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Economic Potential of Kazakhstan's Regions: Methodology, Comparative Analysis and Rating Assessment

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ABSTRACT

The purpose of this study is to develop and test a methodology for comparative assessment of the economic potential of regions in the example of the regions of Kazakhstan. Based on the review of various approaches to the concept and structure of the economic potential (EP) of the region, the author's approach to the definition, content and methodology of assessment is proposed in the article. The authors have processed statistical material for all regions of Kazakhstan for the period from 2000 to 2021 (according to some indicators, the analyzed periods vary). As a method of EP analysis, the authors propose to use a multidimensional comparative analysis, which allows for obtaining a comprehensive rating assessment of the region by the level of economic potential. The authors analyzed the economic potential of all regions of Kazakhstan on the basis of selected criteria of socio-economic indicators averaged over the studied period of time. The authors examined in detail the positions of the country's regions on each component: investment, innovation, labor, industrial, social, and environmental potentials, as well as on the whole on the complex indicator of economic potential. According to the results of the rating assessment, Atyrau region, Almaty, and Astana, received the highest levels of economic potential, Mangistau and Almaty regions received low scores. The comparative analysis made it possible to identify the strengths and weaknesses of the regions of Kazakhstan to determine in which directions to develop and improve positions. The approach developed in the article to the comparative analysis of the economic potential of regions will allow classifying regions both by individual components of the EP and in general, to obtain a comprehensive assessment of the level of the EP.

KEYWORDS: Economic, Economic Potential, Region, Regional Policy, Rating Assessment, Kazakhstan

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Қазақстан өңірлерінің экономикалық әлеуеті: әдістеме, салыстырмалы талдау және рейтингтік бағалау

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ТҮЙІН

Бұл зерттеудің мақсаты – Қазақстан аймақтарының мысалында аймақтардың экономикалық әлеуетін салыстырмалы бағалау әдістемесін әзірлеу және сынау. Мақалада аймақтың экономикалық әлеуетінің (ЭӘ) концепциясы мен құрылымына қатысты әртүрлі көзқарастарды қарастыру негізінде осы категорияны анықтауға, мазмұнына және бағалау әдістемесіне автордың көзқарасы ұсынылған. Авторлар 2000 жылдан 2021 жылға дейінгі кезеңдегі Қазақстанның барлық аймақтары бойынша статистикалық материалдарды өңдеді (кейбір көрсеткіштер бойынша талданатын кезеңдер өзгереді). ЭӘ талдау әдісі ретінде авторлар экономикалық әлеует деңгейі бойынша аймақтың кешенді рейтингтік бағасын алуға мүмкіндік беретін көп нұсқалы салыстырмалы талдауды қолдануды ұсынады. Авторлар таңдалған критерийлер – зерттеу кезеңінде орташа алынған әлеуметтік-экономикалық көрсеткіштер негізінде Қазақстанның барлық аймақтарының экономикалық әлеуетін талдады. Бұл ретте авторлар әрбір құрамдас бөлік бойынша: инвестициялық, инновациялық, еңбек, индустриялық, әлеуметтік, экологиялық әлеуеттер, сондай-ақ тұтастай алғанда экономикалық әлеуеттің кешенді көрсеткіші бойынша ел аймақтарының позицияларын егжей-тегжейлі қарастырды. Жалпы, рейтингтік бағалау нәтижелері бойынша Атырау облысы, Алматы қаласы, Астана қаласы ең жоғары экономикалық әлеуетке ие болса, Маңғыстау және Алматы облыстары ең төмен ұпай жинаған. Салыстырмалы талдау Қазақстан аймақтарының күшті және әлсіз жақтарын анықтауға, позицияларды қай бағытта дамыту және жақсарту керектігін анықтауға мүмкіндік берді. Мақалада әзірленген аймақтардың экономикалық әлеуетін салыстырмалы талдаудың тәсілі аймақтарды ЭӘ -нің жеке құрамдас бөліктері бойынша да жіктеуге, сонымен қатар жалпы алғанда ЭӘ деңгейіне кешенді баға алуға мүмкіндік береді, бұл жекелеген аймақтарды әлеуметтік-экономикалық дамытудың жоспарлары мен бағдарламаларын жасау кезінде сараланған тәсілді пайдалануға мүмкіндік береді.

