



Comparative Analysis of Open Innovation Management: Finnish Experience and Kazakhstan's Practice

Análisis comparativo de la gestión de la innovación abierta: La experiencia finlandesa y la práctica de Kazajstán

G. ISATAYEVA [1](#); A. ISSAKHMETOVA [2](#); A. SADYKBEKOVA [3](#); N. UMBETALIYEV [4](#); A. SABDALINA A. [5](#)

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Contents

[1. Introduction](#)

[2. Methodology](#)

[3. Results](#)

[4. Conclusions](#)

[Bibliographic references](#)

ABSTRACT:

Object of research is a conceptual research of open innovation theory and analysis of modern conditions of innovative activity in the Republic of Kazakhstan. Purpose of work is a survey of approaches to the development of innovation in knowledge-intensive manufactures of Kazakhstan and proposal ways to improve the innovation processes based on the model of open innovation. The research objective is concretized in its tasks: - the analysis of world experience of application of approach of open innovations in R & D on the knowledge-intensive productions and the search for "best practices"; - research of the current innovative processes in R & D of the knowledge-intensive productions of the Republic of Kazakhstan and comparison of this experience with the international practice.

Keywords: open innovation, closed innovation, knowledge-intensive, knowledge-intensive production, questioning, innovative process improvement.

RESUMEN:

Objeto de la investigación es una investigación conceptual de la teoría de la innovación abierta y el análisis de las condiciones modernas de la actividad innovadora en la República de Kazajstán. El propósito del trabajo es la encuesta de enfoques para el desarrollo de la innovación en las manufacturas intensivas en conocimiento de Kazajstán. El objetivo de la investigación se concreta en sus tareas: - el análisis de la experiencia mundial de aplicación del enfoque a las mejores prácticas; - investigación de los procesos innovadores actuales en I + D de las producciones intensivas en conocimiento de la República de Kazajstán y comparación de esta experiencia con la práctica internacional.

Palabras clave: innovación abierta, innovación cerrada, intensivo inteligente del conocimiento, producción intensiva de conocimiento, cuestionamiento, mejora innovadora del proceso

1. Introduction

During the last 20 years, the Finnish economy is reoriented to natural resources on the high-tech industry. And today, Finland is one of the recognized leaders in innovation. In the world has developed a successful model of States which, not having its own database of fundamental science, were able to achieve significant results in innovation. Experience of Finland proves once again that the economy based on knowledge, can be built. Finland managed to become one of the leaders of the post-industrial world (as well as Sweden, Israel and some other countries) due to purposeful policy of the state, effective interaction with business and long-term investment in science, innovation and education. [1]

In the world was affirmed a successful model of States which, not having its own database of fundamental science, were able to achieve significant results in innovation. Experience of Finland shows that an economy based on knowledge, it is possible to build not only relying on the academic science.

Finland is a country of "conquered high-tech" and its national innovation model is recognized as one of the most efficient in the world. And it besides that a few decades ago, the country was not a developed industry, no strong scientific basis, and fundamental research are never given priority. What is the secret of success of Finland's innovation?

2. Methodology

Conceptual analysis of modern world practice and changes of the last years in the sphere of open innovations; Analysis of innovative component industry of the Republic of Kazakhstan; formation of questionnaires for carrying out poll, based on the careful and structured review of the available literature (work with the databases Scopus, Web of Knowledge, Ebsco). According to the purposes and tasks of research, are planned the elaborating a new questionnaire for carrying out poll in companies.

At development of the questionnaire were used developments of researchers from LUT occupied in this project; recommendations of OECD about carrying out researches in the field of innovations; the questionnaires applied in the researches CIS; and also, the scales developed and approved in some previous quantitative statistical researches on open innovations.

Order and mechanism of carrying out researches:

1 Conceptual analysis of modern world practice and changes of the last years in the sphere of open innovations

2 The analysis of innovative development of industries of the Republic of Kazakhstan and the socio-economic factors causing this situation.

