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Innovation as a factor in achieving economic competitiveness

Abstract. *To actively innovate the development of the economy, it is necessary to make full use of scientific and technological developments in the real sectors of the economy.*

Technological progress is a factor of production and a means of increasing factors of production. Those countries which will not survive the «technological race» will be pushed into a zone of impoverishment and backwardness. As a result of systematic efforts on the part of the country, innovation has been identified as a strategically important area for the development of the Republic of Kazakhstan. The State has defined the key priorities of the Third Modernization, the first of which is accelerated technological modernization and increasing the productivity of industries through the transfer of new technologies and the introduction of best practices.

To reorient science and technology to a new level of innovative development, it is necessary to restructure the entire scientific and technical system of the Republic of Kazakhstan into innovative paths, which should lead to a breakthrough in all sectors of the country's economy.

Keywords: *innovation, innovation capacity, intellectual resource, scientific and technological progress, engineering organizations, research, innovation.*

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Introduction

To actively innovate the development of the economy, it is necessary to make full use of scientific and technological developments in the real sectors of the economy. But the development of scientific and technological activities in our country so far is not sufficient to qualify for world indicators, which requires the search for new opportunities and tools for development.

To reorient science and technology to a new level of innovative development, it is necessary to a structural and functional restructuring of the entire scientific and technical system of the Republic of Kazakhstan on an innovative track, which should lead to a breakthrough in all sectors of the country's economy.

Any innovation is associated with one of the following changes: it can be a new technique, technological process, or new production support; new properties of products, new raw materials, a new organization of production or material and technical support, new sales markets. In other words, the properties of innovation include novelty, new applicability, commercial implementation.

For the development of innovative activities, it is necessary to develop and implement innovative development programs. For this, the opinion of all stakeholders should be considered, which, directly or indirectly, can create conditions for stimulating innovation. The subjects of innovation regulation include authorities such as local and central government,

state organisations and enterprises, economies that operate independently, NGOs, scientists, and innovators, etc. [1].

In many cases, the key role of the government in promoting innovation is the leading one. The government itself acquires the necessary systems, products, and services, usually following a procurement procedure that ensures free competition. As a very large and consolidated purchaser, the state has great potential to promote innovation. The state fosters innovation by cooperating in advanced R&D and product development, usually at the pre-project stage, but increasingly at the implementation stage. Often a government agency coordinates R&D or innovative technology.

Formulation of the problem. To actively innovate the development of the economy, it is necessary to make full use of scientific and technological developments in the real sectors of the economy. But the development of scientific and technological activities in our country so far is not sufficient to qualify for world indicators, which requires the search for new opportunities and tools for development.

To reorient science and technology to a new level of innovative development, it is necessary to a structural and functional restructuring of the entire scientific and technical system of the Republic of Kazakhstan on an innovative track, which should lead to a breakthrough in all sectors of the country's economy. To implement these tasks, it is necessary to both activate local and attract foreign high-tech companies. Despite a large amount of research in the field of innovative development, there are still not enough practical recommendations for their implementation.

At present, innovation has not yet become the basis of the country's social and economic development: the country's economy is not experiencing significant technological breakthroughs or signs of intensive mass absorption of the results of research and development. Low innovation activity is typical for all types of economic activity, as well as for all types of innovations (technological, organizational, marketing).

The main problem is the generally low demand for innovation in the Kazakh economy,

as well as its inefficient structure - an excessive shift towards purchasing finished equipment abroad to the detriment of introducing its new developments.

The level of innovation by enterprises is far below that of the leading economies in this field [2].

Obviously, in the innovative development of the sector in the long term, it is necessary to know the starting position, as only those structural and institutional changes that are possible in the prevailing conditions can take place in the economy at any given time.

At present, the innovation system does not create conditions for the full-scale implementation of innovative developments developed by domestic scientists, and in several characteristics Kazakhstan's NIC lags the innovation systems of developed countries. The innovation and financial infrastructure in the country are being actively developed, but the mechanisms of interaction between the elements of the NIS have not yet been fully elaborated.

The purpose of the study. The purpose of the study is to review the current state of innovation and to assess the innovation potential and its impact on the economy of Kazakhstan based on an analysis of industrial and innovation policy. Also, the purpose of the study are to conduct an analysis of innovative development, identify problems and factors hindering the development of the innovation system in the Republic of Kazakhstan, consider measures for state support for innovative development and innovative potential in the country, identify mechanisms and tools for implementing the national innovation system.