ТҮЙІН СӨЗДЕР: экономика, экономикалық әлеует, өңір, өңірлік саясат, рейтингтік бағалау, Қазақстан

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Экономический потенциал регионов Казахстана: методика, сравнительный анализ и рейтинговая оценка

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АННОТАЦИЯ

Целью данного исследования является разработка и апробация методики сравнительной оценки экономического потенциала регионов на примере регионов Казахстана. В статье на основе обзора различных подходов к понятию и структуре экономического потенциала (ЭП) региона, предлагается авторский подход к определению, содержанию и методике оценки. Авторами обработан статистический материал по всем регионам Казахстана за период с 2000 по 2021 годы (по некоторым показателям анализируемые периоды варьируются). В качестве метода анализа ЭП авторами предлагается использовать многомерный сравнительный анализ, позволяющий получить комплексную рейтинговую оценку региона по уровню экономического потенциала. Авторами проведен анализ экономического потенциала всех регионов Казахстана на основе выбранных критериев социально-экономических показателей, усредненных за исследуемый период времени. При этом авторы подробно рассмотрели позиции регионов страны по каждой составляющей: инвестиционному, инновационному, трудовому, промышленному, социальному, экологическому потенциалам, а также в целом по комплексному показателю экономического потенциала. По результатам рейтинговой оценки наивысшие уровни экономического потенциала получили Атырауская область, г. Алматы, г. Астана, низкие баллы получили Мангистауская и Алматинская области. Сравнительный анализ позволил выявить сильные и слабые стороны регионов Казахстана, определить, в каких направлениях развиваться и улучшать позиции. Разработанный в статье подход к сравнительному анализу экономического потенциала регионов позволит классифицировать регионы как по отдельным составляющим ЭП, так и в целом получить комплексную оценку уровня ЭП.

КЛЮЧЕВЫЕ СЛОВА: экономика, экономический потенциал, регион, региональная политика, рейтинговая оценка, Казахстан

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Introduction

The main objective of the regional policy of Kazakhstan is the effective development of the region's economy based on the optimal use of available resources. The sustainable development of the country's economy is based on the economic efficiency of regional economic systems. An analysis of the economic potential of the regions is essential for a differentiated approach to developing strategies for regional development and determining the main directions of their growth. This is especially true for Kazakhstan, where regions differ significantly in terms of natural and economic potential and production and infrastructure. The strategy of regional development is heterogeneous in relation to the different areas. This is due to significant differences between regions in terms of resource provision, the structure of their economy, and the level of development of various economic sectors. Features of the regional development of Kazakhstan, the diversity of production, and the initial level of resources in different regions are the reasons for the unequal economic potential of the regions of Kazakhstan. Kazakhstan is distinguished by a variety of natural and climatic conditions and a different structure of the regional economic potential, so it is impossible to have a single development strategy for the entire republic. Each region has its development conditions, its own advantages and disadvantages in various areas of economic development, so these features must be taken into account when developing an economic development strategy for a particular region.

This article aims to develop and test the author's approach to the rating assessment of the economic potential (EP) of the regions of Kazakhstan. The article defines the concept of "economic potential of the region", provides an overview of approaches to the content of economic potential and proposes its author's vision, as well as the introduction of an environmental criterion in the assessment of economic potential. Since the economic potential is a complex character that takes into account many criteria in different areas, the authors proposed the use of the method of multivariate comparative analysis for the rating assessment of the economic potential of the regions of Kazakhstan.

The scientific novelty of the study lies in the development of the author's approach to the methodology for analyzing the region's economic potential, covering various aspects of socio-economic development and the application of

the method of multivariate comparative analysis to obtain a comprehensive rating assessment of the regions of Kazakhstan. The analysis of the economic potential was based on the study of such areas as innovation, investment, industrial, social, and ecological components. The last component, environmental potential, is proposed to be included by the authors in a comprehensive assessment of the region. According to the scientists' research on this issue, many different approaches to the methodology for assessing the region's economic potential have been proposed. This study differs from the previous ones in the use of a new approach: the method of multivariate comparative analysis, which allows ranking the criteria included in the analysis according to their degree of importance and significance in the overall assessment. However, in this study, all criteria are taken equivalent with the same weight coefficients, in further studies, it is possible to apply a differentiated approach to the significance of the included criteria, while the weight coefficients can be determined by the method of expert assessments.

