REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

IMPROVEMENT OF MECHANISMS FOR ECONOMIC EVALUATION OF INVESTMENT PROJECTS IN THE FIELD OF THE FUEL AND ENERGY COMPLEX

Specialty:	5312.01 – "Industry Economics"
Field of science:	"Economic sciences"
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Baku - 2024

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

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GENERAL CHARACTERISTICS OF THE WORK

Relevance of the topic and the level of study. The smooth operation and development of enterprises in the fuel and energy complex largely depend on the activation of mechanisms for the timely renewal or modernization of production potential. The formulation of an effective investment policy can serve as a "financial instrument" for solving such an economic problem. The importance of the fuel and energy complex is primarily due to the fact that fuel and energy reserves form the basis of the life cycle of enterprises in order to provide the population with fuel and electricity. In this regard, the analysis of the current state of the fuel and energy complex and the assessment of its development prospects, which directly depend on the economic development of the Republic of Azerbaijan, are of great importance.

Effective organization of investment policy in sectoral industrial complexes acts as a catalyst for investment processes in the industry, helps maintain the pace of economic growth, allows for the effective use of labor, financial, material and technical resources, and solves a number of social problems. The transition of the former fuel and energy complex to market relations predetermined the formation of various forms of ownership and management among them, a significant part of which belonged to consolidated corporate structures, especially vertically integrated structures, which presented new economic requirements for the formation of investment policy of mining enterprises specializing in the extraction, transportation, processing, storage and sale of manufactured products.

The Republic of Azerbaijan is interested in foreign investment in Karabakh in the field of renewable energy. President of the Republic of Azerbaijan Ilham Aliyev spoke about the great prospects for the development of renewable energy sources in Karabakh and expressed interest in attracting foreign investment in this area. *"...Before the war, we had already attracted two investors in the field of renewable energy. From this point of view, the liberated lands have great potential. Wind energy in Kalbajar and Lachin and solar energy potential in Zangilan. The relevant structures have already been given instructions to work with foreign partners on these issues. We have*

declared Karabakh a "green energy zone" and are waiting for proposals from investors.

The President of the Republic of Azerbaijan added that the volume of public investment allocated for the restoration of Karabakh is sufficient for the first stage. *"...At the first stage, 2.2 billion manats (1.3 billion US dollars, provided in the state budget for 2021) are acceptable. Moreover, I looked at the investment program for the restoration of Karabakh proposed to me and was surprised that the volume of projects implemented this year is approaching 1 billion manats. These are mainly projects related to infrastructure, roads, airports. We have not allocated funds for construction yet, we are waiting for the city's plans..."*[1]

It is known from economic theory that the overall economic effect and sustainable development of the industry as a whole and of the structural divisions of the industry separately depend on how investment resources are distributed between enterprises. At the same time, in order to make economically sound engineering and management decisions on the feasibility of implementing a particular investment project in the fuel and energy complex, a clear mechanism for the economic evaluation of these projects is necessary.

The results of scientific, practical and applied research conducted in domestic economic science are an important contribution to solving many problems in the field of investment projects. In scientific works and practical works devoted to this issue, various theoretical approaches to its formation are studied, methodological issues of structure and assessment are covered from different points of view, economic models of formation at all levels of the economy are proposed. The lack of sufficient information about the scientific problem posed in such an interpretation is the basis for the relevance and choice of the topic of the dissertation research.

Such scientists as G.D.Antonov, E.Ya.Litau, Samuel A.Van Vastor, made an important scientific contribution to the theory and methodology of investment processes development, to the improvement of the organizational and economic mechanism for

[1] https :// ibn .idsi md / sites / default / files / image_file / p -403-407 . PDF

assessing investment projects. Investment design, assessment of the economic efficiency of capital investments, the topic of financial support for investment activities at different levels of the economy are found in the studies of such scientists as I.V.Gontarev, Agivasenko, L.N.Nekhorosheva, D.V.Osipova. In general, industry-specific features of investment research, especially economic assessment of investment projects in the fuel and energy complex, have been widely studied in domestic economic science. In particular, studies devoted to this problem can be found in the scientific works of such scientists as A.S. Mirzajanzade, Z.A.Samadzade, T.N. Aliyev, G.A. Safarov, E.M. Gadzhizade, A.S. Sayev, K.S. Suleymanov, M.M. Farzaliyev, A.Kh. Tagiev, A.G. Guseynov. In addition to the scientific and applied significance of the research results of the above scientists and specialists, the industrial scale of the fuel and energy complex has a direct impact on the level of theoretical development of the problem of improving investment assessment mechanisms. projects, as well as methodological provisions are necessary in the field of determining the economic efficiency of investment projects.

The reviewed literature, mentioned and directly related to the topic of this dissertation, once again confirm the relevance of the dissertation topic.

Object and subject of the study. The object of the study is the production and economic activity of the enterprise of the fuel and energy complex of the economy of the Republic of Azerbaijan on the example of SOCAR. The subject of the study is the theoretical and practical conditions and scientific provisions of the rationalization of the mechanism of economic evaluation of investment projects in the fuel and energy complex.

The purpose and goals of the study. The purpose of the dissertation is to develop theoretical, scientific and practical recommendations for improving and developing the methodology for economic evaluation of investment projects in the fuel and energy complex.

In accordance with the goal set in the dissertation, research was conducted to solve the following problems:

- study of the economic nature of investments and investment

projects;

- scientific and theoretical analysis of methodological research on the management of investment projects in the industrial sector of the economy;
- scientific generalization of the features of investment activities at enterprises of the fuel and energy complex;
- economic analysis of investment activities in the areas fuel and energy complex of Azerbaijan using SOCAR as an example;
- economic assessment of investment projects in the fuel and energy sector of the republic's economy;
- analysis of directions for increasing the competitiveness of the fuel and energy complex in the energy market;
- study of the impact assessment of investments in the fuel and energy complex of Azerbaijan on economic growth;
- development of scientific recommendations for improving the methodology for economic evaluation of investment projects in the fuel and energy sector of Azerbaijan;
- determination of strategic directions for the development of investment activities in the fuel and energy sector of the economy of Azerbaijan.

