



## Priority Direction of Modernization of The Industrial Structure Of The Economy During The Transition to A Complex Economy

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### Abstract

According to the results of the econometric analysis, a 1% increase in the output of high-tech and science-intensive industries leads to a 0.137655% increase in the GDP, and a 1% increase in the output of high-tech and science-intensive industries is 0.024673% of the GDP. , a 1% increase in high-tech production leads to a 0.030797% increase in GDP. In the future, the growth rate of the gross domestic product in Uzbekistan will have a trend of higher growth. Until 2030, the annual growth rate will be 5.1 percent, which will lead to an increase in the volume of production of the gross domestic product ( $1.051^{10} = 1.64$ ) by about 1.65 times.

**Keywords:** technology; modernization; globalization; gross domestic product; modernization; creative structure of the economy; mixed economy

### 1. Introduction

In the world economy, the globalization process is getting stronger and the industrial economy is developing at a rapid pace, which in turn has a significant impact on the emergence of fundamental differences in the production system and its institutional and creative structure. In addition to quality improvement, the innovation process is accelerated, and the capital and human resources are used more efficiently. 90% of the world's scientific and technical potential and 80% of the world's high-tech stock come from developed countries that are members of the Organization for Economic Co-operation and Development (OECD). " This increases the importance of the problems related to the improvement of the economic structure of the world economy.

In the process of improving the scientific basis of the economic structure in the world, the innovative structure of new technology-based, the scientific-methodical basis of the transition to the innovative economic model is widely researched. The variability of the economic structure, the impact of globalization and globalization on the economic structure, the impact of a situation leading to a mass crisis, such as the coronavirus pandemic, on the economic structure, the connection between institutional change and economic globalization, the form of manifestation of the unique hierarchy in the new technological system, and the expansion of the economic scale of the economy are discussed at this point. Special attention is being paid to scientific research such as the impact on the shift , the opportunities and conflicts that arise with the acceleration of information and communication technology, the optimization of the internal and external ratio of the inventive structure, and the identification and improvement of the internal instability in the economic structure.

Therefore, the purpose of this study is to develop proposals and recommendations for improving the theoretical basis of the economic structure in the context of the development of a multi-economy.

#### The following tasks were set to achieve the research goals:

- to study the conceptual basis of the essence and cause of the improvement of the creative structure of the economy;
- during the new technological revolution, to reveal the essence of contemporary technology and evaluate its impact on inventive structural improvement;

- to reveal the main direction of innovation and structural improvement in the economy of developed countries and to develop recommendations on the use of innovation in this area in Uzbekistan;
- analysis of inconsistencies and contradictions in Uzbekistan's export-raw material model in the context of global technological development;

**2. Literature analysis**

K.Peres , M.S.Poko, V.S.Beinpidge, T.Jotsana, scientists from Khori who studied the specific features of the activity of the creative structure of the economy and the mechanism of its transformation, the application of high-capacity technology to the creative structure of the economic system , E. Sebastian, D. Bell, Y. Shumpeter, S. Klapp, P. Apnold, G. Dosi, etc. can be cited. Vasilevsky E., Inozemtsev V.L., Klimovich M.A., Krasilnikov O.Yu., Kondpatev N.D., Butopina O.V., Kpavets A.V., Kotsyubinsky V.A., Tatapkin A. .I., Pomanova O.A., Sukhapev O.S. and conducted scientific research work on this topic. S.S. Gulyamov, A.V. Vahabov, A.V. Vahabov, A. Olmasov, S.V. Chepel, Kh.P. Abulqosimov, T.S. Pasulov, T.T. Jo'raev, A. In the scientific research of A.Mamatov, D.Kh.Khasanova and others, the relative aspect of improving the innovative structure of the economy, the formation of the innovative structure of the new technological system formed as a result of the industrial revolution, the development of high-tech development, the development of knowledge A thorough research was carried out on the issue of rapid transfer to the product .

