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## **RESEARCH OF INNOVATIVE ACTIVITY OF ENTERPRISES OF THE REPUBLIC OF KAZAKHSTAN**

The effectiveness of the economic policy of the state is the main aspect to the successful development of the country in general and its component is industrial and innovation policy.

New industrialization of the country at a historic juncture of its formation suggests a new economic system, susceptible to upgrading, restructuring, innovation, creation and introduction of new products and technologies, increasing the competitiveness of production, these aspects led to the research by the authors. Industrial-innovative policy of the state and the mechanisms of its implementation were considered in this article. This article deals with the problems of development of business in the Republic of Kazakhstan. Characteristics and natural conditions functioning of small and medium-sized enterprises were analyzed in the country and regional level. The article reveals and substantiates the necessity of state support of entrepreneurship. Economic evaluation of enterprises activity in Kazakhstan was conducted in the field of innovation. The problems, preventing active innovative development of Kazakhstan enterprises were shown in the article as well. According to the research, the authors proved the main directions of solving problems of innovation activity improvement in Kazakhstan.

**Key words:** industrialization, innovative development, competitiveness, economic security, innovation, innovation-active enterprises, innovative products.

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### **Қазақстан Республикасының кәсіпорындарының инновациялық белсенділігін зерттеу**

Мемлекеттің экономикалық саясатын жүргізудің тиімділігі елдің жақсы дамуының кепілі болып табылады, ал оның ішінде маңыздысы – индустриалды-инновациялық саясат. Елдің жаңа индустриялануы жаңа тарихи кезеңде жаңалықтарды тез қабылдап, қайта құруға, инновацияларға бейімделе алатын, жаңа өнім мен технологиялардың пайда болып, енгізілетін, өндірістің бәсекеге қабілеттілікті жоғарылататын жаңа экономикалық жүйенің құрылуын ұйғарады. Осы айтылған мәселелер авторларды зерттеу жұмысын жүргізуге негіз болды. Бұл мақалада мемлекетіміздің индустриалды-инновациялық саясаты зерттеліп, оның жүзеге асу механизмдері қарастырылды. Мақалада Қазақстан Республикасының кәсіпорындарының даму мәселелері қарастырылды. Мемлекеттік және аймақтық тұрғыдан кіші және орта бизнестің қызмет етуінің құқықтық жағдайлары мен ерекшеліктері талданды. Мақалада кәсіпкерлік қызметті мемлекеттік қолдау қажеттілігі анықталып, негізделді. Инновация саласында Қазақстанның кәсіпорындарының белсенділік деңгейіне экономикалық бағалау жүргізілді. Қазақстандық кәсіпорындардың инновациялық белсенді дамуына кедергі болатын мәселелер көрсетілді. Авторлардың жүргізген зерттеу негізінде Қазақстанның инновациялық белсенділігін жоғарылату мәселелерін шешудің негізгі бағыттары анықталды.

**Түйін сөздер:** индустрияландыру, инновациялық даму, бәсекеге қабілеттілік, экономикалық қауіпсіздік, инновациялар, инновациялы-белсенді кәсіпорындар, инновациялық өнім.

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**Исследование инновационной активности предприятий Республики Казахстан**

Эффективность проведения экономической политики государства является залогом успешного развития страны в целом, обусловленного индустриально-инновационной политикой. Новая индустриализация страны на историческом переломном этапе ее становления предполагает новую экономическую систему, восприимчивую к обновлению, реструктуризации, инновациям, созданию и внедрению новых технологий и продуктов, наращивающих конкурентоспособность производства, эти аспекты обусловили проведение исследовательской работы авторами статьи. В данной статье изучена индустриально-инновационная политика государства и рассмотрены механизмы ее осуществления. В данной статье рассмотрены проблемы развития предпринимательства в Республике Казахстан. Проанализированы характерные особенности и закономерные условия функционирования малого и среднего бизнеса в масштабе страны и региона. В статье выявлена и обоснована необходимость государственной поддержки предпринимательской деятельности. Проведена экономическая оценка уровня активности предприятий Казахстана в области инноваций. Показаны проблемы, препятствующие активному инновационному развитию казахстанских предприятий. На основе проведенного исследования авторами обоснованы основные направления решения проблем повышения инновационной активности Казахстана.

