

## Perspectives of Innovation Development (Case of Kazakhstan)

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### ABSTRACT

The article analyzes the problems in the implementation of innovation policy in Kazakhstan. Kazakhstan is in the top 50 in terms of economic development. But this development is based on extractive industries. At the same time the country tried unsuccessfully to enter the number in the top 100 of the innovation economy. Accepted by many government documents and policies, the state spends hundreds of millions of dollars, but the economy is steadily growing on the commodity path. What causes this, and can I fix it?

The author gives advice on the formation of a new concept of innovation. Provides recommendations for an enabling environment for inventors and involvement in innovation regions, the development of effective mechanisms for the relationship between science and innovation, providing demand for innovation and planning innovation.

Kazakhstan is better to focus on a very narrow range of directions of innovative development, especially health care, work on models of global capitalization of ideas, build a culture of innovation with school families, to the regionalization of innovation policy, science and the natural sciences, to reform the regulatory framework of innovation, competition and export support innovative companies, tax incentives for leading companies. The article highlights 3 versions of innovative development.

**Keywords:** Innovative Development; Problems and Inhibiting Factors of Innovation Development; Strategy of Innovative Development; Strengthening Innovation Development

### Introduction

Kazakhstan for many years trying to be a country with an innovative economy. This goal was always stated in the government strategy. The first reference is to the Strategic Plan of Development of Kazakhstan till 2010. Follow then the Strategy of Industrial and Innovation Development for 2003-2015, and then program the formation and development of the national innovation system of the Republic of Kazakhstan for 2005-2015. It was also accepted in 2006

special law "State support of innovation." Incentives for innovation have been taken in the Law "State support of industrial and innovation development", also 50 related laws regulations.

In 2009 were taken the State Program of Forced Industrial-Innovative Development for 2010-2014, an industry program to promote innovation and technological modernization for 2010-2014, also Interdisciplinary plan of scientific and technological development of the country until 2020 and implemented reforms in science.

However, despite the efforts of the state, the innovative development of the state does not achieve the desired results and rates.

Below in the article an attempt will be made to identify the main problems of this and develop recommendations for the correction of the strategy of innovative development.

## Literature review

There are many studies in the literature that explore different aspects of innovation topic. Are explored Innovative processes (Conway&Steward, 2006; Christensen, 1997; Cormican&O'Sullivan, 2004; Kotesmir & Meissner, 2013), the problems of development of new products (Patel & Pavitt,1994; Rogers, 2003; Dosi,1982; Tidd, 2006), the models innovation processes in companies (Nelson, 1993; Isaksen & Tidd, 2006; Du Preez & Louw, 2008; Enkel et al., 2008).

In our opinion, the most complete picture of the essence of the formation and development of innovations was laid in the theories of innovative models. Roy Rothwell made an assessment of the nature of the innovation process and determined that it had transformed from simple linear models to increasingly complex interactive models (Rothwell, 1994).

His concept of "fifth-generation innovation" considers innovation as a multi-event process that requires a high level of integration at both the intrafirm and interfirm levels.

At the first stage, the technological push is based on the assumption that new technological advances based on R & D and scientific discoveries preceded and "pushed" technological innovations through applied research, design, production and marketing towards successful products or inventions as results (Tidd, 2006).

In the second stage, the linear model is complemented by market demand to stimulate innovation. In this case, in the development of the product, instead of scientific advances, new ideas come from the needs of the market.

Next-generation interactive models include interaction loops characterizing the complex links between science, technology and the market. (Eleveens, 2010; P. O'Raghallaigh et al. 2011; Chesborough, 2003)

Let's consider from this point of view the situation and the evolution of innovative development of Kazakhstan

## **Problems and inhibiting factors of innovation development of Kazakhstan**

According of Global Competitiveness Report of the World Economic Forum 2012-2013 (Schwab et al., 2018), Kazakhstan ranks 51 among 144 countries in the world. At the same time, the level of innovation Kazakhstan ranks 103rd. This gap indicates that Kazakhstan is still at the stage of transition from primary to innovation economy.