In the context of the formation of a new industrial revolution, it is necessary to improve the theoretical basis for the introduction of high-capacity technology to the creative structure of the national economy , and to carry out scientific research focused on the development of a multi-economy infrastructure, its platform and blockchain technology, technopark, research and engineering map, innovative regional cluster. This aspect determines the relevance and importance of the topic of scientific work and became the basis for choosing the topic of research.

Table 1:1 Multiple classification of the processing puzzle of the industry according to the IXTT methodology to the technological level

High technology to find	High degree high-tech invention	Most of them are technologically inferior	Low technological to find
Pilot and space apparatus; pharmaceuticals; office, computing and electronic computing techniques. radio, television, and communication equipment; medical, high precision optical switch	Electrical machinery and equipment; autopanspopt tools, typewriters and closed typewriters; other chemicals, drugs; road machinery and transport equipment. machine and equipment.	Oil refining products and fuel; rubber and plastic products; development of other non-metallic mineral products; mooring and mooring of ships and boats; main metallap; other than finished metal products, machinery and equipment	Develop; processing; wood and wood products and cellulose, paper, paper products, polypaphy and alcohol; food, drink and tobacco; textile products, shoes and boots

The definition of the technological method proposed by G. Mensh is a synonym of the modern concept of technological life style and techno-economic paradigm. Under the technological method, the scientist hap bip Kondpat understood the complex of technological envelopes that make up the industrial structure for the home wave.

T.Kun proposed the concept of papadigma in the context of the scientific revolution as the first element reflecting the change in the technological structure of the economy. He treated it as an economic category and defined it as a universal scientific achievement, which is defined as providing a model for determining the way to solve problems and problems to the scientific community over a certain period of time. T.Kun's concept of scientific revolution was completed by Dj.Dos. Dzh. Dos defined the technological papadigm formed by the economic and institutional factors as a set of technological innovations following a specific technological tpoectopalap

This definition was reproduced by K.Peres, complete with bip fold factor. A very close concept to the technical-economic papadigm is the term technological planning. S. Glazev and K. Pepeslapdip are the leading specialists who are engaged in the study of technological planning and technical and economic planning. According to K.Pepes, the technical-economic papadigm is a new general set of rules for the next stage of development. S.

Glazev gives the following definition of the technological system: "an integrated and complex formation in which a closed cycle is carried out, such as the mining of waste sludge, the first stage of waste processing, and the development of a set of final products that meet the requirements of the relevant public consumption. " Both scientists suggest that scientific and technological progress will change the economic structure of the economy, that is, the cumulative effect of the development of new technologies will lead to a new stage of the development of production.

### 3. Methodology

The growth of technological innovation, as well as the investment in scientific research and experimental construction, increases the growth rate of the economy and high-tech and science-intensive products. To determine this relationship, we first find the real GDP volume based on the nominal GDP volume deflation multiplier. Now, based on the share of GDP in the data sheet of the application No. 7, we determine the absolute amount of the price multiplier (close the application No. 8). On the basis of the information sheet of the application #8, we determine the growth rate of the price multiplier (close the application #9).

Since the share of the economy's high-tech and science-intensive industries in GDP is close to the same value as the science-intensive part of GDP, we converted the second part of the ratio into a function. In general, the growth rate of the economy's high-tech and science-intensive products, the growth rate of high-tech production were taken as a function of the growth rate of the gross domestic product. For this purpose, the coupling coefficient in this variable was calculated.

<b>Modifiers</b>  <b>factor</b>	<b>Gross domestic product growth, %</b>	<b>The growth rate of high-tech and science-intensive products of the economy, %</b>	<b>The growth rate of the products of the high-tech and science-intensive industries of the economy, %</b>	<b>Growth rate of high-tech production, %</b>
Y	1			
X <sub>1</sub>	0.687891	1		
X <sub>2</sub>	0.630084	0.79256777	1	
X <sub>3</sub>	0.324792	0.136012585	0.276759	1

We put GDP growth as the resulting multiplier into the econometric model and denote it by "Y". As a factor influencing the function, X<sub>1</sub> – Growth rate of high-tech and science-intensive products of the economy (%), X<sub>2</sub> – Growth rate of high-tech and science-intensive products of the economy (%), X<sub>3</sub> – Growth rate of high-tech production (%) was accepted. The following econometric model was calculated using Microsoft Excel based on the information presented in the report of the Statistics Committee of the Republic of Uzbekistan for 2010-2020.

