DOI 10.52260/2304-7216.2020.1(42).3
UDC 332.12
SCSTI 06.61.33

A. Nurbatsin*, *PhD student*[1]
A. Kireyeva, *PhD, Leading Researcher*[2]
University of International Business[1],
Almaty, Kazakhstan
Institute of Economics MES RK[2],
Almaty, Kazakhstan
* - main author (author for correspondence)
e-mail: nakans_kz@mail.ru

CLUSTERING OF REGIONS BASED ON ECONOMIC GROWTH FACTORS: THE STUDY OF KAZAKHSTAN

The theoretical frameworks of economic growth are considered, and key indicators for assessing the economic development of regions are identified. A cluster analysis of Kazakhstan's regions was conducted, according to a set of economic growth factors. Based on the results of the analysis, a classification of the country's regions is proposed. The level of economic development of regions, according to the theory of sustainable economic growth, was estimated using a number of indicators, which include innovation activity, human capital, private capital, public capital, regional accessibility, regional concentration, and gross regional product (GRP) per capita. Thus, with the help of cluster analysis of factors of socio-economic development of Kazakhstan's regions, we were able to structure indicators of their economic growth by the degree of similarity, and identify 8 regional clusters. The results obtained can be used in the formation of economic, social, and financial policy of the state, taking into account regional features of the Republic's development.

Keywords*: economic growth, cluster analysis, regions of Kazakhstan, growth factors, regional development, clusters, Ward's method, Euclidean metric, GRP, Kazakhstan.*

Кілт сөздер: *экономикалық өсу, кластерлік талдау, Қазақстан аймақтары, өсу факторлары, аймақтық даму, кластерлер, Уорд әдісі, Евклид өлшемі, ЖАӨ, Қазақстан.*

Ключевые слова: *экономический рост, кластерный анализ, регионы Казахстана, факторы роста, региональное развитие, кластеры, метод Уорда, Евклидова метрика, ВРП, Казахстан.*

JEL classification: R11

Introduction. The development of Kazakhstan's regions is a priority task of national importance. The regional development strategy is not uniform in relation to different regions. This is due to significant differences in the regions' resource availability, the structure of their economy, the level of development achieved in various sectors of the economy, the conditions for entering the market economy, the pace of transformation of ownership forms, and overall competitive advantages determined by natural and climatic, demographic, production, and geographical factors.

At present, Kazakhstan has developed a vertically integrated (centralized) model of economic organization of territories, which is characterized by the dominance of one or more large mass industrial enterprises, united in corporate structures, which are the main employers, the main source of replenishment of local budgets and a key factor in the formation of infrastructure economy in the regions. This model is mainly formed in countries with a single-industry economy. For

Kazakhstan, in modern conditions, the network model of territorial-economic organization, characterized by flexible specialization and the ability to innovate, based on the mobilization of resources of the entire network through cluster development, becomes more promising. The strategy of territorial development of the Republic of Kazakhstan puts forward the cluster approach as an effective method of territorial and economic organization and a tool for improving the competitiveness of the country's regions. The Strategy focuses on creating regional clusters that combine regions with similar socio-economic situations in order to involve regions in the system of global and regional markets for goods, Finance, labor resources, technology and information, which determines their competitiveness. The experience of developed European and Asian countries also confirms the multi-functional role of the cluster approach in providing conditions for the formation and implementation of competitive advantages of regions.

The main objective of this research work is to classify the regions of Kazakhstan by clustering, taking into account the factors of economic growth. the results can be used in the formation of economic, social and financial policy of the state, taking into account the regional characteristics of the country's development.

Literature review. Economic growth theories are the starting point for determining factors that could be economically significant for regional growth. There are many theories of economic development. Differing in basic, fundamental approaches, they offer different behavioral hypotheses, use different concepts and categories, explain the development process in different ways, and provide different guidelines. Modern theories of economic growth were formed on the basis of two sources: the neoclassical theory, which has its roots in the theoretical views of J.B.Say and received a complete expression in the works of the American economist J.B. Clarke, and the Keynesian theory of macroeconomic equilibrium.

The founder of the theory of growth poles («points of growth») is Francois Perroux [1].

