

# The Formation of Innovative Clusters in Kazakhstan: Analysis and Methods for Identifying Specialization\*

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## Abstract

The aim of this research is theoretical and methodological approaches to the necessity of formation of innovation clusters as growth poles on the basis of statistical analysis and identification of specialization. In this research, we used methods, which will allow to analyze of innovative processes and to identify of prospective branches of specialization of the formation of innovative clusters in the spatial context. Keeping with the previous literature, the present study is determined by the novelty of the problem, concerning the formation and development of innovative clusters as growth poles, as well as large specifics of problems in our country in the framework of use of innovative clusters. An analysis was showed that Kazakhstan's regions have substantial differences in the groups of regions for most of the indicators have presented form a tightly located clusters and in the ratings of innovative susceptibility and innovative activity. This research has some practical implications, which have proved that innovative clusters become platforms as growth poles for introduction of advanced technologies, development of innovative companies, thereby providing a certain stability of the economy of the regions.

**Keywords:** Cluster; Innovative Cluster; Regional Development.

**JEL Classification:** O31, R11, R12.

## 1. Introduction

The relevance of the problem is caused by occurring in the world and in our country globalization processes in economic

development are directed on need for considerable economic, technological and innovative changes. In 2013-2014 the space of Kazakhstan will develop with really narrow level of opportunities caused by objective factors and barriers of development. The adequate choice of priorities of policy of the state is capable to strengthen influence of positive factors and to soften influence of barriers. But the speed of innovation growth and increase of competitiveness of national economy will depend on this choice.

Thus, will it to be possible to reduce from these barriers with the first challenge is to understand general patterns and trends territorial development. The second challenge is to highlight of objective and subjective conditions and opportunities for improving the competitiveness of the national economy. The third challenge is to form and develop a zone of innovative development, which are capable to transfer innovations at the periphery of the country.

The answer to these challenges will be able to find a cluster approach – organizational model that allows to concentrate its resources and to build partnerships. All this causes relevance of development of theoretical and methodological approaches to formation of ways of innovative development of territories of Kazakhstan within cluster initiatives. In the preceding studies on the theory of the structure and the efficient organization of economic space based on the “growth poles” or on the “agglomeration effect” (i.e. predominating and strongest developing), which take the diffusion of growth is expected to occur towards the surrounding region (Romer, 1986; Krugman, 1991; Steiner & Hartmann, 1998; Bergman & Feser, 1999; Keeble & Wilkinson, 1999). So, Kazakhstan according to these conceptual views is in transition from benefits of “first nature” based on the factors of natural resources, to the priorities of the “second nature” based on the agglomeration effect, human capital, infrastructure and institutional environment. The factors of “second nature” must play a key role in the formation of innovative clusters. Because agglomeration is a set of geographically concentrated organizations are united by a certain sphere of activity.

In our opinion, the strategic plan of the formation of innovation clusters, must be identified so-called “growth poles”, the development of which will be accompanied by a multiplicative effect for the innovation base of the territory. The re-

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regions of Kazakhstan need to diversify their production structure. The main task for the diversification of the regions is the search for new industries (based on innovation), which should be developed. We think that this task can solve a cluster approach to the placement of production facilities with a view of the agglomeration effect. So, we offer at the first stage of expansion of global competitive advantages of Kazakhstan's economy in the traditional economic sectors (energy, industry, processing of natural resources). Simultaneously, should create the conditions for the formation of a number of innovative clusters through "growth poles". Such an approach would make a breakthrough in increasing the global competitiveness of the economy on the basis of transition to a new technological base (information, biotechnology etc).

In this study we use the method of statistical analysis of innovative processes and method on the basis of determination of branches of specialization. These groups of methods are the most specific and recommended for identifying "growth poles" for the formation of innovative clusters. Therefore, we propose to form of innovative clusters with regard to the agglomeration effect. So, due to the high level of influence on the regional economy innovative clusters represent as growth poles, the impact of which will lead to the maximum return not only for the region but also in the whole country.