The expected economic effect of transition of the companies to open-innovative model consists in reduction of costs for research and development, acceleration of a conclusion of a product to the market and improvement of access to the international markets of technologies by means of involvement in the international technological trade. The scientific novelty of the project is to lay the foundations of researching the processes of open innovation in Kazakhstan at the level of theory and practice and to support companies that are interested in rebuilding their own R & D model of open innovation. Scientific novelty is reflected in the following:

- the content of the concept "open innovations" taking into account specifics of the conducted research is specified;

- studying of foreign and domestic literature, the magazines published in highly impact on a research subject. Their systematic analysis;

- features of innovative development of industries of the Republic of Kazakhstan are revealed, the socio-economic factors causing this situation are defined;

The received results will promote high-quality social and economic development of the country

and will give the chance to improve a control system of innovative processes. Theoretical and methodological justification can form the basis of development of manuals on the knowledge-intensive economy.

3. Results

In just a couple of decades, the Finnish economy is reoriented to natural resources on the knowledge-intensive. Today, Finland is one of the recognized leaders in innovation.

In the end of 70th years the increase investment in the research activities was the deciding factor in the quick change orientation of the Finnish economy. Even when the economic recession of the early of 90th years the volume of funding for science is not only not declined, but continued to increase, albeit at a slower pace.

Finland became the first country has adopted the concept of the national innovation system as a basic element of policy in the field of science and technology. In practice, this meant an increase in the number of enterprises which based on innovation and know-how, as well as the strengthening of organizations involved in research activities [2].

The main trend which has traced in Finnish innovation system is the further development of innovation policies, which implies a closer involvement of existing research in the country, including regional infrastructure in the global economy, as well as establishing close contacts with relevant organizations of the European Union. Thus the leadership of Finland considers a question of development of innovative activity as within the country, and beyond its limits as one of the main levers of increase of competitiveness of national economy (table 1).

Table 1
Comparative analysis of the main economic indicators in Finland and Kazakhstan

Indicators	Significance	
	Finland	Kazakhstan
Area	338 424 km ²	2 717 300 km ²
Population	5,4 million people	17,04 million people
GDP	266,6 billion US dollars	231,9 billion US dollars
Economy (Export/import)	52,3 billion euros, 51,5 billion euros (2010)	82,5 billion US dollars 48,9 billion US dollars
R & D expenditures from the budget	55 billion euros (2012)	120 billion euros (2014)
Number of the workers occupied in the research sphere	1 166 000 persons (2009)	25 793 persons(2014)
Foreign investments into economic activity of the country (Direct foreign investments)	153 billion euros (2007) 23 billion euros (май, 2012)	1,6 billion US dollars (2013)
Number of days to begin the business	14 days	3 day

The note is made on the basis of [3]

On the general background of the EU countries of Finland traditionally treats the most successful states in the field of development of high-tech industries of economy and in a share of expenses in GDP of the country on research activity is among the leading countries of the world. Since 1995 export of hi-tech production of Finland exceeds its import, and the share of such production from all export of Finland makes about 21%. Thus 80% of export of production of high technologies are the share of goods of the electronic and electrotechnical industry.

However, starting from 2005, tendencies on reduction in production of hi-tech production by the enterprises of large business and transfer of capacities to other countries were outlined in Finland. Growth of the Finnish export continues to be carried out due to activity of the Finnish subsidiaries abroad where over 37% of all staff of the Finnish enterprises work. In recent years in Finland has somewhat slowed down the growth of industrial investment inside the country.

According to statistical department of Finland, investment into the innovative sphere and expansion of production in the territory to year with direct participation of the European experts the analysis of innovative system of the country which, in general, confirmed the high level of its development was carried out.

Herewith a some of its shortcomings has been noted, first of all, with irrational use of the budgetary funds allocated for research and development, low level of inflow of foreign investments, complexity of management of the existing innovative system and insufficient cooperation with the leading European and world scientific centers was noted.

In response to global challenges Finland could, in comparison, for example, with Chile, the country more favorable on natural resources to create conditions for business development, to transform the production structure to a high-tech industry of the industry which became the engine of national economy. However such shift in priorities of national scientific and technological policy wasn't connected only with increase in national expenses on research and development.

