THE NATURE OF INNOVATIVE ECONOMIC GROWTH AND DEVELOPMENT DIRECTIONS OF ITS FORMATION

Namiq Abbasov

The Institute of Economy of ANAS

Email: namig.abbasov@gmail.com

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ABSTRACT

The purpose of this study is to investigate and identify the directions for improving innovative economic growth in the Republic of Azerbaijan. Also, in this article, the nature of innovative economic growth and innovation activity in the Republic of Azerbaijan has been examined. For this purpose, statistics from the Global Innovation Index Report (GII) 2021 and the State Statistical Committee of the Republic of Azerbaijan have been revised and analised. Innovation activity and its indicators in the Republic of Azerbaijan have been compared with some relevant countries to identify the level of activity in the mentioned field. So, according to the GII 2021, Azerbaijan ranks 80th out of 132 countries with 28.4 points. This indicates are for Belarus (62 points), Georgia (63), Austria (18), and Turkey (41). Correspondingly, according to the 2020 statistics, the gross industrial product (GIP) was 37.27 billion AZN, the GDP was 72.43 billion AZN, and the gross innovation product was 28.58 million AZN, or 0.039% of GDP and 0.076% of gross industrial product. The study concluded with a set of recommendations, the most important of which are the suggestions to achieve innovative development and sustainable economic growth in the Republic of Azerbaijan.

Keywords: innovative economic growth, innovation activity, gross domestic product, industrial product, regional innovation programs

JEL classification: B0, B10, C10, C40, E20, E60, O30, O40

I. INTRODUCTION

It is important to be clear about objectives of research. In the economic development the most common objective of a country is to achieve innovative development and sustainable economic growth. So, this article reviews some main aspects of innovative economic growth of the Republic of Azerbaijan.

In current conditions, for the purpose of achieving high-quality and sustainable economic growth and strengthening the position of the country's economy in the globalized world economy, it is necessary to develop and implement improvement directions for innovative economic development, as well as a legislative frameworks that stimulate the development of an innovative economy, and the regulatory mechanisms necessary to ensure innovative economic growth. In general, economists have identified three interrelated mechanisms of economic growth. The first mechanism is the efficient allocation of resources; the second mechanism is capital accumulation; and the third mechanism is scientific and technological progress. Looking at the experience of developed foreign countries, it seems that the economic progress of society is mainly focused on the effective use of the opportunities of science-intensive technological processes. At present, in developed countries such as the United States, Germany, and Japan, about 70% of exports are science-intensive high-tech products.

From this point of view, one of the main factors of economic growth in the Republic of Azerbaijan should be innovation based on science, education, and high technology. Due to this, effective economic development based on scientific knowledge and high technologies should be one of Azerbaijan's priority goals. Azerbaijan has ample opportunities for implementing innovative economic growth. Thus, as a result of some reforms implemented in Azerbaijan in recent years, our country has strengthened its position at the international level and has taken a leading position in the CIS in terms of GDP growth and foreign investment per capita. At present, the Republic of Azerbaijan has foreign trade relations with more than 170 countries of the world, and foreign investments in the country's economy from 1995 to 2020 amounted to 146.97 billion US dollars (The State Statistical Committee of the Republic of Azerbaijan). However, it is important to note that, according to economic analysis and comparisons, the level of organization and development of innovations in Azerbaijan is lower than in developed countries. Although the amount of funds allocated from the state budget for the development of science has increased in recent years, its share of GDP is 0.2%, which means this share of GDP is 10 times less than in developed countries. It is known that innovation activities have great importance for achieving sustainable economic development and growth in the economy as well as strengthening the position of the country's economy in the world market.

In this regard, in order to achieve sustainable economic growth and reduce the dependence of the country's economy on oil and gas exports, it is important to develop and implement the necessary development directions and mechanisms aimed at innovative economic growth as a systematized function of the state.