In the global innovation index, Kazakhstan took the 57th place out of 137 countries in 2017 (www.wipo.int.) Almost all the components of the index deteriorate or do not improve significantly. This means that the National System for Supporting and Implementing Innovations in Kazakhstan has not yet been created, and Kazakhstan is hopelessly lagging behind the leading countries in the world in innovation. It can be concluded that Kazakhstan lags behind in terms of the main factors of innovation development, the quality of human capital, competitive business, infrastructure base and institutional environment. These factors shape the success of the innovative development of any country.

Coordination system has not become effective mechanism for the relationship between science and innovation. Creating a Higher Scientific and Technical Commission and the Council for Technology Policy at the Government actually led to their parallel operation.

Poor planning, innovative development led to the fact that as the utility of industrial-innovative development and projects for funding were chosen in a hurry. The selected projects were not high-tech.

There are no effective mechanisms to ensure the demand for innovation: in the public procurement system was not developed criteria.

Were not taken explicit measures to develop public-private partnerships.

## **Need for a thorough analysis of the causes**

But these reasons are obvious. Today Kazakhstan should first better understand the causes of failures in the field of innovation development. All the infrastructure for innovation is created and exists in almost 10 years, the last five years, a sharp increase in funding, but there are no results.

This means that the root causes of the failures found. The first step is to conduct a longitudinal and cross-sectional analysis of all innovation policies to find the correlation and other relationships, and specific answers to the questions: Why do not develop university technology parks, why not develop commercialization centers at universities, there is a link between the financing and growth of patents between funding and growth inventions, what are the mechanisms to promote start-up projects and if any of these drawbacks? It is no secret that university technology parks (National University named after Al Farabi, the National Technical University named Satbaev, etc.), there are more on paper and they just do not make sense to compare with foreign university technology parks. But today there is no analysis of the reasons for

this lag. None of the mechanisms of their development. Our preliminary research shows that managers often do not realize or do not take much effort for their development, although some experts in this field could give advice on their development.

After this analysis, a new concept of innovative development should be based on age, education, employment, population, migration, etc. The analysis of the population. You can choose to innovate and to set goals, but if there has been an increase in employment in high-technology innovation to achieve growth will be difficult. Cannot economists and lawyers who are now 90% of the labor market to make innovations in high-tech industries. Also there is no picture of what the age of innovators who work in business incubators and university science parks? Our observations on the national university show that this age has passed the age of fruitful activity.

In other words, you need multimetric analysis of the input (innovation capacity) and output (innovative results). With the discovery of the causes of failures of national must be built a new concept. Otherwise it will be another fruitless and spraying equipment. In general, Kazakhstan, there are three possible scenarios.

First - inertia. He suggests further waste of resources and a lot of resources on the priorities and projects. In this scenario remain raw material orientation of the economy of Kazakhstan, poor basic science and the lack of its interaction with the industry, the weak demand for innovation from the business and the state, distribution of obsolete industrial technologies with high environmental costs. The probability of this scenario, despite the efforts of the state, remains high because the state program of industrial-innovative development today failed, and the economy is based on the primary sector.

The second - a way of borrowing innovations. He suggests the use of available technology in the world market which are purchased or are involved in the country with foreign capital. Or a massive purchase of foreign technology in the stages of forced industrialization. This path is also the case in Kazakhstan because of the huge "oil" money. It also does not work, because the innovative development is as simple as the introduction of innovations. The third - the choice of the leading technology. In this scenario, the marginal concise list of technologies that Kazakhstan has the potential and is able to compete, in which he has some scientific basis. The development of these technologies are directed all the resources, and infrastructure, focused scientific resources.

However, all three scenarios assume that all you need to start with a deep analysis of the problems and causes of failures. Such a micro-economic analysis should materialize in macroeconomic concept.

### **Suggestions for improving the development of innovative**

Particularly in-depth analysis is needed in the choice of priorities and points of growth innovation. Priority sectors for innovation and cannot be selected on the basis of their relative importance in the economy. This approach is unreasonable, because having no relation to innovative development.

