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# **INNOVATIONAL POTENTIAL OF REGIONS**

#### Abstract

The country's innovative development guarantees the trustworthy capacity of future periods. In Kazakhstan, spatial development of regional territories is relevant for academic circles and the business community. The basis of this study is whether Kazakhstan has the potential to form a scientific and technical direction of development in the presence of existing opportunities for the dynamic development of regions. In this study, such scientific methods as analysis and synthesis, generalization, as well as an integrated approach, analytical review, abstraction, and logical analysis were used. The analysis showed that not all regions of Kazakhstan have positive changes: the number of research institutes is decreasing, and the number of research specialists performing R&D does not increase. However, we can note a sharp growth rate in the number of enterprises, as well as the implementation of R&D in terms of high investment activity in the country. In this regard, we note that the preparation of Kazakhstan to become one of the best states in terms of competitiveness is based on long-term planning to increase the position of innovation vitality of organizations, upgrade the innovation climate in the country, increase the share of investments in scientific modernization and convergence of business and science. Thus, the main outcomes of this research show that regional differences in economic development illustrate the uniqueness of conditions for each of them, the development of which shows positive dynamics and changes. The innovative trail of development of Kazakhstan is at an early stage. However, the accumulated experience of this country can rightfully be considered an example for many other countries.

Key words: Innovative potential, region, innovative development, research institutes, scientific potential

#### Introduction

The country's innovative development is a guarantee of a reliable potential for future economic development, and a guarantee of stable and long-term economic growth. Currently, regional problems of innovative development are the object of increased attention of scientists and practical workers at enterprises. First of all, this is because great importance is attached to the role of the regional innovation system, which is formed in the process of achieving the maximum competitiveness of the country as a whole, as well as the entry of domestic products into international markets. In other words, the strengthening of the innovation activity of the regions of Kazakhstan at this stage of development is associated with the development of their key factor - innovation potential.

In recent years, there has been a growing interest in defining the term "innovation potential". A definite influence on the formation of the concept of "intellectual potential" was exerted by the development of the founders of the theory of information-N. Wiener [1], Fischer S. & Dornbusch R [2], Schmalenzi R. as well as scientists working in this field, A.N. Kolmogorov [3], V. Anshin [4], Yu. Voronin [5], Maskaikin [6], Shlyakhto [7], G. Gamidov and et al. [8], Yu. Baklanova [9], A. Davydov [10], M. Sutugina, Ye. Sklyarova [11] was devoted to the definition of the "innovative potential of the region." The works of T.V. Borovikova and others are devoted to the study of the factors of regional development. Consulting firm Arthur D. Little, recognized by Forbes in 2018, 2019, and 2018 as one of the "Best American Management Consulting Firms", has offered to generate new ideas and translate ideas into commercially attractive products, services, and processes. These have been identified as two engines by which regional economies can develop.

The works of many foreign scientists (I. Schumpeter, E. Mansfield, M. Porter, etc. are devoted to the issues of assessing and managing the region's innovative potential. However, there is still no basic definition of the region's innovative potential. Today, our country does not pay attention to the issues of the formation of regional intellectual potential as well as the state of this issue in the conditions of changing factors. Based on the completed research of many scientists, we have drawn the following conclusions. Indeed, today in scientific circulation, several definitions of the concept of "intellectual potential of the region" are used.

A study of the research of scientists and practitioners has shown that the concept of "regional innovation potential" is associated with the presence in the region of useful resources that ensure the implementation of innovation activities and those resources that can be used later if necessary. At the same time, we agree with the opinion that innovation potential is the readiness of the region to carry out innovation activities, as well as to create an innovative product that meets international quality requirements and market needs. We propose to introduce into scientific circulation a new definition of the region's intellectual potential from the point of view of a systems approach. The new definition is as follows: we propose to call the intellectual potential of a region the totality of labor and information potential, which, correlating with the external environment in the process of consumption, creates such results of intellectual work as updated knowledge, improved technology, and new products. Moreover, we believe that this intellectual work contributes to increasing the level of regional competitiveness. At the same time, for this study, the statement is true that regional intellectual potential is associated with the level of competence, which contributes to the emergence of new knowledge and skills that contribute to sustainable economic development and improved well-being of the population of a particular region.

This statement becomes a catalyst for the need to implement the effective functioning of the innovative economy. As a result, this statement can be realistic when developing such activities as: building a system of innovation and technology centers, commissioning a mechanism for managing the development of the region's intellectual potential; forming a system for protecting intellectual property; revising the financial and credit mechanism for investing in innovative developments and projects; adjusting the system of examination and selection of promising innovative business projects; launching effective mechanisms for assessing the socio-economic processes of implementing innovation processes.

Summarizing the above, we believe that the presence of a developed regional infrastructure for innovative development will entail the practical implementation of all stages of the innovation process. To summarize the above, we believe that the presence of a developed regional infrastructure for innovative development will entail the practical implementation of all stages of the innovation process. Of great interest, in our opinion, is the study of the influence of the most significant factors on the share of innovative goods, works, and services in GRP in individual clusters formed as a result of a multidimensional grouping of economic entities [12].

