crisis by signing the Agreement of the Century on September 20, 1994 by the National leader of the Azerbaijani people, H.Aliyev. In subsequent periods, the strengthening of foreign investment flows to the oil sector caused the development of other

Table 1.
The structure of investments directed to fixed capital in the Republic of Azerbaijan at actual prices (million manats)

Years	Total investments	Including		
		Construction and installation works	Machinery, equipment, tools and inventories	Other works
1995	227.98	114.95	72.35	40.6714
2000	967.82	412.33	226.96	328.5251
2005	5 769.88	3 109.70	1 350.77	1309,408
2010	9 905.67	6 569.41	2 579.50	756,7524
2011	12 799.06	7 834.85	2 380.23	2583,984
2012	15 407.27	9 407.90	2 348.76	3650.62
2013	17 850.82	11 837.49	2 222.66	3790,667
2014	17 618.60	13 287.65	2 064.80	2266,152
2015	15,957.03	11 722.89	1 980.58	2253,555
2016	15,772.83	11,531.95	1 866.11	2374,764
2017	17 430.34	12 447.04	2 161.97	2821,334
2018	17 244.86	11 737.62	2 032.31	3474,934
2019	18,539.48	11,974.84	2 301.33	4263,306
2020	17 226.11	11,021.95	2 893.11	3311,051
2021	16 815.46	11 200.13	3 289.04	2326,299
2022	17 878.17	13 142.93	3 094.24	1640,997
2023	21 310.71	15,028.26	3 382.05	2900,395

Source: *Compiled by author.*

areas, including the construction sector, due to the development of this sector. The following chart shows the volume of investments in the industry, including domestic and foreign investments, for 2005-2022.

It can be seen from the diagram that the investment amount developed with increasing dynamics in 2008/2017, and in 2019-2022, this growth was observed with a decrease, the value of the main funds put into use according to the dynamics of investments also changed, investment in the main capital, along with the increase of the country's GDP, it has in turn increased the credit investments. What is being said can be seen more clearly from diagram 3 below:

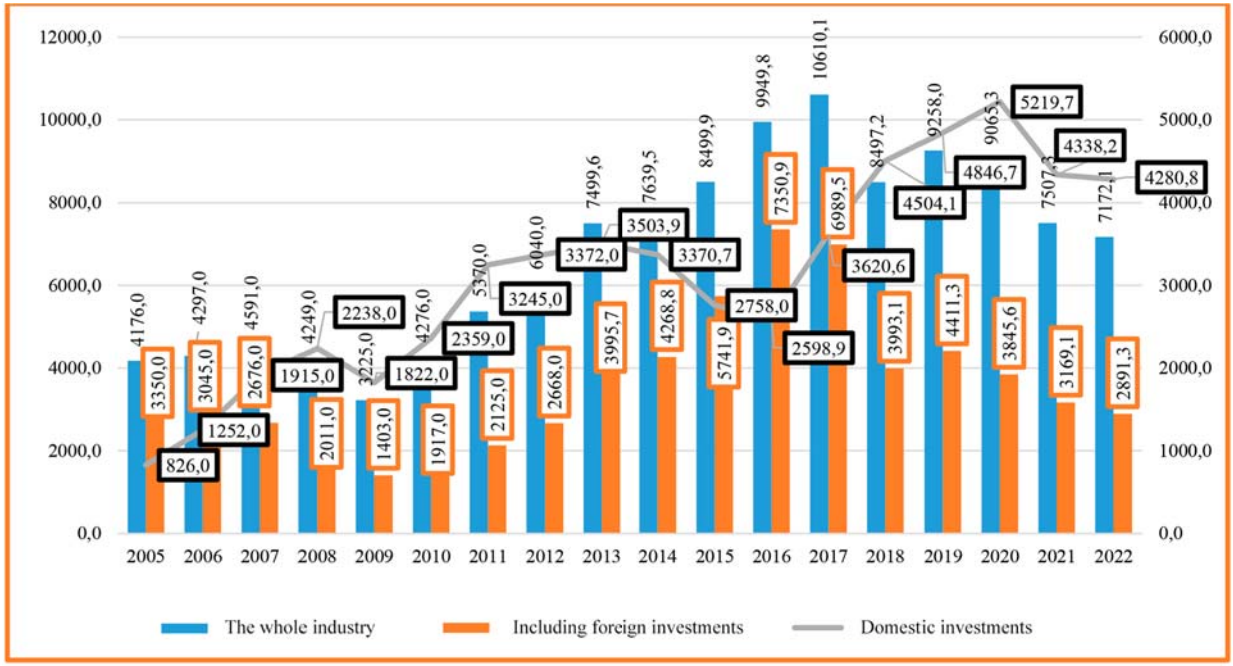


Diagram 3. Investments in industry for 2005-2022, in million manats.