Research methods. The research process was carried out using general and specific methods of empirical and heuristic economic research, which include inductive, deductive, hypothetical methods, methods of theoretical comparison and dialectical analysis, specific and general economic analysis, structural and functional analysis. The research work also widely used economic and mathematical methods, including the method of correlation and regression analysis.

The main protected provisions are:

- as a result of the study, it was concluded that the investment policy in the fuel and energy sector includes a number of strategies, projects and procedures for making and implementing decisions aimed at modernizing existing enterprises and investing in the creation of new enterprises. It also involves the development of effective technologies and equipment, as well as the creation of advanced organizational and production structures aimed at long-term development;

- the main requirement for the effective operation of fuel and energy complex enterprises is interaction with other organizations, focus on achieving economic growth goals, the ability to guarantee the quality of decisions made, and sustainability achieved through the creation of effective economic systems;

- sustainable development is the main requirement for the successful operation of fuel and energy companies. This is achieved through cooperation with other organizations, a special focus on achieving economic growth goals, the ability to ensure high-quality decision-making and the creation of effective economic systems;

- it has been scientifically and practically proven that in order to attract external financing it is necessary to systematize information on the financial, economic, organizational and investment activities of industrial enterprises. This is especially important, since investment projects in this sector require significant capital;

- it became known that an increase in SOCAR's commodity exports to Azerbaijan by 1% leads to an increase in the country's GDP by 0.43%. An increase in investment in crude oil and gas production by 1% leads to an increase in the country's GDP by 0.086%;

- elements that directly influence the development of investment policy in industrial sectors should be systematized according to financial, economic, social, production and technological aspects;

The scientific novelty of the study includes:

- during the study, the "investment policy" in relation to business entities in the fuel and energy complex was examined and expanded from a new angle. This expansion included the inclusion of structural elements, functions and principles for improving the assessment of investment projects and the management of investment processes;

- a methodological approach to the economic evaluation of investment projects has been developed on the basis of a systematic structure of strategic goals for the development of fuel and energy complex enterprises.

- in the course of the study, the features of the investment process in the fuel and energy complex were determined, the essence, concept and effectiveness of the investment policy related to the functioning of the fuel and energy complex were clarified;

- during the period of adaptation to market relations, the main ways of increasing the efficiency of the fuel and energy complex and strategic directions for the development of investment activities in the fuel and energy sector of the economy of Azerbaijan were identified;

- the influence of factors on the effectiveness of investment policy was modeled and a methodology for assessing the effectiveness of fuel and energy complex facilities was proposed;

- a prototype of a public reporting system for fuel and energy complex enterprises has been created. This system includes a description of factors influencing the attractiveness of enterprises for investors, measures taken by the company to increase its investment attractiveness, key financial and economic indicators based on the actual results of its activities, as well as measures to minimize risks and ensure sustainability;

Theoretical and practical significance of the research. The theoretical significance of the study lies in the generalization of the results of previous studies in the field of economic evaluation of investment projects, the development of theoretical and practical prerequisites related to the fuel and energy complex, and the effective distribution of investments. In addition, the dissertation materials can be useful in teaching and preparing lectures on such subjects as industry economics, finance, business administration, and econometrics.

The practical significance of the scientific results of the research work lies in a more accurate assessment of the value of natural resources and the mineral resource base, the creation of effective risk protection systems, the economic assessment of investment projects in the fuel and energy complex, the energy complex of individual enterprises due to the correct choice of criteria for the distribution of investments between the main objects of the fuel and energy complex in order to regulate the mechanism and its activities, which is determined by the possibilities of applying these results at the level of an enterprise in the fuel and energy complex.

The obtained theoretical and practical results can be directly used to improve the management of enterprises in the fuel and energy complex and the effective distribution of investments, and can also be

useful to managers and specialists in this field.

Approbation and implementation. The main scientific and theoretical provisions, results and proposals of the dissertation are reflected in 8 articles (including 2 abroad) and 5 theses (including 2 abroad), published in prestigious journals and conference materials recommended by the Higher Attestation Commission under the President of the Republic of Azerbaijan. Among the conference materials may be shown "Synthesis of optimum linear control systems by excitation of synchronous machines" (Northern Cyprus, 2011), "Azərbaycanın neftqazçıxarma sənayesində investisiya siyasətinin inkişafında xarici investisiyaların rolu" (Baku, 2013), "Sənayedə biznes fəaliyyətinin təkmilləşdirilməsinin zəruriliyi" (Sumgayit, 2022), "Анализ направлений повышения конкурентоспобности ТЭК-а на рынке энергетических ресурсов" (Baku, 2023), "Инновационные стратегии экономической оценки инвестиционных проектов в ТЭК" (Moscow, 2024) the named theses.

During the study, author's articles were also published entitled "Sənaye siyasəti və sənaye sahələrinin inkişaf problemləri" (Baku, 2012), "К вопросу эффективности использования эксплуатационного фонда скважин нефтегазодобывающих предприятий" (Baku, 2012), "Экономическая сущность инвестиций и инвестиционных проектов в условиях рыночной экономики" (Baku, 2013), "İnvestisiya resurslarından səmərəli istifadə mexanizmləri və onun tənzimlənməsi" (Baku, 2014), "İnvestisiya layihə göstəricilərinin müəyyənləşdirilməsi və onların risk faktoru ilə əlaqəsi" (Baku, 2014), "İnvestisiya qoyuluşunun səmərəliliyinin müəyyənləşdirilməsi metodları" (Baku, 2015), "Реализация инвестиционного климата и использование инвестиций в Азербайджанской Республике" (Moscow, 2023), "Technology of production and primary processing of milk in farm conditions" (Ukraine, 2023).

Name of the organization where the dissertation work was completed. Azerbaijan State University of Oil and Industry.