In connection with the above, the hypothesis of this study is the question of whether the regions of Kazakhstan have "points of internal growth" of innovative development at this stage of economic growth.

# **Results and its discussion**

This study is the result of studying the processes of development of the innovation component in our country in the presence of several obstacles accompanying this process. Kazakhstan in 2022 ranked 81th in the global innovation index (GII) which indicates its focus on further development. However, joining the first ranks of the developed countries of the world in 2050 requires Kazakhstan to improve its development indicators. So, according to the quality of innovations in GII-2022, the following countries can be distinguished: the Netherlands,

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#### Innovational potential of regions

Switzerland, the USA, and Sweden. These countries occupy leading positions in the ranking with a high coefficient of efficient use of innovative resources (National Scientific Report (2022).

The above-mentioned countries participate in large-scale R&D, invest in new enterprises, provide quality education and excellent research results, and promote the development of innovative clusters in their territories. In other words, the innovativeness of the business environment is a reflection of the actual picture of the innovative development of countries. Kazakhstan has managed to achieve positive dynamics in the field of innovative development. However, despite the presence of certain competitive advantages, there is an ineffective implementation of resource potential, which distances Kazakhstan from leading countries such as the United States, Switzerland, and the Netherlands.

In the process of writing this scientific article, the analytical data of the annual reports of the Global Competitiveness Index of the World Economic Forum (hereinafter referred to as GCI, WEF) for 2020-2022 were studied, namely on the factor "innovative potential".

During the analysis of this source, we found that for the period from 2020 to 2022. the "innovation potential" factor included 6 indicators (a survey of enterprises organized by the WEF at the national level) and 1 statistical indicator. To obtain answers from the rating survey questionnaires, included 150 questions in 15 sections. It is noteworthy to note that respondents rated aspects of their operational performance on a 7-point scale from worst to best.

Analysis of indicators by the factor "innovative potential" for 2020-2022. showed the following dynamics (Table 1):

- the indicators "ability to innovate" and "company R&D expenses" showed positive dynamics for 2020-2022. R&D costs increased significantly in 2022, i.e. an increase was recorded in 34 positions (from 95 to 61 points);

- the indicators "quality of research institutions" and "availability of scientists and engineers" showed an improvement in the position for 2020-2022. However, in 2020, this situation was reflected in a significant decrease in the indicator "quality of research institutions", it decreased by 15 points (from 63 to 78 points), and the indicator "availability of scientists and engineers" dropped by 2 positions (from 64 up to 66 points);

- indicators of "cooperation between universities and business in the field of R&D", and "government procurement of high-tech products" from 2019 to 2020. showed positive dynamics. At the same time, this figure in 2021 decreased by 9 and 18 points, respectively;

- indicator "number of patents per 1 million population" during 2020-2022. changed chaotically: with slight growth in 2020, 2021, and 2022.

Indicator		2020		2021	2022			
	Meaning	Position	Meaning	Position	Meaning	Position		
Global Competitiveness Index	4,5	42	4,4	53	4,3	57		
Innovation potential	3,3	72	3,4	59	3,2	84		
		Surv	vey					
Ability to innovate	4	68	4,1	73	3,9	84		
Research institute quality	3,6	81	3,9	63	3,7	78		
Company R&D expenses	3,4	55	3,4	61	3	95		
Cooperation between universities and business ( R&D)	3,3	88	3,5	66	3,3	75		
Government procurement and high-tech products	3,4	63	3,4	55	3,3	73		

Table 1 – Innovation Potential for 2020-2022

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Availability of scientists and engineers	4	70	4	64	3,9	66					
Statistical											
Number of patents per 1	1	68	1,4	69	1,3	68					
million population											
Note: WEF Global Com	petitiveness In	dex									

To answer to question of whether Kazakhstan's region has inner points of growth to develop innovations we need to observe the situation in regions in terms of the presence of possibilities to create and distribute new knowledge, products, or services. Thus, in our country in 2022, 414 organizations were engaged in scientific research, although in 2013 there were 341 organizations. This growth was presented in such regions as: Akmola, West Kazakhstan, Karaganda regions, and the city of Astana. At the same time, a decrease in the indicator occurred for various reasons in regions such as East Kazakhstan, Atyrau, Mangistau, Kyzylorda regions, and the city of Almaty. At the same time, it is necessary to add that according to state registration data at JSC National Center of Science and Technology evaluation (JSC NCSTE) in 2022 nearly 1961 R&D projects were implemented in the country within the framework of grant funding and 132 scientific and technical programs for program targeted funding for 2020-2023. According to the Monitoring of the Sustainable Development Goals until 2030 according to the global indicator 9.5.2 The number of researchers in Kazakhstan (in terms of personnel) per million inhabitants in 2022 amounted to 22 456 specialists. Analyzing the indicators of the number of researchers and statistics on the provision of R&D services over the years, it can be stated that the maximum number of R&D services was provided in the Akmola region and the city of Almaty. At the same time, the minimum number of such services was provided in Aktobe and the Karaganda region of the country. Thus, we believe that at present the regional economy of Kazakhstan needs to continue to rework its development trajectory.

