РЕЗЮМЕ

В данной статье проведен глубокий анализ денежных доходов и расходов населения региона, в связи с тем, что это, с одной стороны, мониторинг процесса изменения уровня жизни населения республики, с другой стороны, это необходимая база для разработки и осуществления государственных программ социального развития направленных на повышение качества жизни населения.

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APPLICATION OF THE CLUSTER ANALYSIS METHOD IN ASSESSMENT OF THE RATE OF UNEMPLOYMENT IN KAZAKHSTAN

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ABSTRACT

The research paper was prepared as a part of grant project on «Increasing the competitiveness of national human resources as a condition of balancing the labor resources and job places» (IRN of the project AP05132547, 2018-2020).

The purpose of research. Paper is to study the labor market in Kazakhstan in the regional context using cluster analysis methods and identify the peculiarities of the situation at the labor market of country's territorial units in order to define the impact of a set of specific factors on unemployment.

Methodology. The method used to create clusters of objects (across 17 territorial units of Kazakhstan) is cluster analysis in combination with quantitative method of correlation and regression analysis. A segmentation of regions is observed for the years of 2014 to 2019, based on selected indicators of the labor market situation. The data collected from the databases of the official statistical information of the Statistics Committee of the Ministry of National Economy of Kazakhstan.

Originality / value of the research. The current state of the labor market in regions of Kazakhstan (14 regions and 3 cities of national importance) is analyzed, and a system of statistical indicators that influence the state and development of this market is formed. Based on the obtained results, a differentiated approach of developing measures was proposed in order to reduce the unemployment in the country.

Research results. The main results obtained include: The author carried out the clustering of regions of Kazakhstan by the level of labor market development using the method of cluster analysis. According to

the results of multidimensional grouping, 3 clusters were obtained, which characterize the specifics of the economic situation of the labor market in the cities and regions of the country. The results of the calculations performed are presented, and the main measures and directions are proposed to reduce unemployment.

Keywords: unemployment rate, labor market, correlation, cluster analysis.

ҚАЗАҚСТАННЫҢ ЖҰМЫССЫЗДЫҚ ДЕҢГЕЙІН БАҒАЛАУҒА КЛАСТЕРЛІК ТАЛДАУ ТӘСІЛІН ҚОЛДАНУ

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АҢДАТПА

Бұл мақала «Еңбек ресурстары мен жұмыс орындарының тепе-теңдігін қамтамасыз ету шарты ретінде ұлттық кадрлардың бәсекеге қабілеттілігін арттыру» тақырыбындағы гранттық жоба (жоба ИТН: AP05132547, 2018-2020 жж.) аясында дайындалды.

Зерттеу мақсаты. Қазақстанның әкімшілік территориялық бірліктерінің еңбек нарығындағы жағдайының өзгешелігін анықтау және мемлекет аумақтарының жұмыссыздығына әсер ететеін ерекше факторларын зерттеу.

Әдіснамасы. Кластерлік таалдау және сандық корреляция-регрессия талдаулары жүргіліген.

Зерттеудің бірегейлігі / құндылығы. Мақалада Қазақстанның 14 облысы мен 3 республикалық маңызы бар қалаларының еңбек нарығындағы жағдайының айырмашылығының деңгейін анықтау мақсатында мемлекеттің территориялық бірліктерінің көптік классификациясын жүргізу тәсілдері қарастырылған. Алынған сипаттау белгілерінің негізінде мемелекеттің жұмыссыздығын азайтуға дифференциалданған шаралар ұсынылған.

Зерттеу нәтижелері. Автормен Қазақстанның әкімшілік территориялық бірліктерінің еңбек нарығындағы жағдайы бағаланды. Көптік топтау нәтижесінде 3 кластер алынып, мемлекеттің облыстары мен қалаларының еңбек нарығындағы экономикалық жағдайы сипатқа ие болды. Жұмыссыздықты төмендету арқылы тұрғындардың әл-ауқатын көтеруге шаралар берілді.

