

Innovation Provision of Kazakhstan Industries Competitive Development

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Abstract

The article deals with the current state of Kazakhstan industries from the position of achieving the international competitiveness by the way of structural and spatial modernization. There is revealed the concept of the innovative potential and its components. There are considered the basic theoretical approaches and practical trends of providing the innovation development of Kazakhstan economy.

Keywords: cluster, competitiveness, diversification, industry, innovations, innovative potential, national innovation system, regional innovation system, structural modernization

1. Introduction

The developed at the present day stage complicated territorial-branch structure of the Kazakhstan economy continuous development does not satisfy the requirements of integration in the world market, restrains the forming of the national economy competitiveness and is ineffective. Therefore there exists an urgent need of developing a new spatial system of economic environment that is favorable for occurrence and diffusion of innovations and selective technological development of branches based on the rational use of the basic factors of competitiveness forming. This becomes one of the competitive trends for Kazakhstan as at the present day stage there is observed irrational distribution of productive forces, technological backwardness of industries. The innovative approach to the country economic development supposes the use of the factors of spatial restructuring and development and consists in adaptation to the new conditions of reproduction This adaptation takes place in the conditions of globalization and forming the unified world market, when the forming of innovation systems acquired the character of the central economic process in industrially developed countries. This means that the dominant of the economic growth becomes the system of scientific knowledge, new technologies, innovation processes, products and services that originate the reproductive cycles.

In Kazakhstan a lot of branches that need radical modernization experience an acute deficiency of resources, while in the financial and oil-and-gas sectors there is observed their comparative excess. The solution of the problem of structural modernization seems very urgent including its diversification and achieving the international competitiveness of the domestic non-raw materials industrial productions.

Kazakhstan is known to enter the first ten countries in the explored reserves of uranium, lead, copper, oil, coal, iron, manganese, tin, gold, phosphorites, boron and potassium salts. However, the assessment of the character of the natural resources dislocation in the territory is not so favorable as the assessment of the total value of their reserves. The main features of the natural-resource base geography are:

- the remoteness from the main world goods markets; the absence of the direct way to the sea (ocean) passageways;
- the country narrow specialization in the world and regional division of labor and multidisciplinary character of a lot of the country regions;
- bipolar structure with isolated sectors of the export raw-materials orientation and low-competitive processing industry that are poorly related with each other both in the branch and territorial aspects.

Today the advantage in the competitive struggle is defined neither by the country dimensions, nor by the level of natural resources, nor even by the power of financial capital. It is quite evident that in the nearest years there will

flourish the states that will provide the most complete revealing of professional abilities and talents of their citizens that will be able to excel the other states in acquiring new knowledge and practical skills, their transforming in the most up-to-date technologies and products.

The leading experts far and near abroad believe that without innovations there cannot be a prolonged and powerful economic upgrade (Innovations in the Russian economy, 2001; Searching new paradigms, Global anti-crisis technologies, 2002) and in this connection emphasize the need of forming a new optimal model of STP managing and building an efficient national innovation system (Tops cannot, bottoms do not want, 2002).

According to the forecast of the IIE&IR, by 2020 there must increase the average annual temps of the world economy up to 4.2...4.3 % (in the previous 15 years they made 3.4 %). The world economy will approach the upgrade temps of the late 50-s and 60-s of the last century but with new factors of the economic upgrade. The main contribution into accelerating the temps of the world economy will be made by such countries, as China (average annual upgrade of the GDP makes 7.7 %) and India (6.6 %). In the forecast authors' opinion, in the considered period there will begin the crisis in the development of the investments accumulation and dynamics. If in the XX century the economic development was based on the increasing the share of the GDP accumulation, in the predicted period there is expected decreasing the share of investments in the tangible assets from 22 to 19 % (World Economy: Forecast till 2020, 2007).

It should be noted that the policy of diversification and innovation development in Kazakhstan is not realized in full in connection with presence of a number of system problems that are objectively inherent to the resource economies of the countries with developing markets:

- the used market mechanism did not manage to give signals preventing separate sectors of economy from "overheating" and was not able to help the state to build the "correct" economic structure;
- there become apparent the symptoms of the "Holland disease" of economy that helps reproducing the effect of the resources (investment, labor) redistribution into the raw-materials sector;
- the diversification policy faces the absence of the needed critical mass for its promotion.