**Ключевые слова:** индустриализация, инновационное развитие, конкурентоспособность, экономическая безопасность, инновации, инновационно-активные предприятия, инновационная продукция.

**Introduction**

Innovative development around the world causes necessity to improve and retain continuously the competitiveness of enterprises. The innovation enables enterprise to compete effectively in the market to attract new customers and improve financial results. The level of competitiveness of the enterprise depends on the most significant technological enterprise. In addition, it is necessary to take into account the depth of innovation processes in the enterprise, as a result the growth of competitiveness, not all innovations, but only those that are focused on new markets and accompanied by original development.

The assimilation of a generally positive European experience is appropriate and important for reducing the vulnerability of the domestic economy to face many global challenges such as depletion of natural energy resources, aging population in developed countries, growing income disparities, and environmental degradation. These challenges require a rational response at the level of industrial policy, the launch of innovative industrial strategies. That is why now the role and importance of each state is estimated in the world largely on its contribution to the development and implementation of innovative industrial technologies for the adequate response to negative realities of the present.

**Experimental part.** In the context of globalization, Kazakhstan's economy faces a number of objective problems, which include: raw –material orientation, insignificant integration with the glob-

al economy, weak inter-sectoral and interregional economic integration with global economy, low consumer demand for goods and services in the domestic market, underdeveloped industrial and social infrastructure, the overall technical and technological backwardness, lack of effective communication between science and production, lower costs for research and development work, discrepancy management objectives of economic adaptation to globalization processes and the transition to service-technological economy [1]. The institutional design of the innovative development of Kazakhstan is considered by economists Sagiyeva R. and Zhaparova A., who believe that consistent innovation policy is possible in case of legislative, administrative and economic measures which help to overcome emerging institutional traps. [2]. According to Levitical A. Regional Development of the Republic of Moldova is feasible through the development of strategic management of innovation potential of the regional economy [3]. The features of innovation in economic development of Azerbaijan were investigated by Rustambayov H., Abishli L. and Dzhabrailov I. [4].

**Results and discussion.** The country faces the challenge of new industrialization which is very complex and resource intensive. To meet the challenges of the new economic policy, the basic principles which should be “profitability, return on investment and competitiveness» as stated in the Strategy “Kazakhstan – 2050”, with the scientific justification of the new industrial policy. The effectiveness of neo-industrialization and economic pragmatism depends on consolidation of efforts of business and

government, the mechanisms of their interaction, which is largely dependent on the level of scientific substantiation and adequate assessment of potential opportunities to determine goals and key indicators of development of the industry.

We think that the world experience of technologically developed countries suggests that the global process of industrialization of the economy has entered a new phase, called the neo-industrialization, which is objective and the overall pattern that is similar to the electrification of social labor. At the same time, trailing in the digital industrialization, the country dooms itself to lag behind all other socio-economic parameters of development. In this regard, to ensure national competitiveness development should go on the ascent to the level achieved by the leading powers. Therefore, neo-industrialization is a major factor in the breakthrough of Kazakhstan in the Technotronic twenty-first century. However, it must include the cyclical build-up of qualitative indicators of work of industrial complex on the basis of massive innovation, engineering and technology.

Creating a new neo-industrial economy is possible only on the basis of the new “competitive model” of development, the main engines of which should be the internal market mechanisms, private initiative and competition, as well as the regulatory role of the state, especially by creating incentives, fine-tune the economy.

Experience analysis of developed countries during the period of industrialization, the era of the formation of post-industrial types of economic systems allows to distinguish three main models of structural change: import substitution, export oriented and innovative model. Thus, the fundamental questions in determining the goals and mechanisms of the structural changes is the choice of the ways of the state support given its limited financial resources and the need to develop measures of state control to attract private foreign and domestic investors. In this regard, the strategies vary in goals and key resources to ensure the comparative advantages of:

the strategy of using natural resources;

2) the strategy of “persecution” is that the industry, mainly relying on cheap labor, began production of competitive products produced in the industrialized countries, fills its markets, resulting in a price war;

3) the strategy of “front line”, that is based on the achievements of the scientific – technological progress, where new high-tech products and technology are created, forming the demand for them and, consequently, new markets.