The history. Questions of innovation as a factor of economic growth have been addressed in the writings of A. Smith, D. Ricardo, J. S. Mill, J. Robinson, J. M. Keynes, J. Schumpeter, P. Heine, F. Knight, S. L. Bru, C. R. McConnell, M.-Y. Porter, F. Blank. Among the national economists who have studied the problem, it is worth mentioning G. S. Alimova, D. N. N. Dadabaeva, D. M. Djantemirova, R. T. Dulambaeva, N. K. Nurlanova, G. J. Nurmuhanova, J.K. Bopiev, A. K. Orazgalieva, O. S. Sabden, K. A. Sagadiev, G. B. Sakhanova and others.

Innovation potential should be understood not only as a set of intellectual, financial, scientific, technical, production, and technological and information resources that form a single system capable of ensuring the successful implementation of innovative activities, but also an organizational mechanism necessary to achieve the set goal in the field of science-intensive and technological processes and products. This is since the implementation of new knowledge in innovation requires an appropriate institutional environment.

Based on the definition of innovation potential and existing methodological approaches, we propose the following system of indicators. To quantitatively assess the innovative potential, to apply a system of indicators characterizing the possibility of innovative development of economic entities and the efficiency of using intellectual, financial, scientific, and technical, information resources, determining their place in the overall potential of the economic system (world, country, region, industry, industry).

Depending on the type of resource, the main components of the innovation potential are assessed:

1) intellectual resource - the availability of a highly skilled workforce capable of designing, producing, implementing and managing innovation;

2) financial resource - the availability of financial resources necessary for the production of new or improved types of products, services, production processes, technologies and systems;

3) scientific and technical resources - the existence of documents issued for the volumes of industrial property in the form of patents, licenses, etc., as well as the material and technical support necessary for carrying out scientific research;

4) information resources - the availability of information technologies necessary for the management of the production and economic system;

In the late 1980s. researchers of this direction B.-A. Lundwall and B. Johnson developed the concepts of the national innovation system and the learning economy, which were then developed in

the 1990s. The origin of innovation was examined by Lundwall using the example of Denmark. Based on research, he concluded that innovation is not discrete, but a cumulative process. He introduced such a concept as incremental innovation and 4 types of innovations:

incremental innovation, which is mainly characteristic of the open economies of small countries;

stationary technology that can only be used in a specific region or country;

radical innovation, which is characteristic of states with a large territory and population, for example, the United States;

the technological revolution, accompanied by a change in technological structures throughout the world economy.

Lundwall pays much attention in his research to the learning process, considering it, along with additional innovations, one of the main factors in achieving high competitiveness of the economy in a small country [3]. In the early 1990s. he introduced the term «learning economy», which was further developed in the context of the NIS concept. Learning refers to the process of developing the skills and knowledge needed to create a better product. With this, new knowledge can be obtained both in the course of study and in the performance of work.

Danish researcher B. Johnson noted that in addition to the accumulation of knowledge in the learning process for improving the country's economy, an important process is also the process of forgetting.

In a narrow sense, the «national system of innovations» represents a system of organizations and institutions involved in the process of search and invention, i.e. Research institutes conducting R&D, technological institutes, universities, and divisions of private enterprises.

Methodology

The results of the research are based on the fundamental provisions of the theory of market economy construction, the theory of the development of innovation as the main engine of state economy and its role in the improvement of

population welfare and quality of life. Methods based on research on the dynamics and structure of the main indicators of economic development and innovation infrastructure, rating methods of comparative research were used.

The recommendations contained in the study can be used in the elaboration of the innovative development concept of the economy of Kazakhstan.

There are various approaches to assessing the innovative potential of an economic system (enterprise, region, industry), in which innovation

potential is sometimes understood as scientific and technological potential and represents it as a set of real and hidden scientific and technological resources of enterprises, as well as a diffusion of forces, a vector of action which is aimed at increasing them and improving the quality [4].