The extensive character of the large Kazakhstan business growth oriented at achieving quick returns from raw materials export and, first of all, hydrocarbons, will not permit it to switch to higher conversions at the internal market with the world conjuncture changing.

The topicality of the matters of the industries innovation development is caused by the need of forming the competitive economy in the territory based on the achieving of higher technological mode and providing the increase of its contribution in the solution of social-economic development problems. The complexity of the posed problems is related to the diversity of theoretical approaches to the defining of the innovations effect on the industrial competitiveness, therefore an important step is the revealing of the key propositions in the theories of economic upgrade based on innovations that can be put in the basis of developing the innovation strategy of Kazakhstan economy development.

2. Methodology

For the purpose of developing and implementing the trends of innovation provision of increasing competitiveness in industries it is necessary to carry out continuous monitoring of the innovative potential level. The concept of the "innovative potential" is not interpreted explicitly. In some works it is interpreted as scientific-technical, i.e. the accumulated amount of information of the results of scientific-technical works, inventions, designs, specimens of new equipment and products (Danko, 1999, Lissin, 2002). In other works, it is considered as a system of factors and conditions needed for the innovation process implementation (Nikolayev, 2001). In a number of works it is interpreted as the ability of various branches and enterprise to produce science intensive products satisfying the requirements of the world market that undoubtedly narrows the sphere of its use (Market: Business, 1998; Melamed, 2007). The essence of the innovative potential is completely enough opened by means of its component and elemental structure. There are three components in its structure: the resource, the infrastructural and the effective ones (Matveykin, 2007).

The resource component of the innovative potential is a kind of a "springboard" for its forming. It includes the following basic components of different functional purposes: material-technical, information, financial, human and other kinds of resources.

The material-technical component is a material measure defining the technical-and-technological base of the innovative potential that will later on affect the scales and temps of the innovative activity. It is in turn formed in

the branches making means of production that, by the way of using new technologies, put in them potential abilities implemented or not implemented later on.

The information component means models, algorithms, programs, etc. differing from the other components, practically inexhaustible. With the society development and activation of knowledge, the use of the information component resource increases.

The financial component is characterized by the integrity of the sources and reserves of financial possibilities that are present and can be used for implementing concrete aims and tasks. At this the amount of finances reflects the financial power, the system ability to participate in making material goods and rendering services.

The second, i.e. the infrastructural component of the innovative potential is a link between the resource and effective components. It is expressed in the system ability, on the principles of commercial effectiveness, to involve resources for initiating, making and disseminating various innovations. It includes the assessment of the governmental support resources for developing a favorable innovation climate, as well as the infrastructural resources of the innovation sphere: the presence and the further growth of investment institutions, free economic zones, technological parks, business-incubators, innovative and information centers, centers of technologies transfer.

The third, the effective component of the innovative potential is a reflection of the final result of implementing the existing possibilities, i.e. its target function. It bears potential possibilities of entering a new level of functioning of both innovative potential and the entire system.

The interaction of the resource, infrastructural and effective components of the innovative potential defines the need of revealing in practice their optimal relationship (starting from the role and relevance in forming and developing the potential). An insignificant specific weight of the resource component is, as a rule, caused by the prevailing of qualitative changes over the quantitative ones. At this the limitation of the needed resources by the time and space can be completely or partly overcome by the intensifying of their use, using new methods of the process organization, the search of new sources of their involving. At this it is evident that there exists a certain limit of deviation of the innovative potential components from the optimal level. That is the further changing of any element causes either lowering its own return or decreasing the efficiency of other elements functioning, as they all exist in the system totality.

It should be noted that the innovative potential implementation contains two types of limitations and preferences: transformation and transaction. The first ones define its qualitative content, the second ones – the limits of its existence and implementation (see the Table).

Table 1. Conditions of the economy innovative potential implementation

Indicator	Limitations	Preferences
Transformation:		
Labor	Imbalance	Overcoming functional illiteracy
Land	Exhaustion	Exploring and mining mineral resources
Capital	Own capital limitation	Involving loan capital
Transaction:		
Information	Asymmetry	Unified field of information space
Organization	Contradictions and subjectivism	Agreed cooperation relations

The innovative potential implementation limitations in industries are related to reproductive possibilities of the region enterprises (technologies used and production factors, the level of profitability), managing features and internal risks. The innovation activity subjects' preferences form a system in which some subjects' interests are interrelated and interact, helping or preventing from innovations implementing. The revealing of the innovative potential limitations and preferences in different regions of the country is needed for managing bodies when making program documents aimed to stimulate the regions development and to assist the forming favorable environment for making innovation business.