Thus, aim of this research is theoretical and methodological approaches to the necessity of formation of innovation clusters as growth poles on the basis of statistical analysis and identification of specialization. The study is divided into the following sections. The Section 2 proposes to consider the theoretical aspects of the formation of innovative clusters in the spatial context. Section 3 sets the method of statistical analysis of innovative process and method for identifying of specialization. Section 4 is a concluding part.

## 2. Theoretical Aspects of Innovative Clusters in the Spatial Context

Recent research shows that for developing countries, such as Kazakhstan's economic growth was accompanied by increased spatial inequalities. Naturally, that for Kazakhstan spatial factor is important, because our country has a huge territory. Therefore, all attempts to carry out the modernization and diversification of Kazakhstan's regions still face barriers. The world experience proves that the highest competitiveness and economic growth is ensured factors, which stimulate the introduction of new technologies. An important task is the development of such factors that will drive growth through investigation of the process of clustering in the spatial context. There is an opinion that established a stable consensus spatial development: it may not be uniform.

Today there are some basic directions of development of territorial systems. We offer the following types of the directions:

- "territorial and spatial" on the basis of search of the best placement of competitive (advanced) production and the enterprises concerning sources of raw materials, energy, each other, and also consumers within separate territories (Kireyeva & Nurlanova, 2013);
- "complex" development on the basis of the formation of system approach to management of areas with different levels of economic development and functional status of the business within the territorial units (Barmashevaetal, 2008);
- "point-innovative development" on the basis of geographical concentration of similar enterprises creates a certain market for suppliers and provides scope for strengthening their specialization, as well as the dissemination of new innovative ideas and information between enterprises (Yespayev & Kireyeva, 2013).

Thus, the third direction is important within our research. So, it becomes obvious that the path of cluster development improves the conditions for diffusion of innovations in the spatial context. Thus, we distinguish two main theory of cluster development, which lie in the basis of our research. This study will attempt to expand research in the field of these two theories, and to propose mechanisms for the formation of innovation clusters in the spatial context.

First, it is the idea of "agglomeration effect" by Krugman (1991) – main factor of development is the accumulation of industrial activity in certain geographically interconnected regions, which gives an advantage to enterprises due to increase of their size or from positive externalities arising due to the market presence of other enterprises. It's the study of processes of spatial concentration of the economy, including in the framework of the "new economic geography" (Fujita & Krugman, 2004). The fundamental cause of economic inequality is a process that has long considered the concentration of economic activity in those places which have comparative advantages, to reduce business costs. Krugman (1991) considered that primordial uneven distribution of production in the transition to the equilibrium leads to the formation of agglomerations. The emergence of agglomerations he associates with the concept of increasing returns to scale. Ultimately, uneven development of regions supports agglomeration of industrial activity areas. Therefore Krugman (1991) proposed to create clusters not as a fixed flow of goods and services, but as a dynamic structure based on knowledge creation and innovation.

This theory is further supplemented and developed by Romer (1986). According to him, the main factor of the development in theory of "innovative growth" is the accumulations of productive activities in certain regions which can be united by a certain sphere of activity (Romer, 1986). Industrial processes are occurring in the economy of the countries and enterprises (innovative process) – innovative stage in the growth of management, they cause the phenomenon of the so-called "new growth theory". Such innovative orientation is becoming the main characteristic of clusters, because it determines their competitiveness. Secondly, other researchers have considered clusters as "growth

zones” or “growth poles”, which can be geographically concentrated, typically inside the agglomeration area (Steiner & Hartmann, 1998). The clusters aren't only related and supporting industries, but rather related and supporting institutions, which become more competitive on the basis of their association (Bergman & Feser, 1999).