In the theoretical model of F. Perroux, industries are the primary unit of analysis, they are considered as something that exists in an abstract economic space. In accordance with it, the growth pole is a set of developing and expanding industries (activities) that are geographically located in an industrial zone and can cause further development of economic activity throughout the region of their influence. The concept of «economic development» is defined as follows: it is a structural change caused by the growth of new, «exciting» industries [2]. These industries contain the driving force of economic development. These industries are growth poles that first initiate and then extend development to the surrounding area. The strength of the growth pole theory is that it has been recognized as the main theory of initiation and propagation of development. It is based on the dominance effect discovered by Francois Perroux.

Thus, most of the leading experts in the field of cluster development agree that the concept of «growth poles» should include a set of four elements [3, 4]:

– natural and geographical conditions of the territory;

– rapidly developing industries (the most promising and least expensive for a specific territory);

– stable functioning enterprises (basic for the region's industries) and well-developed infrastructure;

– regional development programs (implemented on the territory of the region and appropriate for further development).

Also, some scientists have argued that active state and local government intervention based on a wide range of mechanisms in relation to cluster policy favourably affected the spatial processes of clusters [5, 6].

In addition, scientists in separate publications noted that the role of the state in supporting the development of high-tech clusters based on «growth poles» should be long-term.

The concept of regional clustering is to attract investments and large business structures to the region (possibly with the involvement of foreign

capital) by optimizing the territory's own potential, improving the indicators of the regional labor market [7], which implies the diversification of the economy, new jobs and new specialties (in connection with the transition to the digital economy), creating the socio-economic infrastructure of the cluster and reducing its payback period, increasing income and paying capacity of the population, as well as the use of advanced technologies and innovations in the production environment of the region [8, 9].

M. Porter considers «industrial clusters» as an effective tool for the development of the regional economy and increasing its competitiveness. They are a group of geographically concentrated firms and closely related industries that mutually contribute to the growth of each other's competitiveness. A cluster as a sustainable partnership of interconnected organizations and individuals is based on taking into account the positive synergistic effects of regional agglomeration and may have a potential that exceeds the simple sum of the potentials of individual components.

Main part. The level of economic development of regions, according to the theory of sustainable economic growth, can be estimated using a number of indicators, which include innovation activity, human capital, private capital, public capital, regional accessibility, regional concentration, and gross regional product (GRP) per capita.

The following indicators were identified as analyzed data on the economic development of Kazakhstan's regions:

1) Innovation activity:

– patent activity, in % of the total indicator for Kazakhstan (I1);

– gross expenditure on research and development per capita (I2).

The number of patents granted and R&D costs can be considered as a measure of technical progress generated by product and process innovations.

2) Human capital:

– number of employees with a university degree per 1000 employees (I3). This indicator shows the region's ability to generate knowledge, as well as the ability to adapt the knowledge of other regions, and improve the tools produced;

– number of employees, including self-employed, per thousand inhabitants (I4);

– number of economically active population per thousand inhabitants (I5).

These two indicators allow us to draw a conclusion about the number of people who participate and accumulate knowledge in the production process. They are also a measure of accumulated knowledge at the regional level.

3) Private capital:

– industrial investment per capita (I6). Allow you to determine the attractiveness of the region for private investors.

4) Social capital:

– budget investments per capita (I7). They can be interpreted as a regional factor that characterizes capital investment. The higher it is, the higher the investment attractiveness of the region, including for private investors;

– public expenditure per capita (I8). The higher this indicator, the more the state is interested in stable and effective development of the region.

5) Regional accessibility (I9). Characterizes the measure of the region's accessibility to markets and national transport infrastructure. This indicator was calculated as follows (see formula 1):

(Distance from the regional center to Almaty + Distance from the regional center to Nursultan)/ (Distance from Almaty to Nursultan). (1)

6) Regional business concentration:

– the number of active entrepreneurs per 1000 sq km (I10). This indicator characterizes business density and can be interpreted as the level of potential urbanization of the economy;

– number of registered entrepreneurs per 100,000 inhabitants (I11). Provides information about the spatial concentration of business and the degree of concentration of business initiative in the region;

– employed in industry per 1000 employees (I12);

– employed in the service sector per 1000 employees (I13).

These are the two most significant indicators that characterize the degree of potential localization of the economy.