As foreign experience shows, the largest success is in the industries with a high degree of participation of scientific centers and university complexes with a high share of innovation production that produce goods with long-term competitive advantages due to the use of the results of scientific research, that train highly qualified

personnel in their own interests (Klessova, 2001; Monastyrny, 2005; Grik, 2004; Rabelotti, 1995). It is evident that in this acute atmosphere of innovations ideas competition in the interests of developing present day innovation production and innovation science intensive products there is the basic potential of industries development.

3. Discussion

At present in the field of studying economic development based on innovations there exist several scientific theories that are based on the system approach and separate the institutional factor as one of the basic factors of territories economic growth.

1. The conception of technological modes (technological systems).
2. The conception of clusters.
3. The conception of national innovation systems.

The interconnection of institutions and the economic growth consists in that, on one hand, institutions can assist or prevent from achieving it, on the other hand, the economic growth effects the institutions organization, development, and transformation.

Y. Shumpeter's theory takes one of the leading places in the theory of economic upgrade based on institutional factors (Shumpeter, 2007). From the institutional point of view, in this theory there is separated the external environment, the market institutional structure in which business acts. The achieving of the balance in the conditions of competition is possible only in special institutional frames permitting manufacturers of new goods and their consumers to exchange information and agree interests.

The conception of theoretical modes which authors are Russian scientists, namely: S. Glazyev and D. Lvov, also seems one of the important trends of the present day theory of innovation development (Glazyev & Lvov, 1992). Studies of the laws of long-term economic upgrade were generalized in the theory of technological modes, i.e. the integral complexes of technologically conjugated productions and corresponding technical-economic paradigms which periodical process of consecutive exchanging defines the "long-wave" rhythm of the present day economic upgrade. In the course of each structural crisis and each depression accompanying the process of replacing the dominant technological modes, there are opened new possibilities of economic success.

The next approach to the territorial economic development with participation of innovations is presented in the cluster theory. For the first time the bases of the cluster approach were used by N. Kondratyev when studying dynamics of innovations (Kondratyev, 1989). N. Kondratyev showed that innovations are distributed in time irregularly, appearing in groups, i.e. clusters. Later on Y. Shumpeter connected the economy prolonged deviations from the state of balance manifested in the conjuncture low-frequency fluctuations, with periodically taking place innovations concentration in clusters and with their further synchronic spreading.

American scientist M. Porter made the largest contribution in the development of the clusters theory (Porter, 1993). The theory is based on that the most competitive in international scales companies of one branch are usually concentrated in one region that is connected with the wave character of innovations that are spread by the most competitive companies and touch deliverers, consumers, and competitors of these companies. Thus, the country competitiveness should be considered through the prism of international competitiveness of not individual companies but clusters: the companies associations of various branches that mutually assist each other's competitiveness, besides, the ability of these clusters to use efficiently internal resources is of principal relevance.

In March 2005 Kazakhstan started implementing the project "Assessment of competitiveness of working and potentially prospective sectors of Kazakhstan economy and developing recommendations for their development". This project got the status of the Kazakhstan cluster initiative, the project developer was an Austrian company "J.E. Austin Associates Inc.", its manager was M. Porter.

In the course of carrying out the cluster analysis there was made the selection of the main segments of cluster specialization. At the first stage of the selection there were such indicators, as the share in the GDP, the GDP and export upgrade in comparison with the growth of similar indicators of the country, the share of employment and potential market attraction. The segments of selection became those in which Kazakhstan had competitive advantages belonging to the attractive markets and which development would lead to diversification in short- or middle-term period. Thus, there were revealed 24 sectors for the second stage. At the second stage of studies there were analyzed markets (world, regional, Kazakhstan) and assessed the branches and concrete productions potential, there were given estimate forecasts of supply and demand for the nearest 5...10 years. Besides, there

were studied the structures of the developed clusters and their competitiveness taking into account the costs. As a result there were selected 11 clusters that were the most prospective for Kazakhstan (About the approval of plans for the development..., 2005).