II. LITERATURE REVIEW

There is vast literature devoted to the economic development of countries. However, in this paper, I have focused on studies that investigate innovation, innovation development, and innovative economic growth. So, the term "innovation" was first introduced into the scientific community as a new economic category by the economist Joseph Alois Schumpeter (1883-1950) in his "Theory of Economic Development" (1911) [T.Albert, Innovation, p. 4]. In his work "The Theory of Economic Development," Y.A. Schumpeter considered innovation as an economic impact on technical changes [I.P. Stepanova, Innovative Management, p. 9]. Schumpeter was probably the first scholar to theorize about entrepreneurship, and the field owed much to his contributions. His fundamental theories are often referred to [Fontana, Roberto (2012)] as Mark I and Mark II. In Mark I, Schumpeter argued that the innovation and technological change of a nation come from the entrepreneurs or wild spirits. He coined the word Entrepreneurship, German for "entrepreneur-spirit", and asserted that "... the doing of new things or the doing of things that are already being done in a new way" [Mansfield, Edwin (May 1983)] stemmed directly from the efforts of entrepreneurs.

Schumpeter tried to find the essence of innovative entrepreneurship in the production function and studied the foundations of the theory of innovative processes. Schumpeter emphasized the role of the entrepreneur in the innovation process, calling it the link between invention and novation, and he viewed innovation as a change in technology and management. Y.A. Schumpeter was the first economist to declare that technological development has a significant impact on economic growth. He noticed technological development as a means of competition between firms. Schumpeter's approach differs from the neoclassical approach in that he expands the concept of innovation to include technological innovation not only as the use of new technologies at the production stage, but also as the production of a new product, opening a new market, organizing a new market, searching for new sources of raw materials, as well as logistics and the emergence of new forms of market supply.

Schumpeter proved that the central figure of the economy and its driving force is innovative entrepreneurship. According to Schumpeter, innovation is the change or replacement of consumer goods, means of transport, and organizational forms of markets and industry. Also, Joseph Schumpeter described development as historical process of structural changes, substantially driven by innovation which was divided by him into five types:

1. Launch of a new product or a new species of already known product;

2. Application of new methods of production or sales of a product (not yet proven in the industry);
3. Opening of a new market (the market for which a branch of the industry was not yet represented);
4. Acquiring of new sources of supply of raw material or semi-finished goods;
5. New industry structure such as the creation or destruction of a monopoly position.
Schumpeter argued that anyone seeking profits must innovate. That will cause the different employment of economic system's existing supplies of productive means [Schumpeter, J.A. 1934].

Also, it should be noted that the current stage of economic growth is based on the effective use of knowledge and information. The introduction of new technologies will help overcome crises and depressions, create new production opportunities as well as obtain sustainable economic growth. Due to these factors, the world's leading industrial countries are moving to a "new economy", which changes the role of innovation in the economy, determines the pace of the innovation process and the implementation of new mechanisms. Therefore, such an economy can be called an innovative economy. Alvin Toffler's "Third Wave", published in 1980, it clearly showed the results of technological process changes and introduced to a wide readership. In the mid-1960s, Toffler noted that in the future, information technology would become the main role in the economy, and then cause better and faster technological changes than in the past. A. Toffler's "waves" concept describes three types of societies and is based on the idea that these types of waves are interchangeable. The first wave formed an agrarian society after the Neolithic revolution. The second wave is the Industrial Age society, which emerged in Western Europe after the Industrial Revolution and spread around the world. The key aspects here are the nuclear family, a factory-type education system and a corporation. A. Toffler noted that "The Second Wave Society is based on mass production, mass distribution, mass consumption, mass education, mass media, mass recreation, mass entertainment, and weapons of mass destruction".

The combination of standardization, centralization, and concentration determines the organizational method. The Third Wave is the post-industrial society, as a result of the intellectual revolution. The third wave is based on the trend of demassification, which is the tendency of the economy to abandon mass production, mass sales, mass media and mass homogeneity. The result of the demarcation process is the transition from mass production to large individual products, from large marketing to small marketing, from monolithic hierarchical control organizations to free networks [Alvin Toffler 1980: page 146].

In 1970, economist Milton Friedman said in the New York Times that a business's sole purpose is to generate profits for their shareholders and companies that pursued other missions would be less competitive, resulting in fewer benefits to owners, employees and society [Friedman, M. (September 13, 1970)]. Yet, data over the past several decades shows that while profits matter, good firms supply far more, particularly in bringing innovation to the market. This fosters economic growth, employment gains and other society-wide benefits. Business school professor David Ahlstrom asserts that "the main goal of business is to develop new and innovative goods and services that generate economic growth while delivering benefits to society" [Ahlstrom, D. (2010)].