7) GRP per capita (I14). It characterizes the average income and expenses per inhabitant of a given region and is an indicator of the well-being of its population. This indicator more accurately determines the level of social development of the region than the gross domestic product per capita. The selected indicators, although they are qualitatively different in economic content and quantitatively multidirectional, at the same time allow us to take into account the dynamics of the population and filter regions by location type.

To combine regions into sufficiently large groups as they resemble each other, it is necessary to conduct a cluster analysis, the purpose of which is to divide a set of objects into a given or unknown number of classes based on some mathematical criterion for the quality of classification (cluster).) a cluster, a bundle, a cluster, a group of elements characterized by a common property). The criterion of quality of clustering to a certain extent reflects the following informal requirements:

a) within groups, objects must be closely related to each other;

b) objects of different groups must be far from each other;

c) other things being equal, the distribution of objects in groups must be uniform.

A great advantage of cluster analysis is that it allows you to group objects not by one parameter, but by a whole set of features. In addition, cluster analysis, unlike most mathematical and statistical methods, does not impose any restrictions on the type of objects under consideration, and allows us to consider a set of source data of an almost arbitrary nature. Also, cluster analysis allows you to consider a fairly large amount of information and dramatically reduce, compress large amounts of socio-economic information, make them compact and visual.

Clustering of Kazakhstan's regions will be performed using the ward's method. The choice of this method is due to the fact that as a result, the set of studied objects is divided into the most homogeneous groups from a statistical point of view. The target function is the intragroup sum of the squares of deviations, which is the sum of the squares of the distances between each point (object) and the average of the cluster containing this object. At each step, two clusters are combined that result in a minimal increase in the target function, i.e., a minimum increase in the target function. intra-group sum of squares. Data for all regions of the Republic of Kazakhstan were used as the initial information (table 1).

Since the selected indicators are heterogeneous, it is necessary to standardize them. We chose the z-transformation of values. Standardization brings the values of all variables to a single range, namely from –3 to +3. Other proposed standardization options are rather secondary.

The results of the cluster analysis are presented:

1) the proximity matrix (similarity);

2) a table of the order of the agglomeration;

3) the table of cluster membership;

4) tree diagram (dendogram).

The proximity matrix obtained after processing the source data is shown in table 2. This matrix provides information about similarities or differences in the socio-economic development of regions. The lower the value, the greater the similarity of the two regions and combinations in the cluster. Conversely, the larger the corresponding value of the proximity matrix, the greater the difference between the two regions.

The join table is shown in table 3. Each line describes the step of actual cluster formation.

A very important issue in the behavior of cluster analysis is the problem of choosing the optimal number of clusters. Quite often, the criterion for combining (the number of clusters) is a change in the corresponding function.

For example, in our case, this is the square of the Euclidean distance defined using standardized values (see formula 2):

$$dist = \sum_{i=1}^{n} (x_i - y_i)^2 . \qquad (2)$$

The grouping process must correspond to a

sequential minimum increase in the value of the criterion.

Ward's method says that the distance between two clusters, A and B, is how much the sum of squares will increase when we merge them:

$$\Delta(A,B) = \sum_{i\in A\cup B} \| \vec{x}_i - \vec{m}_{A\cup B} \|^2 -$$

$$- \sum_{i\in A} \| \vec{x}_i - \vec{m}_A \|^2 - \sum_{i\in B} \| \vec{x}_i - \vec{m}_B \|^2 =$$

$$= \frac{n_A n_B}{n_A + n_B} \| \vec{m}_A - \vec{m}_B \|^2, \qquad (3)$$

where $\vec{m}_i$ is the center of cluster i, and n_i is the number of points in it. Δ is called the merging cost of combining the clusters A and B.

With hierarchical clustering, the sum of squares starts out at zero (because every point is in its own cluster) and then grows as we merge clusters. Ward's method keeps this growth as small as possible. This is nice if you believe that the sum of squares should be small. Notice that the number of points shows up in Δ, as well as their geometric separation. Given two pairs of clusters whose centers are equally far apart, Ward's method will prefer to merge the smaller ones.

Because the objective function is based on the distances between the centroids of the clusters [10] it is necessary to use the squared Euclidean distance as the metric to calculate distances between objects. If the objective function is minimum variance, Ward's linkage method can only be applied to distance matrices using the squared Euclidean distance metric.

