

REPUBLIC OF AZERBAIJAN

On the rights of the manuscript

ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**RESEARCH ON THE EFFECTIVE USE OF
TECHNOPARKS IN THE INNOVATIVE DEVELOPMENT
OF THE AZERBAIJAN ECONOMY**

Specialization: 5311.01 – “Organization and management of
enterprises”

Field of Science: 53 – Economy

Applicant: **Aliheydar Eldar Mahmudov**

Baku – 2025

The dissertation was completed at the Department of "Industrial Economics" of the Azerbaijan State Oil and Industry University.

Academic
supervisor:

Doctor of Economic Sciences, Professor
Mushfig Jamil Atakishiyev

Official
opponents:

Doctor of Economic Sciences, Professor
Elshad Yagub Mammadov

Doctor of Philosophy in Economics,
Associate Professor
Rahim Farahim Sadigov

Doctor of Philosophy in Economics,
Associate Professor
Elnur Abil Mammadov

BFD 4.26 One-time Dissertation Council operating under the ASOIU of the Higher Attestation Commission under the President of the Republic of Azerbaijan

Chairman of the
Dissertation Council:

Corresponding member of ANAS,
Doctor of Economic Sciences,
Professor
Korkhmaz Jahangir Imanov

Scientific secretary
of the dissertation council:

Doctor of Philosophy in Economics,
Associate Professor
Sadat Cumshud Zeynalova

Chairman of the scientific
seminar:

Doctor of Economic Sciences,
Professor
Safar Hasan Purhani



GENERAL CHARACTERISTICS OF THE WORK

Relevance and degree of development of the topic. In the conditions of global transformations and in a period of increasing problems, the issues of increasing the efficiency of the economy come to the fore. There is a need to update traditional mechanisms and practical tools used. In such conditions, it is necessary to take measures in accordance with the characteristics of economic development and resource supply potential of each country, develop and apply economic mechanisms. In world practice, technoparks stand out as one of the economic mechanisms that meet such criteria and attract the interest of potential investors with their multifunctional features. Technoparks attract attention with their characteristics that are quite favorable for the transfer of the latest technologies. The creation of appropriate infrastructure by the state, the organization of energy supply at the highest level, the formation of road infrastructure, the improvement of raw material supply, the provision of tax and customs privileges for at least 10 years are a clear expression of the fact that technoparks are a favorable place for activity.

The Azerbaijani economy has embarked on a dynamic development path in recent years. Important steps have been taken to diversify the national economy and diversify its structure, driven by the oil and gas sector. Thus, by the decree of the President of the country dated February 2, 2021, “Azerbaijan 2030: National Priorities for Socio-Economic Development” were approved. This decree defined quite serious and priority tasks. The main goals are to accelerate the innovation of the economy and ensure development based on high and “smart” technologies. Technoparks are able to perform important functions in these processes. The processes of forming and developing a technopark institute are already underway in our country. However, we believe that, judging by world experience, substantial successes have not been achieved in our country in terms of sufficiently benefiting from the functions of technoparks.

There is a need to fundamentally investigate these problems and conduct research. All this indicates the relevance of the topic of the dissertation.

Regarding the degree of development of the topic, we can note that the problems of innovative development of the economy have attracted wider attention in world economics since the 30s of the 20th century. Over the past 20-30 years, research on the effectiveness of using technoparks in the innovative development of the economy has been intensive. In our country, scientific research in this direction mainly coincides with the last 20 years. Among the Azerbaijani economists-scientists, one can mention academician Z.A.Samadzade, A.F.Musayev, A.Kh.Nuriyev, A.J.Muradov, A.Sh.Shakeraliyev, T.H.Huseynov, T.N.Aliyev, F.H.Gasymov, Z.M.Najafov, A.G.Alirzayev, G.S.Suleymanov, Sh.T.Aliyev, A.D.Huseynova, A.G.Aliyev, A.H.Taghiyev and others.

The scientific works of classical and modern foreign scientists and researchers A. Smith, A. Marshall, P. E. Samuelson, V. D. Nordhaus, C. A. Schumpeter, R. M. Solow, R. R. Nelson, A. I. Ageev, N. I. Antipina, V. A. Barinova, G. V. Bateneyeva, M. V. Braginet, L. V. Glukhova, A. A. Golubev, Y. S. Yemelyanov, O. G. Kukharenko, V. P. Maryanenko, V. N. Ponomaryov, A. Y. Sergeyeva, P. A. Fatkhuddinov, O. V. Fyodorov and others have examined the problems related to the innovative development of the economy, the issues of the efficiency of technoparks in solving these problems, different mechanisms of their use, and the problems that hinder the development of technoparks.

However, as we have noted, the innovative development of the economy requires new approaches and mechanisms, and the importance of developing and implementing more efficient economic mechanisms is noteworthy. In view of these factors, the need to study the effective use of technoparks in the innovative development of the economy remains serious.

The object of the research is technoparks, which are characterized as an effective economic mechanism in the innovative development of the economy, and the processes of activity related to them.

The subject of the research is the direction of ensuring the effective use of technoparks in the innovative development of the Azerbaijani economy, and the improvement of related activity processes and existing mechanisms.

Goals and objectives of the research. The purpose of the dissertation work is to prepare scientifically-economically and practically justified proposals for the regulation and improvement of the processes of ensuring the effective use of technoparks in the innovative development of the economy in the modern period in the Republic of Azerbaijan. To achieve this goal, the following tasks have been identified and investigated in accordance with the structure of the dissertation:

- Study of theoretical and methodological approaches to the use of technoparks in the processes of innovative development of the economy and providing generalizations;
- Investigation of the characteristics of technoparks as an important economic mechanism in the innovation of the economy in the conditions of the challenges of the current era;
- Study and generalization of world experience in the effective use of technoparks in accelerating the innovative development of the economy;
- Analysis of the processes of the creation and development of technoparks in Azerbaijan;
- Assessment of the impact of the effective operation of technoparks on the innovative development of the economy;
- Consideration of the issues of developing the Technopark Institute and strengthening the legislation on its effective use in the innovation of the economy;
- Investigation and improvement of the effectiveness of existing state support mechanisms for technoparks in the innovation of the economy in accordance with the challenges of the revival of the liberated territories and post-pandemic;
- Preparation of proposals and recommendations on determining effective directions of action for the use of technoparks in ensuring the innovative development of the economy in Azerbaijan in the face of new challenges, etc.