Kazakhstan's potential is not enough to compete in many innovative industries to other highly developed countries leaders. For example, the U.S., the cost of biotechnology are tens of billions of dollars, and in this case, Kazakhstan is not able to provide a competitive investment. Obviously, the fact that Kazakhstan is better to concentrate on a very narrow range of directions. We must bear in mind that, in the context of globalization, inventions and innovations to travel easily across borders. The world is becoming a single entity and innovation in the field of biotechnology, for example, can not only be a Kazakh or American. They become global. Does it need to insertion into the industry, if it all over the world have already invested hundreds of billions of dollars. Will investment in Kazakhstan in her \$ 10 million to the development of open? From this point of view, Kazakhstan, may work best on models capitalization of the world of ideas.

Among the branches of the same, which may be high innovation potential in Kazakhstan yet seen so far only one sector - the health care industry. Other industries require more analysis and calculation of innovation capacity.

It is also necessary to develop competition and stimulate national winners prizes for innovative achievements.

The new concept of innovative development should contain as much as a number of important ways to improve the macroeconomic policy has a significant impact on the innovation development.

It should first be noted measures to use levers to stimulate competition. In fact, the only competition is a healthy mechanism innovation.

Secondly, the concept has to be a whole layer of issues on export support. The fact is that the innovative development of countries such as Kazakhstan with relatively small domestic market and geographic fragmentation has significant features. In particular, in such markets offer lower potential rewards for conducting risk innovation. Typically, these markets are attracting fewer competitors, thus providing little incentive for businesses to innovate to survive. In this case, the success of small countries like Finland and Sweden shows that the lack of a small domestic market may be offset by a strong focus on innovation intensive exports.

Thirdly, the new concept of entrepreneurship should be provided for budget reform. Regions must become centers of innovation. The regions should be established full innovation systems, including innovative infrastructure and appropriate tools to support innovation. The core of the regional innovation systems have to become regional park, as the methodological and consulting support should still provide the Ministry of Industry and New Technologies.



But today, in Kazakhstan there is a centralized financial support of the business sector. To conduct the regionalization of innovation policy and financing for small and medium businesses is necessary to budget reform in Kazakhstan.

If regional technology parks cannot hold the commercialization of innovative ideas to develop cooperation with foreign technology parks.

The concept should be dealt with issues for the development of innovative enterprises. We should concentrate on the growth of start-up businesses. For this purpose, it is necessary to provide for Startup-Kazakhstan initiative that will contribute to the development of innovative business across the country, increasing the success of high-growth start-ups. The government's efforts to develop a national Startup-initiative should aim to accelerate the transfer of cutting-edge research from university labs, a sharp increase of the initial funding, able to attract attention and increase brain gain in the innovative sphere, improvement of the legal framework for starting and growing new businesses and increase ties between entrepreneurs and business mentors.

Regulatory and legal support innovative development should be directed to the sharp reduction of administrative barriers (Ortt & Duin, 2008). Kazakhstan needs fulfillment patent revolution, requiring dramatically reduce the time for submission and consideration of patent applications, create new financial mechanisms to improve the evaluation of patents and encourage patent activity.

Under the stimulation of demand for innovation should also be made mandatory rules and standards for performance, sustainability, energy efficiency and resource conservation. The formation of such "technology corridor" will allow more efficient use of natural resources, the safety of products (services), reduce energy and materials.

In accordance with international best practices of national innovation systems must be made to the definition of the special status of small innovative enterprises.

In Kazakhstan in 2012 introduced tax incentives for innovation (50 - interest deduction and 1% for mining companies). But this is only the first step and the next step is the adoption of measures:

- stimulate business innovation through the release of the funds allocated to the creation of innovative enterprises funds;
- state guarantee 70-85% of the volume of lending to the scientific and innovative projects;
- the adoption of targeted technology programs;
- involvement of business angels, informal venture capital investors in the early stages of project financing for commercialization;
- providing innovative modernization grants in accordance with the nature of the priority sectors of the industrial-innovative development;

To create demand for innovation through public procurement will need to have a clear criteria for innovative products and services. The simplest form, was used in China, the government is using 5-10 % of price priority in government procurement to domestic innovative products.