Түйін сөздер: жұмыссыздық деңгейі, еңбек нарығы, корреляция, кластерлік талдау.

ПРИМЕНЕНИЕ МЕТОДА КЛАСТЕРНОГО АНАЛИЗА В ОЦЕНКЕ УРОВНЯ БЕЗРАБОТИЦЫ В КАЗАХСТАНЕ

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АННОТАЦИЯ

Статья подготовлена в рамках грантового проекта по теме: «Повышение конкурентоспособности национальных кадров как условие обеспечения сбалансированности трудовых ресурсов и рабочих мест» (ИРН проекта: AP05132547, 2018-2020 гг.).

Цель исследования. Исследование рынка труда Казахстана в региональном разрезе с помощью методов кластерного анализа. Выявление особенностей ситуации на рынке труда в каждой территориаль-

ной единице административного деления Казахстана и изучение влияния набора специфичесих факторов на уровень безработицы регионов страны

Методология. Применены методы кластерного анализа, количественные методы корреляционно-регрессионного анализа

Оригинальность/ценность исследования. В статье проанализировано современное состояние рынка труда по регионам Казахстана (по 14 областям и 3 городам республиканского значения), и сформирована система статистических показателей, имеющих влияние на состояние и развитие данного рынка. Анализируя полученные описательные характеристики, был предложен дифференцированный подход для разработки мер по снижению безработицы в стране.

Результаты исследования. Автором проведена кластеризация регионов Казахстана по уровню развития рынка труда методами кластерного анализа. По результатам многомерной группировки получено 3 кластера, определяющие специфику экономической ситуации на рынке труда в городах и областях страны. Приведены выводы по результатам проведенных расчетов, и предложены меры по снижению уровня безработицы.

Ключевые слова: уровень безработицы, рынок труда, корреляция, кластерный анализ.

INTRODUCTION

The specifics of the labor market situation in each region orient towards the use of a set of specific factors, the study of the influence of which on the unemployment rate allows to use the methods of correlation and regression analysis for its forecasting, development of an integrated model and use of factors statistically significantly affecting the unemployment coefficient.

However, it is always difficult to choose one attribute as the basis of classification. The multiple classification is even more difficult. The combination of two attributes allows to maintain the visibility of the table, but the combination of more than two attributes gives a completely unsatisfactory result. The structured methods of object classification allow to maintain the complexity of group description and at the same time overcome the disadvantages of cross-classification. These multidimensional methods are combined by the term “cluster analysis”.

The English word «cluster» means a group, a bundle, that is, a union of some homogeneous phenomena. Cluster analysis got widespread due to the use of personal computers and STATISTICA application program packages [1].

The main purpose of cluster analysis is to isolate homogeneous groups in the original multidimensional data, such that the objects within the groups are close in the selected metric in the multidimensional attribute space, and objects from different groups are far from each other.

When studying the methods of cluster analysis, difficulties arise due to the lack of a formal exact statement of the problem of cluster analysis. First of all, the definition of a cluster presents challenges. Besides, a space of bigger dimension has even greater difficulties with various options of mutual arrangement of objects and clusters. Therefore, to classify the objects we first need to introduce the concept of proximity of objects in an attribute space.

The great advantage of cluster analysis is that it allows to split objects not by one parameter, but by a whole set of attributes. Besides, unlike most mathematical and statistical methods, cluster analysis does not impose any restrictions on the type of objects under consideration, and allows to consider a lot of input data of almost arbitrary nature. This is of great importance, for example, for predicting the situation at the regional labor market, when the indicators have a diverse form that impedes the application of traditional econometric approaches. [2] Cluster analysis allows to consider quite a large amount of information and dramatically reduce and compress large files of social and economic information, make them compact and visual.

Cluster analysis is applied to the sets of time series, characterizing economic development (for example, market conjuncture). Here we can highlight the periods when the values of the corresponding indicators were sufficiently close, as well as determine the groups of the time series, the dynamics of which are most similar.