Research methods. During the research, the problems posed in accordance with its structure were investigated. In these processes, methods of analysis, synthesis, comparison and generalization, analysis of dynamic series, analytical-computational methods and other methods were used. As theoretical and methodological approaches, laws, regulatory and legal documents that allow for the effective use of technoparks in the innovative development of the economy and regulate related processes, as well as methodological materials of specialized scientific research institutes and centers and other sources were used.

The main provisions put forward for defense are:

- In an era of global transformations and rapid development of high technologies, there is a serious need to ensure the innovative development of the economy through more efficient economic mechanisms;
- Technoparks can be useful as multifunctional and efficient economic mechanisms in accelerating the innovative development of the economy;
- In order to ensure the level of innovative development in countries with developing national economies, there is a need to study the experience of countries that are strongly developed in terms of innovations and technologies;
- It is necessary to analyze the effectiveness of technoparks in the innovative development of the economy in Azerbaijan;
- Taking into account the characteristics and potential of technoparks, there is a need to objectively assess their impact on the innovative development of the economy;
- Improving the legal regulatory framework and state support mechanisms to increase the efficiency of the use of technoparks in the processes of innovative development of the economy in Azerbaijan can be effective;
- Taking into account the revival of the liberated territories and the challenges of the post-pandemic period, there is a need to increase the role of technoparks in the innovation of the economy;

- Accelerating the innovation of the economy in the new conditions and ensuring the efficient use of technoparks in these processes would be beneficial.

The scientific novelty of the study consists of the following:

- Based on the challenges of the modern era, new approaches have been identified and scientific and practical views have been formed on the effectiveness of using technoparks in intensifying the innovative development of the economy and more actively applying high technologies;
- Based on the strategic importance of innovations in raising the development of the national economy to a new level, the characteristics of technoparks as an important economic mechanism in the innovative development of the economy have been identified;
- Based on the factors that express the effectiveness of using technoparks in the modernization of the economy and its innovative development in global conditions, a block diagram of conceptual approaches to the role of technoparks in innovative development has been prepared;
- Based on the analysis of the mechanisms of innovative development of the economy, qualitative and quantitative criteria have been examined, and the impact of technoparks on innovative economic development processes has been taken as a basis, a block diagram of the factors that determine the role of technoparks in the modernization of the economy in global conditions has been given;
- Based on research materials on world experience, the factors that indicate the multifunctionality and efficiency of technoparks in innovative economic development processes have been identified and a conceptual model of the macroeconomic environment of technoparks has been developed;
- In the context of global transformations, the strategic aspects of using technoparks in the modernization of the economy in Azerbaijan have been schematized and the multifunctional characteristics of technoparks have been determined;

- Criteria for assessing the impact of technoparks on the development of economic sectors, administrative-legal, market and financial mechanisms for increasing their efficiency have been substantiated and schematically developed;
- Based on the GZIT-analysis of the factors determining the efficiency of technoparks in the innovative development of the economy in Azerbaijan, the efficiency of using technoparks and investments in them has been assessed in our country based on a group of indicators of the Sumgait Technology Park, existing problems have been explained and the importance of strengthening action strategies in this direction has been substantiated;
- Based on the analysis and assessment of the processes of creation and development of technoparks in Azerbaijan, the necessity of improving state support mechanisms for technoparks was substantiated and a block diagram of organizational and legal, economic and socio-psychological state support measures adequate to the requirements of the modern era was developed;
- Based on the goals of innovation of the economy in our country, an algorithm-scheme for the optimal preparation and implementation of organizational and economic mechanisms in technoparks was developed;
- In order to maximize the effective use of technoparks in accelerating the innovative development of the economy in Azerbaijan, the stimulating features of the privileges granted to them were explained, the basic conditions of financial mechanisms were given, and a block diagram of state support mechanisms and tools was developed;
- In Azerbaijan, directions have been identified for ensuring innovative development of the economy in the revival of the territories liberated from occupation and implementing adequate measures to meet new challenges in the post-pandemic period, increasing the role of technoparks for the implementation of a wider spectrum of "smart" technologies, and organizing the efficient use of technoparks, etc.

Theoretical and practical significance of the research. It is possible and useful to use the scientific and practical results obtained in the research work in the processes of modeling the development of the economy in our country, accelerating its innovative development, and developing the technopark institute. At the same time, it is possible to use the scientific and theoretical provisions given in the dissertation work in the preparation of textbooks, teaching and methodological aids.

Approval and application. The topic of the dissertation work is in line with the general direction of the scientific and research work of the Azerbaijan State Oil and Industry University and has been discussed and approved at scientific seminars operating constantly as topical issues in modern times.

12 articles and theses of the applicant on the topic of the dissertation work, including 1 article and 1 thesis abroad, were published in reputable local and foreign journals recommended by the Higher Attestation Commission, in materials of republican and international conferences (the list of articles and theses is reflected in the literature list of the work).

Name of the organization where the dissertation work was performed. The dissertation work was completed at the Azerbaijan State Oil Industry University.

The total volume of the dissertation is indicated by the symbol, indicating the volume of the structural sections of the dissertation separately. The total length of the cover and table of contents (2759 characters), introduction (17003 characters), chapter I (68798 characters), chapter II (71055 characters), chapter III (69639 characters), conclusion (9100 characters) and list of references (28946 characters) is 279956 characters. The total length of the dissertation is 228131 characters, excluding tables, figures and list of references.

CONTENTS

INTRODUCTION.