Table 2

Global index of competitiveness of 2014-2015.

Country/economy	General indicator	
	Place	Points
Finland	4	5.5
Kazakhstan	50	4.4

Note: it is made on the basis of [4]

Resources. In 1960-1970 years Finland started modifying the institutional system in the field of science and technologies, having created some agencies responsible for planning, realization and development of initiatives and programs in the field of R & D. However the main emphasis was placed on development of the resource base scientific - technological complex. The policy of Finland, as well as almost all of the countries of OECD, during this period was directed on bringing the amount of financing of science and technologies to 1,1% of GDP by 1970. By the end of 1980 these expenses already made 1,81%. Despite a strong economic crisis of the 90th years, the Finnish government develops the concept of national innovative system. According to

this concept of total investments in science and technology sector were to reach by 2002, 3.43% of GDP, and innovation has been recognized as the main engine of economic growth. In the private sector, he took this concept as one of the most important, he has agreed to implement together with the government. For the private sector have been developed suitable standards and rights to the results R & D, technology and innovation, developed in conjunction with the public sector. This contributed to creation of an attractive image of the national innovation system for industrial companies who are manufacturers of innovative products and processes. Institutionalization. According to some analysts, the success of Finland in the field of innovative economy can not be considered only as a medium-term actions taken 90 years to increase the amount of financing R & D and creation of high-tech industries like ICT. These analysts consider that modernization proceeded about 30 years, changed state scientifically - technological policy, the relevant organizations and mechanisms stimulating innovative activity of the Finnish enterprises of the private sector were created.

In 1960 Finnish Industry specialized, as been reported on the use of natural resources at a low technological level of production. Therefore there was a task to create such scientific and technological system which would provide the industry with new technologies and processes. Finland started solving such problem on the basis of use of experience of industrialized countries of OECD and the EU. The policy of trade liberalization was at the same time pursued. In 2003 the state scientific and technological policy of the last 25–30 years was analysed. On the basis of the carried-out analysis this policy was divided into three main stages (figure 1).

In Kazakhstan formation of national innovative system begins relatively recently. At the first stage (the beginning of the 2000th) a number of the laws regulating and stimulating development of innovative activity in RK are accepted (The law "About Innovative Activity", the Law "About investments).

Figure 1

Stages of formation of NIS of Finland, [5]



In 2003, adopted the Strategy of Industrial and Innovation Development of Kazakhstan for the years 2003-20015. The main the purposes of strategy are: ensuring sustainable, forward development of the country, withdrawal from a raw orientation of development to the processing; create a favorable climate for entrepreneurial activity; the formation of a

competitive environment and a system of public institutions that can stimulate the private sector in the creation of industries with high added value; stimulation of creation of the knowledge-intensive and hi-tech export-oriented productions; diversification of an export potential of the country in favor of goods and services with a high value added; transition to the international standards of quality.

Since 2010 the following stage of development of NIS of Kazakhstan begins. At this stage the Card of industrialization for 2010-2014, the Law "About Special Economic Zones in the Republic of Kazakhstan" is entered.

The third stage NIS of Kazakhstan is included adoption of law "About the state support of industrial and innovative activity" which is directed on:

- Creating favorable conditions for the development of priority sectors of the economy and new competitive industries;
- The creation of favorable conditions for modernization (technical upgrading) of existing production facilities in order to increase in labor productivity as well as the extension of the production chain and market expansion;
- Support for the effective implementation of innovations and development of high-tech industries;
- Assisting the subjects of industrial and innovative activity in the commercialization of technology, as well as the development of export potential, development of scientific and research base in the priority sectors of the economy and its integration with the production process;
- rendering assistance to the subjects of industrial and innovative activities in international cooperation in the field of industrial innovation, including cooperation in preparation of highly qualified personnel for industrial and innovative activity.