The last stage of selection became an estimation of the parameters of possible merging into a cluster: by leadership, structure, readiness to work.

The result of that multistage selection became seven pilot clusters that are at present successfully introduced by the Republic of Kazakhstan Government taking into account where we can really compete in the world market:

- tourism;
- food industry;
- oil-and-gas mechanical engineering;
- textile industry;
- transport-logistic services;
- metallurgy;
- construction materials.

There exists an opinion that the seven clusters make but little for making a real impact on the Kazakhstan economy competitiveness. However, the seven clusters are pilot projects on which example there will be presented the principle of developing other priority branches. It should be noted that not everywhere the cluster initiative is taken positively. It is normal because in economic theories there are a lot of various methods and initiatives able to affect competitiveness. The cluster development in practice recommended itself in the whole world. The best brands, the best business in the world anyhow passed through the cluster stage.

The nest theory is the conception of forming the national innovation systems (NIS) that developed in the 80-90-s of the last century. The definition "national system" is usually interpreted as "the state innovation system". The main designers of the conception of the national innovation systems (NIS) became C. Freeman, 1987; B.-A. Lundvall, 1992; R. Nelson, 1993. The authors of the NIS conception gave an important role to the processes of training and knowledge accumulating, paying special attention to their institutional aspect (i.e. organizations, principles and forms in which these processes take place) and the immediate effect of the institutional context of innovative activity on its content and structure. The scales and dynamics of the innovations development and dissemination depend on a number of interconnected institutional moments:

- the presence of specialized organizations (universities, institutes, scientific-research laboratories, design bureaus, etc.);
- their correspondence to other public institutions (legislative restrictions, traditions, values);
- their interaction with each other as elements of the collective system of knowledge developing and using.

Under the national innovation system there is understood a totality of various institutions that all together and individually make their contribution in the development and dissemination of new technologies forming the organizational-legal base that serves for the governments for forming and realizing the policy affecting the innovative process. The development of the innovation systems can be recommended for forming the innovative policy of industries and can be a working tool of the territorial development.

In accordance with the world practice of organizing innovative activity, the institutional base of the innovation system can consist of two types of subsystems (Kortov, 2004):

- scientific-technological territorially distributed clusters based on national and transnational vertically integrated corporations in high-technology branches of economy (mechanical engineering, manufacturing electronic components and systems, communication and telecommunications, manufacturing composite materials of the new generation, biochemical industry, pharmaceuticals, information technologies, etc.) and defense-industrial sector;
- regional innovation systems (RIS) characterized by a high degree of the territorial integration of science intensive business integration in the form of universities, research complexes, technological polices, technological parks.

These innovation subsystems present two different in content organizational forms of innovative complexes.

Lately in the world economic space there is observed the action of two tendencies affecting the country competitiveness and structural changes. Firstly, there are going the processes of globalization manifesting in the

increasing of the capital mobility degree, the production internationalization growth and economic relations unification. On the other hand, there are observed the processes of regionalization through territories specialization intensification, the division of labor deepening in the global scale and aspiration to regional self-provision and self-sufficiency. The existing differences in the field of business-culture with its unwritten rules, traditions, document turning and a lot of other features characteristic of different regions cause the forming of relatively independently functioning regional subsystems.

The regional innovation system (RIS) is, on one hand, a component of the unified national innovation system, on the other hand, it possesses specific characteristics conditioned by its institutional features.

The RIS is not obligatory to possess a high degree of territorial integration of organizations of scientific-innovation character. The RIS presents an integrity of organizations and enterprises located in the given territory and working for developing, commercialization and dissemination of innovations, as well as an integrity of innovation infrastructure organizations, bodies of the state (regional) management and institutions providing realization of mechanisms of innovation development satisfying both features and requirements of the NIS functioning.

The RIS heart is made by, first of all, large industrial-production enterprises, small and venture companies, special economic zones, scientific-research and educational establishments and organizations. The RIS infrastructure is presented by a wide spectrum of organizations that perform supporting functions in providing innovative processes. First of all, they are technological parks, scientific-technological centers, business-incubators providing implementation of different stages of innovative processes. An important role in the RIS infrastructure belongs to various venture foundations rendering financial support for innovative projects.