Results and discussion

Figure 1 presents an integrated assessment of a country's innovative capacity. In our view, this scheme will make it possible to determine the

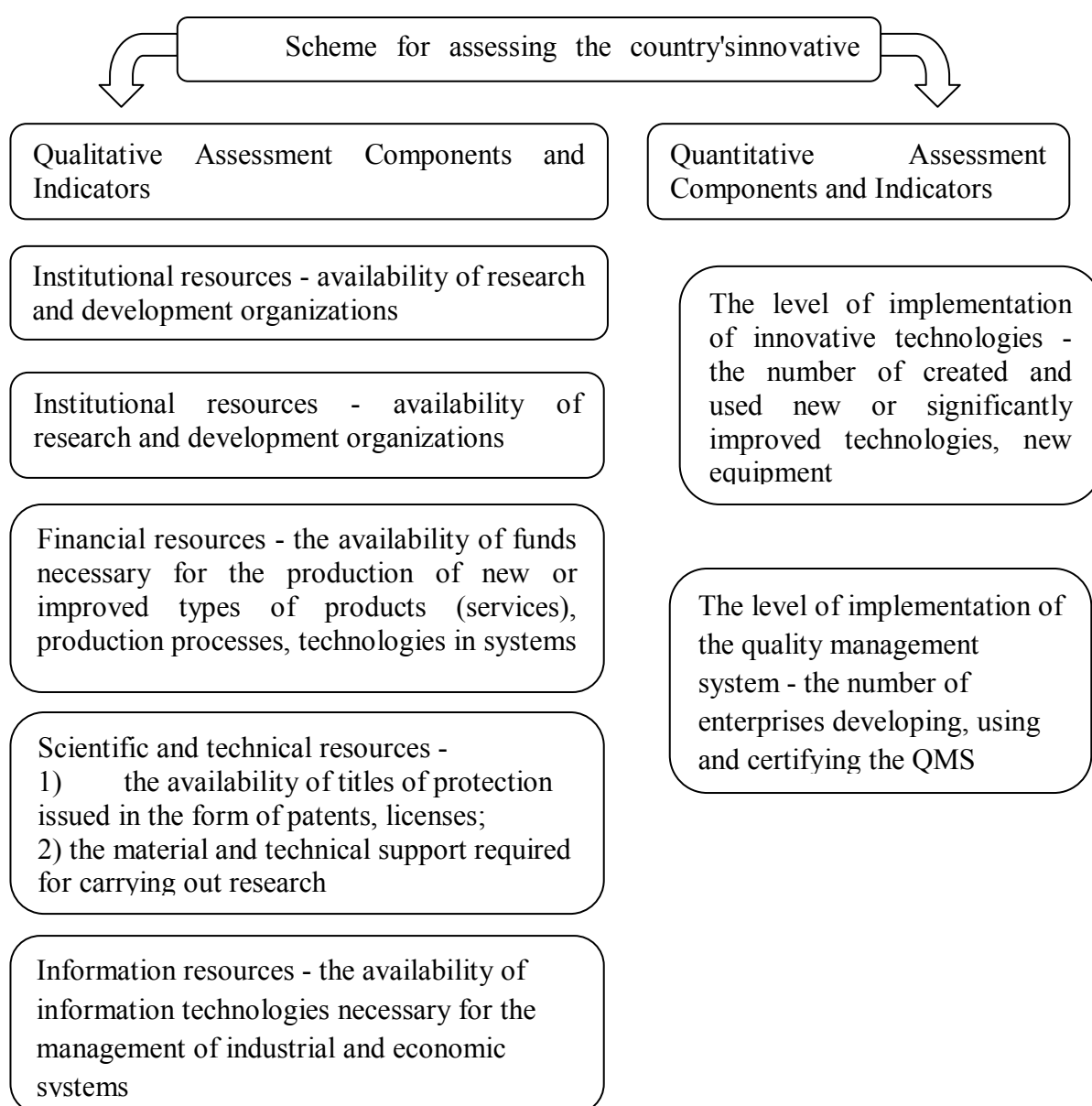


Figure 1 – Scheme for assessing the country's innovative potential

real possibilities of innovative development in Kazakhstan and to assess the degree of influence of factors that promote or constrain technological innovation in enterprises.