Thus, to improve and optimize the industrial structure it's necessary to implement the redistribution

of manpower, financial and material resources in new or innovative-active organizations, based on advanced scientific and technological developments, focused on the creation of fundamentally new products of high quality, with the absolute competitive advantages due to the intellectual nature of production. Innovative development of economy is associated with the formation of an effective national innovation system and involves measures of the state support of its development in all areas and stages of implementation (from the formation and development of innovation infrastructure and financing basic research to practical applications in industrial manufacturing).

Based on international experience, the industrialization of a number of countries it can be argued that successful implementation largely depends on the choice of priorities and directions of development defined by the government, objectives and mechanisms for achieving goals. In case of national competitiveness by taking the leading positions in the world economy, the main efforts should be aimed at the development of the most advanced sectors, defining the level of technological development of the country.

In Kazakhstan the problems of competitiveness are serious and will definitely require detailed analysis to develop a constructive position of the state and the adoption on the basis of its specific solutions. It is generally recognized that the low competitiveness of domestic producers and the country as a whole is the problem of economic security of the state. Therefore, the problems of competition and competitiveness come to the fore as for the national economy as a whole and for industries and companies individually.

Low levels of corporate spending on innovation activities in the country is often associated with the imperfect process of technological modernization, bearing in mind that the company must first modernize production and replace equipment in the shops, and then move on to innovations based on original research. However, experience shows that major investments and innovations do not compete with each other, but on the contrary, accompany each other. And they are those companies that actively invested in recent years, providing innovations of high quality.

Domestic scientists have identified the following main problems hindering the active innovative development of Kazakhstan enterprises:

– lack of innovation finance companies due to the high cost of implementation and development of innovations, as well as long-term investments. Enterprises do not have their own funds to finance

the development, and the ability to attract funding from external sources is limited. Lenders do not guarantee the return of loans and receipt of dividends, since innovation is exposed to many more risks than investment activities;

– the lack of modern base for the implementation of development due to wear or lack of necessary equipment. Many industries are characterized by high resource consumption and the energy intensity of production, exacerbated by the high level of depreciation of the productive apparatus. Due to the backwardness of the equity capital of the enterprises of the economy as a whole is immune to investment in research and development.

– the presence of the phenomenon of resistance to innovation, which most often occurs for two reasons: lack of personnel able to effectively manage the innovation process, and the staffing problem is felt at all levels of management, both the country and individual enterprises, the difficulties in conducting marketing research of innovative products. The

unstable economic situation in the country makes it difficult to reliably assess the demand for innovative products even in the short term;

– innovation in the enterprise requires an appropriate organizational structure of management [1].

By 2020, Kazakhstan plans to increase the share of innovative-active enterprises up to 20%, i.e. in 2 times. It is also expected to increase the share of innovative products in total GDP up to 2.5%. To achieve such results, it is planned to adopt a number of measures aimed at reducing the technological gap in traditional industries, such as metallurgy, petrochemistry, mechanical engineering, chemistry, construction industry and food industry. In addition, the development of new areas of production is planned in Kazakhstan. Main activities will be aimed at creating favorable conditions for business, aimed at the implementation of modern technological solutions. The source in this direction is the localization of products, cheap services, materials and available infrastructure.