The innovation center of the RIS development is necessary for the effective management and coordination of the activity. In the RIS functioning efficiency there participate a number of mechanisms. First of all, this is the mechanism of regulation from the side of the regional administration that defines the RIS "mission". The regulating mechanism is also presented by the state bodies of regulation (ministries, agencies, etc.) that play the role of executors of the made decisions in practice. For the RIS development the active character of the investment processes in the region (investment mechanism) presented by both internal (regional) organizations and various external sources (including foreign ones) is very important.

One of the basic problems of the RIS functioning in Kazakhstan at the present day stage is low efficiency of the mechanism of knowledge and innovations transfer with which help there are interacting two environments: the entrepreneur environment and the environment producing innovations. The direct state interfering in this process based on centralization of innovations transfer provision is not realized by the entrepreneur structures. At the same time the environment initiating innovations is not in full aimed at the satisfying of the manufacturers-entrepreneurs' needs. Thus, the subsystem of innovations promotion is to implement a complex of measures for information provision of the processes of the innovation activity in the region participants. Among such measures there can be establishing regional and branch channels of inter-company communication, developing a unified information portal in the region that is to provide effective exchange between the components of the regional innovation system, developers and consumers of innovation products. Within this subsystem there must be formed the conditions for stimulating the directed diffusion of innovations, the efficient selection of priority trends of innovation development based on the methods of technological mapping, developing recommendations on preferable organizational forms of inter-company interaction for providing innovations diffusion, etc.

The successful development of innovative processes in regions requires forming a network of partnership with various in their functions organizations. One of the most important elements of innovation networks is new and nontraditional channels, forms of transferring and receiving new technologies, know-how from some organizations-participants of such networks to the others.

The need of strengthening the RIS innovation component supposes searching the trends of improving the market coordination of economic agents participating in innovative processes.

4. Conclusions

On the whole in Kazakhstan the task of supporting the innovation development is recognized as a national priority, but at the present day stage the development of innovation strategies and programs faces various problems of methodological character because, as opposed to the West countries, the country economy is in the state of serious structural transformations, forming a new institutional environment. Therefore the RIS forming problems are to find their reflection in a great number of theoretical and applied studies. In this process a useful

experience can become the RIS development and construction in several pilot regions for the purpose of developing methodology of forming the RIS satisfying the Kazakhstan conditions specificity with its further approbation in the regions.

Within the frames of carrying out the structural modernization the national economy competitiveness increase is related to the following trends:

1. The development of the Kazakhstan national innovation system (NIS) is to be performed on the basis of regional modules which require the state interfering in the regional development; so it is needed:

- the governmental support of the “scientific parks”, as well as the allocation in the Kazakhstan territory of technology transfer innovation centers;

- defining the places of allocation in the regions of Kazakhstan of HEIs with functions of research universities carrying out fundamental studies in priority for the state trends and technologies providing integration of scientific and educational activities;

- the university centers are to be allocated first of all in the reference regions (“locomotives of growth”) making the largest multiplicative effect on other regions.

2. Forming the conditions for industry modernization, supporting and developing competitive economic (territorial production) clusters. In present day economy high competitiveness of a territory is supported by strong positions of separate clusters (Dobrota, 2005). Forming clusters is becoming a condition of achieving by Kazakhstan long-term competitiveness. From here, the stimulating of economic clusters occurring is to be related to the number of priorities of the state policy of regional development. The main tasks are as follows:

- prior development of high-technological and science intensive branches, increasing the share of innovation production in the total volume of industrial production;

- efficient foreign-economic policy taking into account the future Kazakhstan joining the WTO, cooperation with the European Union, economic cooperation within the EurAsEC and in the structure of the Shanghai Organization of Cooperation (ShOC) (The Review of the World Economy, 2007).

Thus, the considered scientific-theoretical and practical approaches to the development of the Republic of Kazakhstan economy spatial and structural modernization trends are aimed at the development of the new architecture of the national economy able to provide the “achievement of the qualitatively new level of competitiveness and export possibilities” and implementation of the “integral strategy aimed at providing sustainable character of the economy competitiveness” (Fundamental principles of sustainable spatial development of the European continent, 2003).

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