So, let us assess the potential of Kazakhstan's innovative activities based on the data of the Committee on Statistics, in the analysis we set

the task to give a quantitative characteristic to each type of resource and identify both positive and negative trends in their development. In our view, such a comprehensive assessment provides an objective picture of the status and level of innovation potential of Kazakhstan's industry. Special attention was paid to its qualitative

Table 1

Research and development organizations in Kazakhstan

Indicators	2015	2016	2017	2018	2019	Changes from 2019 to 2015.	
						ea	%
Total organizations that carried out research and development, units	437	438	421	416	424	-13	97
Organizations of ministries and departments	128	109	84	79	80	-48	62,5
Universities	92	97	89	78	95	3	103,3
Research institutes	30	33	34	36	26	-4	86,7
Industry research institutes	34	36	44	24	38	4	111,8
Design, engineering, technology organizations	20	17	20	36	22	2	110
Construction and engineering organizations	11	9	10	10	4	-7	36,4
Industrial enterprises	10	11	11	13	11	1	110
Others	112	124	129	140	148	36	132,1

Note - compiled by the authors

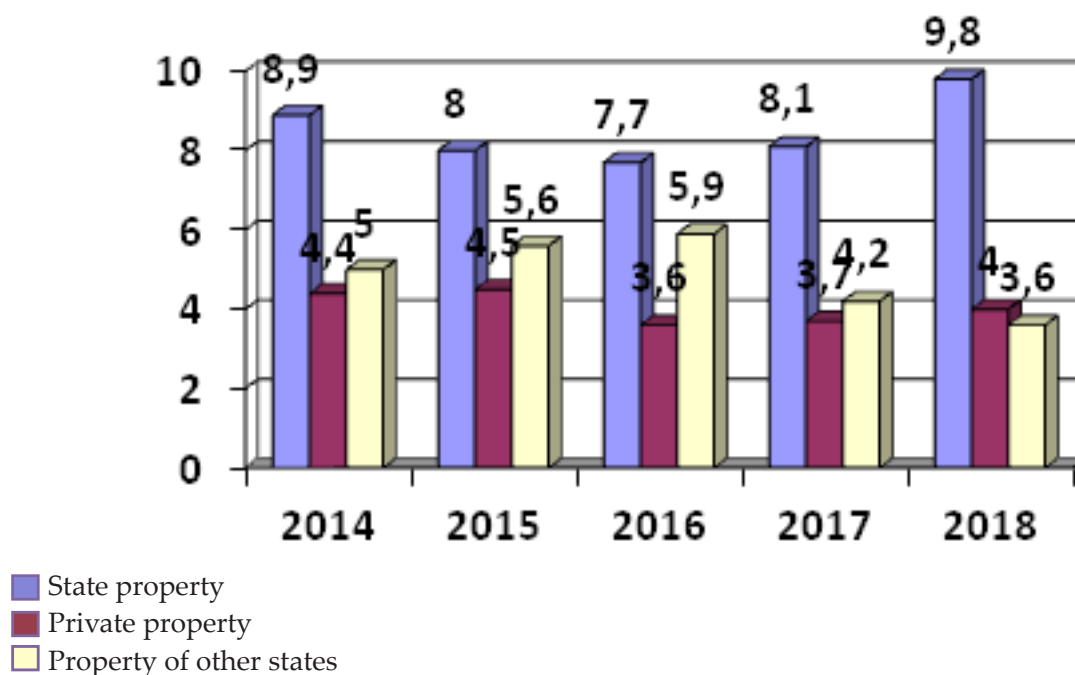


Figure 1 – The share of innovatively active enterprises by ownership

characteristics, as in recent years there has been an increase in industrial output and innovation costs, but the level of adoption of new technologies remains very low.

As shown in Table 1, 2015. 437 research and development organizations were registered, i.e., 14 more or 97 percent more than in 2019. Changes in the structure of the organizations were due to the increase in the number of sectoral research institutes by 11.8 percent and of engineering and technological organizations by 10 percent.

Also, there has been an increase in the number of institutions of higher education. The total number of institutions of higher education has increased by 3 units or 3.3 percent over the period under analysis. In our view, this is a positive development, as these organizations are more intertwined with industrial enterprises as major research clients. However, of the total number of organizations, only 11 are engaged in research and development. It is not difficult to calculate that their share in the total structure is 2.6%, which confirms once again the low interest of domestic industrial enterprises in carrying out their research and development to create and introduce innovations in production.