Our review of domestic literature showed that theoretical approaches and practical solutions to the problem of regional development are still insufficiently studied from the point of view of effective management of human, intellectual, and innovative potential. Therefore, we assume that 20 regions of Kazakhstan, which are resource-based and raw material-oriented, are still transforming into an innovative economy without any visible effect. The attention of scientists in the economics of the regions of Kazakhstan should be focused on improving the human, intellectual, and innovative development of the regions to form a solid foundation of intellectual potential.

The researchers believe that "the innovative potential of the region can be characterized in terms of innovative opportunities for its further improvement, which requires certain resources and conditions".

Research and development services for 2011-2020 were performed in different volumes. So, the lowest volume was recorded at 28.8 billion KZT in 2011, a high of 52.5 billion KZT in 2014 and 2018 amounting to 50.4 billion KZT falling to the point of 38.3 billion KZT in 2022. Meanwhile, the positive growth in 2012 was 21.7%, in 2014 31.74%, in 2018 24.74% decreased to the level of -20.2% in 2020, which during the entire period occurred in 2011, 2015, 2016, 2019, and 2022. (On the state and directions of science development in the Republic of Kazakhstan following the results of 2020-2022).

# Number of enterprises carrying out R&D

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Republic of Kazakhstan	257	259	267	273	295	390	437	438	421	414	424	412
Abai Region												
Akmola	8	7	7	8	7	8	8	8	8	7	7	8
Aktobe	10	13	11	11	11	15	17	17	16	15	16	18
Almaty	8	7	8	5	6	8	9	14	12	7	10	8
Atyrau	12	9	10	9	8	8	10	10	11	12	12	9
West Kazakhstan	4	5	5	6	8	11	13	16	10	10	10	9
Zhambyl	5	5	5	5	7	9	13	12	11	12	10	7
Zhetysu Region												
Karaganda	29	31	35	33	43	51	51	46	40	29	28	29
Kostanay	7	7	7	7	7	10	15	16	13	14	15	13
Kyzylorda	3	3	4	6	5	7	6	6	7	7	14	23
Mangystau	5	5	6	5	3	4	6	7	7	6	8	8
Pavlodar	7	7	5	5	5	10	12	12	11	10	9	11
North Kazakhstan	7	7	9	9	9	5	4	5	5	5	5	3
Turkestan	4	4	4	3	3	6	3	4	3	3	3	3
Ulytau Region												
East Kazakhstan	26	28	26	29	30	36	35	35	35	34	33	36
Astana	9	7	5	5	10	23	30	35	41	43	42	41
Almaty	110	111	117	121	127	170	194	184	183	193	196	180
Shymkent	3	3	3	6	6	9	11	11	8	7	6	6

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Republic of Kazakhstan												
	345	341	392	390	383	386	384	386	396	438	414	425
Abai Region						12	13	11	10	10	10	11
Akmola	9	12	11	11	9	11	11	13	12	10	10	13
Aktobe	16	13	14	14	14	16	16	15	15	15	13	13
Almaty	7	10	13	11	10	9	8	8	8	8	8	9
Atyrau	9	8	9	10	11	10	10	10	10	10	8	11
West Kazakhstan	15	9	9	7	8	8	10	12	10	9	9	7
Zhambyl	8	9	11	11	11	11	9	10	9	9	9	7
Zhetysu Region						2	1	1	1	2	2	2
Karaganda	26	23	31	32	33	28	28	30	29	36	38	39
Kostanay	14	13	13	14	13	14	12	12	13	15	14	15
Kyzylorda	7	6	6	8	10	8	7	6	7	10	7	9
Mangystau	7	7	7	5	7	6	6	6	6	7	5	6
Pavlodar	11	10	11	9	10	11	14	12	10	9	6	6
North Kazakhstan	3	3	3	4	5	5	5	5	5	8	7	7
Turkestan	3	3	5	4	5	6	6	7	8	9	8	9
Ulytau Region						1	-	-	-	2	1	2
East Kazakhstan	34	29	30	30	35	22	22	20	20	27	25	25
Astana	49	52	59	53	55	62	60	56	76	90	90	90
Almaty												
	119	122	148	152	133	131	135	138	135	139	132	134

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Shymkent	8	12	12	15	14	13	11	14	12	13	12	10
Source: www.stat.egov.kz												