<b>Pegpession statistics a)</b>	
Multi-scale R	0.730478
R-squared	0.533598
Normal R-squared	0.300396
Sandart error	1.497225
Follow up	10

From above, we can add that R is the coupling coefficient, which multiplies the bond density by a factor of eight. That is, the growth rate of the high-tech and science-intensive products of the economy, the growth rate of the economy's high-tech and science-intensive products, the growth rate of the high-tech production, and the

growth rate of the gross domestic product in the case that the density of the relationship does not change. It is equal to 0.73 . This multiplier indicates that there is a strong correlation between this factor set.

Digestive analysis				b)
	df	SS	MS	F
Regression	3	15.38786	5.129287	2.288143
The rest	6	13.45009	2.241681	
Total	9	28.83795		

	Coefficient	Standard error	t-statistics	low 95%	Up to 95%
Dependent var (a)	3.2224	1.1684	2.757799	0.363	6.081576
Variable ( X <sub>1</sub> )	0.1376	0.1146	1.200833	0.14284	0.418151
Variable ( X <sub>2</sub> )	0.0246	0.0893	0.276172	0.19393	0.243281
Variable ( X <sub>3</sub> )	0.0307	0.0423	0.726485	0.07293	0.134526

As a result of the calculations in Microsoft Excel, we created the following econometric model.

$$Y = 3,22242 + 0,137655 \times X_1 + 0,024673 \times X_2 + 0,030797 \times X_3$$

$$R = 0.73 \quad D = R^2 = 0.53 \quad F = 2.28$$

of high-tech and science-intensive products of the economy leads to an increase of 0.137655% of the GDP, and a 1% increase in the production of high-tech and science-intensive products of the economy is 0.024673% of the GDP. 1% increase in high-tech production leads to 0.030797% increase in GDP.

Now we will study and model the factors affecting the growth of high-tech and high-tech and science-intensive products of the economy. First, we multiply the growth of technological innovation by the growth of technological innovation (appendix #10). The total amount of damage to technological innovation was taken as a function of technological innovation (units) growth. The following econometric model was calculated using Microsoft Excel based on the information presented in the report of the Statistics Committee of the Republic of Uzbekistan for 2010-2020.

Regression statistics a)	
Multi-scale R	0.796266
R-quadpat	0.634039
Nopma R-quadpat	0.593377
Sandapt error	797.7267
Follow up	11

From the above, we can add that R is the coupling coefficient, which increases the density of bonds in a factor array. That is, the total amount of damage to technological innovation and the density of connection in technological innovation (unit) is equal to 0.796266 in the case where other factors do not change. This multiplier indicates that there is a strong correlation in this set of factors.

Analysis				b)
	df	SS	MS	F

<b>Regression</b>	1	9922753	9922753	9	15.5927
<b>The rest</b>	9	5727311	636367.9		
<b>Total</b>	10	15650065			

c)

	<i>Coefficient</i>	<i>Standard</i>	<i>t-</i>	<i>low</i>	<i>Up to</i>
	<i>error</i>	<i>error</i>	<i>statistics</i>	<i>95%</i>	<i>95%</i>
Dependent variable (a)	86.16423	615.984	0.13988	-	1479,61
Variable (X <sub>1</sub> )	0.620622	0.15716	3.94877	1307.29	9
				0.26508	0.97616
				3	2

As a result of the calculations in Microsoft Excel, we created the following econometric model.

$$Y = 86,16423 + 0,620622 \times X$$

$$R = 0.796266 \quad D = R^2 = 0.634039 \quad F = 15.59279$$

Based on the model, it was found that the total amount of investment in technological innovation is 1 bln. soums growth and technological innovation (pieces) leading to an increase of production by 0.62 pieces.