It is taken as axiomatic that innovative activity has been the single, most important component of long-term economic growth and this paper will start by drawing upon the findings of a very influential paper published by my colleague at Stanford, Prof. Abramovitx, back in the mid-1950s.

In the most fundamental sense, there are only two ways of increasing the output of the economy: (1) you can increase the number of inputs that go into the productive process, or (2) if you are clever, you can think of new ways in which you can get more output from the same number of inputs. And, if you are an economist you are bound to be curious to know which of these two ways has been more important - and how much more important. Essentially what Abramovitz did was to measure the growth in the output of the American economy between 1870 and 1950. Then he measured the growth in inputs (of capital and labor) over the same time period. He then made what were thought to be reasonable assumptions about how much a growth in a unit of labour and how much a growth in a unit of capital should add to the output of the economy. It turned out that the measured growth of inputs (i.e., in capital and labor) between 1870 and 1950 could only account for about 15% of the actual growth in the output of the economy.

In a statistical sense, then, there was an unexplained residual of no less than 85%. Surprisingly enough, no economist had ever undertaken this exercise before - partly because it was only after the Second World War that reasonably accurate estimates of inputs and outputs for the American economy, over some very long time period, became available. Now, in any statistical exercise in which you are trying to tease out the relative importance of some variable, and you find yourself with a residual of 85%, you know you are in big trouble! Yet a number of other economists in the late 1950s and 1960s undertook similar exercises, using different methodologies, different time periods, and different sectors of the economy, with roughly similar results – they found themselves left with a very large residual that could not be accounted for.

Robert Solow, who later won a Nobel Prize in Economics, was one of those other economists who discovered a very large residual, using a very different methodology and different time period. As it happened, he got the same result for the size of the residual – 85%. It was precisely the size of this residual that persuaded most economists that technological innovation must have been a major force in the growth of output in highly industrialized economies [Nathan Rosenberg (2004)].

III. MATERIALS AND METHODS

Studying the nature of innovative economic growth and its development directions in a framework takes into account their theoretical and practical aspects. So in this article, the mentioned aspects have been reviewed.

Innovation economists believe that what primarily drives economic growth in today's knowledge-based economy is not capital accumulation as neoclassical economics asserts, but innovative capacity spurred by appropriable knowledge and technological externalities. Economic growth in innovation economics is the end-product of: [Antonelli, C. (2003)], [Johnson, Bjorn (2008)].

- knowledge (tacit vs. codified);
- regimes and policies allowing for entrepreneurship and innovation (i.e. R&D expenditures, permits and licenses);
- technological spillovers and externalities between collaborative firms;
- systems of innovation that create innovative environments (i.e. clusters, agglomerations and metropolitan areas).

In my view, innovative economic growth is understood as the increase in GDP through the application of new technological advances in the national economy, the creation of new and better-quality, highly competitive products and services.
Especially through commencing innovations that are achieved via the renewal and expansion of relevant markets, changes in working conditions, organization, and management. The innovation resource is a direct product of the intellectual activity of the active part of the more professional and creative working population in the country. The advantage of using the combined factors of innovation is the transition to a new type of development in any economy, the acquisition of important features in the marketing environment, and the achievement of a sustainable and competitive economy. In my opinion, the criteria that characterize innovative economic growth are as follows:

- The main sources of economic growth are science, education, and high and science-based technologies.

- The first place in the structure of GDP is occupied by services that stimulate the development of industry.
- Entrepreneurial initiatives are developing in the fields of market, scientific-technical, and organizational economic activity.
- There is an increase in the share of information in the structure compared to material factors.
- Compared to other sectors, the rapid development of ICT has a more indirect effect on GDP growth than its share of GDP.
- Capital and labor mobilization are increasing.
- Application of high-tech technologies increases savings and efficiency.

As mentioned above, in an innovative economy, the main sources of innovation are science and education. In recent times, science and experience have confirmed that the main factor of development in any economic system is innovation, which includes new types of technology, reorganization of labor and production, new motivation for the economic system, and entrepreneurship. Therefore, during the complex transformation, these innovative components enable the modernization of the production apparatus and the effective use of them by the community. At the present stage, the acceleration of socio-economic development, the increase in production capacity, the constant increase in production efficiency, and labor productivity are all based on scientific and technical progress. Scientific and technical progress, which shapes techniques and technologies, must be constantly supported by fundamental scientific ideas.

