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Managing Innovation in Kazakh small and medium-sized enterprises

The formation of an innovative economy in Kazakhstan is a complexity of economic, social, and political issues. An effective use of research findings and developments in the real economy is most important in terms of Kazakhstan's successful competitiveness, assurance for high economic growth, improved quality of life, and to help realize other innovative priorities. In these circumstances, innovation management and development is becoming more relevant as the basis for developing Kazakh companies, by way of a defined set of relevant technical, operational, organizational, marketing, and financial operations. The purpose of this study is to identify characteristics and practical recommendations for the development and further improvement of management mechanisms relating to the innovative activity of enterprises in Kazakhstan.

Key words: innovation, innovation process, enterprise innovative activity, commercialization of technologies, demand for innovation.

From the moment of following industrial-innovative development in 2003, Kazakhstan had reached a peak of the main innovation activity indicators in 2014. Positive growth was caused mainly by successful realization of «The state program for accelerated industrial innovative development of Republic of Kazakhstan» in 2014.

In 2014 in relation to 2005, shares of innovation active enterprises had increased from 3,4% to 8,1% (Figure 1).

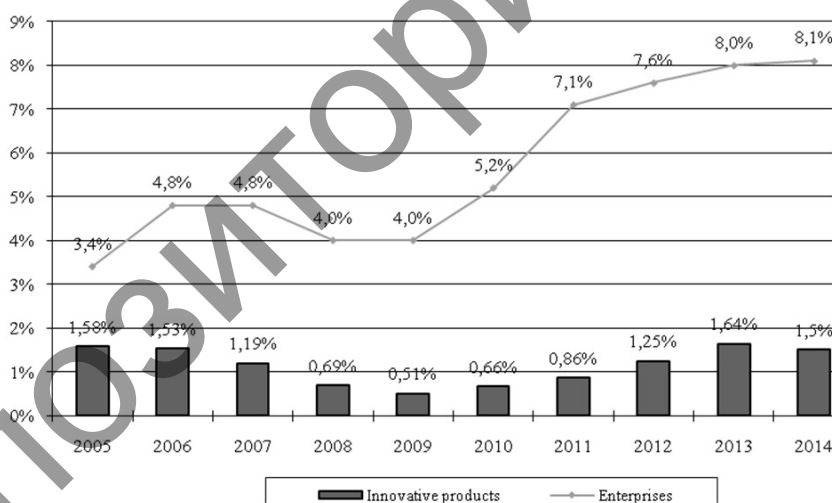


Figure 1. Innovation activity of Kazakhstan enterprises (share of innovative products in GDP, and share of innovation led enterprises among all enterprises)

(Source: Committee on Statistics of MNE RK, <http://stat.gov.kz>) [1]

To draw comparison: in USA shares of innovation active enterprises make up to 50%; among the European Union countries highest shares have Germany (79.3%), Sweden (60%), Finland (58%) [2].

Based on the analysis of institutional changes in Kazakhstan, we have identified the main reasons for the reduced effectiveness of the innovation processes in Kazakhstan, and these are schematically shown in Table 1.

Reasons for reducing the effectiveness of innovation processes in Kazakhstan

Economic	Organizational	Legal	Infrastructural
<ul style="list-style-type: none"> – low scientific-technical and innovative potential; – lack of assets; – adverse terms of crediting; – high innovation cost; – low effective demand for innovation; – high economic risk for innovation; and – long-term payoff. 	<ul style="list-style-type: none"> – lack of interaction between science and production, and between state and private sectors; – lack of new forms of development, cooperation, and production of complex products; and – low level regional and world integration. 	<ul style="list-style-type: none"> – incomplete legislative and normative basis for innovative activity, stimulation and regulation; – defense of rights for intellectual property; and – patent legislation. 	<ul style="list-style-type: none"> – technology market underdeveloped; – information and communication market underdeveloped; and – innovative infrastructure underdeveloped.

Note. Authors.

Innovative enterprise financing

Economic diversification is a well-established activity of the Kazakhstan government. This is reflected in the global task, set by the State Program of Forced Industrial and Innovative Development. This program provides for the sustainable development of innovation. However, the next decade is expected to see a doubling of oil production, creating a challenging political task to reduce the country's dependence on primary commodities [3].