Table 1

Initial data for clustering regions of Kazakhstan

	Innovative activity		Human capital			Private capital	Social capital		Region. availability	Regional concentration business's				GRP per capita, thousand tenge I14
	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	
Kazakhstan	100	962,08	228	467,51	512,62	53,057	11,020	32,07		17	844	170	478	266,9
Akmolinskaya	0,63	703,83	155	497,80	548,23	14,249	5,805	21,30	1,197	15	556	108	391	157,6
Aktyubinskaya	4,72	384,34	188	467,85	518,10	112,083	12,760	20,98	2,502	5	705	153	480	285,9
Almatinskaya	7,41	206,66	175	459,33	502,55	14,976	6,708	16,16	1,424	12	358	114	374	120,8
Atyrauskaya	0,75	2654,20	203	422,57	466,93	468,687	23,694	96,32	3,429	9	691	270	579	1099,4
East Kazakhstan	6,23	2315,86	190	473,68	510,99	23,323	4,591	46,38	1,723	11	599	197	444	196,7
Zhambylskaya	3,81	98,42	194	468,85	527,39	15,350	17,206	17,03	1,365	8	396	113	539	91,2
West Kazakhstan	1,23	127,36	180	472,18	520,59	19,889	13,259	15,92	3,419	8	460	162	421	323,0
Karagandinskaya	5,43	3555,49	206	504,55	545,45	36,079	4,188	28,37	1,189	7	625	305	444	272,2
Kostanayskaya	4,48	638,17	184	540,95	592,49	20,996	10,161	28,83	2,010	11	575	149	509	217,1
Kyzylordynskaya	0,32	32,59	208	419,26	473,20	74,636	9,177	41,87	1,759	5	412	107	462	189,5
Mangistauskaya	0,44	5781,24	250	404,35	447,78	152,406	10,778	10,33	3,764	7	982	438	540	566,5
Pavlodarskaya	2,49	24,96	164	505,57	550,73	36,693	4,042	25,5	1,429	22	860	243	390	289,9
North Kazakhstan	1,98	124,24	132	552,26	600,28	11,996	3,571	18,47	1,813	13	449	74	320	147,8
South Kazakhstan	4,20	55,16	239	404,97	443,07	7,260	3,151	21,68	1,601	28	529	95	445	110,3
Nursultan city	3,93	203,72	394	468,17	511,10	257,729	94,519	62,70	1,000	6170	1810	175	812	510,6
Almaty city	52,67	4549,86	585	447,33	491,03	50,561	11,973	41,36	1,000	45537	3696	223	748	625,7

Table 2

The matrix of proximity (similarity)

The square of the Euclidean distance																
Regions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Akmolinskaya	0	4,944	2,385	57,496	4,811	2,667	7,999	5,166	4,098	8,128	44,127	2,749	3,933	10,979	44,797	82,926
Aktyubinskaya	4,944	0	3,815	37,203	4,425	3,451	2,102	6,529	6,572	4,601	26,979	4,780	11,234	7,854	34,326	72,568
Almatinskaya	2,385	3,815	0	55,242	4,818	2,293	6,545	7,239	9,627	3,941	38,546	5,242	9,967	4,133	45,642	79,533
Atyrauskaya	57,496	37,203	55,242	0	38,650	54,667	43,193	48,071	54,973	38,377	33,469	49,483	71,438	52,047	41,216	90,175
East Kazakhstan	4,811	4,425	4,818	38,650	0	5,553	7,843	4,487	7,758	5,359	26,957	4,758	13,197	9,070	38,139	67,140
Zhambylskaya	2,667	3,451	2,293	54,667	5,553	0	7,258	6,730	6,204	5,096	39,899	5,622	10,124	6,789	34,531	75,852
West Kazakhstan	7,999	2,102	6,545	43,193	7,843	7,258	0	10,150	8,571	8,356	27,435	7,407	11,875	11,164	45,349	84,715
Karagandinskaya	5,166	6,529	7,239	48,071	4,487	6,730	10,150	0	5,700	11,949	32,711	1,067	10,965	15,938	39,613	71,950
Kostanayskaya	4,098	6,572	9,627	54,973	7,758	6,204	8,571	5,700	0	15,739	45,584	4,192	3,596	21,763	40,724	80,031
Kyzylordynskaya	8,128	4,601	3,941	38,377	5,359	5,096	8,356	11,949	15,739	0	33,613	10,529	20,144	2,105	35,917	77,194
Mangistauskaya	44,127	26,979	38,546	33,469	26,957	39,899	27,435	32,711	45,584	33,613	0	36,533	60,531	35,064	59,444	75,139
Pavlodarskaya	2,749	4,780	5,242	49,483	4,758	5,622	7,407	1,067	4,192	10,529	36,533	0	6,686	14,595	42,156	77,823
North Kazakhstan	3,933	11,234	9,967	71,438	13,197	10,124	11,875	10,965	3,596	20,144	60,531	6,686	0	25,074	59,042	100,21
South Kazakhstan	10,979	7,854	4,133	52,047	9,070	6,789	11,164	15,938	21,763	2,105	35,064	14,595	25,074	0	45,065	75,976
Nursultan city	44,797	34,326	45,642	41,216	38,139	34,531	45,349	39,613	40,724	35,917	59,444	42,156	59,042	45,065	0	60,086
Almaty city	82,926	72,568	79,533	90,175	67,140	75,852	84,715	71,950	80,031	77,194	75,139	77,823	100,21	75,976	60,086	0