Fundamental scientific ideas must be widely incorporated into engineering and production, and technology and engineering skills must be embodied in new high-tech machines, devices, and equipment. The leading link in the "science-technology-production" chain of intensive economy is science, which continues the new principles of technology and production.

The purpose of the practical features of scientific research is to solve technical problems, clarify unclear theoretical issues, obtain concrete scientific results, and use them in experimental design work as a basis for scientific and technical progress. In addition, experimental research can be carried out as an independent scientific project. For example, in countries where science is highly developed, education and defense are strategic parts of the state budget. For example, the president of the USA said, “We don't give money to science because we are rich, we give money to science to be rich” [Ronald Reagan].

Thus, in an innovative economy, science is a source of new knowledge, discoveries, inventions, and innovations. Innovation is a key form of knowledge transformation and plays a key role in an innovation-based economy. Reports from the Organization for Economic Co-operation and Development (OECD) show that more than half of economic growth in countries over the past two decades has been driven by innovation [Khokhlov U.E., Shaposhkik S.B., 'Economics based on knowledge of socio-economic trends and political goals'].

It should be noted that the inexhaustible resource of innovative economic growth is scientific knowledge. Under the concept of "knowledge-based economy", knowledge is not only being taught in universities as traditional knowledge, but also it is the more effective ideas and efforts in the organization of production and product development. The main benefit of a knowledge-based economy is not only the production of high-tech products, but also their usage in all areas. Knowledge is not only the creation of new knowledge, but also how to use it effectively [Dagaev Alexander. 'Levers for innovative growth'].

I also believe that innovative economic growth is based on the development initiatives of entrepreneurs in the market, scientific, technical, organizational, and economic spheres. Its preconditions are the modern stages of the scientific and technological revolution, globalization, and fierce competition between firms of different nationalities. Therefore, leading companies build their businesses not only for sales but also to offer products preferred by consumers, as well as to create new products and take measures to increase demand for these products.

The innovative type of growth is a modification of intensive economic growth by its nature, as both are based on the improvement of factors of production. However, the innovative type is more responsive to changing demands and is actively formed on the basis of continuous improvement of products and the creation of new products based on the achievements of scientific and technological progress. I think that another important criterion for innovative economic growth is the information and communication technologies (ICT) sector. The development of ICT creates long-term economic growth, has a positive impact on globalization and a transparent economy, stimulates overall production growth and increases the efficiency of economic activity. In this way, it effectively influences the course of innovative growth.

In the 40s and 60s of the last century, technological progress played an important role in building the neoclassical model of growth, and as a third factor, it stood alongside labor and capital, which are common factors of production.

The economic dynamics of the United States according to mass statistics were analyzed as part of the third factor of the neoclassical model, and it was determined that technical advancement has made a substantial contribution to growth in different times.

As it is known, in pre-industrial and industrial societies, national wealth is expressed in material form, but in an innovative economy, national wealth means the inexhaustible growth of demand, the intellectual and spiritual development of man, and the acquisition of intellectual property. At the current stage of development, the fundamental sciences play a key role in production, consumption, and saving time. In the reproduction process, the role of human capital is related to fundamental scientific knowledge, which includes the implementation of new scientific discoveries, ideas, and new technologies in the production method. With scientific, technological, technical, organizational and managerial bases, human capital is directed to a new cyclical turnover. In this regard, Scientific and Technical Progress is considered as a new requirement and skill based on scientific knowledge. It can be concluded that the main priority of the state is the implementation of scientific activities and the application of their results in production. It is known that the function of education is the rate of acquisition of intellectual property and the rise of the intellectual and educational level of society, which must be passed from one generation to another. Here I can conclude that the dynamic development of the economy is impossible without effective economic growth based on innovation, education, and science, which are the main sources of various innovations. So, the right innovation policy should be implemented in the country, the National Innovation System (NIS) and innovation infrastructure should be improved and developed as the main directions for the development of science, education, and the formation of innovative economic growth. The state's innovation policy, like its economic policy as a whole, is based on general principles. These principles include: natural resource potential, geographical location, nature of economic development, foreign policy directions, etc.