Among the tasks of social and economic forecasting, a combination of cluster analysis with other quantitative methods (for example, regression analysis) is very promising [1]. The good case, where this method could be

useful for application is the unemployment issue in Kazakhstan, that is in large territorial differentiation. The unemployment methodology used by state labor and employment agencies does not reflect the real situation at the labor market of critical regions of the country.

Based on the results of the cluster analysis and the grouping of territorial units having similar situation at the labor market, it is possible to develop a differentiated approach for development of measures to reduce unemployment.

In this context, the aim of this paper is to represent the diversity level of the situation on the labor market among the territorial units of Kazakhstan. In order to reach the set goal, the multidimensional clustering method is applied.

The paper consists of four sections: Section 1 is on the actuality of the given issue, Section 2 focuses on literature review, Section 3 is the main part of the research and Section 4 gives the main outcomes and the directions of solving the problem.

Review of literature. The theoretical base of the labor market was laid by the representatives of the classical school in economic science. For example, the basis of the doctrine of the Scottish economist Adam Smith [3] (1723–1790) was the thesis of free competition as a condition for the optimal use of material, financial and human resources. He reasoned that the volume of employment in a country's economy is determined by the average wage rate of one employee. If the average wage rate of one employee increases, the possibility of securing employment decreases.

Another representative of the classical school, the English economist David Riccardo (1772–1823) [4] substantiated the position on the dependence of wages on labor supply. The dependence is manifested in the fact that an increase in wages above the minimum level necessary for the normal reproduction of the population leads to an increase in labor supply, and this, in its turn, affects a decrease in wages.

The labor market theory appeared in a variety of studies by such outstanding economists as Alfred Marshall (1842-1924) [5], John Maynard Keynes (1883–1946) [6], and others. Modern Russian and Kazakh scientists have contributed to the study of labor market problems – E. A. Utkin [7], A. P. Egorshin [8], B. G. E. Slezinger [9], A. I. Rofe [10], M. K. Meldakhanova, S. A. Kaliyeva [11], and others.

What is meant by the labor market? First of all, this is a system of social relations related to hiring and labor supply, i.e. with its purchase and sale; this is also an economic space – the field of employment, in which buyers and sellers of a specific product – labor interact; this is a mechanism ensuring coordination of prices and working conditions between employers and employees; finally, this is a mechanism that represents the system of internal labor markets of enterprises interacting with local and regional markets, it can regulate employment and unemployment, maintaining them at the desired level. It can successfully function “in automatic mode” under normal conditions, that is, within the permissible values of employment and unemployment. When going beyond these limits, which is typical for the economic crisis, institutional impacts on labor markets are necessary by implementing a set of economic and organizational measures aimed at increasing the demand for labor while increasing its price due to the advanced training of the workers and achievement by them of a high level of labor efficiency [12].

Trends in economic development leading to a change in the structure of consumer demand, in turn, change the structure of total demand for workers, i.e. new, more modern goods and services are created that require implementation of advanced technologies; accordingly, structural reorganization of production is carried out with the reduction of old and the development of new economic facilities. In this regard, advanced training of the existing workers is carried out, with some of the employees being released. Released staff often becomes unemployed, because, as a rule, people react slowly to the emergence of new professions; as a result, the structure of labor offers does not correspond to the structure of jobs, and it turns out that some workers do not have the skills that employers need, and these citizens become unemployed. This type of unemployment is called structural; it creates a new form of functioning of the labor market, which is called a flexible labor market [13].

If a person is given the freedom to choose his\her type of activity and place of work, then at each specific moment some of the employees fall in a state when they have already left their previous work, but have not yet found a new one. Some of them change jobs voluntarily, some are looking for job for the first time, others

have finished seasonal work. The economic function of this part of the labor market is that only wage labor is formed here, and the labor market in its activity is trying to bring the quantity and quality of workers into line with the available jobs. Such type of unemployment is called frictional [14].

The change of situation at the market of goods and services, increase in competition between the goods producers lead to the fact that some manufacturers reduce or even stop production. As a result, employees are transferred from one workplace, enterprise, industry to another, causing serious problems in the labor market. In the course of such transfer, as well as when leaving the sphere of potential labor market, the periods off the hired work of various durations are formed, an army of the unemployed appears; such type of unemployment is called cyclical [15].