**Table 1** – Dynamics of the number of innovative enterprises in regions of the Republic of Kazakhstan

Region	of them												2014 to 2003 in %
	the number of innovation active enterprises												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	2014*	
Republic of Kazakhstan	148	184	352	505	526	447	399	467	614	1622	1774	1 940	1310,81
Akmolinskaya	3	1	8	12	12	7	7	5	7	68	83	92	3066,67
Aktubinskaya	4	10	17	23	24	18	16	27	37	61	68	85	2125,00
Almatinskaya	4	10	15	20	16	14	10	7	28	108	126	139	3475,00
Atyrauskaya	-	1	3	22	11	9	8	9	14	29	41	79	-
East Kazakhstan	16	20	37	63	55	41	47	60	70	117	99	157	981,25
Zhambylskaya	5	9	19	23	32	23	14	31	41	64	75	98	1960,00
West Kazakhstan	6	5	7	7	12	13	12	9	26	53	34	51	850,00
Karagandinskaya	16	30	42	57	60	64	56	67	71	173	148	159	993,75
Kostanaiskaya	14	5	8	11	16	13	9	17	31	189	164	204	1457,14
Kyzylordinskaya	-	3	3	6	6	8	4	17	22	68	85	73	-
Mangistauskaya	5	8	10	13	12	10	6	5	5	17	20	32	640,00
Pavlodarskaya	10	23	16	39	44	19	19	26	28	60	95	79	790,00
North Kazakhstan	4	5	8	8	9	10	10	11	11	104	114	116	2900,00
South Kazakhstan	9	8	16	17	19	17	15	25	51	112	129	143	1588,89
Astana c.	-	1	11	20	22	15	15	18	29	134	179	214	-
Almaty c.	52	45	132	164	176	166	151	133	143	265	314	219	421,15
Remark – compiled by the authors based on data of Agency of Republic of Kazakhstan on statistics													

As can be seen from table 1 the greatest growth of innovative enterprises is observed in the Almaty,

Akmola and North Kazakhstan regions. Graphically this is shown in figure 1.

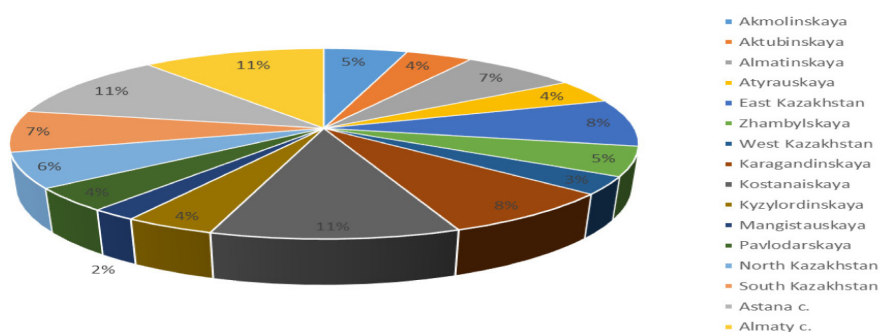


Figure 1 – Structure of innovative enterprises by regions (2014)

As can be seen from figure 2, the events will develop according to the formula:

$$y = 3,422x^3 - 44,67x^2 + 225,4x - 32,34,$$

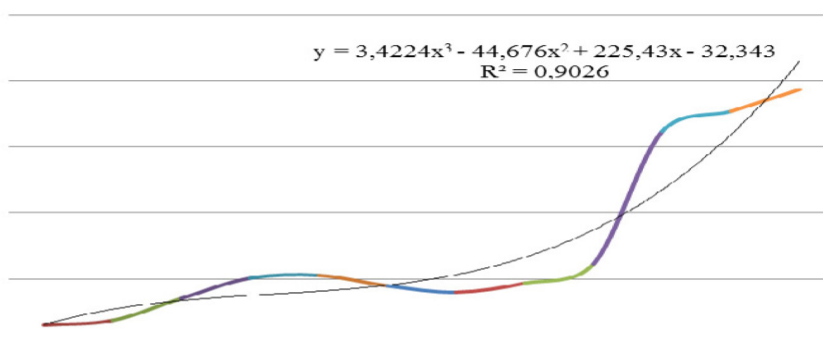


Figure 2 – The trend line on the indicator «number of innovative enterprises» in the Republic of Kazakhstan