At the beginning of the analysis period, 257 research institutes in Kazakhstan carried out R & D, which amounted to 425 at the end of the period. The main regions that had the largest number of research institutes at the beginning of the period were the regions of Almaty (110), Karaganda region (29), and East Kazakhstan region (26). At the end of the period, the leading place in the number of organizations conducting R & D in the country is invariably Almaty (134), Astana (90) Karaganda region (39), and East Kazakhstan region (25). At the same time, it is impossible not to mention that for the entire period of analysis, i.e. 23 years in the Aktobe region the number of research institutes was increased in 2011 to 18, with an average number for the period of 13. In the Kostanay region in 2008, the number increased to 16 with an average number of 12. In the Atyrau region, the number was higher at the beginning of the period (12) and in 2009, and 2010 with an average value of 9. In Kazakhstan as a whole the total number of research institutes a significant increase in research institutes was observed in 2006 (437 with an indicator of 257 in 2000) and 438 in 2021 with the current number of scientific organizations of 425. The indicated changes in the number of research institutes were associated with various circumstances, mainly related to both the expansion of economic and, accordingly, scientific activities of enterprises in these territories, and the general policy of science development in the country.

Studying the experience of R&D development in a world in which the development of science is ahead of the level of scientific and technological progress, it becomes clear that much attention is paid to the obtaining of scientific research. Let's look at the situation with the progress of scientific research in Kazakhstan. For the 1st and 2nd quarters of 2022, investments in professional, scientific, and technical activities increased over the year by 67.9% and amounted to 49.6 billion KZT (the internal currency is KZT), which is considered a record over the past 5 years. According to Ranking.kz, this amount (9 months) exceeded the total volume for 2021. However, in 2018, investments decreased by 17.9% and amounted to 43.2 billion KZT. Although in 2017 this figure reached 52.7 billion KZT. As of the beginning of October 2022, 20 thousand companies working in the field of professional, scientific, and technical activities, of which 19.7 thousand are small, 204 are medium-sized, and 79 are large. At the same time, domestic spending on R&D in 2021 amounted to 72.2 billion KZT, which is 0.12% of GDP (gross domestic product), which is 0.1% less than in 2017. In the regional context, investments in professional, scientific, and technical activities The most were allocated in Almaty city, that is, 50.4% of Kazakhstan. In Kazakhstan's regions, the size of investments increased 3.9 times compared to the same period a year earlier (6.4 billion KZT). In second place among the regions of Astana city: the volume of investments increased over the year by 45.9% and amounted to 8.3 billion KZT or 16.7% of the total volume in the country. The last on the list, which received the largest investments in professional, scientific, and technical activities, is the Atyrau region: 2.8 billion KZT. Note that this direction is financed by 96.7% at the cost of the business's funds, while the volume of capital investments increased by 83.4% over the year, to 48 billion KZT. However, budgetary contributions to this industry decreased by 72% and amounted to 419 million KZT, which is 0.8% of the total investment. Of these, 264.2 million KZT was directed from the local budget, 154.8 million KZT - from the republican budget. Bank loans increased more than seven times and amounted to KZT 406.1 million; other borrowed funds decreased over the year by 56% to 802.6 million KZT.

Assessing the general economic situation in Kazakhstan, some development indicators can be considered. The economy of Kazakhstan is characterized by steady growth due to high investment activity in the extractive sector, increased government spending, and acceptable oil prices. Despite negative external factors - trade barriers and increased geopolitical tensions, including risks associated with BREXIT, as well as internal factors - high inflationary pressure, deterioration of the current account of the country's balance of payments - growth in 9 months of 2022 remained dynamic and amounted to 4.3%, showing an expansion over the same period in 2021 (4.1%). Based on the data of the Constitutional Court of the Ministry of National Economy of Kazakhstan, the volume of GDP produced amounted to 44.1 trillion KZT. The main growth drivers were construction (13.5%), trade (7.6%), and transport (5.5%). So, we can conclude that with positive shifts in the growth of the country's economy, an increase in the level of the intellectual potential of the region can be expected. (On the state and directions of science development in the Republic of Kazakhstan following the results of 2020-2022).

Consider the degree of regional competitiveness in 2021 and 2022. The indicators presented in this table do not reflect all indicators of the Whiteshield Partners rating, however, they demonstrate the general situation in the regions in terms of competitiveness.

As shown by the analysis of the level of competitiveness of the regions of Kazakhstan for 2020-2023 among the regions of Kazakhstan in terms of competitiveness in 2021, the cities of Almaty, Atyrau region, Astana city, and Karaganda region were put forward. In 2022, in first place - Almaty, Atyrau region, Astana city, and Mangistau region.

The three outsiders in 202 consisted of Kostanay, Zhambyl, and Kyzylorda regions. Kostanay region was the only one where in 2020 there was an outflow of foreign investment. Regional differences are observed in each vast country, but there is not such a large gap in the basic social package as in Kazakhstan. In 2022, the Kyzylorda region, North Kazakhstan region, and Zhambyl region. Kyzylorda region has seen the largest decline in industrial production, North Kazakhstan has the least attraction of FDI (foreign direct investments), and Zhambyl region has the lowest wages.