The total volume of the dissertation, taking into account the volume of its individual structural divisions in characters. The

total volume of the dissertation is 242989 characters, including: Introduction - 13489 characters, Chapter I - 79089 characters, Chapter II - 54263 characters, Chapter III - 43680 characters, conclusions - 18322 characters and a list of references - 13552 characters. Volume of dissertation work, excluding figures, tables, graphs, the list of references is 208843 signs.

SUMMARY OF THE DISSERTATION

The introduction substantiates the relevance of the topic, defines the goals and objectives, the object and subject of the dissertation, research methods, reflects the main provisions, scientific novelty and theoretical and practical significance of the work.

The first chapter of the dissertation entitled **"Theoretical and Methodological Foundations of Investment Project Management"** examines the economic nature of investments and investment projects in the context of qualitative transformation of the economy, which are directly related to the research problems, methodological approaches. investment projects management in industry, and investigates the features of investment activities in the fuel and energy complex. The fuel and energy complex is a set of industries specializing in the exploration and development of resources to provide enterprises with fuel and various types of energy to support society and the economy. The issue of the level of development and efficiency of the fuel and energy complex is important for many areas of society, since the indicators of social production as a whole depend on the dynamics of the development of this complex and, in particular, affect it.

The main functional and economic activity of the fuel and energy complex can be called territorial formation, since a powerful infrastructure is developed near energy sources. Enterprises are built that create a city, therefore a number of other problems are solved: the number of new jobs increases, nearby cities, towns, villages and villages are developed.

Then, the dissertation provides a general comparison of scientific opinions and approaches related to such important concepts as "investments" and "investment activity". From a practical point of

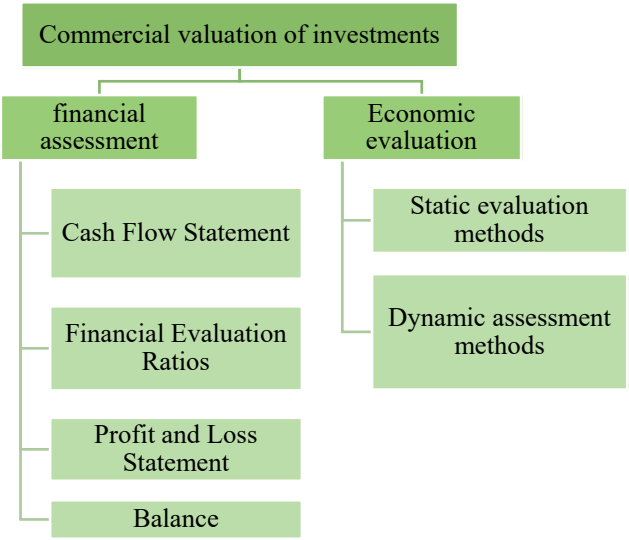
view, it can be said that among foreign scientists and experts, as well as among our compatriots, there is still no absolute consensus that allows us to clearly understand and define the economic nature of investments, so a popular scientific interpretation is given.

The dissertation can be considered the first study analyzing and grouping the factors influencing the economic structure of the state and investment models. An overview of the results of the analysis of scientific positions of representatives of classical and modern economic theory regarding the topic of the study is given.

It can be assumed that the goal of investment policy in a broad sense is to increase profits in the long term as a result of selecting and implementing the most effective investment projects to maintain and expand production activities. Within a narrow framework, the following list of investment goals is defined at the microeconomic level:

- increase in production volume;
- liquidation and replacement of morally and physically obsolete parts of fixed assets of industrial production;
- increasing the technological level of production;
- improving the quality of industrial products and reducing costs;
- expansion of the range of industrial products, etc.

According to the author, the assessment of the effectiveness of investment projects is of great scientific and practical interest, as well as great economic significance in the work of an industrial enterprise. The accuracy and objectivity of the assessment of investment activities affects the speed of development of the enterprise, the payback period of invested resources, as well as the solution of various problems of development of the national economy as a whole. The importance of this assessment, among other things, is emphasized by the development of methodological recommendations for assessing the effectiveness of individual investment projects intended for enterprises of various forms of ownership implementing investment policy at the state level. A comprehensive methodology for assessing investments is presented by the author in diagram 1.



Scheme 1. Methodology of comprehensive investment assessment
Source: Compiled by the author.

According to the author, the functional activity of the fuel and energy complex should proceed in the mode of the necessary renewal and expansion of the production potential, provided by the huge investments of the previous decades. At the same time, the listed technical indicators and the production potential of all areas of the fuel and energy complex, solving the problem of the effective use of investment resources to ensure the normal reproduction process in the fuel and energy complex, creating a favorable investment environment to ensure the necessary volume; it is necessary to take into account the experience of changing the age structure, the rate of wear and tear and the technical condition of the main production assets, so that investments that create economic growth inside and outside the fuel and energy complex do not reach a tense level. Based on similar scientific and practical arguments, the successful operation of the fuel and energy complex in comparison with other sectors of the national economy lays the foundation for sustainable and long-term prosperity, making this complex a permanent and main source of budget funds.

In the theoretical and practical aspects of the dissertation, this

problem can be solved by further attracting investments and using financial resources of the fuel and energy complex in the area under consideration. In terms of financial volume, the main source of investment resources will be own funds of business entities. The share of own reinvestment funds is about 85% of the total volume of investments in the capital of the fuel and energy complex. From a theoretical point of view, a high level of private funds in the financial structure of investments indicates that investment programs of fuel and energy enterprises are necessarily aimed at solving current production problems, as well as a low percentage of external debt funds. in the total volume. Investment volumes show that the investment climate is unattractive even in those areas of the fuel and energy complex that traditionally and universally require high investments. The management of energy companies should be interested in maintaining the maximum growth of reserves at cost. Therefore, the existing legal framework in the field of subsoil use should develop in the direction of creating incentives for the effective implementation of geological exploration at the expense of the subsoil user at his expense. Secondly, norms and rules for the use of the "contribution to the reproduction of the mineral resource base" should be developed for the purpose of maximum use within the framework of the goal of increasing the resource potential. The control function of state regulation over the directions and efficiency of investment activities of natural monopoly entities in the fuel and energy complex should be implemented through the formation by the state of prices for the products and services of these monopolies.