In the first stage, which started in 2010 after a preparatory phase, the state program focused on modernizing production facilities. The second stage, the stage of a new economic creation, was aimed at developing new enterprises in Kazakhstan, involving companies that were world leaders in their sector. The third stage involved the creation of a framework for the future economy through investments in aerospace, biotechnology, information technology, and alternative energy production (Table 2).

Table 2

State Program of Focused Industrial and Innovative Development of the Kazakhstan (SPFIID)

Preparatory stage (2011–2012)	Third stage: base formation for «future economy» (2012–2014) Aerospace, biotechnology, information technology, and alternative energy production
Preparatory stage (2010–2011)	Second stage: new economy creation (high labor efficiency) (2011–2014) The creation of new enterprises with the world's leading companies in certain sectors of the master plan Development of measures to stimulate the economy (SEZ development, reducing the share of oil and gas exports through the export of other commodities, and foreign investment)
Preparatory stage (2009)	First stage: economy base modernization (material refining efficiency) (2010–2014) The establishment and operation of scheduled national and regional investment projects Development of industrial and regional development programs Development of laws on industrial policy, SEZ

Note. Authors.

Currently, the complex instruments under state influence aim to achieve the economic level of developed countries that are close to the technological frontier. Strategies must differ from the measures already implemented, to ensure similar effectiveness to that of the more developed countries. This applies to the various tasks assigned to each of the three stages of the development strategy of Kazakhstan. The modernization

of existing structures is mainly carried out at the expense of investments. It needs imports and effective use of industrial technologies, including the improvement of the workshop management, organizational innovation, and staff development [4].

Initially, booster strategies and measures for developing innovative potential of the economy should dominate in the context of Kazakhstan, which can draw on the second stage of SPFIID, and grow over time. The emphasis here is on creating an enabling environment for innovation that contributes to sustainable and gradual progress on several issues.

State financial institutions

The political stage of SPFIID provides guidelines and a legal framework to develop financial support for innovation within the country. This is a part of the Kazakhstan Strategic Development Plan until 2020.

A number of institutions that are involved in financing and modernizing management operates in Kazakhstan. These include institutions that fund investments, attract infrastructure projects, and provide resources for innovation. The most important institutions in this area are discussed below.

The *Development Bank of Kazakhstan* (DBK) was founded in 2001. It provides financial support to the private sector and government agencies by providing medium- and long-term loans at low interest rates. The Bank focuses on infrastructure projects and crediting industrial enterprises. It is owned by Samruk-Kazyna.

The purpose of the DBK is to promote sustainable economic growth by providing long-term funding and various financial services in non-extractive industries. Since its formation in 2001, the Bank has considered a total of 180 projects, totaling 10.4 billion US dollars, of which 5.1 billion US dollars were provided by the DBK.

From 2007 to 2011, the Bank's portfolio grew more than three times. The Bank's assets amounted to more than 6 billion US dollars, of which about 2 billion US dollars were singled out as loans. The subsidiary organization, DBK-Leasing, established in 2005, provides short-term and long-term lease financing and participates in the program, «2020 Productivity». Their existing loan portfolio shows significant lending to primary industries, based on raw materials, such as oil refining, energy, metals, and non-metals production, which accounted for nearly two-thirds of the total loan portfolio at the end of the first half of 2011. Lending for transport and logistics also comprises a large amount and represents about 10% of the Bank's total portfolio.

The DBK plans to become a major source of long-term finance for infrastructure development, strategic investment projects, and export operations. It plays an important role in the implementation of SPFIID. With this state program, the Bank plans to increase the share of lending to the following industries: metal, transport, energy (electricity), chemical and petrochemical, telecommunications, and others.

The *Damu Entrepreneurship Development Fund* was created in 1997 to provide financial and non-financial support to small and medium-sized enterprises, and to stimulate demand for products and services of these companies. Damu is working at the regional and national levels. With 16 offices across the country, this subsidiary of Samruk-Kazyna tends to be a unifying channel of governmental measures that support entrepreneurship development and small- and medium-sized businesses with 13 financial and 11 non-financial programs. The fund also assists the business environment in general. Damu is currently a financial party of the «Business Road Map 2020», one of the SPFIID activity directions.