Source: *Compiled by the author.*

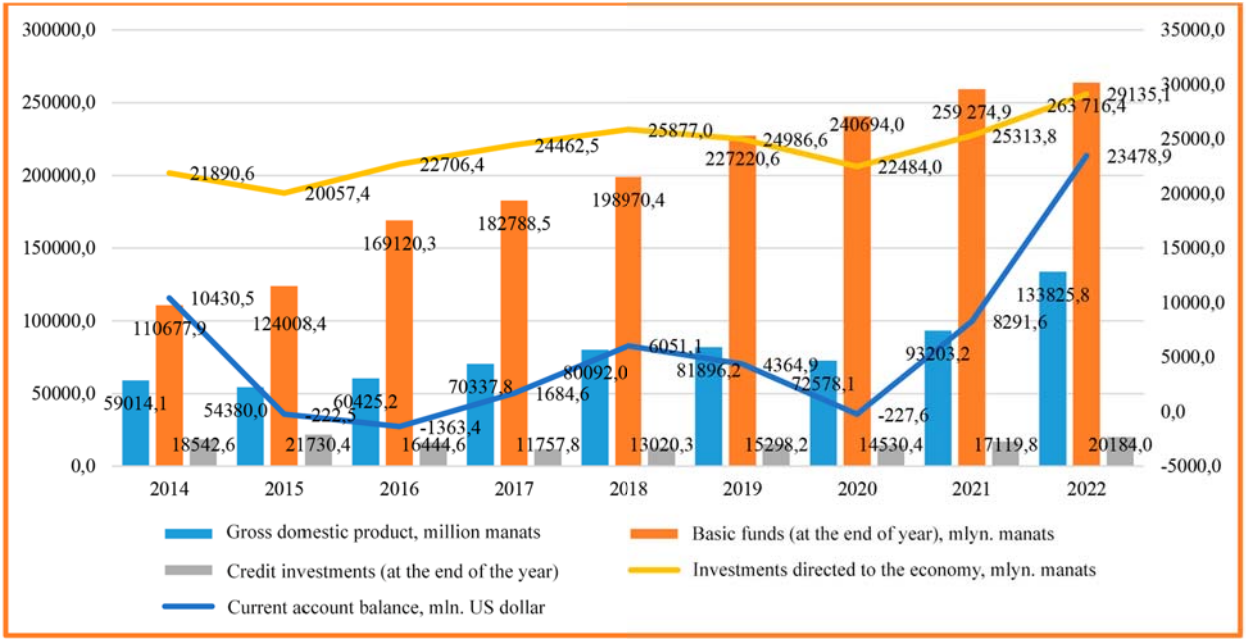


Chart 4. Dynamics of the main macroeconomic indicators for 2014-2022.
Source: *Compiled by the author.*

As can be seen from Chart 4, the GDP of the main macroeconomic indicators developed with increasing dynamics throughout the period. The current account balance was 222.5 million US dollars and 1363.4 million US dollars in 2015-2016, respectively, which is in the world market in those years, due to the sharp decrease in the price of oil, it was caused by the decrease in the exchange rate of the national currency compared to the US dollar. As a result of the COVID-19 pandemic that swept the world in 2019, the current account balance in Azerbaijan in 2020 was 227.6 million US dollars, but it resulted in positive dynamics in the following years and reached 23478.9 million US dollars by 2022. Although investments directed to the building materials industry in the construction sector increased in 2009-2010, this indicator developed with decreasing dynamics in 2010-2012. As can be seen from chart 5 below, foreign investments in the construction industry by investment were in 2015 and 2022. In other periods, investment in this field was regulated by domestic investments.