CHAPTER I. THEORETICAL-METHODOLOGICAL ASPECTS OF INCREASING THE EFFICIENCY OF THE USE OF TECHNOPARKS IN THE INNOVATIVE DEVELOPMENT OF THE ECONOMY

1.1. Study of theoretical approaches and methodological features of increasing the efficiency of the use of technoparks in the innovative development of the economy

1.2. Technoparks in the modern era - as an important economic mechanism in the innovation of the economy.

1.3. International experience in the effective use of technoparks in the innovative development of the economy.

CHAPTER II. ANALYSIS AND EVALUATION OF THE EFFICIENCY OF THE TECHNOPARK INSTITUTE IN AZERBAIJAN

2.1. Analysis of the processes of creating technoparks in the country and the factors determining their efficiency.

2.2. Assessment of the role of technoparks in the innovative development of the economy.

2.3. Assessment of the role of technoparks in ensuring the efficiency of the innovative development of the economy in the regional aspect and increasing investment attractiveness

CHAPTER III. PROSPECTS OF INCREASING THE EFFICIENCY OF THE USE OF TECHNOPARKS IN THE INNOVATIVE DEVELOPMENT OF THE ECONOMY IN AZERBAIJAN

3.1. Strengthening the legislation on the efficient use of technoparks in the innovative development of the economy and regulating organizational and economic mechanisms.

3.2. Improving the mechanisms of state support for technoparks in the context of the revival of post-conflict territories and post-pandemic factors

3.3. Directions for organizing the efficient use of technoparks in the innovative development of the economy in the face of new challenges.

CONCLUSION.

LIST OF REFERENCES

MAIN CONTENT OF THE DISSERTATION

The introduction to the research paper states the relevance of the topic, the degree of development, the object and subject of the research, the goals and objectives, the methods, the main provisions, scientific innovations, etc.

In the first chapter of the dissertation entitled “**Theoretical and methodological aspects of increasing the efficiency of using technoparks in the innovative development of the economy**”, theoretical approaches and methodological features of increasing the efficiency of using technoparks in the innovative development of the economy were studied, the role of technoparks in the innovation of the economy in the modern period was considered, and international experience in the effective use of technoparks in the innovative development of the economy was examined.

In terms of theoretical approaches, we would like to note that R.A. Solow believed that it is important to renew economic mechanisms that operate efficiently at any time after a certain period of time¹. From this point of view, we also think that the development of new mechanisms for more efficient development of the economy and ensuring innovative development in terms of the modern period have been formed as a necessary factor. In the approaches of J. Schumpeter, the innovative development of the economy was largely removed from the foreground². Taking into account the above-mentioned approaches, deepening innovative development in order to develop the economy through new mechanisms and improve the structure of the national economy can be more effective, and in this case, a number of factors can be summarized: 1) increasing the quantity and quality of labor resources; 2) increasing the volume of fixed capital and improving its composition qualitatively; 3) improving production technologies and organizational mechanisms; 4) increasing the quantity and quality of natural resources involved

¹Solow, R.M. A Contribution to the Theory of Economic Growth // The Quarterly Journal of Economics. – 1956, Vol.70, No.1, – p. 73.

² Shumpeter, J.A. Business Cycles. Theoretical, Historical and statistical Analysis of Capitalist Proces. N. Y., – 1939. Vol. 1.2. – p. 154.

in economic turnover and 5) increasing entrepreneurial activity and skills in society.

Figure 1 shows a block diagram of conceptual approaches to the creation of technoparks and their effective use in the innovative development of the economy.

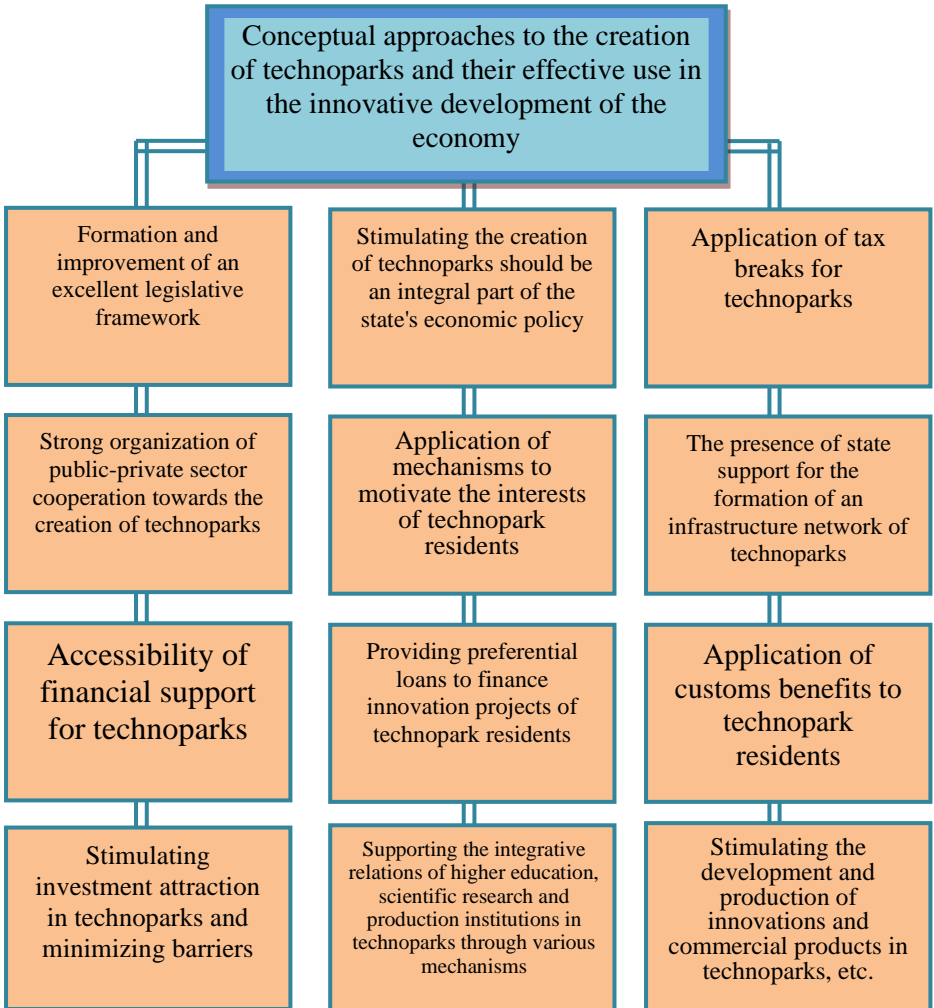


Figure 1. Block diagram of conceptual approaches to the creation of technoparks and their effective use in the innovative development of the economy (prepared by the author).