This study was focused on developing an effective methodology for analyzing the economic potential of regions and obtaining a comprehensive rating assessment of regions by their level and testing the proposed approach in practice. The studies carried out play a certain role in assessing the economic development of regions and developing plans and programs for their development, taking into account the peculiarities of their potential.

Literature review

The study of the theoretical foundations of the concept of the economic potential of the region showed that there are different approaches to this concept. There are significant differences in the definition of the concept of "economic potential", its socio-economic essence, content and internal structure. A number of scientists identify the concepts of the economic potential of territory and progress in socio-economic development (Breuer et al., 2018; Fukase & Martin, 2016), and several other researchers assess the economic potential of a region based on the level of industrial development (Hoo-gwijk et al., 2004), other researchers believe that the economic potential of a region is based on the resources available in it (Sompolska-Rzechula et al., 2019; Pokazanieva, 2018).

Cieřlik et al. (2021) in their study believe that the economic potential of the region depends

on the degree of its involvement in interregional economic relations, they tested the hypothesis that higher economic potential expressed in a more business-friendly economy is found in a country most involved in GVC in the context of foreign trade exchange. Wiśniewska-Szałek (2019) is of the opinion that the level of economic development of a region depends on the development of the education system. Mercure and Salas (2013) find that the level of the economic potential of a region correlates with the level of marginal costs of nonrenewable resources and energy prices.

Ivashchenko et al. (2020) consider that the structure of the regional economic potential has a hierarchical form, dividing it into three levels. The economic potential is presented as a complex economic system, which consists of two components: production-resource and financial. The opinion that the economic potential is a complex indicator, which includes several components, is held by the majority of modern scientists who study this topic. They define the economic potential of the region as the composite index of economic potential development based on objective statistical data characterizing the general level of economic development and welfare of the population, the state of the labor market, investment and innovation processes, and transport infrastructure (Manea et al., 2021), resources, sources, funds and reserves of the territory, as well as methods of their involvement in the economic turnover in order to achieve specific goals (Kondratieva et al., 2017).

Summarizing the above definitions, we can conclude that economic potential includes two components: resource (the totality of resources available for development) and performance (the ability of the region to use available resources effectively).

Having considered the various views presented in the economic literature, we will give the author's interpretation of this concept. The economic potential of the region is a set of socio-economic indicators that determine the efficiency of the use of available resources in order to meet the needs of the population in material and intangible benefits.

The economic potential of the region includes several types of potential - components. A group of particular indicators characterizes each of the individual types of potential. When exploring methodological approaches to assessing economic potential, it should be noted that there is also no consensus here. Various scientists offer

their own methods for assessing the economic potential of the region and see its structure and content in different ways. Table 1 presents some approaches to the components of the regional economic potential.

In developed European countries, a classification of the main regional indicators was proposed to calculate integral indicators in the regions. For example, in order to assess the potential of a region, measure the degree of its significance (impact on economic development) and the dynamics of indicators characterizing the economic situation in the region, it is usually proposed to build integral characteristics of the economic development of the region based on the use of indicators such as gross regional product (GRP) per capita (purchasing power), employment by industry, number of European patent applications per 1 million people. etc. Nevertheless, there is no single methodological approach to conducting an integral assessment of the economic potential of regional systems. Therefore, it is very important to propose a unified system of such indicators, which ensures the correctness of their calculation and the reliability of the result (Nurlanova & Omarov, 2020).

There are many statistical, expert, rating and other methods for assessing the potential of territories. It should be noted that most of these methods are imperfect because they do not have a statistical base sufficient for such studies (Botasheva & Mamysheva, 2020). Le Cacheux (2017) is of the opinion that it is necessary to revise the existing methodological approaches to assessing the economic potential and develop a new, more advanced method. Thus, the literature review gives us reason to conclude that it is necessary to develop a method for evaluating the EP, which makes it possible to obtain a comprehensive characteristic based on the main components - summary indicators of various indicators of the development of the studied territories.