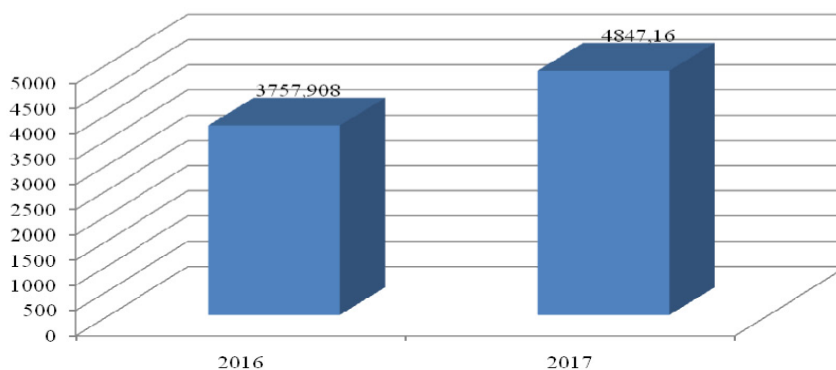


Figure 3 – The forecast results for the indicator “number of innovative enterprises” in the Republic of Kazakhstan

Using source data for the indicator “number of innovative enterprises”, presented in table 1, using

the Microsoft Excel let’s forecast this figure to 2017. (Figure 2).



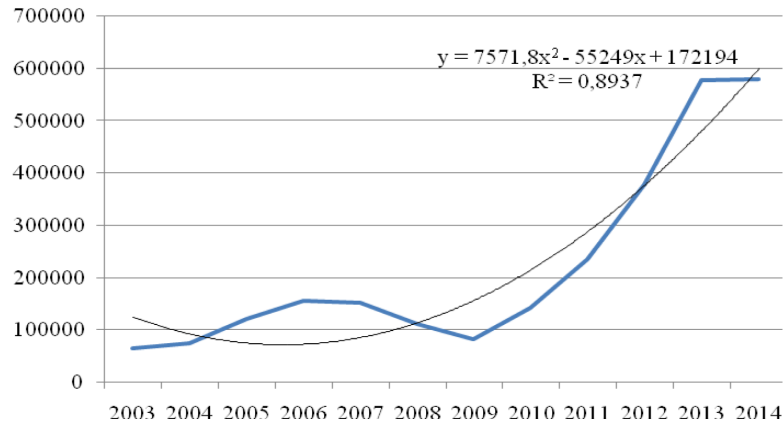
The reliability of the forecast will be  $R^2 = 0,902$ , or 90.2%, indicating a relatively high reliability.

Let's forecast it to 2017 using this formula:

$$y_{2016} = 3,422 \cdot 14^3 - 44,67 \cdot 14^2 + 225,4 \cdot 14 - 32,34 = 3758 \text{ enterprises}$$

$$y_{2017} = 3,422 \cdot 15^3 - 44,67 \cdot 15^2 + 225,4 \cdot 15 - 32,34 = 4847 \text{ enterprises}$$

Graphically, the forecast results for this indicator are presented in figure 4. As can be seen from figure 4 in 2017 compared with 2016, the level of the enterprises activity will increase by 30%.