It should be noted that in international approaches, when assessing the efficiency of technoparks, their innovative indicators are also taken into account at a high level³. The efficiency of the technopark network is mainly determined by two types of criteria: qualitative and quantitative criteria. Taking these criteria into account, the assessment of the efficiency of the technopark's activities is based on the given qualitative indicators and is calculated by this formula:

$$S = \frac{\sum_{i=1}^{K_i} b_i}{K_{\text{ü.s.}} - K} 100 \%$$

here:

S - efficiency of the technopark's operations;

$K_{\text{ü.s.}}$ - total number of quality criteria;

$K - i$ - quality criterion;

$b_i - i$ - quality criterion evaluation score.

It should be noted that modeling the use of technoparks in the context of global technologies is of great importance⁴. If in 1975 there were 79 such institutions in the world, in 2020 their number has already reached 5 thousand in 140 countries. It should be borne in mind that technoparks are forms of special zones of a technological-innovative type. This is an area where research, design and production companies using state support are concentrated.

In world practice, it is possible to find three models for the development of technoparks. American, European and Asian. American technoparks are among the first to emerge among these models. This technopark model consists of young companies renting land, industrial buildings, laboratories, special equipment, etc. at a relatively low cost for research, development and small-scale production. The American model embodies ideas in the direction of developing a scientific and innovative process. The European model has been widespread in Western Europe since the 1980s. The

³Методика ЮНИДО по развитию технопарков - [Электрон ресурс] / URL: http://www.unido-russia.ru/archive/num8/art8_8/.

⁴ Aslanzadə, İ.A. Dövlət innovasiya siyasətinin formalaşması və sənaye sektorunun rəqabətqabiliyyətliliyinin yüksəldilməsi problemləri: / İqtisad elmlər doktoru dis. avtoferatı. / – Bakı, 2013. – 56 s.

European model implies the mandatory participation of three main founders: a university or research center, a city or regional administration and management company. The Asian model - this technopark model was first created in Japan. The main features of the Japanese model can be seen in the example of the technopark operating in Tsukuba, and the main approach is associated with high precision of technologies. The mixed model is parks that combine parts of the American and Japanese models. An example of this is the science parks of France, in particular the largest of them is “Sophia Antipolis”⁵.

In the second chapter of the work entitled “Assessment of the processes of innovation and financing of industrial sectors in Azerbaijan”, the processes of creation of technoparks in the country and the factors determining their efficiency were analyzed, the role of technoparks in innovative development of the economy and ensuring the efficiency of innovative development of the economy in the regional aspect, and increasing investment attractiveness was assessed.

In recent decades, dynamic development of the national economy has been ensured in Azerbaijan, and the deepening of the principles of a market economy has played an important role in these processes. If the share of the non-state sector in the country's GDP was 77.8% in 2005, this indicator was 80.8% in 2020, and 83.5% in 2021. Currently, the share of the non-state sector in agriculture is close to 100%. In recent years, the state has been taking continuous measures to develop non-oil sectors in our country. In particular, ensuring dynamic growth in the processing industry is among the strategic tasks.

Figure 2 shows the dynamics of the volume of product production in the processing industry in Azerbaijan, and as can be seen from it, the increase compared to 2014 was 47%.

⁵Пономарев, М.В., Савельева, Л.В. Университетские технопарки: универсальная модель и инструменты цифрового проектирования. Информационные технологии и архитектура, 2021. №4(57). С. 381.

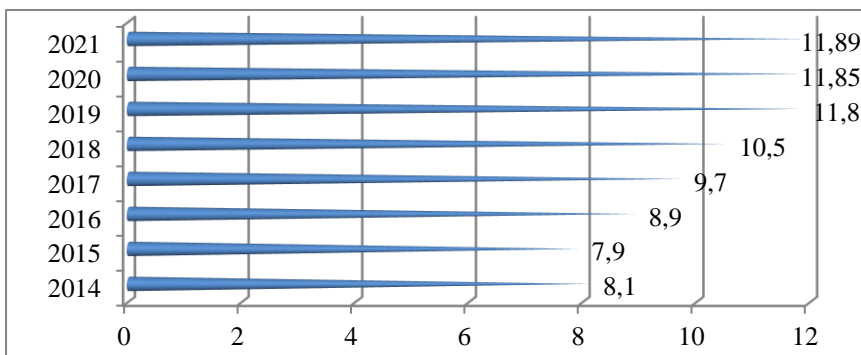


Figure 2. Dynamics of manufacturing industry output in Azerbaijan in 2014-2021, in billion manats (prepared based on data from the State Statistics Committee of Azerbaijan Republic).

The presence of state support mechanisms in technoparks is one of the factors that enable the efficient operation of entrepreneurship and business entities, and in practice there is a serious need to use them to the maximum productive extent.

Figure 3 analyzes the ratio of the added value formed in the processing industry in Azerbaijan to GDP and the specific weight of the added value of medium and high-tech industries in the total added value.

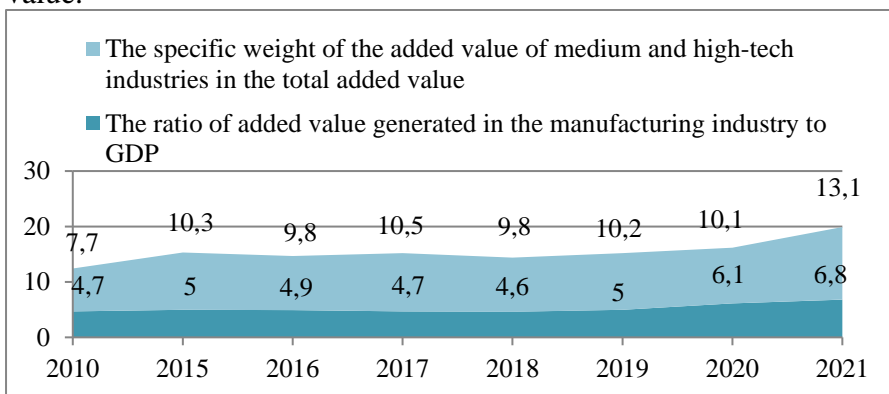


Figure 3. Ratio of added value formed in the processing industry in Azerbaijan in 2010-2021 to GDP and the specific weight of the added value of medium and high-tech industries in the total added value, in % (prepared by the author based on "Sustainable Development Goals". Statistical Review, 2022, 281 p.).