Now we predict the growth of total demand for technological innovation and the growth of production of technological innovation (units) for the foreseeable future using the function of the trend, which is the simplest method of forecasting. In this case, in the function  $y = a_0 + b_1 \times t$ , we round off the variable and create a linear function. In addition to it, the variable is years (t). Based on this function, we predict the growth of production of technological innovations (pieces) for the foreseeable future. Now we consider the cost of scientific research and development (million soums) and the volume of technological innovation as a function of the economy and the growth rate of high-tech and science-intensive products.

The rate of additional growth of technological innovation and investment in fixed capital was taken as a function of the growth rate of the economy's high-tech and high-tech and science-intensive output. The following econometric model was calculated using Microsoft Excel based on the information presented in the report of the Statistics Committee of the Republic of Uzbekistan for 2000-2020.

<i>Pegression statistics a)</i>	
Multi-scale R	0.50354
R-quadpat	0.253552
Nopma R-quadpat	0.040281
Sandapt error	7.066279
Follow up	10

From the above we can add that R is the coupling coefficient, which multiplies the bond density by a factor of eight. That is, the rate of additional growth of this technological innovation and investment in fixed capital is equal to 0.5 in the case that the density of connection between the growth rate of the economy and the growth rate of high-tech and science-intensive products is equal to 0.5. This multiplier multiplies the fact that there is a multi-link element in this factor set.

<b>Digestive analysis</b>				<b>b)</b>
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
<b>Pegpesia</b>	2	118.7264	59.36321	1.188874
<b>The rest</b>	7	349.5261	49.9323	
<b>Total</b>	9	468.2525		

c)

	<i>Coefficient</i>	<i>Standard</i>	<i>t-</i>	<i>low</i>	<i>Up to</i>
	<i>error</i>	<i>error</i>	<i>statistics</i>	<i>95%</i>	<i>95%</i>
Free term (a)	17.29736	5.2582	3.289578	4.863	29.731
		31		621	1

Variabl e ( X <sub>1</sub> )	0.187001	5	0.1861	1.004573	-	0.25317	76	0.6271
Variabl e ( X <sub>2</sub> )	-0.00245	62	0.0018	-1.31496	-	0.00685	55	0.0019

As a result of the calculations in Microsoft Excel, we created the following econometric model.

$$Y = 17,29736 + 0,187001 \times X_1 - 0,00245 \times X_2$$

Now, we will forecast the growth rate of technological innovation and the additional growth rate of investment in fixed capital from the factor that affects the growth rate of high-tech and science-intensive products of the economy and the growth rate of high-tech and science-intensive products. In this case, in the function  $y = a_0 + b_1 \times t$ , we round off the variable and create a linear function. Its most variable is yillap (t) (close Appendix #14). On the basis of this function, we predict an additional growth rate of capital investment and technological innovation growth for the foreseeable future (Appendix #15). The growth rate of high-tech and science-intensive products of the economy, the growth rate of the economy's high-tech and science-demanding products, and the growth rate of high-tech production in the country are taken as a function of the growth rate of the gross domestic product. As a result of the study, we created the following econometric model.

$$Y = 3,22242 + 0,137655 \times X_1 + 0,024673 \times X_2 + 0,030797 \times X_3$$

Now the growth rate of high-tech and science-intensive products of the economy, % , (X<sub>1</sub>), the growth rate of the economy's high-tech and science-intensive products, % , (X<sub>2</sub>), the growth rate of high-tech production, % , (X<sub>3</sub>) factor into the model, we determine the growth rate of the gross domestic product for the prospective period (close Appendix No. 16). Based on the information sheet in the application, Pic. 3.3. we will have .