Western experts distinguish 5 groups of workers with various job and material securities:

1) highly skilled workers with a high social status of employment. The level of payment and working conditions comply with international standards. There are a minority of such workers, and their income growth is usually higher than the growth of the general economic level and inflation rate,

2) workers competing with each other at the labor market, but still having job security and not subject to mass unemployment. They include the majority of skilled workers, and their income growth is equal to the growth of inflation rate,

3) workers engaged in manual labor, mainly in the manufacturing and mining industries. Their professions disappear together with reduction of the industries themselves. Wage levels are supported by trade union organizations, and employment is protected by collective bargaining agreements,

4) workers with those professions that are in excess supply at the labor market. This is a sector of services with low labor productivity. Their wages are low and their employment is not secured,

5) segment of population that is more or less disengaged in the labor market. These are young people and those who have been unemployed for a long time.

The size of the Kazakhstan labor market is significant. The increase in the share of the economically active population is due to those who have not earlier participated in the labor market. According to the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, the unemployment rate in the country has not changed and constitutes 4.9 %.

The absence of any connection between the unemployment rate and the change in the state of economy indicates a low priority of unemployment for government agencies, for which it is easier to classify a certain category of people as self-employed and thereby obtain a low unemployment rate. It does not necessarily mean that all self-employed are unemployed, but it is obvious that most of them have unstable employment, take odd jobs, including seasonal ones, and if there is adequate job, they would prefer to be hired or to do small business by more favorable economic conditions.

MAIN PART OF THE RESEARCH

Cluster analysis is one of multidimensional methods that allows observations to be classified into groups [6]. Cluster analysis include several different algorithms of realization.In order to group the territorial units into clusters, a hierarchical Ward's algorithm based on a Euclidean distance has been chosen [16].

Each unit of population in cluster analysis is considered as a point in a given attribute space. The value of each attribute of this unit serves as its coordinate in this space, by analogy with the coordinates of a point in our real three-dimensional space. Thus, an attribute space is the area of variation of all of the attributes of the totality of the phenomena studied. If we liken this space to an ordinary space having the Euclidean metric, then we will get the opportunity to measure the "distance" between the points of the attribute space. These distances are called Euclidean, formula (1):

$$\rho_E(x_i, x_j) = \sqrt{\sum_{l=1}^{k} (x_{il} - x_{jl})^2}\ , \qquad (1)$$

where $x_{il} - x_{jl}$ is the value of the *l*-th component of the *i*-th (j-th) object (*l=1,2,....,n*).

To bring the attributes into the same units, we normalize each attribute by dividing the centered value by the standard deviation (formula (2)):

$$x_{il}^{H} = \frac{x_{il} - \bar{x}_l}{s_l}, \quad (2)$$

where x_{il} is the value of the *l*-th attribute of the *i*-th object;

$\bar{x}_l$ is the arithmetic mean of the *l*-th attribute;

$s_1 = \sqrt{\frac{1}{n}\sum_i (x_{il} - \bar{x}_l)^2}$ is the standard deviation of the *l*-th attribute.

The result of the classification process is a dendrogram — a tree of cluster groups with serial numbers of objects on the vertical axis and a scale of distances along the horizontal axis. As the obtained clusters represent a homogeneous population by characteristics, it seems possible to get a regression model [16].

This method is the highly recommended due to the efficiency criterion of presenting the actual data structure [17].

To assess the degree of difference in the situation at the labor market, a cluster analysis was carried out for 17 territorial units of the Republic of Kazakhstan: 14 regions and 3 cities of republican status.

Before using the cluster analysis method, it was found out which factors should be used as the basis for multidimensional classification. A more reasonable method for selecting factors is a correlation analysis, which consists in selecting factor attributes X for further analysis, which allows a quantitative description of the relationship between the attributes.