In the second chapter of the dissertation entitled **"Analysis of the Current State of Investment Activity in the Fuel and Energy Sectors of the Republic of Azerbaijan"** using economic statistics reports, an assessment of the subject and object of the study is given. In this chapter, using the example of SOCAR, investment activities in the fuel and energy sectors of Azerbaijan, economic assessment of investment projects in the fuel and energy sectors of the republic, as well as increasing competitiveness are analyzed. The author presents a historical chronology of the development and activities of the fuel and energy complex of the republic. It is noted that the Republic of

Azerbaijan is a country with a rich history of industrial production of oil and natural gas. Since the 1990s, commercial production of oil and natural gas has been carried out both at previously developed and newly discovered oil and natural gas fields, which confirms forecasts about the future role of the oil and gas sector as a major sector of the economy. As a result, more than 90% of electricity production in the Republic of Azerbaijan is produced using natural gas (at 14 production facilities). Interestingly, in 2022, less than twice as much was invested in industrial oil and natural gas production compared to 2017. This economic phenomenon is explained, on the one hand, by the already high, progressive level of fixed capital in the industry under consideration. On the other hand, intra-industry priorities in investment in crude oil and natural gas production and the production of petroleum products have increased many times, and therefore, the volume of investment in the service sector. Graph 1 below shows the volume of investment in the energy sector of Azerbaijan in 2007-2023.

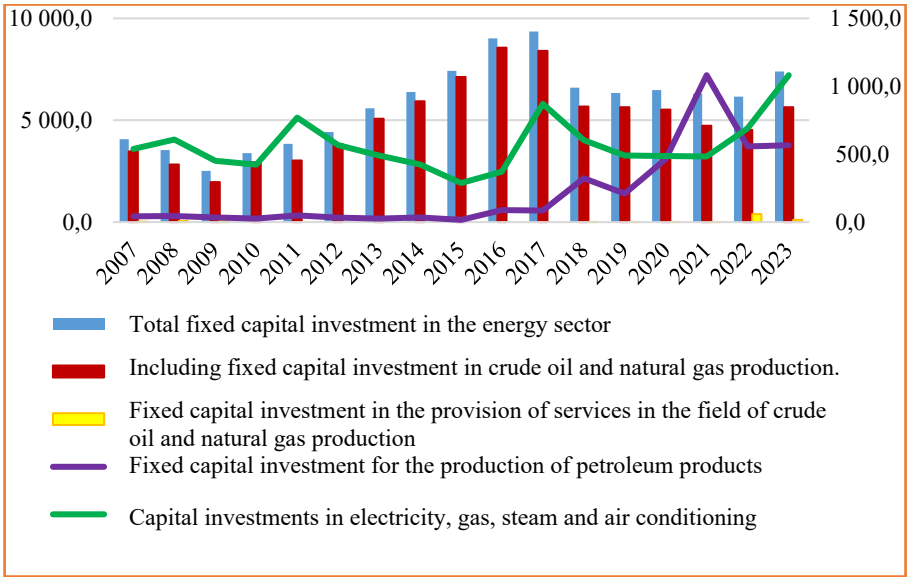


Chart 1. Volume of investments directed to the fuel and energy complex of Azerbaijan in 2007-2023, in millions of manats

Source: Compiled by the author in MS Excel based on data obtained from the website https://www.stat.gov.az

As can be seen from Graph 1, capital investments in the fuel and energy complex of Azerbaijan in 2007-2023 developed mainly with the growth dynamics of 2009-2017 and amounted to 9354.4 million manats in 2017. However, in subsequent years, the share of investments in fixed assets demonstrated unstable dynamics. In 2018, the volume will amount to 6.598 million manats, in 2019 - 6.339 million manats, in 2020 - 6.474.2 million manats, in 2021 - another 6.296.3 million manats and, finally, in 2022 - 6.384.7 million manats.

In 2018-2023, the volume of investments directed to the fuel and energy complex of Azerbaijan decreased compared to 2017 and amounted to 7389.7 million manat in 2023 , which means a decrease of 1.3 times compared to 2017. Interestingly, in 2022, less than two times more were invested in the industrial production of oil and natural gas compared to 2017. On the one hand, this situation is explained by the already high, progressive level of fixed capital of this industry, on the other hand, by intra-industry priorities in investment, so the volume of investments in the service sector has increased many times. times in the extraction of crude oil and natural gas and in the production of petroleum products. The development of these areas of energy affects the economic growth of the national economy. If we establish a correlation and regression relationship between investments in the oil and gas sector and GDP, we will get the following results (Graph 2).

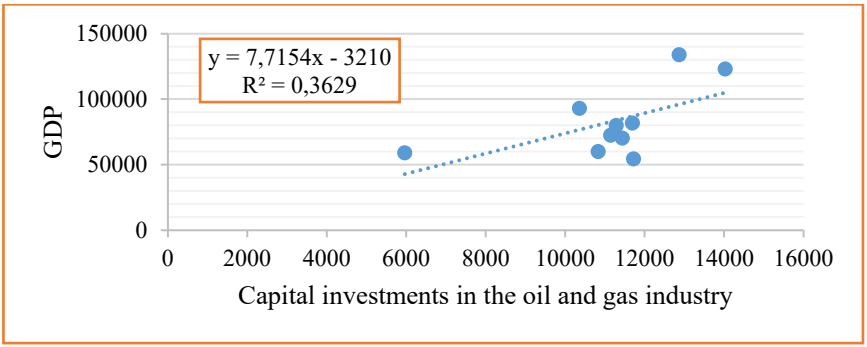


Chart 2. Correlation-regression relationship between capital investments in the oil and gas sector of Azerbaijan and GDP

Source: Compiled by the author in MS Excel based on data obtained from the website https://www.stat.gov.az

According to the graph, there is a correlation between investments in the oil and gas sector and GDP, expressed by the linear regression equation y = 7.7154x - 3210.0.602412 r = √0.3629 =). As can be seen, there is a significant correlation between these indicators according to the Chaddock scale and exceeds its average value.