The purpose of the *Investment Fund of Kazakhstan* (IFK, established in 2003) is to ensure that the industrial and innovation policy in Kazakhstan are included in implementation, and investment projects and financial support is provided for private sector initiatives in non-oil sectors of the economy. The achievement of these goals is provided through direct equity participation in the invested companies.

The IFC invests in new and existing companies that are engaged in raw material processing and which use new technologies in the development of competitive products. As well, it provides services to other companies. The IFC is also co-financed and involved in the management of investment projects in the non-oil sectors of the economy. The fund participates in co-financing overseas investment projects that deal with initiating industrial cooperation between national and foreign companies.

Its current portfolio includes 28 investment projects amounting to 670 million US dollars. The direct participation of IFC makes up 198 million US dollars.

Over the past 10 years, Kazakhstan has adopted a number of measures to create an institutional infrastructure that supports innovation. One involved the creation of the *National Agency for Technological Development* (NATD) in 2003, under the Ministry of Industry and New Technologies. The NATD activities include: operation of the Center for Engineering and Technology Transfer (CETT), direct investments in in-

novative companies, and support to R&D projects. The NATD is actively involved in promoting innovation through investment in equity share capital, redeeming domestic and foreign venture capital funds, supporting technology parks, and stimulating the development of an innovative culture [5].

The *Fund of Science* was established in 2006. The fund is actively operating in the field of information and communication technology (ICT) and space technology, nanotechnology and new materials, biotechnology, renewable energy technology, and nuclear technology. The fund provides loans to scientists who plan to set up a company or sell their findings in the next 3–5 years. The funding ranges from about 50 thousand to 2 million US dollars. Eleven projects are supported so far, and in mid-2011, three of these started redeeming the funds provided (Table 3).

Table 3

Review of main institutions and their financial instruments

Financial institutions	Participation in financing	Loans	Grants
Development Bank of Kazakhstan		Infrastructure development, pilot projects, and industrial companies	
Entrepreneurship Development Fund (Damu)		Various programs, micro-finance, «Business Road Map 2020», «2020 Productivity», etc.	
Investment Fund of Kazakhstan	Various development projects		
National Innovation Fund	Investment projects to innovation companies, national and foreign venture funds		R&D grants for various aims: patenting, technology acquisition, project feasibility study, and R&D
Fund of Science		Commercialization	R&D grants

Note. Authors.

All institutions are currently considering new opportunities to replenish their portfolio of tools. Damu, for example, is working on a guarantee mechanism to assist small and medium enterprises (SMEs) in obtaining financial support from the banking system and have plans to invest in equity share capital. NATD continues its activity on the development of business incubation in technology parks [6].

For more effective actions, sectoral programs have been adopted in all the 13 priority sectors: mining and metals, machinery, chemical, pharmaceutical, textile and construction, production of construction materials, oil and gas, transport infrastructure, agriculture, space activities, information and communication technologies, and tourism. This involves more than 100 new business support tools. Laws pertaining to the state support of industrial innovation, energy conservation and efficiency have been adopted. In addition, laws for creating special economic zones and reducing administrative barriers for business have been developed and adopted [7].

Along with the sectoral programs, there are special programs that support the project. These include 1) the forced modernization of the existing and creation of new productions through «2020 Productivity»; 2) a design-targeted, export development and promotion program with «2020 Export»; 3) support and encouragement for foreign direct investment with «Investor – 2020»; and 4) the development of entrepreneurship in the regions with «Business Road Map 2020». Today, forced industrialization is an objective necessity for Kazakhstan. Through rational territorial organization of economic potential, the «Industrialization Map for 2010–2014» will allow the creation of new economic growth centers in the country, and a balanced development of priority sectors [8].

The development of innovation support system of the enterprise

To ensure further innovative development of enterprises, the following is recommended.

The development of an effective system for technology commercialization. Commercialization of technologies should be linked directly to the practical application of scientific and technological activities, in order to introduce into the market either new or improved products, and processes and services, that have a positive economic effect.

A systematic approach to commercializing technology will give a significant impetus for a rapid introduction of scientific and technical activities in the economic cycle. This will eventually allow the state to create new jobs, to return to the budget through tax revenue, invest in research and development work, and improve the overall competitiveness of Kazakhstan in the global technology market.