At the beginning, the main indicators gathered from official reports of the Statistical Committee of the Ministry of National Economy of Kazakhstan. The selection of the variables is based on the performed literature review on the determinants of labor market and unemployment [18; 19; 20].

The unemployment rate of the regions and cities of Kazakhstan in 2019, in % to the average number of employees, was taken as the main indicator characterizing the state of unemployment in the region (Y), the factor attributes (X) were the following:

X1 – the employment rate of the population to the labor force, %;

X2 – employed population, people;

X3 – self-employed workers, people;

X4 – average monthly nominal wage per employee, thousand tenge;

X5 – employed specialists with higher education from among those who graduated from higher educational institutions in the reporting year, people;

X6 – proportion of vacant jobs in the total number of employees, %;

X7 – dismissal turnover ratio, %;

X8 – turnover rate of personnel, %;

X9 – costs of the enterprise for benefits and compensations for the year, thousand tenge;

X9 – total rate of natural increase (per 1000 people);

X10 – investment in fixed assets, thousand tenge.

The influence of the above mentioned factors on the unemployment rate is determined with the use of the correlation matrix (table 1).

Table 1 – Matrix of matching correlation coefficients for the totality of territorial units of Kazakhstan

	У	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
У	1,00											
X1	**-1,00**	1,00										
X2	0,03	-0,03	1,00									
X3	0,49	-0,08	**0,99**	1,00								

X4	0,55	0,15	0,00	-0,08	1,00							
X5	0,11	-0,11	**0,97**	**0,93**	0,09	1,00						
X6	-0,64	0,64	0,01	-0,05	0,50	0,03	1,00					
X7	-0,32	0,32	0,03	-0,08	0,62	0,18	**0,76**	1,00				
X8	-0,59	0,19	0,06	-0,05	0,48	0,22	0,63	**0,90**	1,00			
X9	-0,03	0,03	**0,98**	**0,96**	0,06	**0,95**	0,04	0,04	0,05	1,00		
X10	0,60	-0,20	0,02	0,03	0,43	0,01	-0,22	-0,20	-0,23	-0,02	1,00	
X11	1,00	-0,02	**0,94**	0,92	0,24	0,92	0,13	0,18	0,13	0,94	0,12	1,00
Note – calculated by the author according to data [21; 22]												

According to the table 1, it is important to note that all factors (X1 - X11) are related to the effective indicator to a different extent. Matching correlation coefficients are determined not only between dependent and factor attributes. The correlation coefficients calculated between the factor attributes are also of great importance.

The data of the table 1 show that there is multicollinearity between some factor attributes. In order to eliminate the multicollinearity of factors, a number of factors were selected and excluded from the model.

The answer to the question whether the obtained calculation results are random or not can be obtained by checking the significance of matching correlation coefficients using t-criterion of the Student (table 2) [21].

Table 2 – Check of significance of correlation coefficients by t-criterion

	Coefficient	t-statistics	t-critical
X3	0,496	2,212	2,131
X4	-0,552	-2,566	2,131
X6	-0,640	-3,222	2,131
X8	-0,588	-2,816	2,131
X10	0,603	2,929	2,131
Note – calculated by the author according to data [21; 22]			

The data of the table 2 show that all observed values of the t-criterion are modulo larger than the critical one; accordingly, the matching correlation coefficients are statistically significant and the obtained values were not formed randomly.

Therefore, it is advisable to include the following attributes in the basis of classification:

X3 – self-employed workers, people;

X4 – average monthly nominal wage per employee, thousand tenge;

X6 – proportion of vacant jobs in the total number of employees, %;

X8 – turnover rate of personnel, %;

X12 – retail turnover volume index, in % to the previous year;

X10 – investment in fixed assets, thousand tenge.

In order to unite the cities and regions of Kazakhstan in clusters according to the attributes indicated above, we used the Ward method and Euclidean distance [2].