Figure 3. Ratio of added value formed in the processing industry in Azerbaijan in 2010-2021 to GDP and the specific weight of the added value of medium and high-tech industries in the total added value, in % (prepared by the author based on "Sustainable Development Goals". Statistical Review, 2022, 281 p.).

Table 1

Dynamics of key indicators affecting economic growth in Azerbaijan (2014-2021).

Indicators	Unit of measure	2014	2015	2016	2017	2018	2019	2020	2021
funds directed to fixed capital	billion manat	17,6	15,96	15,77	17,4	17,24	18,5	17,2	16,8
fixed funds	billion manat	0	110,7	124	169,1	182,8	201,3	240,7	247,6
credit investments in the economy	billion manat	18,5	21,7	16,4	11,8	13	15,3	14,5	17,1
investments directed to the economy (from all sources)	billion manat	21,9	20,1	22,7	24,5	26	25,0	22,5	25,3
foreign investments, including	billion manat	11,7	10,7	10,2	9,1	8,2	7,1	6,1	7,5
foreign direct investments, including	billion manat	8	7,5	7,3	5,7	4,1	4,3	4,5	4,8
to the non-oil sector	billion manat	1318,5	860,4	1706,2	813	967,1	930,1	605,6	790,4

Note: The table was prepared by the author based on data from ARSK.

If we look at Table 1, if we look at the general dynamics of fixed capital investments in the economy in 2014-2021, the total volume of fixed capital investments in the country's economy during this period amounted to 136.5 billion manat. During that period, the total value of fixed assets increased by 2.23 times and was close to 248 billion manat in 2021. The volume of credit investments in the economy was recorded at the level of 128.3 billion manat. Investments from all sources amounted to 188 billion manat. However, foreign direct investments attracted to the non-oil sector were not so high, despite all this.

It is quite difficult to analyze the processes of innovation activity for 2010-2021. Thus, the existing statistics cover only a small number of industrial sectors and, in our opinion, do not fully reflect reality (see: Table 2).

Table 2

Volume of innovation products with significant changes and newly introduced across the country by economic activity type, 2010-2021, thousand manats

By types of economic activity:	Years											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<i>Industry - total</i>	4384	13163	23052	11634	12319	929,7	35747	14777	28952,2	21698,1	11759,7	60977,2
Mining industry	-	2073	396,1	326	-	-	129,6	-	215,3	2495	2415,5	2843,4
<i>Manufacturing industry, of which</i>	4384	11090	22656	11308	12319	929,7	35617	14777	28736,9	19202,4	9344,2	58133,8
Food production							402,5	590	831,2	328,0	-	3859,2
Beverage production		3500	18200		3974	758	41,5	-	-	-	-	-
Textile industry				8933	3098		12844	-	-	-	2121,3	-
Clothing industry							5213	-	-	-	-	-
Manufacture of leather and leather products, footwear							48	-	-	-	-	-
Woodworking and wood products manufacturing		498,1						-	-	-	-	-
Petroleum products production				103,3				-	-	-	-	-
Chemical industry			3049	465,5	0,3	13,4	522,4	1705	55,0	-	-	-
Manufacture of rubber and plastic products							171,3	-	-	-	-	-
Manufacture of construction materials				1159			6586	-	-	-	-	-
Metallurgical industry							500	2176	7690,0	12560	2436,7	53035,2
Manufacture of fabricated metal products, except machinery and equipment	1788						9113	-	-	-	-	-
Manufacture of computers and other electronic equipment		5681	20,4		5101			9990	19937	6073	4742,0	1239,4
Electrical equipment manufacturing		13,5						-	-	-	-	-
Machinery and equipment manufacturing	1262		890,3	238,4	145,5	158,3	174,9	216	222,8	241,2	44,2	-
Furniture manufacturing	22,7							-	-	-	-	-
Installation and repair of machinery and equipment	1311	1295	496,8	511,6				-	-	-	-	-

Source: "Azerbaijani Industry". Baku, 2022, 233 p.

Table 2 shows that the volume of innovation products in Azerbaijan is at a very low level and, unfortunately, this situation has continued in recent years. In our opinion, it is possible to change this situation by using technoparks productively.

It should be noted that technoparks are places of activity that provide sufficient technical capabilities, allow for the development of innovations, conduct pilot work, and organize experiments. High-tech equipment, modern production and processing facilities are operated here.

The level of efficiency of investments made in Sumgayit Technology Park during 2013-2021 and this technopark in general has been assessed, and for this purpose, a model has been provided based on the indicators given in Table 3.

Table 3

**Investments in Sumgayit Technology Park during 2013-2021
and dynamics of a group of key indicators**

Years	Volume of investments, million manats	Cost of product production, million manats	Value of fixed assets, million manats	Revenue, million manats
	y	x1	x2	x3
2013	200,0	18,6	28,9	197,0
2014	251,0	44,8	221,6	150,5
2015	799,0	51,9	195,0	101,4
2016	814,3	58,8	184,7	94,5
2017	1 045,5	80,0	172,5	82,3
2018	1 048,6	79,5	157,4	197,3
2019	1 049,6	90,9	194,3	97,7
2020	1 052,0	50,7	193,7	69,1
2021	1 052,0	142,7	175,8	68,7

Here, the volume of investments is the dependent variable, and the other three indicators (x1+x2+x3) are the influencing factors:

$$Y = 5,14x_1 + 0,46x_2 - 2,02x_3 + 619,09$$

According to the model we received, the cost of product production in Sumgayit Technology Park for an investment of 1 manat was 0.46 kopecks during 2013-2021.