The economic and financial instruments of the state innovation policy are: the implementation of funding for scientific and technological R&D due to their competitiveness; supporting the transfer of technology and the reduction of patenting costs; grants for joint scientific and technical research projects to strengthen ties between science and industry; Clustering policy and application of innovation vouchers; risk sharing in the financing of scientific and technical research projects and activities of the private sector, the introduction of guaranteed lending and subsidy mechanisms; the application of tax concessions for private companies for their innovations; State support for venture capitalization and initial financing.

In general, it should be noted that a common feature that unites different national innovation systems is the importance of state leadership. This leadership should set and ensure three priorities: the development of science; the development of education; the development of scientific production [Gasimov Farman, Aliyev Tarbiz, Najafov Zakir. Organization and management of the National Innovation System, p. 534].

There are five absolute blocks that make up all national innovation systems [IIETI, Baku, 2018, p.36, p. 18], and they include:

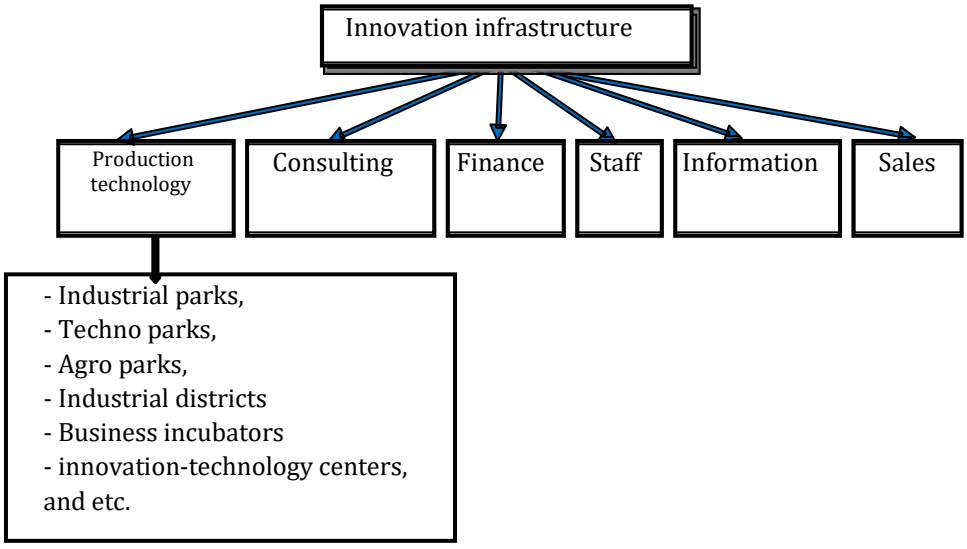
- Creative block - a block that creates knowledge;
- Technology transfer block;
- Financial block;
- Production block;
- Staff training block.

In general, the NIS enables a country's economic development intensity to be increased by collecting, communicating, and efficiently utilizing the findings of scientific, technical, and innovative activities in practice.

The activation of innovation activity in Azerbaijan requires the transition of the country's economy to a new stage of development, i.e., fundamental changes in functional, sectoral and regional subsystems of NIS.

Taking into account the institutional state of the business fields, it is necessary to make important changes in this sphere in order to achieve positive progress in the use of modern ICT, knowledge, and innovation. One of the main features of the management of the economic system is the combination of industrial, social, and regional policies into an innovation policy. The competitiveness of any country's economy depends on technological changes in various fields, the formation of high-tech production, and organizational innovations that combine all sectors of the economy into the national innovation system. At the same time, it is worth noting that improving innovation infrastructure is critical to the development of innovative economic growth. The main role of innovation infrastructure in achieving innovative economic growth is to make far more efficient use of the resources required to carry out the innovation process. An innovation infrastructure is an integral system consisting of subsystems (elements). Varying approaches to the division of innovation infrastructure subsystems differ in different studies. According to the theory of G.V. Shepelev, organizations can be divided into 6 subsystems for providing services to subjects of innovation (see Figure 1).

Figure 1. Innovation infrastructure



In my opinion, the process of forming the NIS should be completed, and innovation infrastructure should be developed in our country, as well as the existing shortcomings in the legislative framework should be eliminated in order to develop science-intensive high technologies in our country.