The result of the grouping is a dendrogram (Fig. 1.), the ordinates of which reflect cities and regions of Kazakhstan, and the abscissa shows the value of the integral indicator, represented by a value formed on the basis of the studied indicators. This indicator does not have a unit of measurement, but is a multidimensional statistical assessment. In our case, an assessment of the situation at the labor market in the regions of Kazakhstan. Based on the results of the multidimensional grouping, 3 clusters were obtained (Table 3), which determine the specifics of the economic situation at the labor market in cities and regions of Kazakhstan.

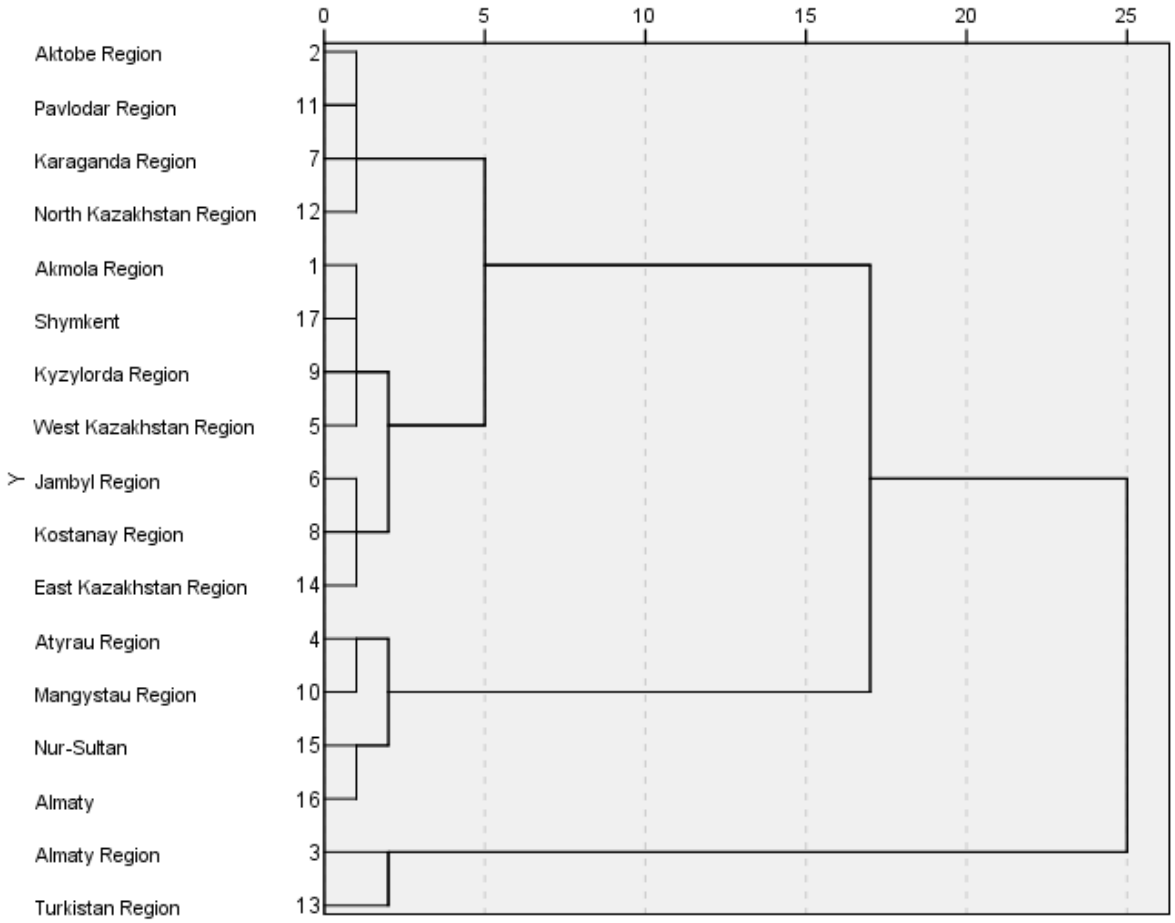

Figure 1 – A dendrogram of clustering by using the Ward method
Note – created by the author according to data [21,22]