<i>Regression analysis statistics</i>	
R - multifactorial	0,754151346
R - square	0,568744252
R - standardized	0,309990803
Standard error	289,4840588
Number of observations	9

Analysis of variance

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>import ance F</i>
Regression	3	552588	184196	2,198016	0,206531
Residual	5	419005,1	83801,02		
Total	8	971593,1			

	<i>coefficient</i>	<i>Standard error</i>	<i>t-statistic</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>aşağı 95,0%</i>	<i>Upper 95,0%</i>
Y-result	619,0966167	676,0874	0,915705	0,401827	-1118,84	2357,035	-1118,84	2357,035
Factor X 1	5,142686679	3,327923	1,545314	0,182932	-3,41201	13,69739	-3,41201	13,69739
Factor X 2	0,46165649	2,277902	0,202667	0,847384	-5,39388	6,317189	-5,39388	6,317189
Factor X 3	-2,02243774	2,638713	-0,76645	0,478015	-8,80547	4,760591	-8,80547	4,760591

The dispersion coefficient is not very close to unity, the normalized R is much lower than unity, and the number of observations is also small. In this model, the analysis and influence of the x1 factor can be considered satisfactory. The analysis of the other two x2 and x3 factors is not satisfactory, since their P-values are low. In general, it can be noted that the indicators obtained from investments in the Sumgayit Technology Park are not so high and there is no stable dynamics in the factors considered. The instability of the technopark's income is also noteworthy. Unfortunately, the necessary statistical data on the financial and economic and other

performance indicators of the technopark in our country are not officially published and are not in the publications of the State Statistics Committee. If we compare the data in Table 3, despite the continuous investment in recent years, the income of the Sumgayit Technology Park has not increased, but rather decreased. This shows that there may be other reasons for such a situation, such as the weakness or absence of the technopark's production, sales, marketing and foreign trade strategies, or the failure to form a stable management team with high professionalism, etc.

The third chapter of the dissertation entitled **“Prospects for increasing the efficiency of using technoparks in the innovative development of the economy in Azerbaijan”** examines the issues of strengthening the legislation on the efficient use of technoparks in the innovative development of the economy and regulating organizational and economic mechanisms, and identifies directions for improving the mechanisms of state support for technoparks in the context of the revival of post-conflict territories and post-pandemic factors, and organizing the efficient use of technoparks in the innovative development of the economy in the context of new challenges.

In our country, work is being carried out in the areas of forming central executive structures in this area, creating an Innovation Agency within the relevant ministry - the Ministry of Digital Development, and starting up startups at various universities, etc. . However, there is a serious need in the country to create innovation centers, innovation technology centers and research institutions to organize activities that meet the requirements of the modern era, a high level of technological development, and allow for the transition to technological innovation.

The algorithm-scheme for the optimal preparation and implementation of organizational and economic mechanisms in technoparks in the modern era is given in Figure 4.

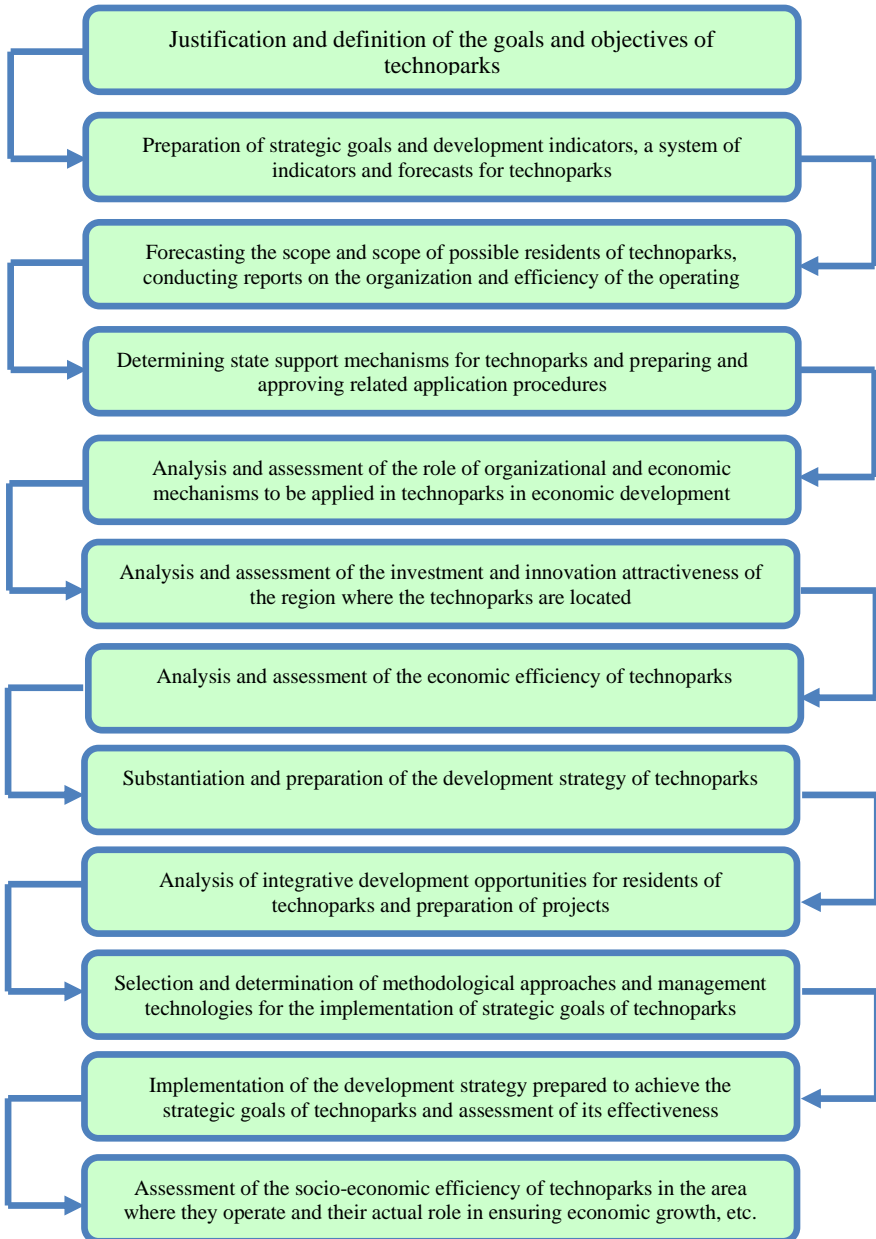


Figure 4. Algorithm-scheme for the optimal preparation and implementation of organizational and economic mechanisms in technoparks (prepared by the author).