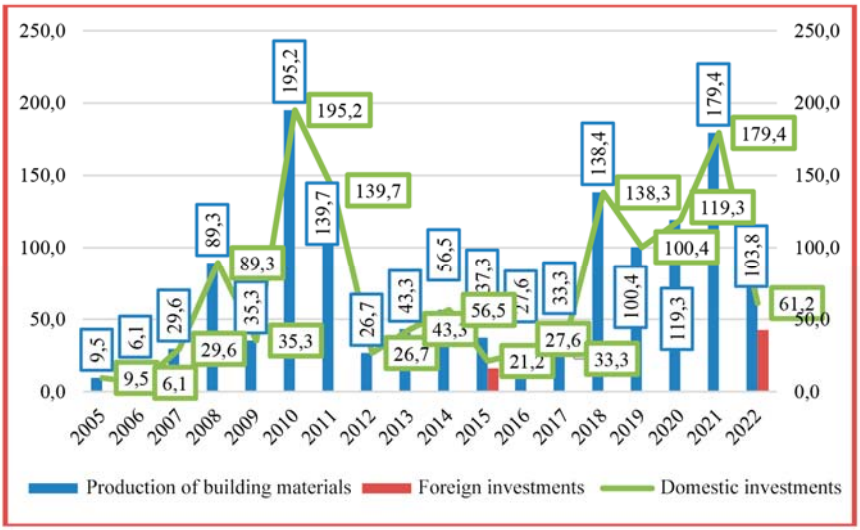


Diagram 5. Dynamics of the main macroeconomic indicators for 2014-2022
Source: *Compiled by the author.*

The expansion of investments directed to the main capital took place due to the investments of funds by local and foreign investors in the country's economy. With the implementation of fundamental reforms in our country, the volume of internal investments has increased significantly, while on the one hand, the amount of capital allocated by the state for the development of infrastructure has increased, on the other hand, the participation of private sector investors in the projects implemented in the country's economy has expanded.

Analyzing the risks of construction projects and preparing corresponding proposals is of particular importance in the efficient management of projects, the correct assessment of the demand for financial resources, and the realistic preparation of forecast indicators. At the same time, the expertise of the project allows to assess the possible negative consequences of the shortcomings that may appear. The main component of investment project expertise is the analysis and assessment of risks that play an important role in investment. Investments in the construction sector involve some risk, as the project may fail, be ineffective or less effective than expected. During the analysis of the capital project, it is appropriate to take into account the risk factor, to detect as many types of risk as possible, and to implement measures to minimize the overall risk of the project.

In this work, it is proposed to systematize entrepreneurs investing in construction and installation works into three groups.

- Risk-averse (not investing in high-risk construction projects);
- Risk-neutral (those who are indifferent to the presence or absence of risk, these projects are mainly supported by the state).
- Risk-prone (continuation of the process considering the risk of construction);

Attitude to risk directly depends on the investment objective (riskiness level of the project), as well as the investor's financial situation. In order to make the right investment decision, it is necessary to determine not only the volume of income to be earned, the level of risk, but also how much the risk that will affect the expected income will be compensated. Sometimes, the problem that arises in the business plans of some construction projects, which contain risk analysis, is completely replaced by bank risk analysis,

which does not fully reflect the project risks, only by considering them in the financial risk analysis.

Summarizing what has been said, it is concluded that the general sequence of risk assessment can be systematized as the following directions of action:

1. To determine the source, cause of the risk, the steps that lead to the occurrence of risk in the execution process, and to identify the work to be done.

2. Taking into account the nature of the accepted construction project and identifying possible risks specific to it.

3. Separate and overall assessment of the level of different risks that determine the economic feasibility of construction.

4. Determining the possible level of risk;

5. Development and implementation of the relevant action plan aimed at reducing the danger of risk.

It should be noted that the design of construction and installation works in the construction field, the adoption of technical-installation, organizational-technological and management decisions, economic decisions in the construction process are carried out in multivariate conditions.

That is, the objects under construction can have different structural and volume-planning solutions, can be built using different methods and methods using traditional and modern machines and mechanisms, using different types of materials, and applying innovative technologies. It has been determined that choosing the most favorable of the many available options that ensure efficient and on-time performance of construction and installation works is a priority and necessary issue.