The analysis carried out a number of Western researchers, shows that over the past 25-30 years scientific and technological policy of Finland is not rigid and centrally planned mechanism for the development of scientific technological and innovation complex. An important element of liberalization in this area has been the construction of the so called network economy, which has become constructively based on information and communication network of technology developers and users, namely industrial firms.

Creation of "network economy" became one of the priority directions, a key element of development of a scientific and technological complex and innovative system of the country. Finland, according to Eurostat, has achieved the highest rate in the world on the use of information and communication technologies and the Internet, particularly in the creation of collaborative networks for implementing innovative activities between universities state research institutes and industrial companies. Actually "the network economy" in this sector includes more than 50% of university networks and more than 40% of networks between the state scientific research institutes and industrial firms.

The modern role of the government in Finland in the scientific and technological and innovative sphere in the increasing degree switches to support to the private sector, stimulation of growth of volumes of their R & D funding, targeting firms on researches, the priority for the Research Society on the medium and long term from 5 to 15 years. On the other hand, according to some Western experts, the Finnish Government takes a certain 'laziness and sluggishness' in relation to the use of tax incentives to attract foreign investment in R & D.

According to statistical data Finland has positive value of "inflow of minds" thanks to good infrastructure and the internal climate promoting R & D. development. First of all, it's inexpensive and well-educated staff. The government, in principle, does not plan any special measures for the suspension of "brain drain". Except for quite a high income tax, equipment for researchers is a high quality and optimal according to modern standards and in sufficient quantities for R & D in various sectors of the economy. Infrastructure, financing and quality of

life in exceptionally high comparison with the European standards, which contributes to attracting foreign researchers. It is possible to note with full confidence that the public sector of a scientific and technological complex, by estimates of the western analysts, is quite well organized, effectively managed and is inseparably linked with the private sector. Differentiation of functions of government bodies of executive power, scientific research institute, universities and business is quite well verified and balanced.

In Finland there are no special laws on innovative activity, the regulatory legal base is based on the legislation on small and medium-sized enterprises, and also on protection of intellectual property which question of providing is one of the major. Finland does not apply the tax incentives for R & D, and use other forms of government support. In Finland, the concept of "national innovation system" has been adopted at the beginning of 1990s as the theoretical basis for the scientific and technical policy. Shift of accents of innovative policy is reflected in it: from the single company to a network of the companies and from financing of universities and research institutes to financing of technological programs.

Since 2007, after entering into the legislation of the EU of the changes concerning allocation of financial resources on carrying out R & D there was a possibility of public financing of innovations not only in the field of equipment and technologies, but also in services and the commercial activities of companies, which is an essential factor for the development of high technologies. Innovative activities in Finland are regulated by the Order of the Government about Council for policy in the field of science and technologies of Finland, the Communique of the Government about National innovative strategy of Finland for Parliament of 2009, intellectual property laws, about small and medium scale enterprises, about regional development, etc. laws and bylaws.

The structure of public administration by innovative activities of Finland looks as follows (tab. 3) [6].

The policy of Finland on support of Research and Development and development of innovative activities is directed as on rendering assistance from the state directly to the firms conducting researches and on development of the institutional environment which is necessary for effective functioning of national innovative system. The state support extends practically on all research firms. It is performed at all stages of their activities, has complex nature and includes the most different forms of financial aid and rendering services. These activities are closely linked to national policy development and support of small and medium-sized businesses, as well as regional policy aimed at equalize the level of development of the various regions of the country.

Table 3
Structure of public administration by innovative activities of Finland

Government of Finland			
Council for scientific technological policy at the prime minister (STPC)	Parliament		
	Ministry of Education and cultures	Ministry of employment and economy (former Ministry of Trade and industries)	Other ministries
The stimulating and supporting organizations			
	Academy of Finland	Agency of financing of technologies and innovations of TEKES (261 people)	

State education and scientific organizations, private researches			
Universities (20)	VTT - The center of technical researches of Finland - 2471 persons.	Other state scientific research institutes (19)	The firms which are carrying out research and development and joint scientific research institutes
Communications and transfer of technologies			
Scientific and technological parks	Innofin - Fund of inventions of Finland	The universities / scientific research institute which created the companies on a transfer of technologies	T&E Centers - Jobcenters and economic development
Support of the venture capital			
SITRA FINNVERA FINPRO	Industry investment ltd. - Company of industrial investments	Venture capitalists	
The note - a source [7]			

At the beginning stage of the innovation of the company, there are many government programs to support business, which include assistance in registration activity, the provision of special loans and guarantees for risk capital, attracting regional venture funds.