In ensuring the innovative development of the economy, it is of great importance to investigate the potential of technoparks and assess the adequacy and efficiency of their existing organizational and economic mechanisms.

The concessions granted to technoparks and their explanation are schematically presented in Figure 5.

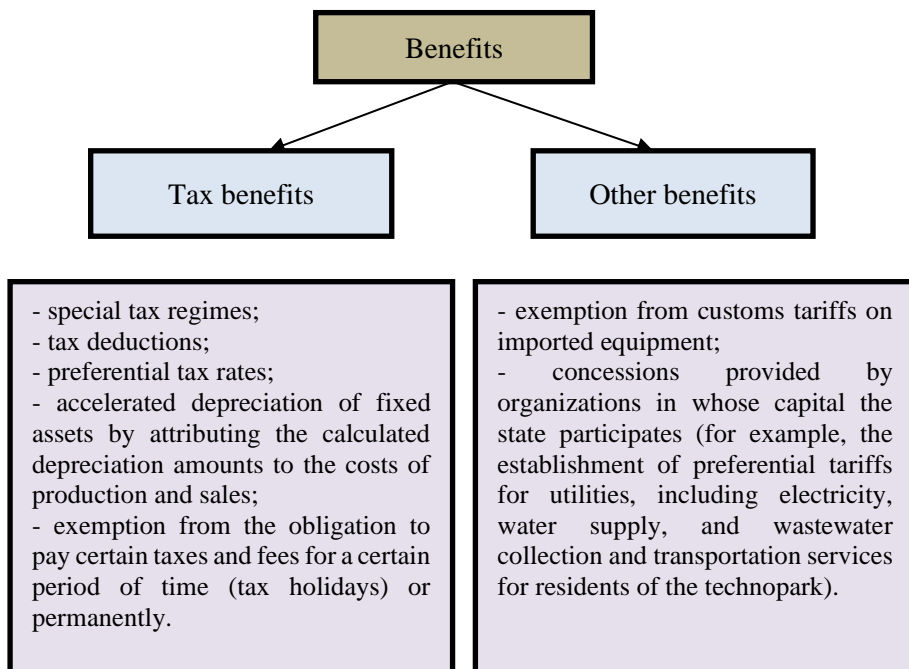


Figure 5. Incentives granted to technoparks and their explanation (compiled by the author).

Technoparks have significant advantages in terms of organizing an attractive space for local and foreign investors, having an appropriate incentive system and discount mechanisms. In recent decades, most technologically advanced countries of the world have increasingly begun to use various mechanisms to stimulate innovations.

Figure 6 shows the directions for organizing the effective use of technoparks in the innovative development of the economy in Azerbaijan.

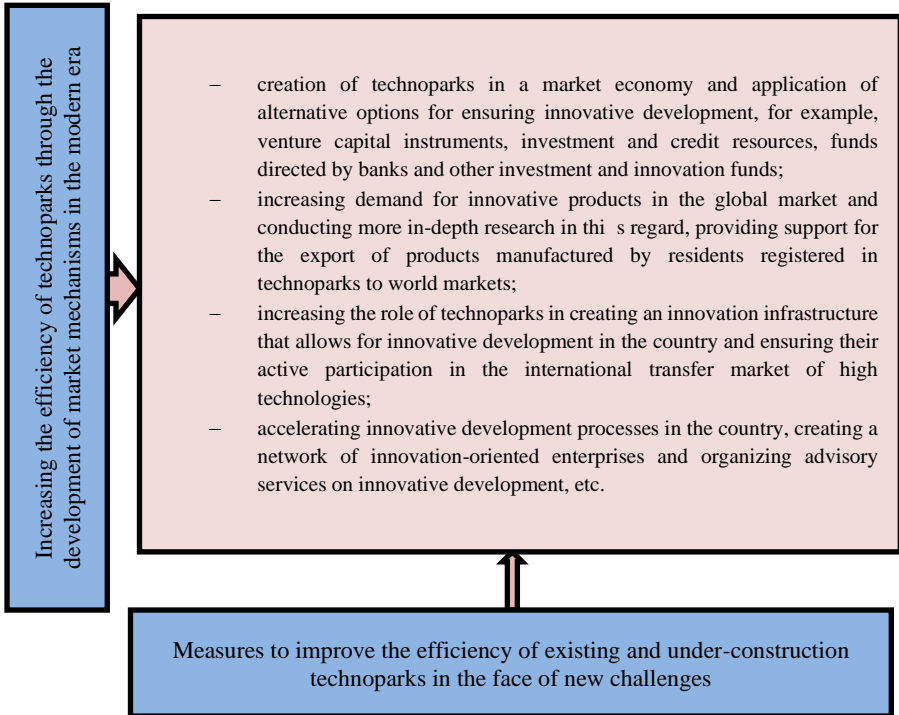


Figure 6. Directions for organizing the efficient use of technoparks in the innovative development of the economy in Azerbaijan (prepared by the author).

A number of steps have been taken towards the development of technoparks in Azerbaijan. The “Model Regulations on Technology Parks” were approved by the Decree of the President of the country dated May 15, 2014. At the same time, based on new challenges, the Decree of the Head of State dated May 15, 2014 on amending the Model Regulations was published on December 30, 2022. These documents reflect issues related to the establishment, management and regulation of the activities of technoparks.