**Figure 4** – The trend line in terms of «the volume of innovative products» in the Republic of Kazakhstan

**Table 2** – Dynamics of the level of activity of the enterprises of Kazakhstan in the field of innovations, %

Region	The level of activity in innovation, %												2014 to 2003 in %
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	2014*	
Republic of Kazakhstan	2,1	2,3	3,4	4,8	4,8	4,0	4,0	4,3	5,7	7,6	8,0	8,1	6,00
Akmolinskaya	0,6	0,2	1,5	2,2	2,1	1,2	1,2	0,7	1,0	5,8	7,1	7,3	6,70
Aktubinskaya	7,4	3,2	4,6	6	5,6	4,1	4,0	6,1	8,5	5,9	6,5	7,6	0,20
Almatinskaya	4,9	1,7	2,2	2,9	2,1	1,9	1,4	0,9	4,6	8,8	9,5	9,4	4,50
Atyrauskaya	-	0,5	1	7,8	3,7	2,7	2,9	3,7	6,6	4,8	5,1	8,1	-
East Kazakhstan	1,5	2,8	4,1	6,8	5,6	4,3	5,9	6,4	8,1	6,8	5,6	7,6	6,10
Zhambylskaya	5,4	2,7	5,7	6,6	8,8	6,0	4,4	7,8	10,2	9,7	10,2	12,2	6,80
West Kazakhstan	2,9	2	2,2	2,1	4,9	4,9	4,5	4,6	12,7	9,5	5,3	6,6	3,70
Karagandinskaya	1,6	4,2	4,5	6,4	6,1	6,5	6,2	7,0	7,2	8,5	7,6	8,4	6,80
Kostanaiskaya	6,3	1,2	1,4	1,9	2,5	2,0	1,5	2,6	4,8	14,1	11,8	13,6	7,30
Kyzylordinskaya	-	1,3	1,2	2,4	2,4	3,0	1,5	6,1	8,0	12,8	12,0	10,1	-
Mangistauskaya	2,2	4,5	2,5	3,2	2,3	1,9	1,4	1,1	1,1	1,6	2,4	3,4	1,20
Pavlodarskaya	2,3	3,4	2,8	7,2	8,1	3,6	3,8	5,1	5,4	5,5	6,4	6,9	4,60
North Kazakhstan	1,7	1,4	1,9	2,1	2,2	2,5	2,6	2,4	2,4	11,0	10,9	11,6	9,90
South Kazakhstan	0,7	1,4	2,3	2,5	2,8	2,4	2,2	3,4	7,0	5,4	6,4	7,0	6,30
Astana c.	-	0,4	1,5	2,8	3,0	1,8	2,1	2,6	4,1	7,5	11,1	10,7	-
Almaty c.	3,8	2,6	5,5	6,3	7,2	6,4	6,7	5,4	5,7	7,3	8,0	5,0	1,20

Remark – compiled by the authors based on data of Agency of Republic of Kazakhstan on statistics

Table 3 – Dynamics of volume of innovative production, million tenge

Region	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2014 to 2003 in %
Republic of Kazakhstan	65020,4	74718,5	120408,4	156039,9	152500,6	111 531,1	82 597,4	142166,8	235962,7	379005,6	578263,1	580 386,0	892,62
Akmolinskaya	1,1	9,8	6278,1	31947,9	41235,6	4 316,9	1 039,0	6959,6	9822,5	19902,1	18205,7	33 801,6	3072872,73
Aktubinskaya	6493,5	8076,5	1249,8	6450,4	11680,0	14 056,9	4 428,3	9792,3	16880,9	6542,4	8300,6	4 454,4	68,60
Almatinskaya	501,4	897,8	6571,9	10370,2	8577,4	334,0	419,5	521,0	5498,1	13288,0	13153,8	16 608,9	3312,50
Atyrauskaya	-	9,2	334,9	1940,1	186,9	1 598,4	55,3	126,1	1828,1	4772,2	38078,2	18 655,3	-
East Kazakhstan	4144,3	4188,2	11411,9	13747,5	26015,4	5 118,2	6 939,5	13854,5	33592,5	99332,1	109378,9	97 778,9	2359,36
Zhambylskaya	848,1	378,0	1135,0	1575,1	2241,6	6 286,1	2 190,4	723,8	11251,8	19181,2	19637,4	25 250,3	2977,28
West Kazakhstan	1827,7	391,4	1181,0	2327,9	2343,8	390,6	728,7	-	24804,9	4399,3	9009,5	5 996,5	328,09
Karagandinskaya	34798,0	37483,8	56239,0	59871,8	37986,5	16 473,8	14 412,4	14897,7	14388,6	30891,5	53731,2	21 578,1	62,01
Kostanaiskaya	203,3	89,7	184,7	861,6	1344,8	4 084,0	1 848,3	1966,9	12453,0	29769,7	35728,9	57 633,9	28349,19
Kyzylordinskaya	-	4,6	3,8	2,0	8,0	30,3	66,7	-	2281,3	3645,0	6641,7	4 761,2	-
Mangistauskaya	1126,2	3005,2	8576,2	6639,6	7353,0	5 002,9	133,0	233,2	618,6	3609,0	1395,4	1 546,8	137,35
Pavlodarskaya	8765,3	7691,4	10147,8	1249,7	2002,7	38 060,2	35 420,1	72592,6	73279,0	97620,0	83368,0	83 070,6	947,72
North Kazakhstan	279,7	2235,9	1430,4	2789,4	959,9	3 228,6	2 751,0	2880,6	1469,5	6098,3	16028,0	16 500,4	5899,32
South Kazakhstan	885,7	6163,6	5057,6	5522,4	2715,1	1 451,4	4 422,5	4859,9	15374,0	22588,7	33177,5	45 153,5	5098,06
Astana c.	-	-	2779,0	2866,8	13,0	13,2	31,1	72,2	1818,6	4787,0	119923,4	125 507,0	-
Almaty c.	5146,1	4093,4	7827,3	7877,5	7836,9	11 085,6	7 711,5	12686,6	10601,4	12579,1	12504,9	22 088,6	429,23