All these theories aren't competitors, but they complement each other. In essence, these theories are applied in parallel and in various combinations, depending on the characteristics of the national economy. It should be noted that centers or areas of the economic space, in which there are enterprises of leading industries and there are opportunities for the development of cluster structures, become poles of attraction factors of production, as they provide their most efficient use. According to the theories we can conclude that the formation of innovation clusters can be evolutionary in two ways (in the spatial context):

- the first way – by the hierarchical system of cities (i.e. from the most big cities to smaller cities in size and status);
- the second way – by the system from centers in the surrounding areas (i.e. “spilling” the neighboring territory, which is especially intensively develops in the limits of the largest agglomerations).

In our opinion, the theory of “agglomeration effect” (Krugman, 1991) and the theory of “innovative growth” (Romer, 1986) show how important a role in the development of the country is played by the city: it is not only the “reference frame” of settlement, but the “engines” translation impetus of innovation at the periphery. It is these two theoretical sights are the basis of our research in the field of formation of cluster structures in the spatial context. So, need to understand under the cluster approach that different industries could positively influence each other in close geographical location. When deciding on the establishment of new innovative enterprises in the regions should take account of this cluster effect. Thus, the most important direction clustering of regions is the spatial aspect.

So, one should highlight the hypothesis that the formation of innovative cluster structures should begin from centers or areas of the economic space, in which there are enterprises of leading industries and there are opportunities for the development of cluster structures, become poles of attraction factors of production, as they provide their most efficient use. This approach provides an effective transformation of inventions into innovations, and innovation in competitive advantages of the cluster.

### 3. Methods

The methods used in this research are aimed to provide analysis the process of innovative development of regions of Kazakhstan and to identify priority sectors for accommodation innovation. The study involves the use of general economic indicators, analysis methods development of a region, to determine its economic profile and place in the economic complex

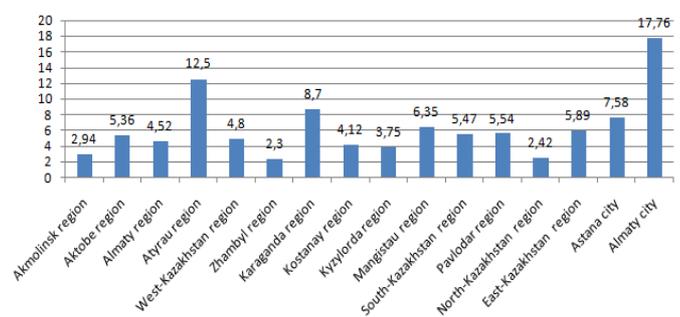
of the country. In accordance with diverse backgrounds to study the process of innovative development of regions can use certain methodological approaches (Balabanova, 2009; Koshkarov, 2012). Such methodological approaches will help to define the most competitive territory in which it is possible to form effective of innovative clusters.

On the basis of the methods used to assess possible to do the following: to establish the compliance of the existing level of innovation development of a region; to determine the conformity of the productive forces of the region with its economic conditions; to identify the growth pole for broadcast innovation. The experience shows that as important indicators that can assess the existing level of innovation development of regions can be used the following indicators used in this study:

- gross regional product (GRP) and the rate of growth of the gross regional product;
- level of labor productivity and the number of employed population in the regions;
- total volume of innovative products in the regional economy, including per capita and the dynamics of these indicators;
- research and development (R&D) costs and expenditure on technological innovation;
- derivatives and other indicators that reflect the specific characteristics of the innovative potential of the region.

#### 3.1. Statistical Analysis of GRP and Innovative Process in Regions

At this stage we propose to analyze the economic potential of innovative processes in regions. Thus the evaluation of innovative processes should begin with the analysis of GRP, dynamics of sector and territory structure of GRP, analysis of indicators of GRP per capita, fixed capital investment and industrial development in the spatial context. For a start, Kazakhstan occupies 2.724.900 sq km (thus being the 9th largest country of the world). Unlike other countries, Kazakhstan is characterized by: huge territories, low population density and highly dispersed production potential. Administratively Kazakhstan is comprised of 14 regions and 2 cities of republican subordination. So, *Figure 1* illustrates the dynamics of GRP for 16 regions of Kazakhstan.