Table 3

Table of the order of agglomeration (Ward's method)

Steps	Association to a cluster		Coefficients	The step at which the cluster appears for the first time		Next step
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	8	12	0,534	0	0	7
2	2	7	1,585	0	0	8
3	10	14	2,637	0	0	2
4	3	6	3,784	0	0	10
5	1	3	5,086	0	4	3
6	9	13	6,884	0	0	1
7	5	8	9,788	0	1	9
8	1	5	14,833	5	7	5
9	1	2	20,705	8	2	1
10	1	9	28,766	9	6	1
11	1	10	41,703	10	3	1
12	4	11	58,438	0	0	1
13	4	15	86,413	12	0	4
14	4	16	131,586	13	0	4
15	1	4	210,000	11	14	7

The presence of a sharp jump can be interpreted as a characteristic of the number of clusters that objectively exist in the study population, that is, at a step where the coefficient value increases abruptly, the process of merging into new clusters must be stopped, since otherwise clusters that are relatively far from each other would be merged.

In our case, this is a jump from 9.788 to 14.833. This means that after the formation of eight clusters, there is no need to perform further joins, and the result with eight clusters is optimal. The optimal number of clusters is considered to be equal to the difference between the number of observations (here: 15) and the number of steps, after which the coefficient increases abruptly (here: 7).

After determining the optimal number of clusters, it is necessary to find out whether each region belongs to a particular cluster (see table 4).

Table 4

Belonging to the cluster of regions of Kazakhstan

Regions	Number	Clusters	Regions	Number	Clusters
1	Akmolinskaya	2	9	Kostanayskaya	4
2	Aktyubinskaya	3	10	Kyzylordynskaya	5
3	Almatinskaya	2	11	Mangistauskaya	6
4	Atyrauskaya	6	12	Pavlodarskaya	1
5	East Kazakhstan	1	13	North Kazakhstan	4
6	Zhambylskaya	2	14	South Kazakhstan	5
7	West Kazakhstan	3	15	Nursultan city	7
8	Karagandinskaya	1	16	Almaty city	8

The most common method for representing the proximity matrix is based on the idea of a tree diagram, which is a graphical representation of the results of the process of sequential cluster formation (see figure 1).