In the near future, we propose and consider it important to implement a number of strategic measures to expand the effective use of technoparks in the innovative development of the economy:

– Action mechanisms that allow for innovative development of the economy in technoparks should be developed and measures should be taken to effectively use the potential in this direction, problems and solutions should be systematically reviewed and evaluated on the basic principles and criteria of innovative development, basic conditions and optimal solutions should be determined for each problem, resources and innovative development opportunities should be objectively assessed, an innovative development strategy for the economy should be developed and implemented, reflecting measures for the formation and development of productive sources that stimulate innovative development;

– In order to create more efficient action strategies for innovative development of the economy in technoparks and form development directions in this direction for the long term, the conditions and requirements for state support mechanisms, including increasing the efficiency of tax incentives, strengthening incentive features, and allowing the applied incentives to create a highly productive economic growth base and innovation infrastructure in technoparks should be taken into account.

In the "Conclusion" section of the dissertation, results of scientific and practical significance arising from the essence of the research were obtained and suggestions were made:

1. In an era of increasing global threats, technoparks can play an important role in increasing the immunity of the country's economy to global threats, as well as in developing the market for technologies and innovations, diversifying the structure of the economy, and, in the case of Azerbaijan, providing additional incentives for the intensive development of the heavy machinery sector of the non-oil and gas industry.

2. When implementing economic innovation mechanisms in technoparks, it is necessary to ensure the acceleration of the processes of applying science and technology to production by creating favorable conditions for the joint activities of higher education, scientific research institutions, various enterprises, societies, and

funds specializing in innovation and technology, along with investors.

3. In the new conditions created by the 4.0 industrial revolution and the faster development of digital technologies, the relevance of using technoparks will increase significantly, and in this regard, it is possible to create a productive operating environment in the development of various economic sectors from new technoparks, since there are more favorable conditions for the efficient operation of resident companies in technoparks, including tax and customs benefits.

4. In the context of giving priority to the application of high and, first of all, "smart" technologies in the liberated territories, the processes of creating industrial parks and economic zones have already begun. In our opinion, there is a need to create several technoparks in these processes, and the main goals should be to ensure the efficient use of the rapidly developing production, transport and logistics infrastructure of the liberated territories, to form a sectoral economic structure based on the natural resources of the region, to create "green" economic sectors, and to make additional contributions to the innovative development of the country's economy in general, etc.

The following scientific articles and theses have been published on the topic of the dissertation:

1. Texnoparkların iqtisadiyyat sahələrinin innovativ inkişafına təsirinin qiymətləndirilməsi. Elmi əsərlər, AMEA İqtisadiyyat İnstitutu, № 6, Bakı, 2018, səh. 108-114.

2. Qlobal transformasiyalar şəraitində texnoparkların iqtisadiyyatın modernizasiyasında strateji əhəmiyyəti. Elmi əsərlər, AMEA İqtisadiyyat İnstitutu, № 2, Bakı, 2019, səh. 28-34.

3. Azərbaycanda texnopark institutunun səmərəliliyinin yüksəldilməsinin müasir problemləri və həlli yolları. «Geostrategiya» jurnalı, №5, Bakı, 2019, səh. 145-149.

4. Azərbaycanda iqtisadi islahatlar proseslərində texnoparkların rolunun artırılması perspektivləri. AMEA "Xəbərlər" jurnalı. İqtisadiyyat seriyası, №6, Bakı, 2019, səh. 84-92.

5. Перспективы повышения роли технопарков в процессах экономических реформ в Азербайджане. Журнал «Финансовая экономика», №12 (2), Москва, 2020, с. 160-164.

6. Dünya ölkələrində və şirkətlərində texnoparklardan istifadənin nəzəri-metodoloji və praktiki aspektləri. AMEA “Xəbərlər” jurnalı. İqtisadiyyat seriyası, №05, Bakı, 2020, səh. 19-27.

7. Azərbaycanda texnoparklar şəbəkəsinin genişləndirilməsi məsələləri. «Geostrategiya» jurnalı, №06, Bakı, 2021, səh. 73-79.

8. Texnoparklardan istifadənin səmərəliliyinin yüksəldilməsinin maliyyə təminatı. “Azərbaycanın qeyri-neft sektorunun inkişaf perspektivləri” mövzusunda Respublika Elmi konfransının Materialları. Sumqayıt Dövlət Universiteti, 2019, səh. 360-362.

9. Strateji yol xəritəsi çərçivəsində texnoparklardan istifadənin səmərəliliyinin yüksəldilməsi istiqamətləri. Doktorantların və gənc tədqiqatçıların Respublika elmi konfransı. AMİU. Bakı, 2019, səh. 345-347.

10. Xarici-İqtisadi fəaliyyətin gücləndirilməsində texnoparkların rolunun strateji aspektləri. / Azərbaycan Dövlət Neft və Sənaye Şüurasının 100 illik yubileyinə həsr edilmiş gənc tədqiqatçı və doktorantların onlayn Elmi Konfransın materialları, Bakı, 2020 may, səh. 1080-1083.

11. Xarici-iqtisadi fəaliyyətin gücləndirilməsində texnoparkların rolunun artırılması məsələləri. “İqtisadi təhlükəsizlik: mövcud vəziyyət və perspektivlər” mövzusunda Beynəlxalq Elmi konfransının Materialları. Sumqayıt Dövlət Universiteti, 2020, iyul, səh. 81-84.

12. Актуальные проблемы эффективности технопарков в современных условиях. IX Международная Научно-Практическая Конференция «Развитие науки и практики в глобально меняющемся мире в условиях рисков», 28 марта 2022 года, с. 268-276.



The dissertation defense will be held on October 31 2025 at 11⁰⁰ at the meeting of the BFD 4.26 One-time Dissertation Council operating under ASOIU of the Higher Attestation Commission under the President of the Republic of Azerbaijan.

Address: AZ1010, Baku, Azadlig Avenue 20

The dissertation is available for viewing at the ASOIU library.

Electronic versions of the dissertation and abstract are posted on the official website of ASOIU (<https://asoiu.edu.az>)

The abstract was sent to the necessary addresses on "01" October 2025.

Stamp signed: 30.09.2025
Paper format: A5
Volume: 37763
Circulation: 20