As shown in figure 1, the proportion of State-owned enterprises with research and

development is almost double the total number of private enterprises. The percentage is 9.8%. This is a very low figure, because it is R&D in enterprises that ensures the realization of research in the form of design documents, prototypes, and a complex.

To characterize the intellectual resource, the distribution of the number of specialists by types of organizations is of particular importance. So, in 2019, the number of government researchers engaged in R&D was only 6557 people, and their share in the total number of employees is 38.5%. In 2019, the number of government employees engaged in R&D decreased by 4,328 compared to 2015. (Table 2). Engineering institutes have seen an increase in the number of employees to 1,129, which is 207 more than in 2015. On the contrary, we can see a decline in the number of employees in sectoral research institutions - from 2,187 in 2015 to 1,921 in 2019. These indicators tell us that innovation is declining rather than developing.

Changes in the number of highly qualified specialists with a degree (Ph.D. or Ph.D.) and engaged in scientific and technical activities are shown in table 3.

From 2015 to 2019. The increase in researchers with academic degrees, including doctorates and Ph.D. candidates, averaged 3.3%. This is a

Table 2

Number of employees engaged in research and development by type of organization, persons

Organization type	2015	2016	2017	2018	2019	Changes from 2019 to 2015
In total, R&D is employed at the place of main work, persons	19563	17774	16304	15793	17021	-2542
including:						
Scientific organizations of state authorities	10885	8706	6604	6252	6557	-4328
Universities	4360	4424	4298	4504	5232	872
Industry research institutes	2187	2268	2458	1675	1921	-266
Construction and engineering organizations	922	753	703	1443	1129	207
Industrial enterprises	306	227	291	303	251	-55
Others	903	1396	1950	1616	1931	1028
Note: Science and innovation activities of Kazakhstan. - 2019.						

Table 3

Number of researchers with scientific degrees, by sector of scientific and technical activity

	2015	2016	2017	2018	2019	Changes from 2019 to 2015	
						person	in %
Researchers with advanced degrees, people, including by sector of activity:	4304	4224	4952	4154	4447	143	103,3
- state	2397	2019	1503	1383	1406	-991	58,6
- entrepreneurial	403	447	392	477	520	117	129
- higher education	1457	1712	2065	2033	2198	741	150,8
- private non-profit	47	55	92	271	323	276	7 times
including:							
Doctors of Science:	1157	1166	1191	1340	1347	190	116,4
- state	689	572	458	389	404	-285	58,6
- entrepreneurial	94	114	95	142	132	38	140,4
- higher education	361	465	603	716	705	344	195,3
- private non-profit	13	15	35	93	106	93	8 times
Candidates of Science:	3147	3058	2861	2756	3041	-106	96,6
- state	1708	1438	1045	975	995	-713	58,3
- entrepreneurial	309	333	297	332	377	68	122
- higher education	1096	1247	1462	1279	1456	-736	132,8
- private non-profit	34	40	57	170	213	179	6 times

Note: Science and innovation activities of Kazakhstan. - 2019.

positive factor. Unfortunately, the public sector is experiencing a decline of 1.7 times or 40 percent in the number of researchers.

In general, an analysis of the intellectual resource suggests that there is a shortage of R&D personnel in the State, and that the system of training of highly qualified specialists and promotion of personnel requires major changes. Another equally important indicator of the level

and dynamics of innovation capacity in industry is the availability of financial resources to produce new or improved products, etc. The main sources of financial resources include investments, internal research and development costs, and technological innovation costs. Let us analyse the level of use of these sources of funding.

As can be seen from Figure 2, for 2015-2019. for all types of investments there is a growing