Remark – compiled by the authors based on data of Agency of Republic of Kazakhstan on statistics

Table 2 presents changes in the level of activity of the enterprises of Kazakhstan in the field of innovation. The analysis presented in Table 2, the data showed that in 2014, in comparison with 2003 the level of activity in the field of innovation in the Republic of Kazakhstan increased by 6%. Leaders in terms of increasing the level of activity in the field of innovation are: North-Kazakhstan region (an increase of 9.9%), Kostanay (an increase of 7.3%), Karaganda and Zhambyl region (an increase of 6.8%).

As can be seen from table 3 in 2014 in comparison with 2003, the growth of volume of innovative products in Kazakhstan increased up to 792, 62%.

The highest growth rates are observed in Almaty, Kostanay, and North and South Kazakhstan regions.

Using original data on the main indicators of development of innovative enterprises activity of Kazakhstan, presented in table 2, using the Microsoft Excel let's forecast data rates up to 2017. (Figure 4).

As can be seen from figure 4, the events will develop according to the formula:

$$y = 7571, x^2 - 55249x + 17219$$

The reliability of the forecast will be  $R^2 = 0,893$  or 89, 3%, indicating a relatively high reliability.

Let's forecast it to 2017 using this formula:

$$y_{2016} = 7571 \cdot 14^2 - 55249 \cdot 14 + 17219 = 727649$$

million tenge

$$y_{2017} = 7571 \cdot 15^2 - 55249 \cdot 15 + 17219 = 891959$$

million tenge

From 2009 to 2014 the share of innovation active enterprises increased from 4% to 8%, 7 times increased the costs of enterprises on technological innovation, – from 61.0 to 431,9 billion tenge, and

the volume of innovative products – up to 82.6 578,2 billion tenge [2].

Priority areas for development are: integrated solutions in the energy and utilities, especially alternative energy with a focus on the EXPO-2017; new materials -alloys with rare earth elements; new agriculture -robotics, automation of agricultural production, water resources management, bioinformatics, bioengineering; intelligent transport logistics, navigation systems of mobile objects, software tools for data processing [3,4].

## Conclusion

Analysis of the situation gives you the opportunity to formulate some possible directions of solving problems of innovation activity improvement in Kazakhstan. They include:

The necessity to implement a set of measures to improve the incentive mechanisms and support from the government to develop and implement effective enterprise innovation in organization and management of production. It can enhance the competitiveness of products in the global market. This group of measures could include a number of areas. The necessity to develop national-scale development and production of high technology innovative products and projects, as well as the modernization of technical and technological content in order to ensure compliance with current requirements. The necessity to develop measures of state influence for the development of innovation infrastructure and bringing the system into the sphere of private capital innovation. One of the important areas to achieve these goals is to attract foreign investment, the effectiveness of which depends on the degree of economic attractiveness of Kazakhstan. Thus, the improvement of public policies to attract investment in innovation can greatly improve the competitive edge of the national economy.

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