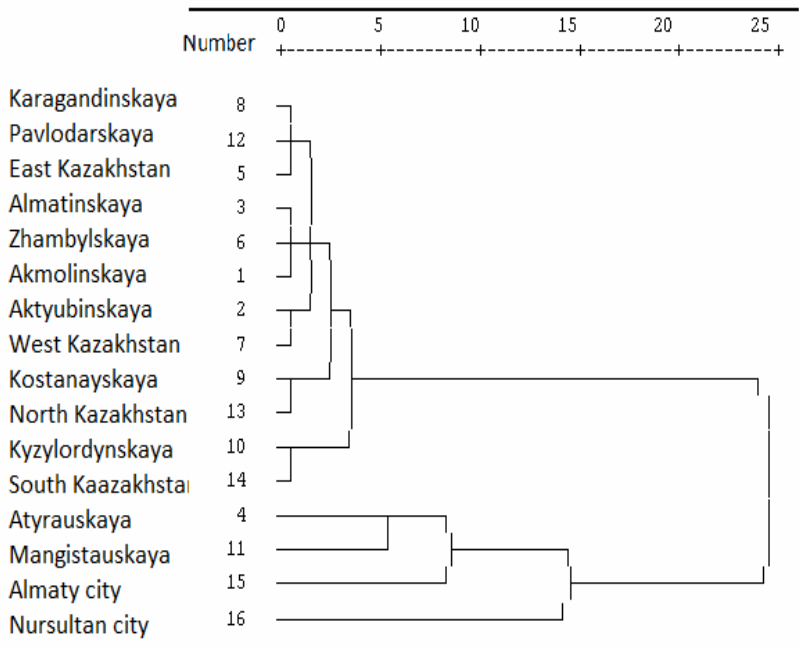

Figure 1. **A dendogram constructed using the Ward method**

Conclusion. The cluster analysis made it possible to come to the conclusion that even regions that are close to each other on the geographical map differ so much in resource and human potential that they cannot be assigned to the same economic cluster.

In accordance with the strategy of territorial development of the Republic of Kazakhstan, the main directions of increasing the economic potential and competitiveness of the selected regional clusters, in our opinion, should be:

– conducting marketing research to determine the direction of positioning (specialization) of regions and reference cities of the country in the national, regional and global economic system;

– focus of regions not only on the effective use of traditional factors of production, but also on the development of specialized factors, such as innovative potential, skilled labor, modern infrastructure and institutional environment;

– combining the efforts of small and medium-sized companies, as well as other interested organizations to reach those niches where the regional cluster has potential competitive advantages;

– in regions dominated by large vertically integrated companies (mainly in oil and gas and mining industries), the development of industries of higher added value (based on deep processing of raw materials), the creation of mechanisms of outsourcing and strengthening of local content in major projects with the formation of auxiliary, servicing and processing unit for small and medium enterprises.

Thus, using cluster analysis of factors of socio-economic development of Kazakhstan's regions, we were able to structure indicators of their economic growth by the degree of similarity, and identify 8 regional clusters. The obtained results can be used in the formation of the economic, social, financial policy, taking into account regional peculiarities of development of the Republic, in particular through the development of implementation of the strategy for territorial development.

REFERENCES

1. Perroux, F. (1955). Note sur les notion de pole de croissance // Economie Appliquee 7 (1-2). – P. 307-320.

2. Fritsch, M., Mueller, P. Effects of new business formation on regional development over time // Regional Studies. – 2004. – Vol. 38. – No.8. – P. 961-975.

3. Storper, M. The Regional World: Territorial Development in Global Economy. – New-York: Guilford Press, 1997. – 338 p.

4. Broekel, T., Benner, T. Regional factors and innovativeness: an empirical analysis of four German industries // Annals of regional science. – 2011. – Vol. 47. – No.1. – P. 169-194.

5. Bass, S. Japanese research parks: National policy and local development // Regional Studies. – 1998. – Vol. 3. – No.5. – P. 391-403.

6. Fukugawa, N. Science parks in Japan and their value-added contributions to new technology-based firms // International Journal of Industrial Organization. – 2006. – Vol. 24. – No.2. – P. 381-400.

7. Plahin A. Principy klasterizacii pri sozdanii industrial'nyh parkov v Rossijskoj Federacii // Upravlenec. – 2014. – No.4. – S. 72-78.

8. Solvell, O., Lindqvist, G., Ketels, C. Thee cluster initiative Greenbook. – Stockholm: Bromma tryck AB, 2003. – 93 p.

9. Walcott, S. Chinese Science and Technology Industrial Parks. – UK: Ashgate Publishing Company, 2003. – 220 p.

10. Rencher, A. Methods of Multivariate Analysis. – 2nd ed. – New-York: John Wiley & Sons, 2002.

ЛИТЕРАТУРА

1. Perroux, F. (1955). Note sur les notion de pole de croissance // Economie Appliquee 7(1-2). – P. 307-320.

2. Fritsch, M., Mueller, P. Effects of new business formation on regional development over time // Regional Studies. – 2004. – Vol. 38. – No.8. – P. 961-975.