Table 1 - Components of the economic potential of the region

No.	Component	Characteristic	Indicators
1	Natural	The totality of the natural resources of a given territory that can be used in the process of social production. Characterizes the availability of economic activity in the region with balance reserves of the main types of natural resources (Khasanova et al., 2020)	<ul style="list-style-type: none"> – extraction of hydrocarbon resources (oil and gas); – extraction of mineral resources, except for hydrocarbons; – non-metallic building materials; – area of the region; – degree of usefulness of regional areas; – volume of reservoirs; – availability of biobulotological resources; – climatic conditions; – the level of development of the natural resources of the region; – the state of the ecology of the region
2	Industrial	The total ability of the region's enterprises to create and produce competitive products, promote them on the market, profitably sell and provide the required level of service (Bakanach, 2012)	<ul style="list-style-type: none"> – gross regional product per capita; – volume of industrial production; – fixed production assets and their depreciation; – investments in fixed capital; – volume of foreign trade turnover per capita; – turnover of retail trade per capita; – balanced financial result of the real sector; – share of unprofitable enterprises
3	Demographic (labor)	The possibility of involving the active part of the population, labor resources in production. Availability of a professionally trained workforce and qualified engineering and technical personnel (Nikulina et al., 2012)	<ul style="list-style-type: none"> – population growth; – an increase in the labor force; – the level of employment; – life expectancy at birth; – mortality rate; – coefficient of labor potential retention
4	Social	The social structure of society and the standard of living of individual strata, the degree of differentiation of the population, the structure of income and wealth of the population and the share of wages in income, the level of employment, the physical, mental and spiritual state of the population, the level of personal and public security, social infrastructure (Nagimova, 2010)	<ul style="list-style-type: none"> – average per capita income of the population; – the ratio of average per capita cash income and the subsistence minimum; – the share of the population with monetary incomes below the subsistence level in the total population; – the ratio of average per capita incomes of 10% of the most and 10% of the poorest population; – provision with objects of social and cultural life and engineering infrastructure; – unemployment rate
5	Infrastructural	A set of structures, buildings, systems and services necessary for the functioning of material production, the market and the social sphere (Pokazanieva, 2018).	<ul style="list-style-type: none"> – availability of preschool educational institutions; – release of specialists by higher and secondary educational institutions; – provision of the population with outpatient clinics, doctors and paramedical personnel
6	Financial	Financial resources of the region and opportunities to attract them (Bulatova, 2010)	<ul style="list-style-type: none"> – financial security of the region, taking into account purchasing power parity per capita; – budget deficit and surplus per capita; – regional borrowings and debt per capita; – structure of the financial and credit system
7	Innovative	The level of implementation of the achievements of scientific and technological progress and the degree of modernization in the region (Glagolev et al., 2014)	<ul style="list-style-type: none"> – coefficient of renewal of fixed production assets; – share of spending on science and scientific research in the gross regional product; – the share of innovative products in the total industrial output of the region; – the number of employees performing scientific research, including doctors and candidates of sciences, and the number of organizations performing scientific research and development

Note: compiled by authors

Methodology

It is proposed to use the method of multidimensional comparative analysis for a comprehensive analysis of the economic potential of the regions. Let us represent economic potential as a combination of innovative, labor, economic, investment, social and environmental factors.

The last environmental factor is proposed to be included as a new criterion for assessing the economic potential since this criterion is essential in developing the region's economy.

Table 2 presents the components proposed by the authors for assessing the economic potential of region and the criteria for each component.