Table 3 – Results of clustering the territorial units of Kazakhstan

Number of cluster	Number of regions	Name of the territorial units
1	11	Akmola Region Aktobe Region West Kazakhstan Region Jambyl Region Karaganda Region Kostanay Region Kyzylorda Region Pavlodar Region North Kazakhstan Region East Kazakhstan Region Shymkent
2	2	Almaty Region Turkistan Region (formerly South Kazakhstan)
3	4	Atyrau Region Mangystau Region Nur-Sultan Almaty
Note – created by the author according to data [21; 22]		

Analyzing the obtained descriptive characteristics (Table 4), it can be noted that according to average values, the regions that fell into the third cluster (20.0 % of the total number of regions and cities) can be referred to territorial units with a favorable situation at the labor market. This is evidenced by the low values of the self-employed population, high level of average monthly wages and the share of vacant jobs in the total number of employees, while there is a high level of staff turnover rate. For regions and cities of the third cluster, the economic situation should be considered favorable.

The values of indicators (Table 4) calculated for the regions of the second cluster are as follows: high rates of self-employed, low wages compared to other clusters, low rate of vacant jobs, low staff turnover. Thus, the situation at the labor market in the second cluster is unfavorable.

Table 4 – Characteristics of average values of clusters by factors

Factors		Cluster1	Cluster 2	Cluster 3
The unemployment in the region, %	У	4,76	4,85	4,78
Self-employed workers, people	X3	115794,18	314245,50	49255,50
Average monthly nominal wage per employee, thousand tenge	X4	130564,09	109618,50	252622,50
Proportion of vacant jobs in the total number of employees, %	X6	1,01	0,45	1,68
Turnover rate of personnel, %	X8	18,89	12,35	26,10
Investment in fixed assets, thousand tenge	X10	10,64	20,31	20,56
Note – calculated by the authors according to data [21, 22]				

The values of the indicators of the first cluster are generally lower than the values of the indicators of the third one, but higher than of the second one; therefore, it can be considered good compared to the situation at the labor market in the regions of the second cluster. Relatively high average values of the self-employed population, share of vacant jobs in the total number of employees, as well as the staff turnover rate, and relatively low average monthly nominal wage per employee, which should be considered as a negative trend for the labor market of these regions.

Figure 2 – Characteristics of average values of clusters by factors

Note – created by the author according to data [21; 22]

Based on the calculated multiple regression model, we can conclude that one of the significant factors affecting unemployment among the studied ones is the factor X6. With a 95 % probability, it can be argued that an increase of this factor by 1 unit leads to a decrease in the unemployment rate in the confidence interval from 0.06 % to 0.42 %. This conclusion is statistically significant, which is proved by comparing the actual value of the Student criterion of 3.06 with a critical value of 2.13.

$$У = 4{,}61 + 0{,}00053X3 + 0{,}00099X4 – 0{,}24X6 + 0{,}012X8 – 0{,}001X10$$

Let's consider the dynamics of change of factor X6 - the proportion of vacant jobs in the total number of employees - in different clusters.

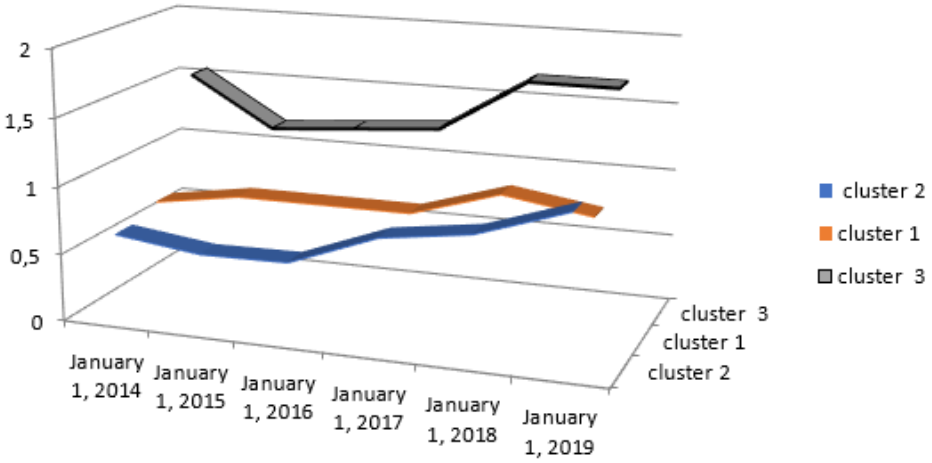

Figure 3 – Dynamics of changes in the proportion of vacant jobs in the total number of employees
Note – created by the author according to data [21; 22]