<Figure 1> Dynamics of GRP of Kazakhstan in 2012 (in %)

As shown in Figure 1, that the first place and the most high dynamics shows Almaty city – 17,76 %, Atyrau region according to this data takes the second place – 12,5%. Then there are the following regions: Karaganda region (8,7%), Astana city (7,58%) and Mangystau region (6,35%). The lowest share in GRP demonstrated by such regions as Akmolinsk (2,94%), Zhambyl (2,3%) and North-Kazakhstan (2,42%). The stable indicators share of GRP of Almaty city in the general structure caused by the development of the sphere of services, which includes telecommunications, financial, insurance and other industries. In turn, the stable indicators share of GRP Atyrau region and Mangystau region is characterized by dynamic development of oil and gas industry. The greatest reduction in participation in proceedings of GRP shows in the Kostanay region (for 7%), East-Kazakhstan region (for 5,5%) and North-Kazakhstan region (for 5.1%).

Over the past 10 years, the territorial structure of GRP of Kazakhstan has undergone some changes. So, in 2002 the greatest shares of this indicator are concentrated in Almaty city, Atyrau region, Karaganda region, East-Kazakhstan region and South-Kazakhstan region (on their share accounted for a third of total GRP). By the end of 2012 almost half of the country's economic potential are concentrated in such regions as Almaty city, Astana city, Atyrau region, Karaganda region, Mangystau regions. Analysis of the main indices of GRP of the regions of Kazakhstan for 2012, such as the total volume, the specific weight of regions, growth index and GRP per capita, let's make the conclusion that the lost of the positions advanced industrial regions, as well as that was formed the new leaders of the regional development – Atyrau region, Mangystau region, West-Kazakhstan region, Astana city and Almaty city (Table 1).

So, statistical analysis has revealed the regions-outside: South-Kazakhstan region, Kostanay region, Akmola region, Almaty region and North-Kazakhstan region. Also this rating showed that in the regions of Kazakhstan there are indeed some changes in the territorial structure of industry. In recent years a considerable growth of industrial production is observed in the oil and gas regions – Atyrau region and Mangystau region. The share of these regions in domestic industrial production increased by 38,8 % in 2012.

According to the theory of “innovative growth” by Romer (1986), main factor of economic growth is the increase in investments in research and development (R&D). Currently, innovative process is now normally seen as an activity to development of national economy and competitiveness generally, but it can be argued there is, there are important spatial aspects to the process of innovation – ranging from the production arrangements of enterprises engaged in R&D (Castells & Hall, 1994; Sternberg, 1996). Hence, the R&D employees can be considered the necessary resource for innovative processes, while the factors presented below represent supportive elements (Broekel & Brenner, 2011).

So, one of the key component of the innovation process will be R&D. For full and objective evaluation of innovative process and the dynamics of future innovation potential, need to use statistical data. From a quantitative point of view the scientific potential of qualified specialists does not meet the needs of innovative development. Data on the number of staff employed in R&D can be seen in Table 2.

<Table 1> Ranking of Regions of Kazakhstan According to the Main Indicators of GRP in 2012