Also, for the purpose of accelerating the development of the country and achieving sustainable economic growth, the government of Azerbaijan has adopted 'Azerbaijan 2030: National Priorities for Socio-Economic Development'. According to these 'National Priorities', for the long-term sustainable and accelerated development of our country, successful connections within the society-business-state triad must be strengthened. The following will be key factors in the economic recovery: effective and efficient management of the state's role in the economy via market-oriented reforms; the bolstering of private institutions; government-friendly business management; and further liberalization of trade practices for the increase of local products sold to foreign markets. Creative and innovative development of private initiatives in the country will ensure that our economic resources are directed to areas that create higher added value.

The implementation of these goals requires the formation of an effective framework of macroeconomic policy, one that enables sustainable macroeconomic stability and strengthens the medium and long-term driving forces of economic development: the modernization of human capital, the expansion of the digital economy, and the full provision of economic sovereignty. Over the next decade, the following five National Priorities for the country's socio-economic development should be implemented:

1. A steadily growing, competitive economy
2. A dynamic, inclusive society based on social justice
3. Areas of modern innovations and competitive human capital
4. The great return to the territories liberated from occupation
5. A clean environment and a country of "green growth"

The above-mentioned National Priorities are of particular importance to the fulfillment of our commitments arising from "Transforming Our World: the 2030 Agenda for Sustainable Development" of the United Nations [Order of the President of the Republic of Azerbaijan on approval of 'Azerbaijan 2030: National Priorities for Socio-Economic Development']. In my opinion correct implementation mechanisms of these 'National Priorities' have to be defined and carried out accordingly so that to ensure sustainable, inclusive and innovative economic growth in the Republic of Azerbaijan.

IV. RESEARCH RESULTS

Investment in innovation reached an all-time high prior to the pandemic, with research and development (R&D) having grown an exceptional 8.5 percent in 2019. When the pandemic hit, the big question was what its effect on innovation would be. Historical evidence suggested a severe cutback in innovation investments. However, according to the Global Innovation Index Report 2021, scientific output, R&D expenditure, IP filings and venture capital (VC) deals continued to grow in 2020, building on peak pre-crisis performance:

• Publication of scientific articles worldwide grew by 7.6 percent in 2020.
• Government budget allocations for the top R&D spending economies that have already disclosed their R&D budgets continued to grow in 2020. The top global corporate R&D spenders, for which data is available, grew overall R&D expenditure by around 10 percent in 2020, with 60 percent of R&D-intensive firms reporting an increase.
• International patent filings via WIPO reached a new all-time high in 2020. An increase of 3.5 percent was driven by medical technology, pharmaceuticals and biotechnology.
• VC deals grew by 5.8 percent in 2020, exceeding the average growth rate for the past 10 years.

Strong growth in the Asia Pacific region more than compensated for declines in Northern America and Europe. Africa and Latin America and the Caribbean also registered double-digit increases. First quarter figures suggest VC activity will be even more vibrant in 2021 [Global Innovation Index Report 2021].

Innovation activity covers all scientific, technical, organizational, financial and commercial steps aimed to the implementation of innovations. As we know, the main factors of innovation are institutions; human capital and scientific research; infrastructure; market characteristics; business features; knowledge and technology results; applies to creative outcomes. In this regard, the main factors mentioned are reflected in the Global Innovation Index Report. The Global Innovation Index includes two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index. The first sub-index is based on five pillars: Institutions, Human capital and research, Infrastructure, Market sophistication, and Business sophistication. The second sub-index is based on two pillars: Knowledge and technology outputs and Creative outputs. Each pillar is divided into sub-pillars and each sub-pillar is composed of individual indicators. Looking at the 2021 Report, we see that Azerbaijan ranks 80th out of 132 countries with 28.4 points.

The profile of Azerbaijan in the Global Innovation Index reports for 2019-2021 is given in the table below. Azerbaijan has improved its position in 2021 edition of GII of the World Intellectual Property Organization (WIPO) Azerbaijan took 80th place in the ranking, in 2020 Azerbaijan ranked 82nd.