If we calculate the elasticity coefficient, we will get the following result.

$$E = \alpha * \frac{\bar{x}}{\bar{y}} = 7{,}7154 * \frac{953{,}979}{9075{,}16} = 1{,}0388$$

This shows that a 1% increase in investment in Azerbaijan's oil and gas sector results in a 1.04% increase in GDP.

Research shows that the increase in investment in the oil and gas sector has had a significant impact on increasing SOCAR's revenues from work and services, and has strengthened the commodity structure of export products. This can be seen more clearly in Chart 3 below.

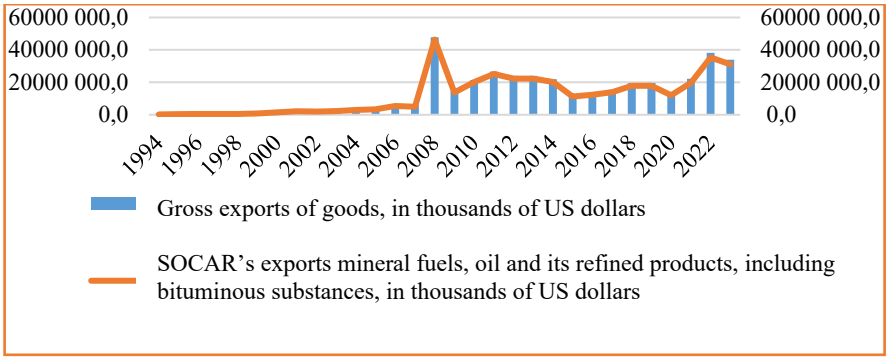


Diagram 3. Commodity products exported by SOCAR in 1994-2023 and their structure, in thousands of US dollars

Source: Compiled by the author in MS Excel based on data obtained from the website https://www.stat.gov.az.

According to the compiled graph 3, the volume of exports in Azerbaijan was at a low level in 1994-1996. In 2008, it increased to 47,756,040.2 thousand US dollars. This means 97% of the total commodity structure of the Republic of Azerbaijan in the first years of

independence (1991-1993) and after the signing of the "Contract of the Century". By the order of the great leader H.Aliyev dated April 20, 1994, an increase in export volumes was observed. As a result, the increase in exports in subsequent years was due to foreign investments in the oil sector. In subsequent years, this indicator declined and was observed with volatility against the backdrop of the global financial crisis and the COVID-19 pandemic. In 2023, the export of SOCAR products decreased by 33.1 percent compared to 2008 and amounted to 31,017,150,700 US dollars, which accounted for 91.5 percent of the total commodity structure of exports. The dynamically developing Republic of Azerbaijan has expanded the commodity structure of exports by exporting various types of petroleum products.

Research shows that the development of the country's energy sector is carried out on the basis of several national programs, decisions and regulations. These approaches are used to support the wider use of renewable energy sources.

The production potential of energy production using renewable energy sources in the Republic of Azerbaijan is about 25,350 MW, and the potential of wind energy is 15 GW. In comparison, solar energy uses about 8 GW, biomass - 900 MW, geothermal energy - 800 MW and small hydropower - 650 MW.

The main directions were developed and proposed by the Energy Regulatory Agency, a state legal entity under the Ministry of Energy of the Republic of Azerbaijan. Thanks to this mechanism, a basis for coordination has been created between state companies implementing functional production activities at electric power enterprises and gas fields. In the energy sector of the economy, ongoing work is underway to diversify energy sources and introduce clean energy sources (alternative energy sources), the actual progress is 56% of the planned. In the remaining part of the work, partial progress is observed on 36% of the tasks, and the remaining 18% of the tasks are not fulfilled. In parallel with the work on diversification of energy sources and introduction of environmentally friendly energy sources (alternative energy sources), forecasts of electricity consumption in the country and abroad are being compiled. In addition, the working group of the state energy company - Azerenerji OJSC assessed the export potential

of Azerbaijan, other costs associated with the production of fuel and electricity, customs duties, electricity transmission costs and other costs of entering the market. Taking these factors into account, the Law of the Republic of Azerbaijan “On Energy” was adopted, taking into account international experience, the peculiarities of the country’s economy and other aspects.

Last year, production in the oil and gas sector of industry decreased by 1.9 percent, while in the non-oil and gas sector it increased by 7.2 percent. At the same time, in the mining industry, commercial oil production decreased by 5.4 percent, while commercial natural gas production increased by 9.8 percent. "Strategic Road Maps of the Main Sectors of the National Economy" (hereinafter referred to as the "strategic road map") were approved by the Government of the Republic of Azerbaijan in December 2016 due to the fall in oil prices on the world market in 2014. . This "strategic road map" is drawn up in the direction of sustainable development of the republic's economy, including improving the quality of social security. Given the forecasts that world oil prices will not return to the 2008 level, the main goal is to "stimulate" domestic investment, ensure conditions for free trade and open competition, increase the potential of human resources and other areas for the development of non-market markets. oil sectors of the economy, as well as to develop the skills of all sectors of the country to take advantage of its strategically advantageous position at the crossroads of trade routes coming from (the Great Silk Road). For each of the 11 different sectors of the republic's economy, a "Road Map" was drawn up, consisting of 12 documents with corresponding goals divided into three time periods: from 2016 to 2020 - short-term; after this period until 2025 - medium-term and from the 2025 calendar year - long-term. In 2016, the Project to Support Planning of Financial Reform of the Energy Sector was also launched.

This project includes:

- accounting of actual costs for the supply of electricity (production, transmission and distribution);
- revision of tariff setting systems taking into account the characteristics of consumers associated with the production, transmission and distribution of electrical energy;

- reforming the internal system of consumer support by adapting electricity tariffs to the various energy sources used (solar, wind, water and gas).