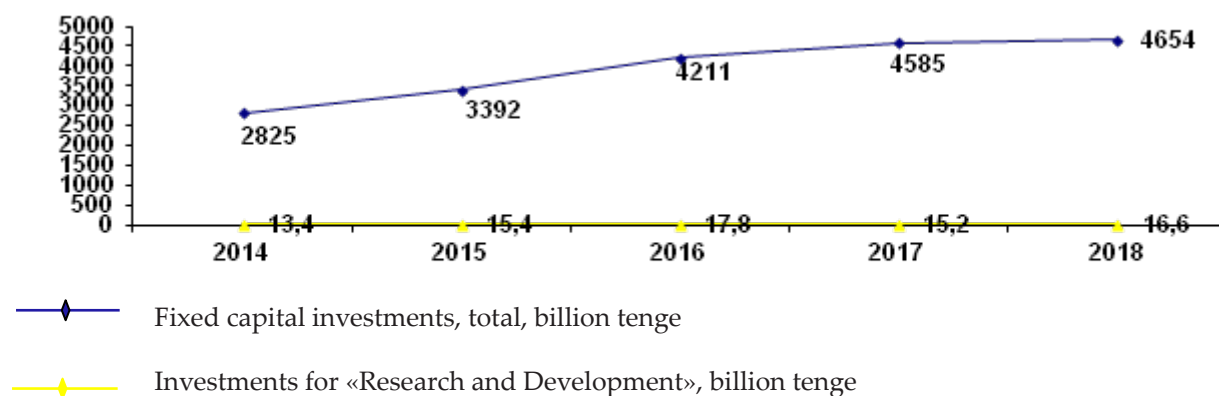


Figure 2 – Dynamics of investment growth by type of economic activity «Research and Development»

trend, but investments in fixed assets by type of economic activity «Research and Development» have practically remained at zero. In 2016, their share in the total volume of investments in fixed assets is 0.46%, and in 2019, 0.36% [5].

However, investment in «research and development» is extremely inadequate. A positive factor is that during the analysed period, the total technological costs increased by almost 3 times, i.e., from 79 985.9 million tenge in 2015. up to 235 501.7 million tenge in 2019. At the same time, the largest share falls on the own funds of enterprises, which in 2019 amounted to 218 666.4 million tenge or 92.8 percent. The third place in the structure of costs is taken by funds from the state budget, the share of which is 3.3 percent. On average, government spending from 2015 to 2019 increased by 1.1 times, but in 2016. compared to 2015, this figure decreased by 4.5 percent.

The material and the technical base play an important role in scientific and technological potential, as the quality and quantity of research and development, as well as the introduction of technological innovations, depending on the degree of equipment and machinery.

For example, in 2019, the average annual cost of R&D equipment was 22,810.8 million tenge, compared to 2015. 18.5 percent more. Cars and equipment account for 12,066.6 million tenge, which increased by 23% between 2015 and 2019 (Table 4).

As can be seen from table 3, the period under review is characterized by a high rate of growth across all sectors of activity, especially in the public sector, which accounts for 54.7 percent of the total amount of fixed assets used for research and development. For the business sector - 25 percent, for higher education institutions - 3.7 percent, for the private non-profit sector - 7.8 percent.

The effectiveness of scientific and technical activities is characterized by the volume of exports of high-tech products. Kazakhstan has a relatively small volume of exports of high-tech products in relation to the technology giants - China, the USA, Germany, which in 2019 amounted to \$ 1.8 billion, which is on average about 135 times less than the similar indicators of the above countries [5]. However, on the territory of the CIS, Kazakhstan ranks second in terms of

Table 4

Fixed assets for research and development by sector of performance

	2015	2016	2017	2018	2019	Changes from 2019 to 2015, %
Fixed assets, total	19247,7	18781,9	19176,7	22011,3	22810,8	118,5
including:						
Government sector	12776,3	10903,2	8014,7	7379,4	12472,5	97,6
Higher education sector	2892,9	3080,7	5146,8	3962,9	2836,9	98
Business sector	3530,3	4717,3	5658,3	8078,3	5718,4	162
Private non-profit sector	48,2	80,7	356,9	2582,7	1783	3,7 times
of them:						
Machinery and equipment, total	9809,8	10005,4	9654,5	12393	12066,6	123
including:						
Government sector	7224,5	7068,5	4784,8	5028	7519,3	104
Higher education sector	1142,6	1045,4	2212,5	1354,8	1274,7	112
Business sector	1413,5	1856,4	2561,9	3918,5	2149,3	1,5 times
Private non-profit sector	29,2	35,1	95,3	2091,7	1123,3	3,8 times
Note - compiled by the authors						

exports after the Russian Federation, while ahead of Belarus and Ukraine (Table 5).

The above table shows that in 2019 there was a sharp decline in high-technology exports worldwide, including in Kazakhstan, due to the global financial crisis. Between 2016 and 2019, virtually all countries experienced negative growth, except China, which registered positive growth.