To create a normative legal base for the development of a system for intellectual property and commercialization in the Republic of Kazakhstan, the interests of all stakeholders in intellectual property and commercialization should be taken into account, to ensure investments are stable and secure. This measure will allow research institutions to participate in all forms of intellectual property and commercialization, and likewise for researchers working in public research institutions. As well, it will allow them to manage and own a share of the stocks in an innovative company. This would reduce the risk of scientific unities creating their own intellectual-property based business.

In particular, according to the experience of European countries, state support for the use of the commercial potential of research institutes and universities, stimulates and motivates scientists and institutions to commercialize their knowledge and technology. The continuous transfer of knowledge from the public sector to the private should be developed. It is necessary to arrange measures to recognize domestic patents abroad, develop a system of intellectual property for implementation into the economic circulation, and develop a state system of intellectual property valuation [8].

It is also necessary to create a system of information exchange — *a state created network of institutions for innovative development*, to support innovative projects at all stages. As a part of such a system of information exchange, the mechanism of forwarding on information, which promises innovative projects among institutions of innovative development, should be established. An information exchange system should also be an effective tool of “linking» the research and development with the business, resulting in the formation of new companies based on the results of applied research.

Development of national human resources and accumulation of competences in the field of technology commercialization. To build competencies in the field of technology, a development priority would be to provide commercialization training to staff supporting the commercialization process and their primary beneficiaries.

The development of human resources is required for successful commercialization. Training, exchange of experience, and targeted outsourcing of professional advice will play a central role in creating a sustainable system of technology commercialization in Kazakhstan. In this regard, it is necessary to encourage local experts to participate in various programs that improve competence in the field of commercializing innovation and to visit foreign structures of technologies for best practice in commercialization.

The stimulation of enterprise innovation activity. The transition of Kazakhstan’s innovation system from a model driven by the state to a sustainable system driven by the private sector is necessary to reduce administrative barriers and tax incentives, provide access to finance, create innovation clusters, develop the business environment, and to create demand for innovation.

The reduction of administrative and technical barriers, together with improved access to finance will contribute to the emergence of a large number of innovative companies.

The openness of the domestic markets will lead to an increased access to global knowledge and technologies. In this case, the transfer of advanced knowledge and technologies could be implemented through the creation of an enabling environment and incentive tools, including the following important directions:

- the involvement of foreign innovative companies of small- and medium-sized, and the creation of joint ventures among these;
- the maximum use and attraction of scientific potential from fellow scientists who are successfully working in foreign research institutions; and
- disclosure of foreign patents and licenses with the transfer of advanced technologies to improve the competence of local specialists.

In order to better promote Kazakhstan's high-technology products in international markets, it is necessary to strengthen regular interaction among stakeholders (e.g. the export-oriented high-technology and innovative enterprises and companies; joint-stock company «National Agency for Technological Development»; JSC with their «Damu Entrepreneurship Development Fund»; and JSC with their «National Agency for Export and Investment»).

The reduction of administrative barriers and tax incentives. Today, Kazakhstan functions under the principle of tax legislation unity, which provides a single regime for all businesses, regardless of the innovative component of their products.

At the same time, innovative companies are in need of an unprecedented legal regime that will minimize administrative barriers.

In order to develop possible administrative and tax incentives for innovation, the following actions are needed:

- explore the possibility of developing and implementing mechanisms for the promotion of enterprises that work in the legal field; and
- consider the desirability of introducing a special tax regime to facilitate the conditions for innovative enterprises during the first five years of development.

Financial inclusion. Financial inclusion remains a key limiting factor for the development of entrepreneurship in Kazakhstan. This is due to the reluctance of the banking sector to finance risky and innovative projects. In particular, these are projects, belonging to small- and medium-sized businesses, which, in most cases, can provide only limited resources to secure a loan.

In our opinion, for these purposes, it is necessary to work through the following measures:

- increase the issuance of micro credits and small grants to promote pilot implementation of capacities and entrepreneurial initiatives;
- develop financing of equity instruments and tools, aimed at financing the early stages of development of the company; and
- develop corporate venture capital, by encouraging large companies, including foreign companies, to acquire shares in the new innovative companies.