The concept to show the mechanisms of support for industrial leading companies. Innovative development should be based not only on the mechanisms of direct state support, but also the mechanisms of cluster development, public-private partnerships.

Also, you need to provide a mechanism for the involvement of the mining companies in the sphere of innovation through contributions of 1% of the total annual income for the development of innovation. Companies need to develop research projects, establish venture capital funds, to create innovative small businesses. Otherwise, they have to make contributions to the regional industrial parks in the amount of 5% of revenue.

In Kazakhstan, the acute problem - raising the level of innovation culture of the population, the formation of the key competencies of citizens as the ability for critical and creative thinking, initiative and ability to take risks, knowledge of foreign languages.

The basis of such skills by human physiological device should be put on pre-school education. At the level of primary school education support measure should be to the current conditions of the learning process, including not only the technical equipment of schools, but also the implementation of good practice in research skills of students.

At the university level should be given to vocational and technical education, science and research in research universities.

In order to strengthen the scientific system must be provided coverage of foreign scientific training programs of at least 20% of all scientists of the country. The structure of scientific personnel necessary to ensure that at least 25-30% have direct implementation projects.

For academic institutions, research institutes, academic organizations should be the goal of global or regional leadership on specific technologies (experience the U.S., EU, Korea, Japan). Need to expand such a direction as training and education in innovation (including patents, patent system in the world, etc.). Educational sector should be one of the key events in the development of innovative potential.

The focus should be placed on a world-class workforce - there is a direct relationship between the level of a highly skilled workforce, and innovation. Unfortunately, in Kazakhstan, is one of the main problems.

The driving forces of innovation is the training in the sciences, particularly in mathematics. To do this, the capitalization of the Science, for example, in Kazakhstan, is expected to increase tenfold.

In Kazakhstan there is no common system for today risks of public funding for innovative projects. As a result, most of the state development institutions based on performance and recoverability of investments, but there is no venture capital funds and venture capital. Meanwhile, funding for innovative projects - this is not a traditional government funding and funding should be based on a system of risk assessment and risk arising from it.

At the same time, to enhance the effectiveness of the work, we can provide the system of executive compensation in the case of the profit from the financing of innovative projects.

## Findings

Modern Kazakhstan is in the process of transition from primary to innovation economy. Years of attempts to develop an innovative economy fall flat. The country has the infrastructure adopted many laws, increased government funding annually. However, in fact indicators of innovation policy are low:

- Few companies created on the interface of science and business;
- Costs several times the revenue;
- Techno inactive and there are formal;
- Government institutions of inaction;
- There is no effective system of commercialization;
- Scientific discoveries do not grow.

According to the author in the country has not carried out a deep analysis of the real reasons for the ineffectiveness of innovative development.

Multimetric needs analysis of the input (innovation capacity) and output (innovative results). With the discovery of the causes of failures of national must be built a new concept. In general, Kazakhstan, there are three possible scenarios: slow, way of borrowing innovation, and choice of leading technologies.

Kazakhstan is better to focus on a very narrow range of directions. Perhaps the best way to work on models of capitalization of the world of ideas. Among the branches of the same, which can potentially be highly innovative in Kazakhstan yet seen - the health care industry.

The new concept of innovative development should contain as much as a number of important ways to improve the macroeconomic policy has a significant impact on the innovation development. It is about promoting competition, the development of export support, budget reform. You also need to improve the legal support of innovative development, create a special status for small innovative companies to introduce tax incentives to innovation, government guarantees of funding, insurance and procurement. producingraw materials companies have an incentive to innovate or to bear the financial costs in the form of contributions to the regional technology parks. University technology parks should develop cooperation with foreign university parks, and university science should receive extensive financial support. Innovative culture should have the character of state policy with.

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