3. Storper, M. The Regional World: Territorial Development in Global Economy. – New-York: Guilford Press, 1997. – P. 338.

4. Broekel T., Benner, T. Regional factors and innovativeness: an empirical analysis of four German industries // Annals of regional science. – 2011. – Vol. 47. – No.1. – P. 169-194.

5. Bass, S. Japanese research parks: National policy and local development // Regional Studies. – 1998. – Vol. 3. – No.5. – P. 391-403.

6. Fukugawa, N. Science parks in Japan and their value-added contributions to new technology-based firms // International Journal of Industrial Organization. – 2006. – Vol. 24. – No.2. – P. 381-400.

7. Плахин А.Е. Принципы кластеризации при создании индустриальных парков в Российской Федерации // Управленец. – 2014. – №4. – С. 72-78.

8. Solvell, O., Lindqvist, G., Ketels, C. Thee cluster initiative Greenbook. – Stockholm: Bromma tryck AB, 2003. – 93 p.

9. Walcott, S. Chinese Science and Technology Industrial Parks. – UK: Ashgate Publishing Company, 2003. – 220 p.

10. Rencher, A. Methods of Multivariate Analysis. – 2nd ed. – New-York: John Wiley & Sons, 2002.

А.С. Нурбацин, А.А. Киреева

АЙМАҚТАРДЫ ЭКОНОМИКАЛЫҚ ӨСУДІҢ ФАКТОРЛАРЫ НЕГІЗІНДЕ КЛАСТЕРЛЕНДІРУ: ҚАЗАҚСТАН МЫСАЛЫНДА

Аңдатпа

Бұл мақалада экономикалық өсудің теоретикалық негіздері қарастырылды және аймақтардың экономикалық дамуын бағалаудың басты көрсеткіштері анықталды. Экономикалық өсудің факторларының жиынтығы бойынша Қазақстан аймақтарына кластерлік талдау жасалынды. Талдау нәтижесіне сүйене отырып, мемлекеттің аймақтарының классификациясы ұсынылды. Аймақтардың экономикалық даму деңгейі тұрақты экономикалық өсу теориясына сәйкес бірнеше көрсеткіштерді қолдана отырып бағаланды, оларға инновациялық белсенділік, адами капитал, жеке капаитал, мемлекеттік капитал, аймақтық қолжетімділік, аймақтық шоғырлану және жалпы аймақтық өнім (ЖАӨ) жатады. Нәтижесінде, Қазақстан аймақтарының әлеуметтік-экономикалық дамуының факторларын кластерлік талдау арқылы біз олардың экономикалық өсу көрсеткіштерінің ұқсастығы бойынша құрылымдадық және 8 аймақтық кластерлерді белгіледік. Алынған нәтижелер республика дамуының аймақтық ерекшеліктерін ескере отырып мемлекеттің экономикалық, әлеуметтік және қаржы саясатын қалыптастыруда қолданылуы мүмкін.

А.С. Нурбацин, А.А. Киреева

КЛАСТЕРИЗАЦИЯ РЕГИОНОВ ПО ФАКТОРАМ ЭКОНОМИЧЕСКОГО РОСТА: НА ПРИМЕРЕ КАЗАХСТАНА

Аннотация

В данной статье рассмотрены теоретические основы экономического роста, определены ключевые показатели оценки экономического развития регионов. Проведен кластерный анализ регионов Казахстана по совокупности факторов экономического роста. По результатам проведенного анализа предложена классификация регионов страны. Уровень экономического развития регионов, согласно теории устойчивого экономического роста, была оценена с использованием ряда показателей, к которым относятся инновационная активность, человеческий капитал, частный капитал, государственный капитал, региональная доступность, региональная концентрация и валовой региональный продукт (ВРП) на душу населения. Таким образом, с помощью кластерного анализа факторов социально-экономического развития регионов Казахстана нам удалось структурировать показатели их экономического роста по степени сходства и выделить 8 региональных кластеров. Полученные результаты могут быть использованы при формировании экономической, социальной и финансовой политики государства с учетом региональных особенностей развития республики.

ҚАЗАҚ ЭКОНОМИКА, ҚАРЖЫ ЖӘНЕ ХАЛЫҚАРАЛЫҚ САУДА УНИВЕРСИТЕТІНІҢ ЖАРШЫСЫ, 2021. – №1(42)