To assess the innovative development level, the level of human potential of the region, labor potential, professional and qualification potential of the region, demographic potential, scientific and technical, and social potential of the region are considered. At the same time labor, professional, demographic, and other potentials are the basis of more complex hierarchical systems such as scientific, innovative, and social potentials of the region.

In Kazakhstan, a programmatic approach is being implemented aimed at socio-economic development both at the national and regional levels. Consider two regions related to different types of innovative development, namely the creative region (Karaganda region) and the adaptive region (Akmola region).

According to the Regional Development Program until 2020 (Government of the Republic of Kazakhstan (2021) Karaganda region belongs to the Central-Eastern region and has an industrial focus. Akmola region entered the Northern region and has an agrarian development direction. So, in 2016 about 175.8 thousand people worked in the technical sector in the Karaganda region, and 53.2 thousand people in the Akmola region. While 32.7 thousand people worked in the agricultural sector in the Karaganda region, and 135.5 thousand people in the Akmola region.

An analysis of the program documents showed that both regions are implementing regional programs, such as the "Development Programs of the Karaganda Region and Akmola Region for 2016-2020". In these documents, human potential issues are presented in the context of the program goal (in the Karaganda region - 38 indicators, in the Akmola region - 32 indicators) to achieve social indicators. As mentioned above both regions have different directions, therefore, the Karaganda and Akmola regions are different in their economic structure which affects the difference in the levels of human capital development.

As there is a direct correlation between the indicators of the human potential of the region and the level of development of the region the development of human potential also depends on the indicators of the regional labor market. The average monthly salary in 2021 amounted to 121 358 KZT in Akmola region, which is 41 137 KZT higher than the level of 2019 and 140 433 in 2021, which is 19 075 KZT higher than in the previous year. In the Karaganda region, the average monthly salary in 2020 was 146,324 KZT, which is 67,833 KZT (in 2019) more and 169112 KZT in 2021 which is 22,788 KZT higher than the level of 2020.

Labor productivity in the Karaganda region exceeds the republican indicator. Labor productivity in 2018 in the region increased by 7.5%, reaching USD 12 thousand per person and amounted to USD 13 thousand in 1. In the Akmola region labor productivity in the agro-industrial complex for 9 months of 2020 increased by 13.1%, reaching 8 thousand US dollars, and in 2021 this figure increased to 9 thousand US dollars.

A significant factor impacting the regional economy and human capital is the development of innovations in the territorial areas. Innovation activity in the Karaganda region for all types of innovations is one of the best in Kazakhstan, amounting to 14.7% in 2021, and in the Akmola region, this figure is 7.7%. At the same time, the processes of digitalization of agriculture are being intensively introduced in the Akmola region, which improves the position of this region in the rating of innovativeness. So, in 2021, 3 basic enterprises for the introduction of precision farming technology were identified in the Akmola region, and a pilot project was launched to monitor agricultural land through a web portal. In addition, a precision farming landfill was created. In animal husbandry, digitalization processes are accelerating, namely the automation of processes in many enterprises in the region.

We should also note that the level of human capital development correlates with the level of development of the following indicators:

1. analysis of industrial and innovative development of the region (according to statistical data of the national statistical agency, growth is observed in the Karaganda region);

2. the degree of efficiency of regional educational systems (according to statistical data of the national statistical agency, growth is observed in the Akmola region and Karaganda region equally);

3. the level of development of regional healthcare (according to statistical data of the national statistical agency, growth is observed in the Akmola region and a decrease in the Karaganda region);

4. assessment of the business climate of the regions (according to statistical data of the national statistical agency, growth is observed with an advantage in the Karaganda region than in the Akmola region);

5. the level of competitiveness of the regions (according to statistical data of the national statistical agency, growth is observed in both regions);

6. HDI (Human Development Index) (according to statistical data of the national statistical agency, stability is maintained in both regions).

Thus, as our study has shown, innovations arise not only in small high-tech sectors but most likely have the potential to form in any industry. Thus, in the United States, the share of companies in non-innovative sectors is 15.4% and provides 65.6% of jobs. [14] From this, we can conclude that any innovative company is capable of producing results regardless of the degree of innovation in the industry. According to this statement and statistical data, we concluded that the regions of Kazakhstan today have "internal growth points" of innovative development with their unique features. Indeed, the conditions conducive to the development of innovative potential have been formed only in some regions. Thus, the total number of enterprises in Kazakhstan in 2020 was

28,087 units, of which 3,236 units (11.5%) have innovations and 1,202 units (4.28%) cooperate with other enterprises. However, the largest number of enterprises are registered in such cities as Almaty, Astana, Karaganda, Shymkent, and Kostanay region (only 5 out of 17). The largest number of enterprises with innovations is recorded in Almaty, Astana, Karaganda, East Kazakhstan, Kostanay, and Aktobe regions (only 7 out of 17).