Table 2 - Indicators for a comparative analysis of the economic potential of the regions

Factor	Indicators
Innovation potential	I1 - Expenses for product and process innovations in industry, million tenge (2004-2021) I2 - Number of organizations (enterprises) performing R&D (2000-2021) I3 - The level of innovative activity of enterprises (2004-2021) I4 - Share of large and medium enterprises in the manufacturing industry using digital technologies (2019-2022)
Labor potential	L1 - Labor productivity (GVA per employee, thousand tenge, (2010-2022) L2 - Share of unproductive employed in the total number of employed (2013-2021) L3 - Unemployment rate, % (2001-2021)
Industrial potential	B1 - GRP per capita, USD (2001-2021) B2 - Foreign trade turnover, million USD (2010-2021) B3 - Number of active legal entities (1999-2021) B4 - Index of physical volume of industrial production (geometric mean 1990-2021)
Investment potential	Inv1 - Indices of the physical volume of investments in fixed capital, in % of the previous year (geometric mean (2003-2021)) Inv2 - Indices of the physical volume of investment in housing construction, in % of the previous year (geometric mean 2003-2021)
Social potential	S1 - Percentage of the population with incomes below the subsistence level (2009-2021) S2 - Index of real money income (in % of the corresponding period of the previous year) (2010-2021) S3 - Depth of poverty (2001-2021) S4 - Gini coefficient (2001-2021)
Ecological potential (aspect of atmospheric air purification)	Eco1 - The volume of current costs for environmental protection, thousand tenge (2005-2021) Eco2 - Air emissions of pollutants from stationary sources, thousand tons (2005-2021) Eco3 - Captured and neutralized pollutants, thousand tons (2005-2021)

Note: Compiled by authors

Multidimensional comparative analysis is used in cases where it is necessary to compare several objects according to several criteria or when several things are compared according to a feature that cannot be represented by one indicator. A comprehensive assessment of the economic potential is a characteristic of the region obtained as a result of studying a set of socio-economic indicators. Thus, this method is applicable for a comprehensive assessment of the activities of various objects: enterprises, regions and countries.

For analysis, as a rule, they try to select a large number of criteria in order to obtain more accurate generalized results. At the same time, it should be taken into account that a large number of selected criteria may only sometimes give

reliable results, some indicators may correlate with each other, and the inclusion of such equally directed factors may give incorrect results.

The main problem in assessing the economic potential of the region is the need for a generally recognized integral indicator, based on which it would be possible to obtain an objective rating assessment of the territory in terms of the level of EP. A review of available studies showed that such an integral indicator has yet to be proposed.

The versatility of the concept of economic potential does not allow solving the problem in another way - to choose any of the generalizing performance indicators as an integral one. For example, a region may have a better result in terms of industrial production with an increase in environmental pollution or have a high investment potential with a low social one.

Therefore, a generalized assessment of indicators of the economic development of regions is usually carried out for a whole range of indicators. In this regard, the task usually becomes more complicated since the subordination of regions according to different indicators will be different. For example, in terms of labor potential, the area will take first place, in terms of innovation - third, and in social - fifth, etc.

When conducting a comprehensive comparative analysis, the problem arises of choosing the most appropriate method for calculating a generalizing indicator, which would make it possible to make the various indicators included in the analysis comparable. For this purpose, the algorithms of the "sum of places", geometric mean, etc. are used. However, it is worth noting a significant drawback of these methods, which consists in the fact that they do not allow taking into account the degree of importance of a particular criterion. Therefore, in this regard, the method of multivariate comparative analysis is a more effective approach since the Euclidean distance method used on its basis makes it possible to evaluate both the absolute values of the selected criteria and the distance from the reference value of the criterion under study, which is taken as a unit.

Let us consider the practical side of solving the problem of multivariate comparative analysis.

Stage 1. The indicators are selected, according to which the EP of the regions will be assessed. The analysis includes both absolute and relative indicators. Depending on the type of data: absolute or relative, a simple arithmetic mean for absolute indicators or a simple geometric mean for relative indicators was calculated as the average level of the time series. The data summarized for the period under review are presented in Appendix A.

Stage 2. Choosing a reference (best) value for each criterion is necessary. The table of Appendix A contains the maximum or minimum (if the minimum value is the best according to this criterion) element. Each indicator of the corresponding column (a_{ij}) must be divided by the found maximum value ($\max a_{ij}$), or the minimum value ($\min a_{ij}$) is divided by each element. Thus, the best result will be equal to one, and the closer the value of the standardized coefficient to one, the better the region's position according to this criterion. The resulting matrix of standardized coefficients (x_{ij}) is presented in Appendix B by the formula (1):

$$x_{ij} = \frac{a_{ij}}{\max a_{ij}}. \quad (1)$$

If, from the economic point of view, the minimum value of the indicator is the best (for example, emissions of pollutants, unemployment rate), then the calculation scale should be changed so that the highest value of the coefficient corresponds to the lowest result (Savitskaya, 2011).