Today, although the elimination of legal inconsistencies with international standards in the field of determination and regulation of electricity tariffs, environmental protection and other areas is a very complex task, the electricity tariff set for consumers remains at a fairly low level. Such conditions are objective and at the same time cannot be of economic interest to investors. The task of diversifying electricity production based on the principle of "green" energy and the use of environmentally friendly generating capacities is relevant for the economy of the Republic of Azerbaijan. The government of the republic also hopes for a further increase in electricity exports. This is in line with scientific and practical provisions related to the introduction of renewable energy sources (in particular, wind energy, currently promoted by the government of the Republic of Azerbaijan), strengthening export-oriented high-voltage power lines and building an electricity supply system.

Analyzing the main factors influencing the competitiveness of the fuel and energy complex on the basis of research, we consider it necessary to identify (or rather, emphasize) the advantages and disadvantages that significantly affect the competitiveness of the oil and gas sector of the Republic of Azerbaijan.

The Republic of Azerbaijan has important advantages in the fuel and energy sector:

- rich historical heritage and experience (oil production has been carried out since the end of the 19th century);
- availability of natural resources. According to the annual BP review, the country's discovered and confirmed oil reserves amount to 7 billion barrels of oil;
- coastal zone of the Caspian Sea – 750 km;
- stable political regime;
- increase in citizens' income;
- high quality oil, proximity to major sales markets.

It should be noted that the oil and the resulting oil

The quality of the product directly depends on the chemical

composition. Thus, the main indicators of the quality of crude oil are density, sulfur content and fractional composition.

The density of oil depends on the content of paraffin hydrocarbons and resins. To characterize the density of oil, relative density (g/cm3), measured in degrees, and the density of the American Petroleum Institute (API) are used. Relative density is equal to the ratio of the mass of oil to the mass of the same volume of water. API density = (141.5 / relative density - 131.5). The lower the density of oil, the easier it is to process this raw material and the higher the quality of petroleum products.

If we take into account the oil produced in the Republic of Azerbaijan, its quality surpasses not only Russian Ural oil, but also Brent and Dubai. Due to the high quality of Azerbaijani Azeri Light oil, this product is sold at a higher price than Brent oil.

In the third chapter of the dissertation entitled **"The Main Directions of the Mechanism for Improving Investment Projects in the Fuel and Energy Complex of Azerbaijan",** a correlation and regression analysis was conducted between the GDP and SOCAR's commercial product exports, investments in crude oil and natural gas production. was conducted and assessed. Under the influence of both indicators, the country's GDP changes dramatically. In this regard, based on the statistics of primary data and the correlation analysis of the indicators recorded using the Eviews-12 software package, the regression of SOCAR's commercial product exports (X1), investments in crude oil and gas production (X2) and GDP (Y) as The analysis of dependent variables was conducted and the following graphical description was obtained.

Using the data presented in Figure 4, we conducted a regression analysis in the Eviews-12 software package, the results of which are presented in Table 1.

According to the Eviews-12 software package, the regression equation in this case will have the following form.

Chart 4. SOCAR's commercial exports, investments aimed at crude oil and natural gas production, and GDP dynamics in the country, million manats

Source: compiled by the author in the Eviews-12 program based on data obtained from the website https://www.stat.gov.az.

Table 1.

Results of correlation and regression analysis between GDP and SOCAR commercial exports, investments in crude oil and natural gas production

Dependent Variable: Y
Method: Least Squares
Date: 11/07/24 Time: 06:21
Sample: 2010 2023
Included observations: 14

Variable	Coefficient	Std.Error	t-Statistic	Prob.
X1	1.906695	0.119769	15.91972	0.0000
X2	1.169538	0.967037	1.209404	0.2519
C	16390.73	6506.352	2.519188	0.0285

R-squared	0.958445	Mean dependent var	74026.96
Adjusted R-squared	0.950890	SD dependent var	26849.41
SE of regression	5950.059	What is the info criterion?	20.40760
Sum squared residence	3.89E+08	Black standard	20.54454
Log likelihood	-139.8532	Hannan-Quinn Criterion.	20.39492
F-statistic	126.8549	Durbin-Watson stat	1.051908
Prob(F-statistic)	0.000000		

Source: Developed by the author based on Eviews-12 software .

Y = 1.90669495618*X1 + 1.16953842639*X2 + 16390.7269521

$$\mathbf{Y = 1,191x_1 + 1,169x_2 - 16390,73(3.3.1)}$$

(t) (15.92) (1.21) (-2.52) DW= $\mathbf{1,052, R^2 = 0,951}$

According to the obtained result, the coefficients of the explanatory variables are statistically significant, since the coefficients of the explanatory variables are less than their standard error. Since Fisher's F-criterion = (126.8) > F_(tab.)=4.10, the model based on the obtained regression equation is statistically significant. If we use the Darbon-Watson statistical tests based on 2 explanatory variables for 14 observations to check the autocorrelation of the residuals in the model, the critical points of the Darbon-Watson statistics will be as follows.

$$d_l = 0{,}905 \leq \text{DW} = 1{,}052 < d_u = 1{,}551$$

Given the formula, the conclusion about the presence of autocorrelation between the indicators of the causal factor is considered uncertain.

It should be noted that the uncertainty of the statistical significance of the model can be determined from the elasticity coefficient as follows.

$$E\_(SOCAR\ Commercial\ Export\ Volume) = \frac{\alpha \times \overline{x_1}}{\bar{Y}} = \frac{1{,}191 \times\ 26873{,}6036}{74026{,}96} = 0{,}43236221$$

$$E\_(investments\ in\ crude\ oil\ and\ natural\ gas\ production) = \frac{\alpha \times \overline{x_2}}{\bar{Y}} = \frac{1{,}169 \times\ 5469{,}22857}{74026{,}96} = 0{,}08636756$$

As can be seen, elasticity was mainly observed in SOCAR's commercial exports. According to the elasticity coefficient, a 1% increase in SOCAR's commodity exports to Azerbaijan leads to a

0.43% increase in the country's GDP. A 1% increase in investment in crude oil and gas production leads to a 0.086% increase in the country's GDP.

Forecasting investments in crude oil and natural gas production using a polynomial model in MS Excel, we obtain the following result.

