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Innovation Potential of Kazakhstan's Regions: Evaluation and Ways For Development

Abstract. The paper aims to evaluate innovation potential of regions in the Republic of Kazakhstan and propose ways for its development.

Despite the fact that regional innovation systems in Kazakhstan have been formally established for more than 10 years, there are a lot of unsolved problems and lack of understanding in this field. This defines the urgency of identifying real innovation potential of regions in our country with following attempts to find solutions.

Key words: innovation, innovation potential, regions, Kazakhstan, development

Introduction

Recognition of the role of innovations in the modern world has generated a large number of theoretical and applied researches. The nature of innovations and innovation processes and their role in competitiveadvantages formation are the subject under consideration in (Porter, 1998a, 1998b; Dosi, 1988; Feldman and Audretsch, 1999; Zhits, 2000). K.M. Misko (1991), G.Schienstock (1996),L. Botazzi and G. Peri (2003), B. Asheim and M. Gertler (2004) studied innovation processes at national and regional levels. Innovation potential of the regions is one of the most important factors for regional competitiveness. G.I. Zhits (2000) defines innovation potential as a system of resource provisionfor the system to function at the level which corresponds to the world's level or higher. Repchenko and Fokin (2007) states that the expert evaluation of innovative potential of the region should be carried out within four sections: technical scientific potential, educational potential, investment potential, and potential of the consumer's sector. According to Martin (2003) many internal and external factors, starting with business partners, customers, competitors, over the disposable human capital, regional knowledge infrastructure, and ending with institutions, regulations and legislation create so called Regional Innovation System (RIS).

Multidimensionality of the innovation concept and great variation in innovation processes, in terms of their objectives, organization, cost and use of research results stipulate for the absence of the innovational potential integrated indicator (Korobeinikov et.al, 2000). On the other hand, modern literature on economics suggests various methods and models for the evaluation of innovativedevelopment of the region (IDR) as well as in the system of strategic management (Tafti, S. F., Jahani, M., Emami,S. A., 2012, Kortelainen, S., Lättilä, L., 2013). According to S.V. Kazantsev (2012), while doing research of a specific item with a specific target, one should not over-expand the set of indicators, taken into consideration, and should not increase the precision of their quantitative representation to the fullest extent. Therefore we used two approaches in identifying factors and correlation between them in this research.

Based on multivariate correlation-regression analysis, calculation and trying different models we have been able to identify and justify the equation satisfying the criteria according to the gross regional product of the system of indicators for innovative activity regions of Kazakhstan.

Methods

Using the method of successive inclusion, we found that the most acceptable is the 5-factor model, which has the form (see formula 1)

$$Y = 185384 + 13179X_1 + 18{,}52X_2 + 2{,}67X_3 + 917{,}3X_4 + 159{,}76X_5, (1)$$

Y – gross regional product, millions tenge;

X_1 – the number of innovatively active enterprises and organizations, units;

X_2 – the volume of innovative production that has been improved, millions tenge;

X3 – a total volume of innovative production, millions tenge;

X4 – investments in main capital per capita, thousands of tenge/people:

X5 – number of employed, thousands of people. As a result, a high level of correlation coefficient approaching a unit (R=0,83) indicates a close connection between the identified factors and gross regional product. The resulting model was the basis for assessing the level of innovative potential areas of the Republic of Kazakhstan and the subsequent ranking on this criterion.

Then, sharing the view of Professor O. V. Kuur (2009) who states that innovation potential can be calculated starting from the GRP; we offer our formula (see formula 2):

$$Y = \frac{X1 + X2}{GRP} \times 100\%$$

Y – innovation potential;

X1 – expenses on technological research = A+B;

A – expenses on product innovations;

B – expenses on process innovations;

X2 – expenses on research and development.

The choice of the mixed methods has been preconditioned by several factors. Data sources triangulation allows overcoming limitations and lessening the biases of the research methods and ensuring results convergence. Besides, it provides a comprehensive analysis of the research problem contributing to the investigation objectivity.