Stage 3. Each element of the matrix of standardized coefficients is squared. In the presence of a differentiated approach to the degree of importance of the criteria, we also multiply by the weight coefficient (K). The values of the weight coefficients are determined based on the method of expert assessments (Appendix C). Next, we find the sums of the results obtained and determine the value of the integrated rating score for each region by the formula (2):

$$R_i = K_1 x_{1j}^2 + K_2 x_{2j}^2 + \dots + K_n x_{nj}^2. \quad (2)$$

In this study, the weighting coefficients were taken equally, that is, all indicators were taken as equal in terms of importance in assessing the economic potential. In subsequent studies, it is possible to differentiate these criteria by the method of expert assessments.

Stage 4. The obtained ratings (R_j) are ranked and the place of each region is determined based on economic development results. The first place is occupied by the region, which corresponds to the largest amount, the second place is taken by the region with the next result, etc.

The following reasons justify the choice of the method of multivariate comparative analysis:

1. The region's economic potential is a multidimensional indicator that cannot be assessed by one criterion.

2. This method allows you to determine the position of each region according to the degree of proximity to the best result for each criterion.

3. The chosen method makes it possible to find a comprehensive rating of the regions' ES based on dynamic data.

According to the calculated standardized coefficients, we will compare the regions for each component of the economic potential. Standardized coefficients allow for assessing the contribution of each criterion, eliminating the incompatibility of data due to different units of measurement in assessing the potential and comparing regions by different types of components. The authors propose to use the values of standardized

coefficients to assess each component of economic potential.

For example, for a summary assessment of innovation potential, we summarize the values of standardized coefficients of all the criteria selected for its analysis (3):

$$I = I1+I2+I3+I4 \quad (3)$$

The innovative potential of the regions was assessed according to three criteria: I1 - costs for product and process innovations in industry, million tenge, I2 - the number of organizations (enterprises) that carried out R&D, I3 - the level of innovative activity of enterprises, I4 - the share of large and medium-sized enterprises in the manufacturing industry using digital technologies. The calculation of the consolidated standardized coefficient makes it possible to rank the regions according to the level of innovation potential.

The summary indicator of labor potential is determined by the formula (4):

$$L = L1+ L2+L3 \quad (4)$$

The analysis of the labor potential was carried out according to the following criteria: L1 - Labor productivity (GVA per employee, thousand tenge), L2 - The share of unproductively employed in the total number, L3 - Unemployment rate, %.

The formula determines the summary indicator of industrial potential (5):

$$B = B1+B2+B3+B4 \quad (5)$$

The industrial potential of the regions was assessed according to four criteria: B1 - GRP per capita, US dollars, B2 - Foreign trade turnover, mln. USA, B3 - Number of active legal entities, B4 - Index of the volume of industrial production.

The formula calculates the summary indicator of investment potential (6):

$$Inv = Inv1 + Inv2 \quad (6)$$

We estimate the investment potential of the regions according to two criteria: Inv1 - indices of the physical volume of investments in fixed assets in % of the previous year, Inv2 - indices of the physical volume of investments in housing construction in % of the previous year.

The following formula determines the combined social potential (7):

$$S = S1+S2+S3+S4 \quad (7)$$

We evaluate the social potential of the regions according to the following criteria: S1 - The share of the population with incomes below the subsistence level, S2 - The index of real money income (in % of the corresponding period of the previous year), S3 - The depth of poverty, S4 - Gini coefficient.

The following formula estimates the summary ecological potential (8):

$$Eco = Eco1+Eco2+Eco3 \quad (8)$$

The ecological potential of the regions was assessed according to the following criteria: Eco1 - The volume of current costs for environmental protection, Eco2 - Air emissions of pollutants from stationary sources, and Eco3 - Captured and neutralized pollutants.