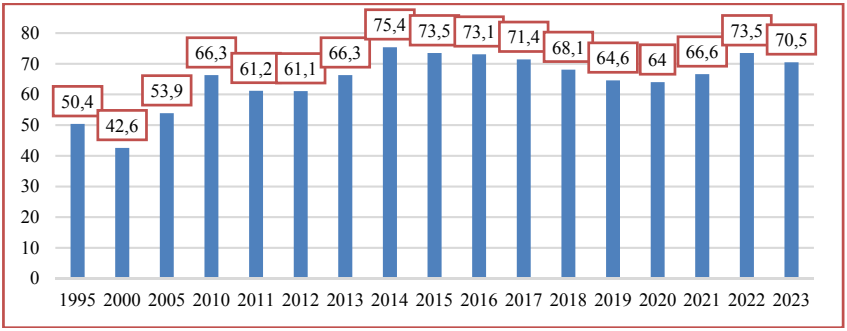
The work shows that the most efficient and optimal options are usually selected by a comparative analysis of the technical and economic indicators of all available options and taking into account the indicators of the new construction project in the obtained results. As a rule, when comparing possible and different solutions, both operation and main and auxiliary indicators are considered as a criterion for economic efficiency, and at the end, more favorable economic and technical indicators are systematized and made usable.

The main indicators system includes indicators belonging to the category of investments, information and reporting indicators about the production and economic activity of the enterprise, the price of construction and installation works (or the price of a unit of goods and materials). At the same time, along with these, indicators related to labor activity, productivity coefficient, cost of basic construction materials, cost estimate of construction and installation works, continuity of road operation along with engineering communication channels, volume of earthworks related to construction-communication and road construction, land acquisition important costs (demolition of buildings, transportation, deforestation, drainage, etc.), volume and parameters of constructed buildings, operating costs for engineering, communication and transport, raw materials, fuel and energy costs, service life of buildings and structures and other construction and operational indicators can also be attributed.

In the third chapter of the dissertation called **"Directions for improving the management of innovation-investment activity in increasing the competitiveness of construction enterprises in the Republic of Azerbaijan",** the issues of improving the living conditions and quality of people's living conditions and the quality of the innovative activities of enterprises and organizations, and increasing the efficiency of economic systems in the business environment were studied.

At the current stage of the development of the economy of Azerbaijan, the management of innovation and investment problems with the aim of effective use of the existing structural divisions of economic activity is of great importance. In the first years of the transition period in the country, that is, from 1995, reform, development programs and measures were implemented in all fields, including the construction sector. During this period, the investments directed to the fixed capital for construction and the value of the fixed funds put into use were studied in the study and the following chart was drawn up as a result of the research.

According to Graph 1, the share of construction-installation works in the composition of investments directed to the main capital in construction in the Republic of Azerbaijan for the years 1995-2023



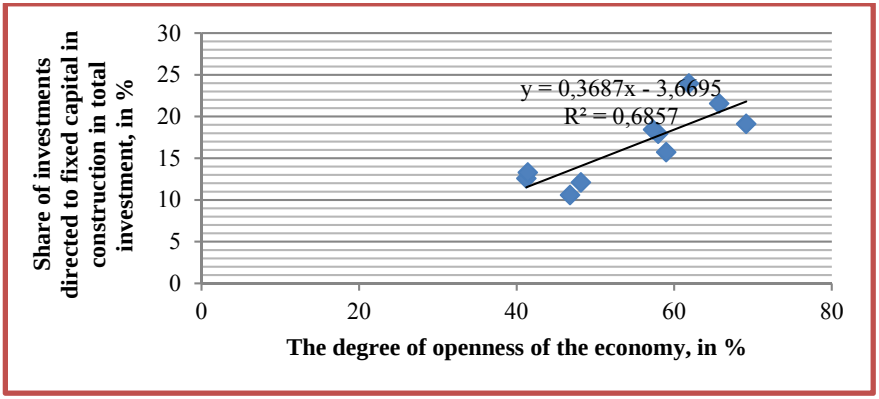
Graph 1. The share of construction and installation works in the composition of investments directed to the fixed capital for construction in the Republic of Azerbaijan for the years 1995-2023, in %.

Source: *Compiled by the author.*

changed in the range of 42.6%-75.4%. Since 1995, the signing of strategically important agreements and our country's membership in a number of international organizations have already conditioned the growth of foreign trade activities and increased the flow of investments into the country.

It should be noted that along with the improvement of the investment environment, the degree of openness of the economy, characterized by the share of the trade turnover in the GDP, also has an important effect on the increase of the foreign investment flow. Graph No. 2 shows the result of the correlation-regression analysis between the share of construction and the degree of openness of the economy in investments directed to the construction capital in the Republic of Azerbaijan, compiled on the basis of statistical data of 2012-2022.

It can be seen from the graph that there is a high correlation dependence expressed by the linear regression equation y = 0.3687*X - 3.6695 with the share of construction in the investments directed to the fixed capital in the Republic of Azerbaijan, in the range of the degree of openness of the economy $r = \sqrt{0,6857}$=0.828070045. According to the coefficient of determination, the degree of openness of the economy as an explanatory variable included in the linear regression model explains 68.6% of the result factor of the corresponding regression model.