	The main indicators of GRP				Rating of regions in terms of GRP per capita, ranking position
	Volume GRP, mln.KZT	Share of regions in the GRP, %	Index of physical volume of GRP in relation to 2011, %	GRP per capita, thnd. KZT	
Republic of Kazakhstan	30 218 544,3	100,0	105,0	1 799,4	
Akmolinsk region	815 177,4	2,7	93,9	1 113,4	13
Aktobe region	1 534 424,8	5,1	108,4	1 939,3	7
Almaty region	1 459 471,2	4,6	106,2	757,0	14
Atyrau region	3 105 359,0	12,1	98,1	5 655,4	1
West-Kazakhstan region	1 728 736,7	4,9	103,5	2 810,2	5
Zhambyl region	778 240,3	2,3	112,7	732,0	15
Karaganda region	2 576 849,4	8,8	99,8	1 893,8	8
Kostanay region	1 110 497,9	4,2	95,6	1 262,2	11
Kyzylorda region	1 180 334,1	3,9	104,7	1 639,6	9
Mangystau region	1 982 137,1	6,4	102,8	3 559,2	4
South-Kazakhstan region	1 684 069,9	5,5	108,0	635,5	16
Pavlodar region	1 466 131,9	5,4	107,4	1 959,8	6
North-Kazakhstan region	677 541,1	2,4	92,8	1 164,9	12
East-Kazakhstan region	1 761 063,9	5,8	113,7	1 262,9	10
Astana city	2 717 262,4	8,5	112,4	3 573,0	3
Almaty city	5 641 247,2	17,3	109,4	3 856,1	2

Source: Statistical Yearbook of the Republic of Kazakhstan by the Agency for Statistics

&lt;Table 2&gt; Number of Enterprises Engaged in R&amp;D in the Regions of Kazakhstan in 2008-2012

	2008, pcs	2009, pcs	2010, pcs	2011, pcs	2012, pcs	2012 in relation to 2008,%
Republic of Kazakhstan	421	416	424	412	345	81,9
Akmolinsk region	8	7	7	8	9	112,5
Aktobe region	16	15	16	18	16	100,0
Almaty region	12	7	10	8	7	58,3
Atyrau region	11	12	12	9	9	81,8
East-Kazakhstan region	35	34	33	36	34	97,1
Zhambyl region	11	12	10	7	8	72,7
West-Kazakhstan region	10	10	10	9	15	150,0
Karaganda region	40	29	28	29	26	65,0
Kostanay region	13	14	15	13	14	107,6
Kyzylorda region	7	9	14	23	7	100,0
Mangystau region	7	6	8	8	7	100,0
Pavlodar region	11	10	9	11	11	100,0
North-Kazakhstan region	5	5	5	3	3	60,0
South-Kazakhstan region	11	10	9	9	11	100,0
Astana city	41	43	42	41	49	119,5
Almaty city	183	195	196	180	119	65,0

Source: Statistical Yearbook of the Republic of Kazakhstan by the Agency for Statistics

According to these data, for the period 2008-2012 there is a reduction in the number of enterprises engaged in R&D for 81,9%. Reduction in the number of enterprises engaged in R&D, means that lost an important place in the links of production and science, as well as decreased the shortest way of introduction of scientific results into production. Besides, for the period 2008-2012 is the greatest decrease in the number of organizations engaged in R&D show Almaty city (58,3%), North-Kazakhstan region (60,0%) and Karaganda region (65,0%). There is an objective reason for such a substantial reduction of the scientific enterprises: financial situation of many industrial enterprises does not allow for the support of scientific and design studies (although the relevance of such studies is very affects the competitiveness of production in the field of innovation).

However, some regions of Kazakhstan during the analyzed period 2008-2012 demonstrate a high level of scientific potential by increasing the number of enterprises engaged in R&D. In particular: West-Kazakhstan region (150,0%), Akmolinsk region (112,5%), and Astana city (119,5%). Certainly in Astana city increase in the number of research organizations is connected with forthcoming international exhibition "Astana EXPO-2017". The regional economic policy should focus on creating of en-

abling environment for an innovation stage in the under-developed regions, such as to create of educational and scientific centers. Thus, innovative activity can be maintained by the creation and development of such structures as innovative clusters on the basis of industrial parks, technology incubators, and data banks of innovation. So, we conducted a study of innovative processes in the regions in order to identify the points of growth, which have the necessary conditions for the formation of innovation clusters (i.e. they have a sustainable system for the dissemination of new technologies and knowledge, so-called technological network based on the joint scientific or production base).