As shown in Figure 5, investment in crude oil and natural gas production is expected to grow by only 8.3% on average by 2030 compared to 2023.

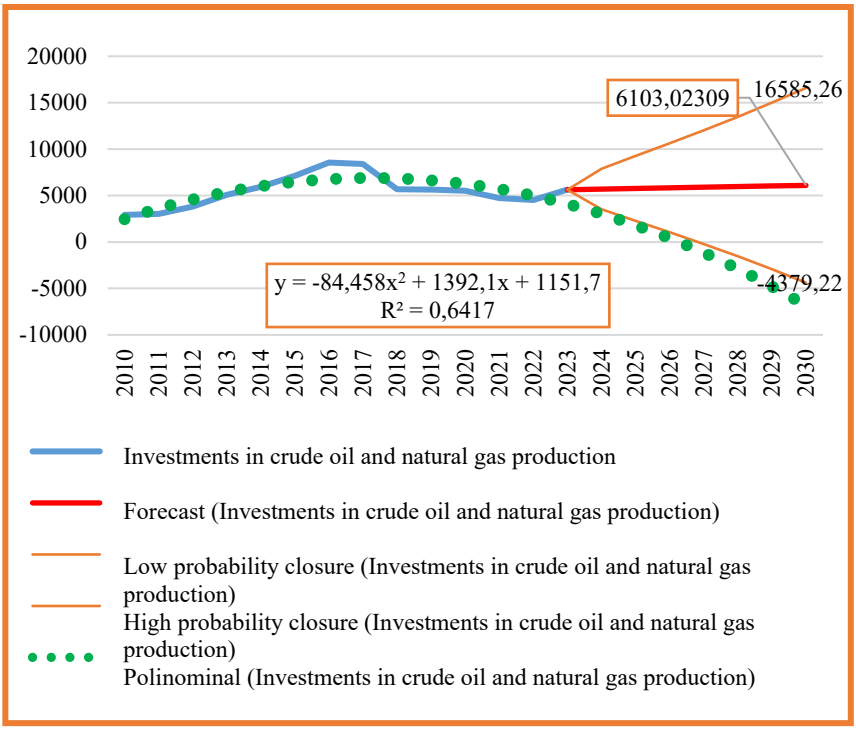


Chart 5. Forecasting investments aimed at the extraction of crude oil and natural gas

Source: Compiled by the author based on the MS Excel software package.

According to the researcher, to increase the efficiency of investments it is necessary to organize a continuous process aimed at identifying, analyzing and assessing risks, as well as developing

measures to minimize them. Their implementation allows you to get a positive result from the implementation of the project. The assessment of multifactorial risks is carried out on the basis of an expert-statistical assessment of the most significant risks.

Risk assessment and comprehensive economic modeling of the results of the investment project's effectiveness are carried out taking into account the correlation coefficients of the initial parameters.

The main problem of industrial energy on a global scale is the high energy intensity of national economies. The main efforts of state bodies and governments of the world community are united in reducing the level of energy intensity of national economies.

Being a capital-intensive and highly inertial national economic complex, in the process of economic development of countries the fuel and energy complex acts in two opposite qualities: as a strengthening factor (or economic "engine") and at the same time as a limiting factor of the country's economic growth (or economic "slowdown") as such. At the stage of qualitative changes in national economies the fuel and energy complex can become one of the main driving forces of economic development, a real economic "locomotive" of the economic growth of these enterprises due to impressive indirect regeneration.

Based on similar scientific and practical arguments, the successful operation of the fuel and energy complex, compared to other sectors of the national economy, lays the foundation for sustainable and long-term prosperity and turns this complex into a permanent and primary source of budgetary funds.

It should be recognized that the functional activity of the fuel and energy complex should be carried out in the mode of the necessary renewal and expansion of the production potential, provided by large investments of previous decades. At the same time, according to the researcher, it is necessary to take into account the experience of changing the age structure, the rate of wear and tear and the technical condition of the main production assets of all areas of the fuel and energy complex. Here, the listed technical indicators and the production potential of the fuel and energy complex are at a limited level, the solution to the problem of the effective use of investment

resources to ensure the normal course of the reproduction process in the fuel and energy complex comes to the fore. fields.

Our study shows that the most important limiting factor in the financial structure of investments is non-payment. The tax system used in a particular country, where the volume of calculated taxes may exceed the tax base, on the one hand, the low level of solvency of energy consumers, on the other hand, non-payments to the budget, the main direction of "covering" taxes calculated after paying the full financial amount in "live money" and at the same time expanding or at least implementing investment activities of the fuel and energy complex, necessary to maintain simple reproduction.

It is noted that fuel and energy complex enterprises have authorized capital based on the legislation. For this reason, investments in new infrastructure projects can be secured by the terms of project financing, i.e. financial flows created by the same project. Changes in the legislation related to the production sector of the fuel and energy complex, acceptable for the purposes of project financing, should be made in the direction of improving both the licensing system of subsoil use and the subsoil use system established by the basis for the application of the Law of the Republic of Azerbaijan. Also, if necessary, it is necessary to eliminate organizational "gaps" and "obstacles" in project financing by amending the relevant legislation on subsoil use, investment activities and taxation.

In our opinion, in order to expand business opportunities for attracting investment for geological development of fossil fuel deposits, including from interested countries, and to reduce the costs of raising debt, it is advisable to allow the pledge of subsoil use rights through legislation. Such a legislative "step" can be considered as a special case of the formation of a system for the circulation of use rights. Another stimulation method considered by the author is the formation of a stock market segment - the market for licenses for the right to use the subsoil, giving this segment the attributes of the securities market. At the same time, given the specifics of the mining industry and economic relations, it is advisable to limit the ability of the subsoil owner to protect the subsoil and the right to use this subsoil in this market segment. Thus, the legislative transfer of subsoil use

rights can be carried out not through the state, but directly between business entities controlled by the state, which dramatically increases the liquidity of the subsoil use license.