In 2019, there is a significant increase in the number of organizations that have created and use new technologies and equipment to 338 units, or 2.4 times the level of 2018 [6].

Similarly, there is an increase in the number of created and used new technologies and equipment from 487 units in 2018 to 1037 units in 2019. The largest share in the use of new technologies at the end of 2019 is occupied by the Almaty and East Kazakhstan regions with a share in the total volume of 21.7% and 20.1%, respectively [6].

Trends in the development of innovative activities in the world, the emergence of new mechanisms of interaction have awakened interest in the study of the organizational and economic mechanisms of the national innovation system and the innovative potential of the country.

In each specific case, the strategy for the development of the NIC and the innovative

potential of the country's economy is determined by the state macroeconomic policy, regulatory legal support, forms of direct and indirect state regulation, the state of scientific, technological, and industrial potential, domestic commodity markets, labour markets, as well as historical and cultural traditions. and features [7].

It was determined that the effective functioning of the NIC and the innovative potential of the economy presupposes the presence of the following key patterns in the development of innovative activities: a high level of financial support for R&D (1.5-3% of GDP); the predominance of private capital in financing research and development; the high innovative activity of enterprises, the development of a large number of innovations in high-tech industries (automotive, pharmaceuticals, electronics, etc.); the high innovative activity of large corporations, the creation of their own laboratories and research centres; the historically established symbiosis of science and production on the basis of business incubators, technology parks;

analysis of the functioning of the main subsystems of the NIC and the innovative potential of the economy of the country of Kazakhstan revealed its following weaknesses:

there is a downward trend in the number of researchers, disproportions in the placement of personnel engaged in R&D (the predominance of

Table 5

The volume of exports of high-tech products in 2015-2019, billion US dollars

Countries	2015	2016	2017	2018	2019
China	214,25	271,17	337,01	381,34	348,29
USA	190,86	219,18	228,65	231,13	141,52
Germany	142,45	159,01	155,92	162,42	142,45
Japan	122,68	126,62	121,42	123,73	99,21
Singapore	105,08	124,14	105,55	120,35	97,21
France	69,66	80,53	80,46	93,21	83,83
Great Britain	82,84	115,46	63,07	61,78	57,18
Finlan	14,49	14,11	15,56	16,66	8,6
Russian Federation	3,69	3,83	4,14	5,11	4,58
Kazakhstan	0,42	0,99	1,46	2,25	1,8
Belarus	0,22	0,27	0,35	0,4	0,31
Note - compiled from the source [4]					

researchers in the public sector and the education sector), the lag of researchers' salaries from the average in the economy;

technology parks do not have a noticeable impact on the innovative development of regions, experience organizational and financial difficulties, there is no or weak demand for the services of technology parks on the part of entrepreneurs;

in the structure of expenditures on technological innovations, the main volume belongs to the state sector, while the efficiency of expenditures on technological innovations is rapidly decreasing;

with the participation of development institutions and venture funds, single innovation projects are being implemented;

Kazakhstan's positions on the WEF Global Competitiveness Index have been declining for several years. Analysis of such factors of the index as «Conditions for business development» and «Innovation» made it possible to identify such weaknesses as low level of companies' expenditures on development and research activities, low competitiveness of domestic goods in international markets, a small number of internationally recognized research institutes and laboratories, weak patenting activity, low degree of interaction between industry and higher educational institutions in research activities;

the study of the problems of introducing innovative developments into production revealed the need to support innovative activities at the regional level. To finance innovative small and medium-sized enterprises, a mechanism of unsecured provision of financial resources has been proposed, which is proposed for implementation within the framework of the creation of regional venture funds

Conclusions

During the analysis and assessment of the innovative potential of the industry of Kazakhstan, data were obtained, which are summarized and presented below. The main results indicate that today in the economy of Kazakhstan:

- the share of design and engineering organizations and industrial enterprises engaged in research activities is extremely small;

- in the industry in recent years, there has been no increase in the number of highly qualified specialists engaged in research and development;

- low level of attracting investments in fixed capital and intangible assets, insufficient expenditures on research and development, technological innovation;

- a low level of use of information and communication technologies at enterprises, although there is an increase in the number of enterprises using ICT and an increase in costs for them in the industry as a whole;

- the level of use of new technologies and equipment in industrial production is much lower than the level of new technologies and equipment created.