Graph 2. The relationship between the share of construction in investments directed to construction capital in the Republic of Azerbaijan and the degree of openness of the economy.

Source: *Compiled by the author in MS Excel.*

It should also be noted that the analysis of the volume of construction works begins with the study of its dynamics over the last 5-10 years with comparative prices. It is estimated by calculating the base, chain and average annual growth rates and growth of the volume of construction products. The following table 2 shows the value of construction works in the Republic of Azerbaijan and the value of capital funds put into use, with investments directed to the main capital in construction.

It should be noted that the value of construction works and the growth of investments directed to fixed capital in construction fundamentally affect the increase in the volume of work and services in this sector, so the assessment of the dependence between these indicators is of great importance. As can be seen from the table data, the value of construction works in the construction sector in the Republic of Azerbaijan for 2006-2023 has developed with increasing dynamics. If we give a graphic description of the capital funds and construction works put into use in the years 2006-2023 with investments directed to the capital of the construction sector in the Republic of Azerbaijan, we will get the following result in the EViews-12 application software package.

Table 2.

In the Republic of Azerbaijan, the value of capital funds and construction works for the years 2006-2023, with investments directed to the capital of the construction sector, mln. manats

Years	Capital investments in construction, mln. manats (X1)	The value of capital funds put into use for construction, mln manats (X2)	The cost of construction works, mln manats. (Y)
2006	453.8189	280,4309	2119.7
2007	484,4211	312.6551	2702.4
2008	813.6093	429.2677	3785.5
2009	681.0388	535,3391	3484.9
2010	925,1412	631.8863	4531.4
2011	1157,482	915.4945	6115
2012	1868,233	1470,676	7716
2013	1894,751	1549.27	8721.2
2014	2221,678	1828,767	8591.9
2015	2123,465	1710,518	7319.6
2016	2831,773	1930,048	7660.4
2017	2746,055	1915,875	7762.1
2018	3721,428	1472.85	8448.3
2019	3550,443	1661,764	9439.2
2020	3178,451	1808,868	9778.8
2021	4033,232	1826,222	8741.2
2022	3523,728	2613,206	10558.9
2023	4727.5	2423.4	12635

Source: *Compiled by author.*

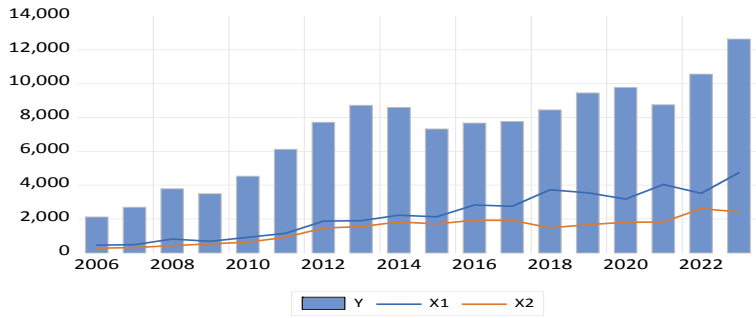
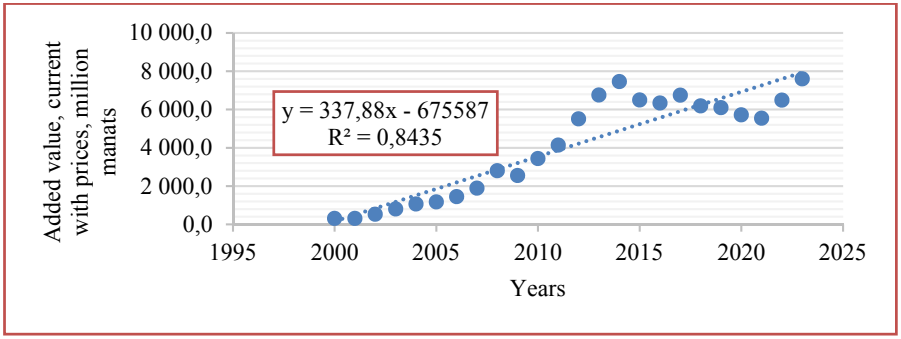


Diagram 6. Description of the value of capital funds and construction works put into use in the years 2006-2023 with investments directed to fixed capital in the construction sector in the Republic of Azerbaijan in the EViews-12 application software package

Source: *Compiled by the author in the EViews-12 application software package according to Table 3.2.1.*

As can be seen from the diagram, the volume of investments directed to fixed capital in the construction sector and the balance value of fixed funds at the end of the year have developed with a tendency to increase over the period under study. This growth caused the development of the value of construction works with increasing dynamics in general, except for 2015, and in 2023 it reached 12635 mln. manats resulted in the creation of value for construction works.