Table 1: Azerbaijan GII 2019-2021 rankings

Factors	2021		2020		2019	
	Score	Rank	Score	Rank	Score	Rank
1. Institutions	65.5	58	65	59	64.5	59
2. Human capital and research	24.2	89	21.8	89	17.0	106
3. Infrastructure	35.1	88	36.1	85	45.3	70
4. Market sophistication	53.2	36	52.2	36	56.5	31
5. Business sophistication	20.7	92	20.6	96	24.5	103
6. Knowledge and technology outputs	10.5	115	10.0	118	14.9	101
7. Creative outputs	23.5	67	20.5	65	22.8	84

According to the Gİİ reports from 2019 to 2021, Azerbaijan has made a little improvement in innovation activities in the country. Azerbaijan has high scores in two out of the seven GII pillars: Institutions and Market sophistication, which are above average for the upper middle-income group. Conversely, Azerbaijan scores below average for its income group in five pillars: Human capital & research, Infrastructure, Business sophistication, Knowledge & technology outputs and Creative outputs. The table above gives an overview of the strengths and weaknesses of Azerbaijan in the GII 2021.

GII strengths for Azerbaijan are found in six of the seven GII pillars.

- Institutions (58): exhibits strengths in the sub-pillar Business environment (33) and in the indicator Ease of starting a business (9).
- Human capital & research (89): the indicator Pupil–teacher ratio (8) reveals a strength.
- Market sophistication (36): shows strengths in the indicators Ease of getting credit (1) and Microfinance gross loans (13).
- Business sophistication (92): displays strengths in the indicators University/industry research collaboration (23), State of cluster development (27) and FDI net inflows (25).
- Knowledge & technology outputs (115) reveals a strength.
- Creative outputs (67): shows strengths in the indicators ICTs & organizational model creation (35) and National feature films (27).

GII weaknesses for Azerbaijan are found in five of the seven GII pillars.

- Human capital (HC) & research (89): shows weaknesses in the indicators Expenditure on education (106) and Global R&D companies (41).
- Infrastructure (88): the sub-pillar General infrastructure (127) displays a weakness.
- Business sophistication (92): demonstrates weaknesses in the sub-pillar Knowledge absorption (128) and in the indicators GERD performed by business (85), GERD financed by abroad (100), Joint Venture–strategic alliance deals (87), Intellectual property payments (124) and High-tech imports (118).
- Knowledge & technology outputs (115): the indicator Intellectual property receipts (113) reveals a weakness.
- Creative outputs (67): displays weaknesses in the indicators Creative goods exports (83) and Mobile app creation (96).

In order to compare the level of innovation activity in our country with some other countries, see Global Innovation Index for 2021 in the below table 2.

Table 2: Ranking of some countries in the Global Innovation Index report for 2021

Economy	GII 2021	Institutions	HC and research	Infrastructure	Market sophistication	Business sophistication	Knowledge and technology outputs	Creative outputs
Azerbaijan	**80**	**58**	89	88	36	92	115	67
Belarus	**62**	**85**	38	59	101	69	37	93
Georgia	**63**	**35**	60	85	34	61	75	74
Austria	**18**	**16**	7	7	40	15	19	27
Ukraine	**49**	**91**	44	94	83	53	33	48
Turkey	**41**	**93**	26	48	49	46	50	35
Latvia	**38**	**29**	46	55	45	40	45	39

The above table compares the global innovation indexes of some countries with Azerbaijan, which has similar aspirations in terms of population and area, as well as economic relations.

According to the statistics of 2020, the gross industrial product (GIP) was 37.27 billion AZN, the GDP was 72.43 billion AZN, and the gross innovation product was 28.58 million AZN, or 0.039% of GDP and 0.076% of gross industrial product. The dynamics and specific weight of innovative products in the industry for 2016-2020 are shown in table 3.

Table 3: Dynamics of innovative products in industry for 2016-2020

Years	GIP, thousand AZN	Newly applied & significant changed Product in thousands of AZN	Improved product, thousand AZN	Gross innovation product in the industry, in thousands of AZN	Share of gross innovation product in % industrial output	Share of gross innovation product, %GDP
2016	32300200	35747	540.9	36287.9	0.112	0.06
2017	39892500	14676.7	383.8	15060.5	0.037	0.02
2018	47677000	28952.2	855.3	29807.5	0.062	0.037
2019	46999200	21698.1	3905.9	25604	0.054	0.031
2020	37269900	11759.7	16828.4	28588.1	0.076	0.039

Source: Author's calculation based on official data published by State Statistics Committee

The mentioned comparison in table 2 and the statistics in table 3 show that our country is still lagging behind in the activities and applications of innovation, and there is a need for serious improvement in this area.