However, the level of activity in the field of innovation is typical only in such regions and cities as the Kostanay region, North Kazakhstan region, Almaty city, Astana capital city, Kyzylorda region, Zhambyl region, Karaganda region (only 7 out of 17). Moreover, cooperation in the field of innovation with other organizations is better established only in Almaty and Karaganda (only 2 out of 17).

`The reasons for not carrying out innovative activities at the regional enterprises: lack of financial resources (Almaty, Astana, Karaganda, East Kazakhstan region), innovation costs are too high (Almaty, Astana, St. Karaganda, North Kazakhstan region), uncertainty in demand for innovative goods or services (Almaty, Astana, Karaganda, East Kazakhstan region), there is no need due to earlier innovations (Almaty, Astana, Karaganda, Almaty region, North Kazakhstan region), there is no need due to the lack of demand for new technologies (Almaty city, capital city, Karaganda, East Kazakhstan region). Today, there is a positive trend in the field of innovative development in the country. However, despite the presence of competitive advantages, there is an insufficiently effective implementation of internal potential.

These findings resonate with the main findings of other studies in this direction. So, Strukova M. [13] in her study set the goal of developing and testing tools for monitoring and auditing innovative processes to increase the innovative potential level of the regions of the Republic of Kazakhstan and its effective use. At the same time, the object of the study was the processes of development of the potential of technical development and scientific accomplishments of the country's regions. Among the basic factors limiting the pace of innovation in the regions of the Republic of Kazakhstan, the scientist noted the lack of funds, the insolvency of the customer, insufficient development of financial mechanisms for ensuring processes, underdevelopment of structures organizing the process of creating and selling science-intensive products, inefficiency of the regulatory framework and lagging production base for the release of pilot batches of science-intensive products. Moreover, ineffective use of R&D results and insufficient return on investment in research is one of the acute problems of the national innovation system.

The study of the scientist Nurlanova N. [14] confirms the conclusions of this study that an important condition for the innovative development of regions of the country is the grouping of zones of advanced development, capable of broadcasting innovations across the entire scale of the country. Several large cities of Kazakhstan with preserved scientific potential (Almaty, capital city Astana, Karaganda) can be such zones. In other words, the rest of the regions are not yet ready for the transit of their supply of such quality. Thus, the scientist N. Nurlanova substantiated the choice of a methodological approach to assessing the level of innovative development of the country's regions. The scientist based his methodology on indicators reflecting the innovative activity and innovative susceptibility of the economy. In addition, the author identified a tendency to increase the differentiation of the country's regions in terms of the degree of innovative development and identified key problems, risks, and threats to the innovative development of the country's regions.

We have an interesting result of another study the work "Territorial model of the innovative potential of Kazakhstan" by scientists K. Baitov, E. Alpysova [15] in which the conclusions confirm the conclusions of this study. The authors believe that innovative activity plays a significant role but it is not yet a source of increasing the competitiveness of the republic in the foreign market. Today, there is no definite breakthrough in the field of innovative development of

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the economy of the republic, and incomplete scientific research, their separation from production, and applied developments do not continue in the form of commercialization and implementation in production. Also, the lack of funds in the regions does not make it possible to largely coordinate, attract, and focus the existing potential of the enterprise on the development of its innovative activity. An example of the growth of regional innovative activity is the effectiveness of the implementation of the anti-crisis program of the Government of the Republic of Kazakhstan "Road Map" which ensures the smooth operation of industrial enterprises, reduces unemployment, and creates conditions for the growth of entrepreneurial activity.

We also have more controversial studies that were obtained by the researcher Vechkinzova E. [16] in the work "The innovative potential of development of the regions of Kazakhstan: assessment of the state and level of use." The researcher provides information confirming the existence of innovative potential in regions other than those indicated by us. So, Vechkinzova E. to determine the level of use of the innovative potential of the regions compared the actual volume of innovative products in the regions of the country with the calculated potential. We have found that the level of use of innovation potential in industries fluctuates from 1.26% in the Mangistau region to 110.23% in the Kostanay region. Having analyzed the data, we have identified groups of regions with different levels of use of innovation potential: regions that are characterized by a high level of use are Kostanay, Pavlodar regions, and the city of Shymkent; the average level of use is typical for East Kazakhstan, Aktobe, West Kazakhstan and Zhambyl regions; the remaining 10 regions are characterized by a low level of use. At the same time, the author notes that the full use of the innovative potential is typical for the Pavlodar region, Kostanay, and Shymkent, which used their innovative potential by more than 100%, which indicates the intensification of the use of their innovative factors and/or the attraction of innovative factors to the territory of the region and resources of neighboring regions or countries, which was not considered in our study.