It should be noted that the increase in the value of completed construction works caused the increase in added value in this sector (Graph 3).



Graph 3. The trend model of the added value generated by the construction sector in the Republic of Azerbaijan for the years 2000-2023

Source: *Compiled by the author in MS Excel.*

As can be seen from the graph, the dependence of the amount of added value created in the construction sector in the Republic of Azerbaijan for the years 2000-2023 on the time factor is in the form of a linear regression equation y = 337.88x - 675587. The trend model shows that the added value created in the construction sector in Azerbaijan has a high correlation dependence on the time factor according to the Chaddock scale ($r = \sqrt{0{,}8435} = 0.918423$). Since the added value created in the construction sector is determined by the increase in the value of work and services in this sector, it is important to evaluate the impact of the investments directed to the fixed capital of the construction sector in the Republic of Azerbaijan, the capital funds put into use and the cost of construction works.

It should be noted that after the statistical significance of the established model is checked, the elasticity coefficient can be used to determine how the explanatory variables included in the model explain the outcome factor.

We get the following result by calculating the coefficient of free variables in the relationship equation and the average values of the volume of the causal factors and the result factor for the studied periods [4, p.149].

$$E_{İN} = \frac{\alpha_1 \times \overline{x_1}}{\bar{Y}} = \frac{0{,}818213 \times\ 2274{,}236}{7228{,}4} = 0{,}25743$$

$$E_{\partial F} = \frac{\alpha_2 \times \overline{x_2}}{\bar{Y}} = \frac{2{,}44811 \times\ 1406{,}474}{7228{,}4} = 0{,}476344$$

As a result of the conducted research, it can be concluded that in Azerbaijan, the investments directed to the fixed capital in the construction sector increased by 1%, the value of the works in the construction sector increased by 0.25%, the value of the capital funds put into use increased by 1%, the value of the works in the construction sector increased by 0.48% results in an increase.

Thus, since innovation is the main factor determining the competitiveness of the enterprise, its measurement in scientific activity markets is quite complicated.

It is noted that the factors and sources determining the country's economic development in the modern world are facing important changes due to the globalization of the world economy. Depletion of hydrocarbon resources, which are the basis of Azerbaijan's economy, as a traditional resource that determines economic growth in the country, requires the formation and development of innovative processes, scientific knowledge, new technologies, and as a result, the system of new goods and services. A distinctive feature of the modern economy of the countries of the world is innovation, which will become a priority for development very soon. Instead of the material factors of production, as in the industrial economy, as a resource of an innovative developed economy, the structure consists

of labor factors that sharply increase the specific weight of the intellectual labor of researchers. The current state of the world economy shows that countries with highly developed innovative activity have a significant competitive advantage, which is reflected in the intellectual products they produce, as well as in the great demand for goods and services for countries with weak innovative activity and specializing in the production of material goods. The development of alternative energy sources in the world markets make the question of reducing the dependence of our economy on today's oil exports an urgent issue in the future. This requires determining ways to improve the innovation-investment activity of enterprises in the construction sector as well as in all areas of the economy. It should be noted that the innovative development of the construction sector in recent years compared to previous years was determined by the increase in the volume of investments directed to this sector. The added value created in the construction sector was mainly realized through the application of innovative technologies due to the increase in the volume of investments directed to this sector. Since the investment factor plays an important role in the economic growth of construction, it is important to estimate the amount of investment required for economic growth. It should be noted that this assessment is determined based on the acceleration coefficient. From this point of view, it is possible to determine the direction of development of the construction sector in Azerbaijan in accordance with the increase in the value of construction works in this sector due to the increase of investment in the main funds for construction. Thus, it is possible to assess the ability of the construction sector to develop due to internal opportunities or state support. This assessment is characterized by the ability of construction enterprises to develop independently.

In the "Conclusion" section of the dissertation, proposals and recommendations of scientific and practical importance arising from the nature of the research are given:

1. As a result of the conducted research, it was determined that in order to ensure sustainable competitiveness of construction enterprises in market conditions, it is necessary to determine the

characteristics of labor functions related to the implementation of innovative activities of employees engaged in the main type of activity when organizing the innovation-investment process.