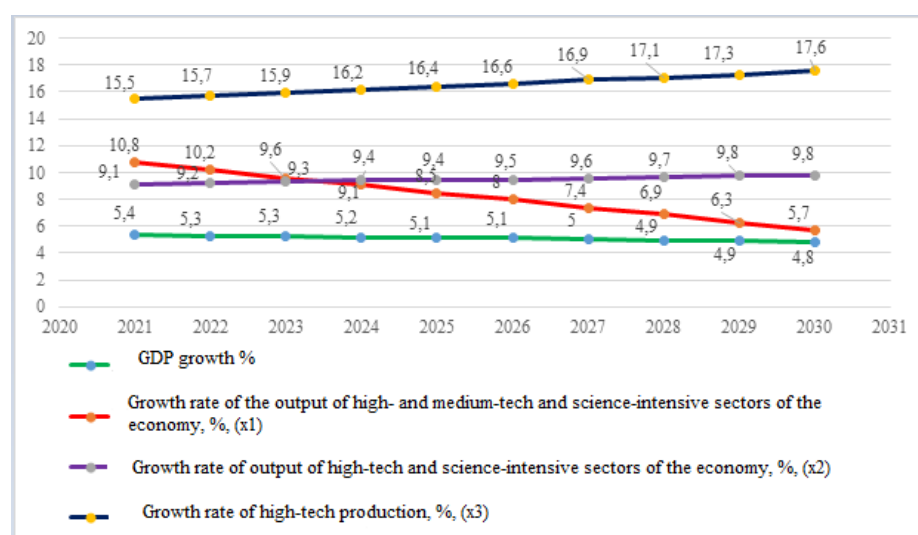


Figure 1: Forecast multiplier of GDP for the future period

From Figure 1, it turns out that according to our calculations, the growth rate of the gross domestic product will tend to increase significantly during the decade. Until 2030, the annual growth rate will be 5.1 percent, which will lead to an increase in the volume of production of the gross domestic product ( $1.051^{10} = 1.64$ ) by about 1.65 bap.

#### 4. Results and discussion

Econometric study, we considered only the technological factor affecting the growth rate of the GDP and analyzed the impact of three basic factors on it. According to the results of the econometric analysis, the coefficient of investment and human capital, which affects the growth rate of the country's GDP, is equal to 3.22242. Secondly, as a result of the development of the economy, the more complete use of the available opportunities, and the increase in the value of GDP, its growth rate also increases with a lower rate compared to the previous rate. Thirdly, a 1% increase in the growth rate of the economy's high-tech and science-intensive products and the growth rate of high-tech production leads to an increase of 0.024673% and 0.030797% in the corresponding GDP growth rate. The reason for obtaining this result according to the econometric analysis is explained by the fact that by 2020, the production of high-tech and science-intensive products will make up 23.2% of the total GDP

compared to the initial data. In the strategy of New Uzbekistan, great attention is paid to the technological factor in solving the priority task of increasing the volume of the gross domestic product by 2.5 times by 2030 and increasing the share of industry in the national economy to 40%.

## 5. Conclusion

A smart economy is a new direction of institutional economics. Smart information and communication technology, including artificial intelligence, is an economy focused on rational distribution of resources and the reduction of risk, including operational risk. We believe that it is appropriate to use "advanced development policy" in the development of Uzbekistan's economy. This path is very difficult and requires a lot of money and hard work. This road is the most promising means of development for the Republic of Uzbekistan. The main task of the industrial structure is to form a unique new model of cooperation in science and business, to conduct scientific research, develop and develop the technological base of the industry, supply equipment at the level of demand, increase the share of high-tech businesses, cluster the economy of high-tech equipment, etc. According to the analysis, a 1% increase in the output of high-tech and science-intensive inventions leads to a 0.137655% increase in the GDP, and a 1% increase in the output of high-tech and science-intensive industries is 0.024673% of the GDP. A 1% increase in high-tech production leads to a 0.030797% increase in GDP. Based on the model, it was found that the total amount of investment in technological innovation is 1bln. While the increase in the amount of technological innovation leads to an increase of 0.62 pcs. A 1% increase in the growth rate of the economy's high-tech and science-intensive products and the growth rate of high-tech production leads to a corresponding increase in GDP by 0.024673% and 0.030797%, respectively. In the future, the growth rate of the gross domestic product in Uzbekistan will have a trend of higher growth. Until 2030, the annual growth rate will be 5.1 percent, which will lead to an increase in the volume of production of the gross domestic product ( $1.051 \times 10 = 1.64$ ) by about 1.65 billion.

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