The diagram in Figure 3 illustrates the difference of this factor in three clusters, which largely explains the situation at the labor market in different regions. That's why one of the priority areas of employment programs should be the creation of new vacancies.

RESEARCH RESULTS (CONCLUSION)

Thus, the unemployment in Kazakhstan has a large territorial differentiation. The unemployment methodology used by state labor and employment agencies does not reflect the real situation at the labor market of critical regions of the country.

Based on the results of the cluster analysis and the grouping of territorial units having similar situation at the labor market, it is possible to develop a differentiated approach for development of measures to reduce unemployment. For the regions of the cluster 1, the "weak points" are the following factors: a relatively high staff turnover rate, a low level of remuneration, and a low proportion of vacant jobs in the total number of employees. That's why by the development of programs for promotion of employment for the regions of the cluster 1, special attention must be paid to these factors.

Territorial units of the cluster 2 are characterized by a high number of self-employed population, the lowest average monthly nominal wage per employee, and the lowest proportion of vacant jobs in the total number of employees, which results in the highest unemployment rate in these regions.

The regions of the cluster 3 have an average unemployment rate compared to other clusters, while there are high values of the share of vacant jobs in the total number of employees and the staff turnover rate.

The activity of the administrative bodies of territorial units should be focused on improving the situation at the registered labor market for regions with an unfavorable situation at the labor market (cluster 2), the social and labor climate for regions with a relatively favorable situation (cluster 1), social and economic indicators

for regions with a favorable situation at the labor market (cluster 3), which have a great impact on the level of unemployment in specific regions and cities of the country. Positive trends in the regional labor market, formed due to a number of measures for reduction of unemployment, will ensure increase of the level of welfare of the population of Kazakhstan.

This paper could be helpful for policymakers. It identifies the reginal similarities and differences in the labor market of Kazakhstan. In order to keep stability in the labor market, it is required to pay a special attention to the regions with weak state of position [23]. The government should reduce the disparities between the different territorial units. The high level of discrimination among the regions makes people to have different quality of living with high rate of unemployment.

Furthermore, the outcomes of this paper may be a starting point for getting new ideas for new research topics, as equalization of opportunities for different regions of Kazakhstan.

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SUMMARY

The article analyzes the territorial distribution and assesses the situation at the labor market of the territorial units of Kazakhstan. To assess the degree of difference in the situation at the labor market, a cluster analysis was also conducted for 17 territorial units of Kazakhstan. The labor market trends of these regions were identified and a number of measures were proposed to reduce unemployment, which would increase the welfare of the country's population.

ТҮЙІНДЕМЕ

Бұл мақалада Қазақстанның әкімшілік территориялық бірліктерінің орналасуы мен еңбек нарығындағы жағдайының талдауы берілген. Еңбек нарығындағы айырмашылықты анықтау үшін Қазақстанның 17 территориялық бірлігіне кластерлік талдау жасалынды. Аталған аумақтардың еңбек нарығының тенденциясы анықталған және жұмыссыздықты жоюдың бірқатар шешу жолдары көрсетілген.

РЕЗЮМЕ

В статье представлено исследование рынка труда Казахстана в региональном разрезе с помощью методов кластерного анализа. Дана оценка степени различия ситуации на рынке труда в каждой территориальной единице административного деления Казахстана. Выявлены тенденции рынка труда этих регионов и предложен ряд мер по снижению уровня безработицы, которые обеспечат повышение уровня благосостояния населения страны.

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