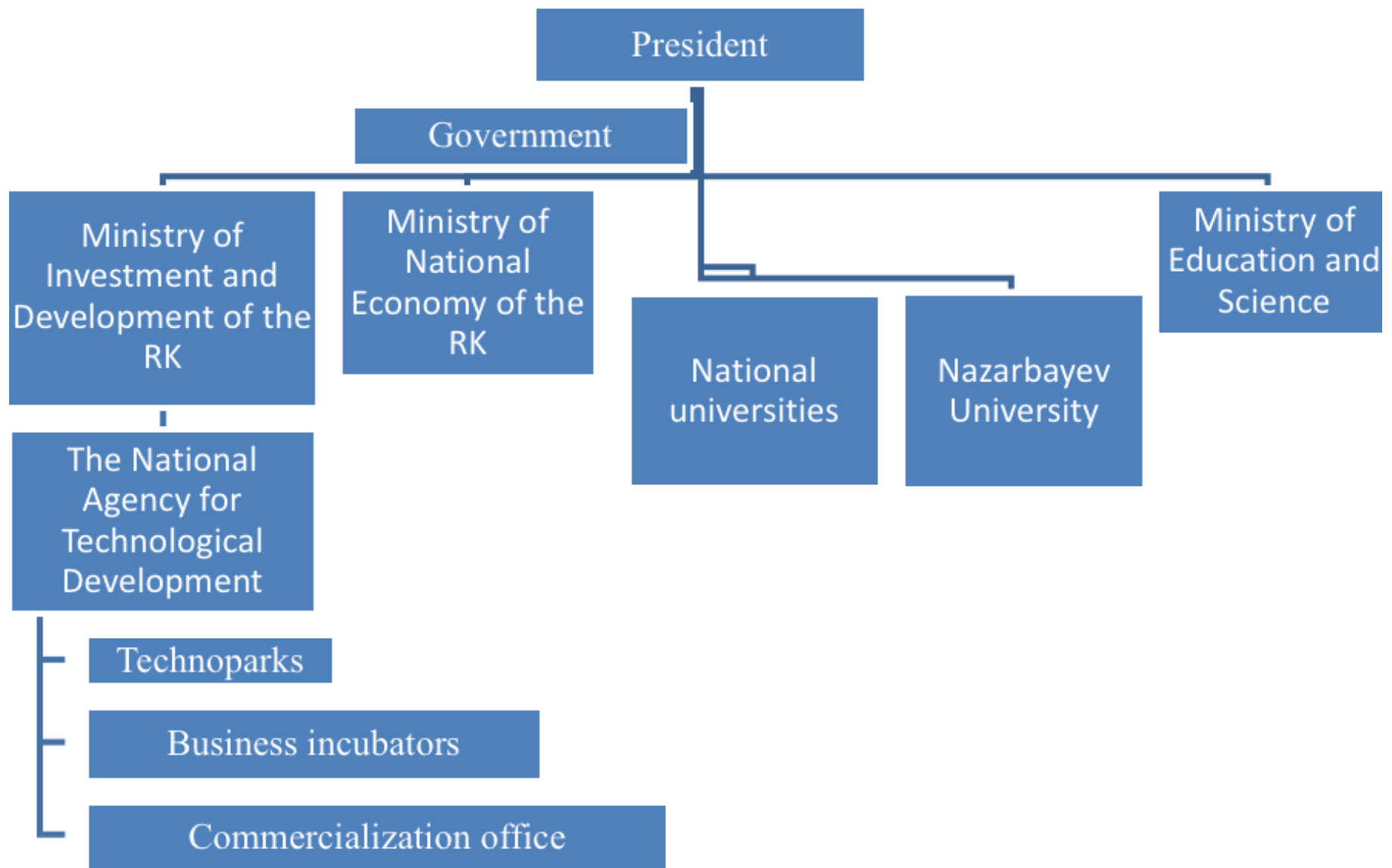
The state performs expert evaluations of innovative projects and, in case of their compliance to the priority directions, can finance to 50% of works, promotes cooperation increase between participants of these research works, including at the international level. On the stage of the business state can accompany the innovative project for 1-3 years.