*Generalization* it's necessary to develop the innovative infrastructure of the region by strengthening the knowledge-intensive industry, and to improve of the innovation capacity of the economy through the centers for innovation generation (techno parks, techno polis, laboratories and research units). Innovative clusters become a kind of a "platform", which can accelerate the process of innovation, and cluster participants develop such benefits as innovative susceptibility and innovative activity.

### 3.2. Identifying of Specialization of the Region

It should highlight that the leading role in achieving a competitive stability of the region belongs to the clusters. So, Porter have given definition of clusters as "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g. universities, standards agencies, and trade associations) in a particular field that compete but also cooperate" (Porter, 2000 p.15). Exactly clusters are critical mass necessary for competitive success in certain industries. It's so obviously innovative clusters most known or positive effects of the agglomeration effect, such as the proximity between enterprises facilitating collaboration, important R&D environment and a high degree of interaction and knowledge sharing of entrepreneurship and innovation. In many, if not most, cases enterprises cooperate with each other in terms of labor, access to knowledge, producers linkages and access, or some optimal mix all of these factors (Scott, 1990; Keeble & Wilkinson, 1999)

Therefore, one of the important tasks is to improve competitiveness of the region, i.e. to identify potential clustering of the region. So, analysis will help to identify of the competitive stability of the region, which depends on the specialization. Thus, very interesting issue is the degree of regional specialization in Kazakhstan. In this study used the method is based on determination of branches of economic profile of the region and the substantiation of directions of its effective specialization. This method is more specific, and also it is recommended for definition of expediency of formation of cluster in the region (Kireyeva, 2013).

All industries of specialization of the region must be considered together, as an element of its economic complex and from the position of the leading enterprises of the natural and eco-

conomic conditions, and also the competitive advantages of the territory (Gavrilov, 2002). So, during the analysis should focus on the possible changes of the prerequisites of specialization and the emergence of new conditions. So, creation of new technologies or the discovery of new natural resources can affect change in specialization and create conditions for the development of new directions of specialization of the region. A generalized indicator to determine the specialization of the region can serve as the share of manufactured products in the total production of the country. It's necessary to make a quantitative assessment of the potential clustering through of identifying specialization of the region (Novokshonova, 2013). But often to quantify the level of specialization of the regions have used coefficient of localization – CL (Yusupov, 2006).

Industries which have coefficients of localization of more than 1 (one), and products which are in a large extent taken out from the city to other regions and other countries, can be assigned to the branches of production specialization. Indicators are below 1 (one) characterize the greatest possible degree of satisfaction of the needs of the city from its own production.

Coefficient of localization can be calculated by the formula:

$$CL = \left( \frac{V_{bc}}{V_{br}} \times 100 \right) : \left( \frac{V_{ic}}{V_{ir}} \times 100 \right) \quad (1)$$

Where: CL – coefficient of localization;

$V_{bc}$  – volume of production of industry specialization of the city;

$V_{br}$  – volume of production of industry specialization of the region;

$V_{ic}$  – volume of industrial production of the city;

$V_{ir}$  – volume of industrial production of the region.

It should be noted if coefficients of localization greater than or equal to 1 (one) there is a possibility of formation of cluster in the region in the near future. Thus for the formation of clusters and selection of the most priority clusters, it's appropriate to evaluate the dynamics of the coefficients of localization (Novokshonova, 2013). Thus, the increase in the values of indicators in dynamics testifies to the possibility for accommodation cluster in the region. In turn, the reduction indicators dynamics shows on the need to develop a new product line, expand the range of products and urgent modernization of production, i.e. there aren't prospective of formation of cluster in the region. Therefore, the determination of the coefficient of localization or branch specialization of the regions allows us to concentrate maximum efforts and resources on such activities, in which the benefits are more. It gives the possibility to optimize costs of all kinds of resources so as to ensure the required pace of innovative development in those branches where the greatest impact is achieved.