The implementation of large investment programs, such as energy conservation programs, requires effective state support for local investors. A specialized investment fund operating on the principles and conditions of the development budget, formed taking into account the specifics of the development budget, can become a mechanism for implementing this. The financial resources of the fund can act as collateral for debt funds attracted by companies to finance fuel and energy projects. One of the sources for the formation of the fund can be the future portion of the state's oil revenues in projects being developed and under development (for example, medium-term projects).

The financial source of the main part of capital investments in the electric power industry will be depreciation charges and profits of enterprises provided for by electricity tariffs with the simultaneous attraction of state support and borrowed funds. As for the current historical period, there is an objectively justified need for change. The priorities of the state investment policy can be formed in areas that provide higher income per unit of investment, primarily in the following areas :

- meeting the demand for supplied energy;
- reproduction of the mineral resource base of the fuel and energy complex.

Increasing the share of non-renewable resources in the structure of the raw material base of the fuel and energy complex, investments in energy production (in increasing the supply of primary energy, purely theoretical low efficiency of energy use in all links of the "energy chain") give a smaller return than investments in increasing the efficiency of energy use. For this reason, first of all, it is necessary to try to increase the efficiency of energy use at all stages of the "energy chain", create incentives for financial contribution to energy saving, thereby reducing the demand for energy consumption, other factors. be equal. The main problem, which is difficult to solve here, seems to be the lack of functional mechanisms for organizing the financing of

energy-saving measures. The task of the state may be to expand the terms of financing the long-term re-equipment of equipment in the processing industry in accordance with the economic interests of the fuel and energy complex. This is possible in the form of industrial cooperation, integration of the mechanical engineering and fuel and energy industries. At this time, liquid products of fuel and energy deposits or energy reserves in the depths of developed deposits can act as a guarantor of borrowed funds for prospective construction and modernization.

The following results were obtained during the study and, based on them, corresponding recommendations and proposals were given:

1. It has been established that there is a correlation between investments directed to the economy of Azerbaijan and GDP, which expresses economic growth, expressed by the linear regression equation y = 12.573 x – 130806. According to this ratio, economic growth by 1% leads to an increase in GDP by 2.585%, and an increase in investments in the oil and gas industry by 1% leads to an increase in GDP by 1.039%;
2. The study established that the main products exported by SOCAR, which play an important role in the fuel and energy complex of Azerbaijan, are crude oil and oil products obtained from bituminous rocks (47.91%) and natural gas (40.35%). In general, it was established that the products exported by SOCAR form the basis of the commodity structure of the country's export products;
3. The study, conducted using the Eviews -12 software package, conducted a correlation and regression analysis between SOCAR's GDP and commercial exports, investments in crude oil and natural gas production. It was found that there is a high correlation between these indicators, determined by the linear regression equation Y = 1.191 x _1+1.169 x _2-16390.73;
4. During the study, the adequacy of the normality criteria of the model histogram was checked, the autocorrelation of the residuals was checked according to the Durbin-Watson criteria, a heteroxedasticity

test was carried out, the prognostic characteristics of the model were checked and the appropriateness of its use for forecasting purposes was determined.

5. Based on the forecast trend model between investments in oil and natural gas production and the time factor, a polynomial regression equation was constructed: y = -84.458 x 2 + 1392.1 x + 1151.7. The polynomial regression equation for forecasting between the volume of SOCAR product exports and the time factor is: y = 379.29 x 2 - 3058.5 x + 22314. According to these regression equations the volume of SOCAR investments is expected. By 2030, crude oil and natural gas production will reach 6103.0 million manat, and the volume of exports of commercial products will reach the corresponding level of 71145.1 million manat.

6. Globally, the energy sector faces challenges such as high energy intensity of the economy and environmental impacts, which highlight the need to improve energy efficiency and introduce renewable energy sources. In general, the fuel and energy complex play the role of both a driver and a constraint on the economy, depending on the modernization of production facilities and investment opportunities.

7. Low levels of foreign investment in Azerbaijan's energy sector highlight concerns about the investment climate and non-payments, and measures to improve tax and pricing policies are considered important for sustainability. Proposed measures include systematic support for the oil and gas sector through initiatives such as a "single window" regulatory approach, expansion of export subsidies, and improved subsoil licensing.

8. Recommendations for legislative and institutional reforms include the creation of a stock exchange for subsoil use licenses, improving the regulatory framework for project financing, increasing sector activity, and developing cooperation between industry stakeholders and government agencies to attract investment.

8. The study identifies significant barriers to the transition from traditional fossil fuels to renewable energy. These include high start-up capital requirements, technology adaptation challenges and insufficient infrastructure for large-scale deployment of renewable energy. Despite these barriers, renewable energy was identified as a

critical area for reducing energy intensity and environmental impact.

9. Effective government intervention is critical to coordinating investment strategies in the oil and gas sector. This includes risks of overproduction, inefficiencies in export logistics and coordination between public and private stakeholders. The role of government in ensuring coherent planning and implementation through laws and commissions is emphasized as key to sustainable development.

10. Although the oil and gas industry remain the main source of Azerbaijan's export revenue, studies highlight the need to diversify into value-added petrochemicals and alternative energy technologies. This strategy would enhance the country's global competitiveness and reduce economic vulnerability to changes in oil prices.

The main provisions of the dissertation are reflected in the following scientific publications of the author:

1. S.R.Muradova, R.Z.Kazimzadeh, R.A.Muradova, T.D.Vəliyeva. Synthesis of optimum linear control systems by excitation of synchronous machines // – North Cyprus: International Conference on Technical and Physical Problems of Power Engineering, 7-9 iyul 2011. – s. 87-90.

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The defense will be held on 30 January 2025 at 16^{00} at the meeting of the 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,

Address: AZ1106, Azerbaijan Republic, Baku, Najaf Narimanov street, 93.

Dissertation is accessible at Azerbaijan Cooperation University's Library.

Electronic versions of dissertation and its abstract are available on the official website of the Azerbaijan Cooperation University (www.aku.edu.az).

Abstract was sent to the required addresses on 27 December 2024.

Signed for print: 25.12.2024

Paper format: 60x84.

Volume: 43888 characters

Number of hard copies: 20