The creation of innovative clusters will increase the innovative activity of business entities, as well as lead to the emergence of synergies. For example, form clusters of participating companies, which are more likely to create new products than single enterprises. In this case, the activity of enterprises within the cluster can overlap and complement each other. The formation of innovation clusters, simultaneously, promotes interchange between related industries and fierce competition within industries.

The formation of the demand for innovation. When building an effective national innovation system, the attention should be focused on implementing measures that increase the demand for innovation. Most countries that are rapidly developing their innovative systems do not succeed, due to poor demand for innovation.

As shown from international practice, central to the system of national innovation are businesses with their own capacity for carrying out research and development that enables them to innovate successfully.

Today, a weak demand is the key constraint to the promotion of innovation within the country. The formation of demand for innovation should be provided by the state through regulatory measures and incentives.

The development of innovative infrastructure. The activity of innovative infrastructure should focus on providing the necessary financial, methodological, and information support at all stages of the innovation process. It should also create and promote new developments that provide advanced scientific development, and introduce high-technology industries. *The main elements of the innovative infrastructure are:* a special economic zone, «Park of innovative technologies»; regional technical parks; venture capital funds; industrial design offices; and international technology transfer centers.

By interacting with each other, these elements of innovative infrastructure will provide an integrated system of support for innovation at all stages of implementation, and this will allow companies to:

- maximize capture of innovative subjects with tools supported by the state;
- establish an effective system of commercialization and promotion of innovation, based on national scientific research; and
- establish a system of transfer, localization and distribution of the necessary foreign technologies.

Conclusion

Integrative processes provide an opportunity for Kazakhstan to expand its markets and increase its capacity for innovation. Competitive pressure creates a huge incentive for Kazakhstan enterprises to innovate. To take full advantage of these opportunities, it is necessary to make effective policy measures to support further modernization and diversification of the economy.

The questions regarding innovative processes, management improvement, and innovative achievements are now becoming more relevant. They require the participation of the various layers of Kazakh society. At the same time, as evidenced by the latest Kazakhstan experience, the coordinating and controlling (combining) role of the state in this area is becoming increasingly important and serves an inherent function.

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Қазақстанның шағын және орта кәсіпорындарындағы инновациялық қызметті басқару

Қазақстанда инновациялық экономика кешенін қалыптастыру экономикалық, әлеуметтік және саяси міндет болып табылады. Экономиканың нақты секторында ғылыми зерттеулерді және зерттемелердің нәтижелерін тиімді қолдану арқылы Қазақстанның бәсекеге қабілеттілігін жақсарту, экономикалық өсудің жоғары деңгейін қамтамасыз ету, өмір сүру деңгейін жоғарлату, басқа да инновациялық басымдылықтарды жүзеге асыруға болады. Осы ретте қазақстандық кәсіпорындарында техникалық, өндірістік, ұйымдастырушылық, маркетингтік, қаржылық операциялар сәйкестігінің жиынтығы инновациялық үрдістерді басқаруды дамытуда үлкен мәнге ие. Зерттеу жұмысының мақсаты — Қазақстандағы кіші және орта кәсіпорындардың инновациялық қызметті басқарудағы тетіктерінің ерекшеліктерді зерделеу мен тәжірибелік ұсыныстарды өңдеу.

В. Шарфф, Н.А. Курманов, К.К. Байгабулова, Д.А. Айбосынова

Управление инновационной деятельностью на малых и средних предприятиях Казахстана

В статье отмечено, что формирование инновационной экономики в Казахстане является комплексной экономической, социальной и политической задачей. Важнейшим условием успешной конкурентоспособности Казахстана, подчеркнута авторами, является обеспечение высокого экономического роста, повышение качества жизни, реализация других инновационных приоритетов, эффективное использование результатов научных исследований и разработок в реальном секторе экономики. Определено, что в этих условиях все большее значение приобретает развитие управления инновационным процессом как основы улучшения работы казахстанских предприятий, определяемого совокупностью соответствующих технических, производственных, организационных, маркетинговых, финансовых операций. Авторами исследованы особенности и разработаны практические рекомендации по дальнейшему совершенствованию механизмов управления инновационной деятельностью на малых и средних предприятиях Казахстана.

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