The costs of technological innovation in the industry for product and process innovation are described in the table below.

Table 4: According to the types of innovations for 2010-2020, the expenditures on technological innovations in the industry (thousand AZN).

Years	2019	2020
The whole industry	**48037.1**	**35919.8**
product innovations	38343.5	20059.2
process innovations	9693.6	15860.6
Mining industry	**378.6**	**1001.1**
product innovations	290	638.2
process innovations	88.6	362.9
Processing industry	**47658.5**	**34918.7**
product innovations	38053.5	19421
process innovations	9605	15497.7

As can be seen from the table, expenditures on technological innovations in all industries in 2020 amounted to 35919.8 thousand manat and decreased by 0.7 times compared to 2019. Which of these expenditures, 20059.2 thousand manat were spent on product innovations, and 15860.6 thousand manat were spent on process innovations. The total cost of technological innovation by industry can be expressed as follows. Thus, 1001.1 thousand AZN was spent on the mining industry and 34918.7 thousand AZN on the processing industry.

Innovation expenditures in industry were only 0.39% of industrial investments in 2020 and 0.51% in 2019. These facts show that there are serious problems in financing the development of innovation.

V. DISCUSSIONS

The current study aimed to investigate the innovation activities and identify development directions in the economy of the Republic of Azerbaijan. At the end, the article concluded with a conclusion and some improvement recommendations. However, the author also thinks that, in order to achieve sustainable economic growth, the government has to support innovative development, high technology, education, and fundamental sciences in its policies and state programs that cover all the regions of the country. And in these programs, the following items should be taken into account:

- The state's principles take into account macroeconomic conditions;
- Azerbaijan's socioeconomic development goals and priorities;
- conditions in foreign economics and foreign policy
- Forecasting general government needs and financial resources
- Analysis and forecasts on the country's social and environmental situation;
- Focus on scientific, technical, and structural policies;
- Considering the global innovation trend;
- International treaties.

Future research may identify development strategies for improving economic activities in the regions of the country according to their economic potential. Also, the concluded research can be helpful for further investigations and preparing development directions towards achieving sustainable economic growth.

IV. CONCLUSION AND SUGGESTIONS

The current stage of economic growth is based on the effective use of knowledge and information, which leads to the development of innovative economic growth. Innovative economic growth is the increase in GDP through the application of new technological advances in the national economy and the creation of new and better-quality, highly competitive products and services. According to the statistics, our country is still lagging behind in the activities and applications of innovation, and there is a need for serious improvement in this area. That is why the government have to implement proper innovation policy. Taking into account the multifaceted features of innovation, the enrichment of innovation policy in in the Republic of Azerbaijan have be ensured.

For this purpose the government should take the responsibility for risk sharing between stakeholders in order to establish the right partnership and cooperation in this area that is why the following measures should be taken into practice:

- Ensuring the improvement of laws and regulatory frameworks in the field of innovation;
- Conducting proper coordination in terms of the complexity of innovation;
- In order to facilitate partnerships and cooperation among innovation stakeholders, the authorities should develop a state policy and plan to attract targeted investment;
- To form a relevant normative legal framework covering the goals, tools, and mechanisms for the development of the financial system in Azerbaijan so that the issues of initial financing, which are critical in the field of innovation and the activities of startups, are resolved.

Also, in order to accelerate achieving innovative development and sustainable economic growth, the following measures have been proposed in this article:

First, to ensure the innovative development of all regions of our country. For this, it is important to adopt regional innovation programs for each region of the country. The regional innovation programs have to ensure that organizational-technical, technological, social, economic, etc. measures are implemented with regard to achieving the sustainable economic development of the regions. The sequence, duration, and execution of these measures, as well as the information base of the measures, must be clearly indicated.

- ✓ Second, an innovation strategy must be adopted and state programs have to be composed to address each of the problems outlined in this strategy.

- ✓ Third, the improvement of innovation infrastructures, including scientific and technical parks, innovation centers, consulting companies, business incubators, design services, technology transfer centers, etc.
- ✓ Fourth, the creation of "Scientific and Technical Development" zones in our country
- ✓ Fifth, the implementation of practical measures to improve local technologies.
- ✓ Sixth, improvement of the legislative framework in the country.

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