2. Based on the reproductive-evolutionary approach to the development of methods of increasing the competitiveness of the construction enterprise aimed at constantly renewing construction production to meet the needs of the developing market, increased competition in the construction products market has been proven to be an objective condition for innovative changes in the construction industry. At the same time, the formation of sustainable competitive advantages of construction products is the result of the activation of innovative activity of construction enterprises, which is confirmed by the obtained economic indicators.

3. Setting a goal in choosing a competitive strategy that takes into account development prospects and real capabilities of construction organizations is very important to increase the competitive advantages of products. Based on this provision, the target model of the competitive strategy was drawn up and a model was developed for the formation of the competitive strategy of the construction enterprise taking into account the requirements of the innovative development of the industry.

4. Analytical summarization of the characteristics of the competitive environment in the construction field helped the process of setting the goals of construction enterprises, the implementation of an alternative competitive strategy, the determination of the factors of increasing the competitiveness of construction products that have a direct impact on ensuring the sustainability and longevity of competitive advantages. In this regard, the logical sequence of the process of development of competitive advantages is disclosed, the conditions for increasing the competitiveness of construction products are grouped, taking into account the actual directions of the innovative development of the construction industry.

5. As a result of the research, it was determined that there is a high correlation between the share of construction in the capital investments for construction in the Republic of Azerbaijan and the degree of openness of the economy expressed by the linear

regression equation y = 0.3687*X - 3.6695. Studies show that a 1% increase in the degree of openness of the economy leads to a 1.22% increase in the share of construction in construction capital investments in the Republic of Azerbaijan.

6. It was determined that the added value generated in the construction sector in the Republic of Azerbaijan for the years 2000-2023 has a high correlation dependence, expressed by the linear regression equation y = 356.37x - 712705, depending on the time factor on the trend model.

7. In the research work, in the Eviews-12 application software package, residual diagnostics and histogram normality tests of the model were carried out on the confidence ellipse and Q-statistics for the diagnosis of the factors expressing the value of the investments directed to the fixed capital and the value of the fixed funds put into use and the value of works and services for the construction sector in Azerbaijan, and adequacy was checked based on the statistical characteristics of the model. It was determined that a 1% increase in investments directed to the fixed capital in the construction sector in Azerbaijan results in a 0.26% increase in the value of the works in the construction sector, a 1% increase in the value of the capital funds put into use, and a 0.47% increase in the value of the works in the construction sector.

8. The regression equation $\boldsymbol{y = 0,818x_1 + 2,448x_2 + 1924,386}$ obtained in accordance with the EViews application software package along with the standard errors of the value of works in the construction sector for the respective years, as well as a number of characteristics of the use of the equation for forecasting purposes, and the predictive suitability of the model were determined;

9. In the research work, it was determined that there is a very high correlation relationship between the forecast prices of construction works and the time factor in the total output of the construction sector in the Republic of Azerbaijan, expressed by the regression equation $y = -25{,}608x^2 + 2146{,}3x - 17483$ based on the trend model, and according to the forecasts it is predicted that the value of construction works in the construction sector in the Republic of

Azerbaijan will develop with increasing dynamics until 2030 and be 14155.41 million manats;

10. In this work, the independent development capacity of the construction sector was evaluated by establishing a linear relationship according to the obtained acceleration coefficient and the free limit on the growth of investments directed to fixed capital at the expense of the growth of total product production in the construction sector in the Republic of Azerbaijan for the years 2008-2023;

11. It has been determined that there is a high correlation relationship between the forecast prices of capital investments in the construction sector in the Republic of Azerbaijan and the time factor expressed by the logarithmic regression equation $y = 4559,6\ln(x) - 8689,8$ according to the trend model, and according to the forecasts, in the Republic of Azerbaijan although the investments directed to the main capital in the construction sector will develop with increasing dynamics until 2028, it will decrease in the following years and will be 5745.9 million manats in 2030. Also, it is practically impossible to increase the productivity of equipment and staff without the organization of innovative activities.