In the next part of the research, after identifying potential ratings of regions, we studied more than 50 secondary sources of information, including laws, concepts, programs, events and reviews of major international organizations. That allowed us to identify key problems and propose ways for development of regional innovation potential.

Main body

In the result of first part of research we found out there are substantial differences in the level of innovation potential of the regions in the Republic of Kazakhstan, meanwhile most regions' innovative features and potential can be assessed as average. It should be noted here that there are 14 regions and 2 major cities in Kazakhstan. By using the formula (1), it is estimated that the innovation potential ranges from 70.03 points in Almaty city to 2.63 points in Kyzylorda region. Thus, there is a large enough gap between the maximum and minimum values for this indicator. Results of estimation by formula (2) also showed that the innovative potential of oblasts ranges from 5.97 in the East Kazakhstan region to 0.06 in North Kazakhstan and Kyzylorda regions, which supported previous calculations.

After analysis of previously used methods, it can be concluded that the ranking of the level of innovation potential of regions takes place in the following order:

– High level of innovative potential: East Kazakhstan (3 matches), Almaty city (2 matches), Pavlodar (2 matches) and Zhambyl regions (2 matches);

– Low level of innovative potential: Almaty (2 matches), Mangistau (2 matches), West Kazakhstan (2 matches), Kyzylorda oblast (2 matches).

Key factors which hinder innovative development of regions were identified as follows:

– Limited domestic demand for innovation.

– The lack of a systematic approach in support of innovation infrastructure operation.

– The lack of specialists in innovation management.

– Low level of innovative culture of the business community.

– Low commercialization of research results as a consequence of poor relation between university and industry.

Table 1 – Measures for improving the effectiveness of public policy in the innovative development of regions

Related area of measures	Ways to implement measures to improve efficiency
Legislative basis	1. Strengthening the protection of intellectual property rights 2. Adoption and implementation of simple and clear regulatory acts for public-private partnerships in innovation 3. Suppression of unfair competition 4. Reduction of the burden on the business sector for government bureaucracy
Cooperation and coordination of elements of the innovation system	1. The mobilization of the business sector 2. Transfer of knowledge and technology commercialization 3. Coordination of activities of the state in the sphere of innovation 4. Strengthening regional government in innovation 5. Monitoring and evaluation

Support for high-tech industries	1. Measures to improve the survival rate of new high-tech companies 2. Promotion of exports of high technology products 3. Promote innovative activity in state-controlled companies
Commercialization of the results of research and development	1. Implementation of the system analysis and evaluation of the effectiveness of the investigations 2. Encourage international scientific and technological cooperation 3. Development of innovative activity of small and medium-sized companies
Stimulating innovative activity	1. Development of motivation research staff 2. Support of R & D investment by the business sector through the provision of tax incentives 3. Improving access to «seed» and venture capital for new companies
Building human capacity and human resources in the innovation sector	1. Increase the number of young researchers and raising the level of existing knowledge of researchers 2. Increasing the mobility of and renewal of research staff 3. Modernization and expansion of innovative infrastructure in the new priority areas of research 4. Enhancing innovative activity based clusters

Thus, the whole complex of state-level initiatives should contribute to the revival of high-tech industries, and strengthen their position both on the domestic and foreign markets. The result should be an increase in overall economic activity of industrial enterprises, improving the investment climate and socio-economic situation in the country. The above measures of state regulation would contribute to a gradual transition to a more efficient form of interaction between the state, business and science, where most costly part of R & D funded by big business and the state is responsible for funding of basic research.

Conclusion

Levels of research and innovation in a region have long-term and cumulative effects on regional prosperity. EURAB report (2005) emphasizes that the challenge which policy makers are facing is how tounlock the potential for research and innovation which exists in each region through mobilizing the actions of individuals and organizations. This is best undertaken at aregional level for it is within regions that policies to stimulate research and innovationcombine to influence levels of activity 'on the ground'.

Having examined the measures taken by the Government of the Republic of Kazakhstan and foreign countries previously, list of measures were designed to improve the effectiveness of public policy in the innovative development of regions (see Table 1)

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