One of the latest studies that preceded this study can be considered the work of Musabalina D and Kireeva A. [17] "Assessment of the level of innovative development of the regions of Kazakhstan and the possibility of their further clustering." The key objective of their research was to develop theoretical and methodological approaches to assessing the level of innovative development of the regions of our country and their implementation, as well as identifying existing opportunities for creating innovative clusters. The researchers concluded that the most promising regions for the formation of innovative clusters are the cities of Almaty, and Astana and some industrial regions such as Aktobe, Karaganda, and East Kazakhstan regions. These conclusions were based on calculations that showed that these areas have extensive potential for a "multiplier effect" on the development of both the region and the regions geographically close to it. At the same time, to date, there are no unified approaches to solving this scientific problem either at the regional or international level. Based on the findings of the previously mentioned scientist Nurlanova N.K., they believe that assessing the level of innovative development comes down to calculating scientific and technological potential, innovative competitiveness, investment attractiveness, innovative activity, and innovative receptivity, which were not considered indicators in this study.

At the same time, a recent study of Kilina I.P [18] shows a different approach to this issue. The scientist believes that in a strategic context, not enough attention is paid to spatial aspects. The scientist refers to such aspects as uneven distribution of technologically updated resources and enterprises using new equipment and technology; point localization of innovative activity and its concentration in a limited volume in the regions, the presence or absence of technologically developed regions in the country's macrozone, factors of interregional interaction in matters of innovation. Kilina I.P. [18.-49] in her study proposed a systematic approach and identified many

factors that affect the innovative development of regions. The study substantiates that the dynamics of regional development in terms of innovation are determined by the quality level of the country's innovation space as a whole and directly in the spatial zone of localization of the subjects of the Republic of Kazakhstan.

Although these results differ from some published studies by E. Vechkinzova [14.-184] and I. Kilina [18.-52], they are consistent with the results of N. Nurlanova [1.3-2], M. Strukova [12], K. Baitova, Alpysova E. [15.-16], Musabalina D. and Kireeva A. [17.-154]. Moreover, another domestic scientist in this regard believes that "the level of innovation activity in the region is characterized by a successful combination of characteristics of the innovative potential and innovative susceptibility of the region and is the result of their joint implementation" [19] because, according to Perevozchikova N.A., Bagdasarova D.G. (2020) "innovative production is the most important factor in economic growth" [20]. At the same time, one cannot ignore the opinion of Inozemtseva A.A. (2021) that "despite all the theoretical study of the synergy of subjects of innovation activity in the region, in practice numerous problems arise in the implementation of their interaction, which ultimately affects the economic performance of the region."[21] This result correlates with this thought of Svintsova E.A. (2021), who argues that "of the risks from the point of view of technological development, the most important is the innovative development of the enterprise, as well as the search for new production technologies and the creation of unique product properties." [22]. For example, about 90% of the world's business models are obtained by combining 55 basic business models and are the result of the intellectual work of the creators [23]. Accordingly, increasing innovation activity largely depends on the introduction of preferential policies, primarily in taxation for enterprises investing in the development of innovation [24]. At the same time, it is important to note that "it is necessary to develop and strengthen the innovation system in such a way as to combine the innovative potential of the regions with a set of economic measures that are designed to facilitate the rapid commercialization of innovations in the domestic and foreign markets." [25]. Thus, it can be noted that the innovative potential of regions is largely determined by appropriate measures on the part of the state, which determines the importance of developing the structure of the regional economy.

### Conclusion

Thus, in this article we have tried to present material on the level of development of scientific potential in the regions. The review made it possible to reveal that not all regions of Kazakhstan have positive changes: the number of research institutes is decreasing, the number of research specialists performing R&D is not increasing, a small rate of rise in the number of organizations performing research and development, etc. against the background of steady growth due to high investment activity in the country. In this regard, we can make the following conclusion. The innovative potential of Kazakhstan's regions requires constant funding for science, widespread state support for regional innovations, maintaining a high level of material incentives for scientific workers, orienting regions to achieve maximum results of scientific research, creating and introducing innovations at enterprises located on the territories of the regions to enhance the competitiveness of the regions. The authors of the study agree with the opinion of scientists that Kazakhstan needs foresight research on an ongoing basis, as it is practiced by leading countries with innovative economies. This approach allows you to more accurately predict the upcoming science and technology. At the same time, realities show that the involvement of business structures in the development of innovative solutions is one of the most effective systems for greater effect from the joint work of science and entrepreneurship. In this regard, it should be noted that the preparation of Kazakhstan to become one of the best competitive countries in the world is based on many goals. This is long-term planning to increase the level of innovation activity of enterprises, improve the country's innovation climate, increase the share of investments in the field

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of scientific modernization, and convergence of business and science, which will contribute to a shift in the development trajectory of the innovation component to the best positions. Regional differences in economic development show the uniqueness of the conditions of each of them, the development in the sectors of which shows positive dynamics and changes in the structure of the results of the previous stage.