In addition to financial assistance, the state renders so called "step by step" support for to firms all stages of development their innovative business (development of technological strategies and programs, involvement of experts, training of specialists, information and legal assistance in the field of patents according to international norms and standards, the search business partners, support and full range of services to the companies entering with an innovation the foreign market).

The organizational structure of innovative policy in RK looks as follows (figure 2).

Figure 2

Organizational structure of innovative policy in RK, [8]



The Ministry of Education and Science of the Republic of Kazakhstan is the authorized body responsible for forming, implementation and coordination of all basic and applied researches conducted in the country, a condition and development of research infrastructure, preparation and advanced training of scientific personnel, and also carrying out the State research examination of the scientific projects and programs realized at the expense of means of the government budget.

In Kazakhstan, along with legislative, institutional measures for stimulation of development of innovations are undertaken. So, today set up and operate 9 regional technology parks (RTP), 4 sectoral construction department (SCD), 2 international center for technology transfer, 15 offices of commercialization, 4 centers of commercialization.

4. Conclusions

The carried-out analysis by determination of the main tendencies of development of innovations of the Republic of Finland, and also allocation of features of forming of national innovative system by results of development of innovative activities allowed to draw the following conclusions and offers:

1. Traditionally Finland had quite high level of primary goods in structure of foreign trade. However since the beginning of the 1980th the share of primary goods in export of the country started being reduced constantly. If in 1981 it was 28% of the total amount of export, by 2000 this indicator already constituted 14%. The analysis of scientific and technological and innovative policy of the country for the last 20–25 years shows that Finland sharply reconstructed the priorities as it was already noted above. Considerable emphasis in this policy has been made in the direction of formation of innovative industrial production. Industries of Finland was able to move to the production of goods with greater added value due to intensive partnership of the state and the private sector. The role played by a pioneer of venture financing State Fund Sitra, which was established in the 1980s. since the beginning of 2000s,

he became a major investor in biotechnology.

2. Another important point which could be learned from the experience and lessons of Finland - it is the institutional construction of National Innovation System. Suppose that should be using positive institutional experience of Finland, especially in the part concerning the creation of such organizational structures which finance knowledge-intensive firms in the pre-competitive stage of the innovation process. This refers to the venture, and "seed" funding. Probably, it would be necessary to work a question of creation of appropriate programs of rendering essential financially - credit and other support to high-technology Kazakhstans business .

3 Significant progress of Finland in the innovation sphere achieved thanks to steady increase of the state providing science, education and innovative activity, continuous improvement of innovative system of the country and the mechanism of attraction of private means in development of the priority directions of science, equipment and technologies. After world financial and economic crisis the sphere of high technologies continues to remain a zone of considerable financial risks in connection with which foreign investors almost don't investing investments in Finland in these productions. The investments arriving from abroad are aimed, mainly, at the development of the sphere of trade and service. Private business actively participates in national priority researches as it is interested in reduction of own expenses and decrease in risks at implementation of innovative projects due to partial financing and coordination of works from the state. Most of the budgetary allocations the government allocates to universities and the Academy of Finland, thus worked through well-coordinated mechanism to stimulate and promote innovative initiatives among the younger generation.

In the conditions of growth of the international competition Finland actively seeks to increase efficiency of use of budgetary funds at implementation of researches in the field of high technologies and to expand innovative activity in the country.