12. In order to improve the production process, the organizational structure in which the search, development and application of innovations will be carried out continuously should be formed in accordance with international practice, and this structure should become an integral part of the duties of leaders and managers at all levels of management;

13. The effect of some macroeconomic indicators on the innovation activity of enterprises and the scheme of the requirements of innovative development were drawn up and it was determined that in addition to macroeconomic factors in the implementation of the innovation policy of enterprises, financial resources of the enterprise play an important role in the interaction of this group of factors. Thus, since the introduction of innovative innovations is related to a fairly high amount of funds, the lack of financial resources of the enterprise causes a weak innovation potential in the enterprise due to the refusal of the enterprise to innovate;

14. It was determined that the high amount of information about modern innovative technologies and products has a positive effect on the innovation activity of enterprises, on the contrary, insufficient amount of information about modern innovative technologies and consumers of information products results in a decrease in the demand for innovative products;

15. In modern conditions, the reduction of state support for the innovative activities of enterprises and the weakening of the conditions for the development of cooperative relations of enterprises with an innovative structure in the real sector slows down innovative development. In this regard, the expenses incurred on ETLI are of particular importance in solving environmental problems, which are important global problems of the world, besides stimulating economic growth by having a positive effect on the increase of the volume of new innovative products.

The main content of the dissertation work is reflected in the following scientific studies:

1. Mammadov, M.A., Nagdiyev, O.A. National priorities are the basis of perspective development of the economic region liberated from occupation // – Baku: Construction economics and management magazine, 2021, № 4, – p. 15-20.

2. Badalov, M.M., Nagdiyev, O.A. Development trends of Azerbaijan's economy and directions of state regulation of innovative development // - Baku: Construction economics and management magazine, 2021, № 4, - p. 193-198.

3. Mammadov, M.A., Mammadova, F.A., Ganiyev, Kh.I., Nagdiyev, O.A. Organizational and economic mechanism and development strategy for the restoration of the liberated territories of Azerbaijan in the post-conflict period. // – Kharkiv: Kharkiv National Automobile and Highway University, Journal – Economics of Transport Complex, 2021, № 38, – p. 45-60.

4. Badalov, M.M., Nagdiyev, O.A. Organization and management of the modern state and prospective development of the gas industry infrastructure in Azerbaijan // - Baku: Construction economics and management magazine, 2022, № 1, - p. 172-177.

5. Nagdiyev, O.A. The mechanism of organization and management of construction in the market economy // - Baku: Economy and management magazine of construction, 2022, № 3, - p. 91-96.

6. Nagdiyev, O.A. Evaluation of the innovation-investment factor in increasing the competitiveness of construction enterprises // – Baku: Reintegration of territories liberated from occupation into the country's economy: materials of the international scientific conference on goals and directions. Azerbaijan University of Architecture and Construction, June 13-14, 2023, - p. 290-295.

7. Nagdiyev, O.A., Adigozalova, A. The essence and formation principles of investment activity // – Baku: Reintegration of territories liberated from occupation into the country's economy: materials of the international scientific conference on goals and directions. Azerbaijan University of Architecture and Construction, June 13-14, 2023, - p. 338-342.

8. Mammadov, M.A., Nagdiyev, O.A., Gasimli, M.B. The main directions of reintegration of the economy of the territories liberated from the occupation into the country's economy (part 1) // – Kharkov: “Сучасні напрямки розвитку економіки І менеджменту підприємств України" Збірник матеріалів міжнародної науково-практичної конференції здобувачів вищої освіти і молодих вчених, November 17, 2023, - p. 25-29.

9. Mammadov, M.A., Nagdiyev, O.A., Gasimli, M.B. The main directions of reintegration of the economy of the territories liberated from the occupation into the country's economy (part 2) // – Kharkiv: “Сучасні напрямки розвитку економіки І менеджменту підприємств України" Збірник матеріалів міжнародної науково-практичної конференції здобувачів вищої освіти і молодих вчених, November 17, 2023, – p. 29-33.



The defense of the dissertation will be held at the meeting of the ED 2.46 Joint Dissertation Council of the Azerbaijan Cooperation University and Baku Business University operating under the Azerbaijan Cooperation University at 14^{00} on 23 October, 2024.

Address: AZ1106, Azerbaijan Republic, Baku city, Najaf Narimanov Street, 93.

It is possible to get acquainted with the dissertation in the library of Azerbaijan Cooperation University.

The electronic version of the abstract is posted on the official website of Azerbaijan Cooperation University (www.aku.edu.az).

The abstract was sent to the necessary addresses on 21 September, 2024.

Signed for issue: 20.09.2024

Paper format: 60x84

Volume: 45944 characters

Edition: 20 pieces