We would like to join scientists` ideas Hollanders, H., Tolias, Y., Radovanovic, N., Gonzalez Evangelista, M., Fabbri, E., Gerussi, E., Sasso, S. and Miedzinski, M. (2024) as "for identifying industries with an emerging economic potential, three main approaches have been used: approach based on growth performance over time in employment, turnover and/or wages;• approach based on annual percentage changes in the economic variables; approach based on trends, where trends are calculated as the slope of a linear regression using the data for the last 6 years of any period." [26]. These ideas could be fruitful in conditions of Kazakhstan's economy as well.

The experience of foreign countries with the best indicators of innovative development shows that the innovative path of development of Kazakhstan is still at the initial stage, but has similar conditions for starting on this path with these countries. The accumulated experience of mastering a new way of development in Kazakhstan can rightfully be considered an example for many other countries.

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# АЙМАҚТЫҢ ИННОВАЦИЯЛЫҚ ӘЛЕУЕТІ

#### Аңдатпа

Елдің инновациялық дамуы – болашақ кезеңдердің сенімді әлеуетінің кепілі. Бүгінгі таңда Қазақстанның өңірлік аймақтарын озық дамыту мәселелері ғылым мен бизнес өкілдері үшін өзекті болып отыр. Бұл зерттеудің негізгі тезисі Қазақстан аймақтарда қарқынды дамуға үлкен мүмкіндіктерге ие бола отырып, осы дамудың ғылыми-техникалық бағытын қалыптастырады. Бұл зерттеуде талдау және синтез, жалпылау, жүйелік тәсіл, сонымен қатар кешенді тәсіл, аналитикалық шолу, абстракция және логикалық талдау сияқты ғылыми әдістер қолданылды. Талдау көрсеткендей, Қазақстанның барлық аймақтарында оң өзгерістер жоқ: ғылыми-зерттеу институттарының саны азайып келеді, ҒЗТКЖ (ҒЗТКЖ) жүргізетін ғылыми мамандардың саны өспейді. Дегенмен, еліміздегі жоғары инвестициялық белсенділік тұрғысынан кәсіпорындар санының күрт өсу қарқынын, сондай-ақ ҒЗТКЖ-ны жүзеге асыруды атап өтуге болады. Осы орайда, Қазақстанның бәсекеге қабілеттілік деңгейі бойынша үздік мемлекеттердің бірі болуға дайындығы ұйымдардың инновациялық өміршеңдігінің позициясын арттыру, елдегі инновациялық климатты жаңарту, инновациялық даму үлесін арттыру бойынша ұзақ мерзімді жоспарлауға негізделгенін, бизнес пен ғылымның ғылыми модернизациясына және конвергенциясына инвестициялар үлесінің артуын атап өтеміз. Осылайша, осы зерттеулін негізгі нәтижелері экономикалық дамудағы аймактық айырмашылықтар одардың әркайсысы ушін жағдайлардың бірегейлігін көрсетеді, олардың дамуы оң динамика мен өзгерістерді көрсетеді. Қазақстан дамуының инновациялық жолы әлі де ерте сатыда. Дегенмен, бұл елдің жинақталған тәжірибесін көптеген басқа елдерге үлгі етуге әбден болады.

**Негізгі сөздер:** Инновациялық әлеует, аймақ, инновациялық даму, ғылыми-зерттеу институттары, ғылыми әлеует.

# ИННОВАЦИОННЫЙ ПОТЕНЦИАЛ РЕГИОНА

#### Аннотация

Инновационное развитие страны является залогом надёжного потенциала будущих периодов. Сегодня вопросы опережающего развития регионов Казахстана актуальны для представителей науки и бизнессообщества. Основной тезис данного исследования заключается в том, что Казахстан, имея большие

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возможности для динамичного развития регионов, формирует научно-техническое направление этого развития. В данном исследовании были использованы такие научные методы, как анализ и синтез, обобщение, системный подход, а также комплексный подход, аналитический обзор, абстракция и логический анализ. Анализ показал, что не во всех регионах Казахстана наблюдаются положительные изменения: количество научно-исследовательских институтов сокращается, количество научных специалистов, выполняющих НИОКР (НИОКР), не увеличивается. Однако можно отметить резкие темпы роста количества предприятий, а также осуществления НИОКР на фоне высокой инвестиционной активности в стране. В этой связи отметим, что подготовка Казахстана к вхождению в одно из лучших государств по конкурентоспособности базируется на долгосрочном планировании повышения позиций инновационной жизнеспособности организаций, модернизации инновационного климата в стране, увеличения доли инвестиции в научную модернизацию и конвергенцию бизнеса и науки. Таким образом, основные результаты данного исследования показывают, что региональные различия в экономическом развитии иллюстрируют уникальность условий для каждого из них, развитие которых демонстрирует положительную динамику и изменения. Инновационный путь развития Казахстана находится на начальном этапе. Однако накопленный опыт этой страны по праву может считаться примером для многих других стран.

**Ключевые слова:** инновационный потенциал, регион, инновационное развитие, научноисследовательские институты, научный потенциал.

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