The events for increase of prestige of science and education, creation of modern research base held in Finland at universities and the high level of compensation of research associates, allow the state to develop the market of highly skilled labor and to raise a commercial orientation of researches at universities.

4. Internationalizations of science, first of all basic (fundamental). Involvement of the Finnish and foreign students who graduated the universities to the sphere of scientific researches in Finland is considered one of important tasks of an education system and scientific policy. For the solution of this task Finland provides to foreign researchers the same privileges and access to budget financing (grants) which the Finnish students and university researchers have. Along with a high level of R & D funding, exceeding many industrialized countries, Finland are more and more integrate their science with the international scientific system, primarily with the EU countries. Its researchers are increasingly are leaving and work in foreign countries, increasing the volume of programs for the exchange of scientists and researchers that encouraged and financed by the Government of Finland, together with the invitation of foreign researchers. This contributes not only to the exchange of knowledge, but also increase the competitiveness of Finnish science in the world market of intellectual property and the Finnish technology, especially in ICT sphere embodied in marketable innovative products. The international exchange of researchers estimated the OECD and the EU, improve financing mechanisms for science and innovation activities in result of using innovative financing mechanisms available in other countries.

5. According to foreign analysts, Finland, having a small size of the domestic market in the EU - one of the most competitive and technologically advanced countries in the world. According to forecasts, the country in the medium and long term will have a fairly low rate of inflation. This will certainly affect the inflow of domestic and foreign direct investment in scientific and technological complex of the country, strengthen its innovative activity. The literacy rate in Finland allows to take a leading position in the European innovation system and therefore to secure a strong position in the scientific and technological sector of the European Community. Such estimates are contained in the Global Competitiveness Report (2011-2012), prepared for

the World Economic Forum in Davos. Among the main advantages and mechanisms to facilitate this level were noted: a high level of management of the national economy and the quality of Finnish public institutions, culture of innovative activity, financing of scientific and technological sector, the quality and reliability of industrial processes and manufactured innovative products; political stability; the world's lowest level of corruption; quality of life.

6. Finland is included into ten the countries which have the most large number of the patents per capita registered in the European patent office and Patent office of the USA. In comparison with other EU countries of Finland shows especially high specialization in patenting of the latest information and communication technologies (ICT). Finland has a very high potential for innovation (5th place) and according to the magazine Newsweek, the country is ranked 1st in the list of "Best countries of the world" 2010. No less serious assessments provide to development of Finland and well-known international organizations and programs.

Thus, the United Nations Development Programme (UNDP) estimates Finland as the most advanced country in the world for the development of the Internet, consider that the population of this country has a high predisposition to use the Internet in professional and daily life, studies and creates new, innovative technologies, using them in their direct work.

7 A certain lack of national innovative system of Finland – underdevelopment of the market of the venture capital, and also low profitability of mechanisms of an exit of venture funds from the share capital of the companies "invested" by them. It is one of tasks of the government aimed at correction of a situation with the market of the venture capital, at formation of liquidity of this market.

8 Finland answers global challenges by means of restructuring of the economy, increase in productivity of the enterprises of both the state, and private sectors. All this demands increase in costs of research and development, their more exact target use, development of new models of modernization of a scientific and technological complex. The main objective of the government of Finland – to lift a share of costs of research and development in GDP. However, as analysts believe, such objectives can be achieved only at the expense of increase in corporate costs of research and development on the basis of the corresponding use of the budgetary mechanisms stimulating corporate expenses. The government of Finland aims to achieve the highest world level of costs of research and development financing, to strengthen the leading role of business and business in this sphere.

In this regard, it is planned to expand the use of information technologies in various industries. And to provide more business rules on the acquisition and possession of intangible assets obtained as a result of cooperation with the State Research Institute of scientific research and development.

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1. South-Kazakhstan State Pedagogical Institute, Kazakhstan
 2. Regional Social-Innovative University, Kazakhstan
 3. Shymkent University, Kazakhstan
 4. Shymkent University, Kazakhstan
 5. Shymkent University, Kazakhstan
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[Índice]

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