In general, the specific methods have their own variant for preferred use. However, the level of economic development of the region depends on the performance of enterprises represent-

ing the industry specialization, which has a significant influence on the development of associated infrastructure industries. In fact the hallmark of a cluster is the concentration of specialized enterprises in a particular industry. The contradiction lies in the fact that there is no direct dependence between specialization and integrated economic development of the region (Rohchina & Zhilkina, 1999). It should be noted that enterprises included in the cluster are more innovative.

Taking into account the above, we begin the calculation of the indicated coefficients of localization for certain regions of Kazakhstan: Karaganda region and East-Kazakhstan region. It should be noted that the calculation of the coefficient of localization will make for six sectors: metallurgy; manufacturing; machine building; electric power; chemical; production of construction materials. All data are absolute units and taken from Statistical Yearbook of the Republic of Kazakhstan by the Agency for statistics in 2008-2012.

As an example, we offer calculation of the coefficient of localization for Karaganda region. In Karaganda region the first place in the structure of the industry are enterprises of a mining branch. Second place is occupied by the enterprises of ferrous and non-ferrous metallurgy, production of which is export oriented. In Table 3 presents coefficients of localization for Karaganda region.

<Table 3> Coefficients of Localization for Karaganda Region in 2008 and 2012

No.	Branch	2008	2012	2012 compared to 2008
1	Metallurgy industry	3,1	4,0	↑
2	Manufacturing industry	2,0	2,4	↑
3	Machine building industry	0,4	0,3	↓
4	Electric power industry	0,9	0,7	↓
5	Chemical industry	0,9	1,2	↑
6	Production of construction materials	0,2	0,4	↑

According to this data there is a growth factor for localization for metallurgy, manufacturing, chemical and production of construction materials industries. Reduction of this indicator shows machine building and electric power industries. Thus, the most developed in Karaganda region metallurgical industry, i.e. the value of the coefficient of localization indicates that this industry is a branch of specialization of the region. In general, the calculated coefficients of localization can be interpreted as follows: they show how many times concentration of a particular industry more (or less if the value is less than 1) than the regional average. The high value of the coefficient indicates that the industry is a branch of specialization of the region. Industry specialization play a leading role, indicate the direction of production and the role of the region in the territorial division of labor.

So, coefficient of localization has identified the most effective

cluster groups in Karaganda region:

- “Cluster for metalworking” – an innovative project, which includes metalworking enterprises, welding companies, manufacturers of machinery and equipment, construction companies, scientific research institutes and other related sectors.
- “Coal-energy cluster” – an innovative project that combines itself, mining, power generating and processing capacities, construction companies, scientific research institutes and other related sectors on the basis of Shakhty coal basin.

So, we begin the calculation of the indicated coefficients of localization for East-Kazakhstan region. In East-Kazakhstan region the first place in the structure of the industry are the enterprises of a metallurgy branch. Second place is occupied by enterprises of machine building industry. In Table 4 presents coefficients of localization for East-Kazakhstan region.

<Table 4> Coefficients of Localization for East-Kazakhstan Region in 2008 and 2012

No.	Branch	2008	2012	2012 compared to 2008
1	Metallurgy industry	2,6	3,2	↑
2	Manufacturing industry	1,8	2,6	↑
3	Machine building industry	1,4	1,5	↑
4	Electric power industry	0,9	0,7	↓
5	Chemical industry	1,1	0,9	↓
6	Production of construction materials	0,7	0,5	↓

According to this data there is a growth factor for localization for metallurgy, manufacturing, and machine building industry. Reduction of this indicator shows electric power, chemical and production of construction materials industries. Thus, the most developed in East-Kazakhstan region metallurgical industry, i.e. the value of the coefficient of localization indicates that this industry is a branch of specialization of the region.