Today the innovative potential of the industry of Kazakhstan is characterized by its low level. Among the most important problems that negatively affect the innovative potential of the industry are the technical and technological backwardness of industrial enterprises, especially in the manufacturing industries, limited investment, and intellectual resources.

Thus, the analysis of the current state of the economy of Kazakhstan showed that, despite the results achieved during the implementation of the state program for the accelerated industrial and innovative development of the Republic of Kazakhstan, the innovative activity of industrial enterprises still remains quite low, and the innovative potential is characterized by such features as the lack of effective communication between research organizations and production, the state and the private sector, insufficient financial resources, a shortage of qualified specialists and the weak development of science-intensive and high-tech industries.

There are many reasons for this situation, but the main one is the lack of favourable conditions for the implementation of innovative activities of enterprises. In our opinion, in conditions of weak interest of enterprises in innovations, a powerful organizational, managerial, and legal mechanism

is needed for the self-regulation process to work. This requires the institutionalization of an innovative culture, i.e., its transformation into an organized, orderly process with a certain structure of relations, rules of behaviour, the responsibility of the participants. We are talking about the necessary consolidation measures since it is necessary to solve large socially significant issues in a short time [8].

Economic reforms in the Republic of Kazakhstan presuppose the creation of conditions for the development of state regulation of innovation through the organization of state support, privatization of state property, stimulation of small and medium-sized businesses, each of which, in turn, includes a sufficient number of measures for the formation and development of new economic relations.

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Инновационность как фактор достижения конкурентоспособности экономики

Аннотация. Для активного инновационного пути развития экономики необходимо всемерное использование научно-технических достижений в реальных отраслях экономики.

Технологический прогресс является самостоятельным фактором производства и способом увеличения факторов производства. Те страны, которые не выдержат «технологической гонки», окажутся вытесненными в зону обнищания и отставания. В результате системных усилий со стороны государства инновации были определены в качестве стратегически важного направления развития Республики Казахстан. Государством определены ключевые приоритеты третьей модернизации, первый из них – ускоренная технологическая модернизация и повышение производительности отраслей экономики через трансфер новых технологий и внедрение лучших практик.

Для переориентации науки и техники на новый уровень инновационного развития необходима структурная и функциональная перестройка всей научно-технической системы Республики Казахстан комплекса, что должно привести к прорыву во всех отраслях экономики страны.

Ключевые слова: инновации, инновационный потенциал, интеллектуальный ресурс, научно-технический прогресс, проектно-конструкторские организации, научные исследования, инновационная деятельность.

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Инновация – экономиканың бәсекеге қабілеттілігіне қол жеткізу факторы

Аннотация. Экономиканы дамытудың белсенді инновациялық жолы үшін экономиканың нақты салаларында ғылыми-техникалық жетістіктерді жан-жақты пайдалану қажет.

Технологиялық прогресс – бұл өндірістің тәуелсіз факторы және өндіріс факторларын ұлғайту тәсілі болып табылады. «Технологиялық жарысқа» төтеп бере алмайтын елдер кедейшілік пен артта қалу аймағына ығыстырылады. Мемлекет тарапынан жүйелі күш-жігер жұмсау нәтижесінде инновациялар Қазақстан Республикасы дамуының стратегиялық маңызды бағыты ретінде айқындалды. Мемлекет Үшінші жаңғыртудың негізгі басымдықтарын айқындады, олардың біріншісі – жедел технологиялық жаңғырту және жаңа технологиялар трансфері мен үздік практикаларды енгізу арқылы экономика салаларының өнімділігін арттыру.

Ғылым мен техниканы инновациялық дамудың жаңа деңгейіне қайта бағдарлау үшін Қазақстан Республикасының барлық ғылыми-техникалық жүйесін инновациялық рельстерге құрылымдық және функционалдық қайта құру қажет, бұл ел экономикасының барлық салаларында серпінді болуы тиіс.

Түйін сөздер: инновациялар, инновациялық әлеует, зияткерлік ресурс, ғылыми-техникалық прогресс, жобалау-конструкторлы ұйымдар, ғылыми зерттеулер, инновациялық қызмет.

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