So, coefficient of localization has identified the most effective cluster groups in East-Kazakhstan region:

- “Nonferrous metallurgy cluster” – an innovative project on the basis of aluminum and aluminum smelter in Ust-Kamenogorsk city will help build a complete chain, from bauxite extraction, obtaining alumina, primary aluminum and manufacture of products from aluminum, i.e. will be created fourth and fifth repartition of the production of aluminum.
- “Metallurgy-machine building cluster” – an innovative project, which will unite the efforts of metallurgical, engineering and other companies working with metal, i.e., create a cluster group on the basis of rational use of energy saving technologies.

*Hypothesis* – findings suggest since calculated coefficients of localization of more than 1 that there are certain prerequisites and opportunities for the further formation of clusters in the considered sectors. In this connection, the region also has certain possibilities for association of efforts of metallurgical, coal-mining, manufacturing, engineering and other companies, aimed at creat-

ing conditions for further development of the cluster groups.

The result will be created industrial structure of the cluster, which will bring to a qualitatively new level of a coal mining and metallurgy, processing and consumption. Clusters become platforms as growth poles for introduction of advanced technologies, development of innovative companies, thereby providing a certain stability of the economy of the regions. In this context, we define that the development of innovation clusters in Kazakhstan will become more effective, if it will follow by principle of identification of specialization of the region, which is aimed to identify and development of the unique competitive advantages of the region and formation of cluster around them.

## 4. Conclusions

This work marks a starting point for further research in the field of the formation and development of innovative clusters in the spatial context. It provides some suggestions for improvement of future studies dealing with this subject. It also delivers innovation specific insights into the coherence between the city-centers and peripheral regions. On the basis of these research findings of this paper, the practical implications are listed below:

First, the theoretical part of this study shows the importance of theory “agglomeration effect” and “innovative growth”, they aren’t compete among themselves, but they complement each other. In essence, these theories are applied in parallel and in various combinations, depending on the characteristics of the national economy. In our opinion, these theories show how important a role in the development of the country is played by the city: it is not only the “reference frame” of settlement, but the “engines” translation impetus of innovation at the periphery. It is these two theoretical sights are the basis of our research in the field of formation of innovative clusters in the regional context.

Second, monitoring of the innovative process in the regions of Kazakhstan showed heterogeneity of innovative space. Over the past four years was registered a decline in the number of enterprises, R&D, which is connected with the decrease of demand for innovations in the Kazakhstan economy. Therefore, regional policy should focus on creating of enabling environment for an innovation stage in the underdeveloped regions, such as to create of educational and scientific centers. So, innovative activity can be maintained by the creation and development of such structures as innovative clusters on the basis of industrial parks, technology incubators, and data banks of innovation. In between the centers and peripheral areas, there is movable area of the semi-periphery, which is more active and when a sudden change of conditions of development they can intercept functions of the centre. All this proves how important a role in the development of the country play “growth pole”: it’s not only the “reference point” to distribute, but it’s the main “engine” to translate innovations at the periphery. Innovative clusters be-

come a kind of a “platform”, which can accelerate the process of innovation, and cluster participants develop such benefits as innovative susceptibility and innovative activity.

Third, method for identifying of specialization will help find the most effective cluster groups, which become poles of attraction factors of production, as they provide their most efficient use. In our opinion, the regions based on mining and manufacturing industry in its development should seek to strengthen the processing of raw materials and to increase the competitiveness of industries. Attention should be paid to the development of production and engineering sphere services. Calculated coefficients of localization shows there are certain prerequisites and opportunities for the further formation of clusters in the considered sectors. A number of large cities of Karaganda region and East-Kazakhstan region could play the role of “translators” of innovations. After all, formation of innovative cluster structures should begin from centers or areas of the economic space, in which there are enterprises of leading industries and there are opportunities for the development of cluster structures; become poles of attraction factors of production, as they provide their most efficient use. The result will be created industrial structure of the cluster, which will bring to a qualitatively new level of a coal mining and metallurgy, processing and consumption. Clusters become platforms as growth poles for introduction of advanced technologies, development of innovative companies, thereby providing a certain stability of the economy of the regions.

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