Findings and Discussion

Following the methodology chosen and described above, we will conduct a comparative analysis of the regions for each component separately based on the values of the obtained standardized coefficients, and then as a whole we will conduct a rating assessment by a comprehensive indicator of economic potential.

According to the results obtained, in general, the leaders in terms of innovation potential are Atyrau, East Kazakhstan, Pavlodar regions. The lowest positions were occupied by Mangistau and Turkestan regions (see Figure 1).

Regarding spending on product and process innovations in the industry, Atyrau region leads the lowest figure in the Turkestan region. In terms of the number of organizations (enterprises) performing R&D, the city of Almaty is the leader, Turkestan and Mangystau regions are outsiders here. The level of innovative activity of enterprises in the regions does not differ much, here we can note the lowest indicator in the Mangistau region. In terms of the share of large and medium-sized manufacturing enterprises using digital technologies, the Kyzylorda region leads the lowest figure in the Turkestan region.

Analyzing the labor potential of the regions of Kazakhstan, the following can be noted: in terms of the composite indicator of labor potential, Astana, Atyrau region, and Almaty are in the lead, the Zhambyl and Almaty regions have the lowest indicators (see Figure 2).

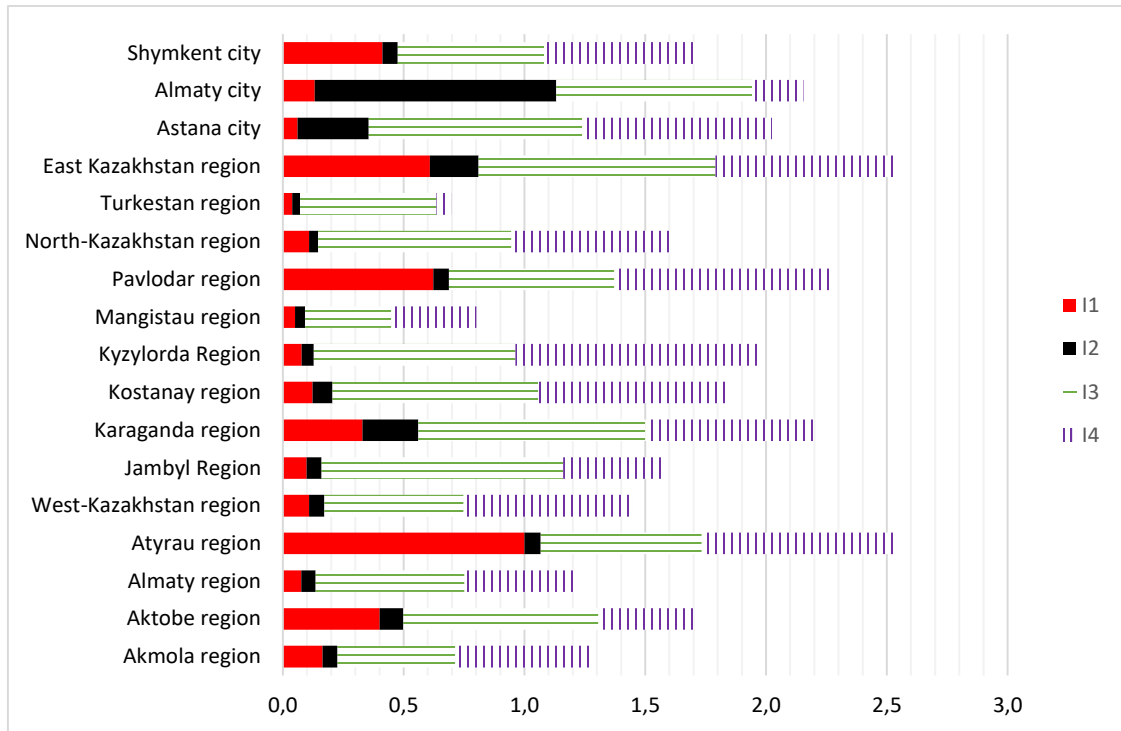


Figure 1- Comparison of regions by innovative potential

Note - compiled by authors

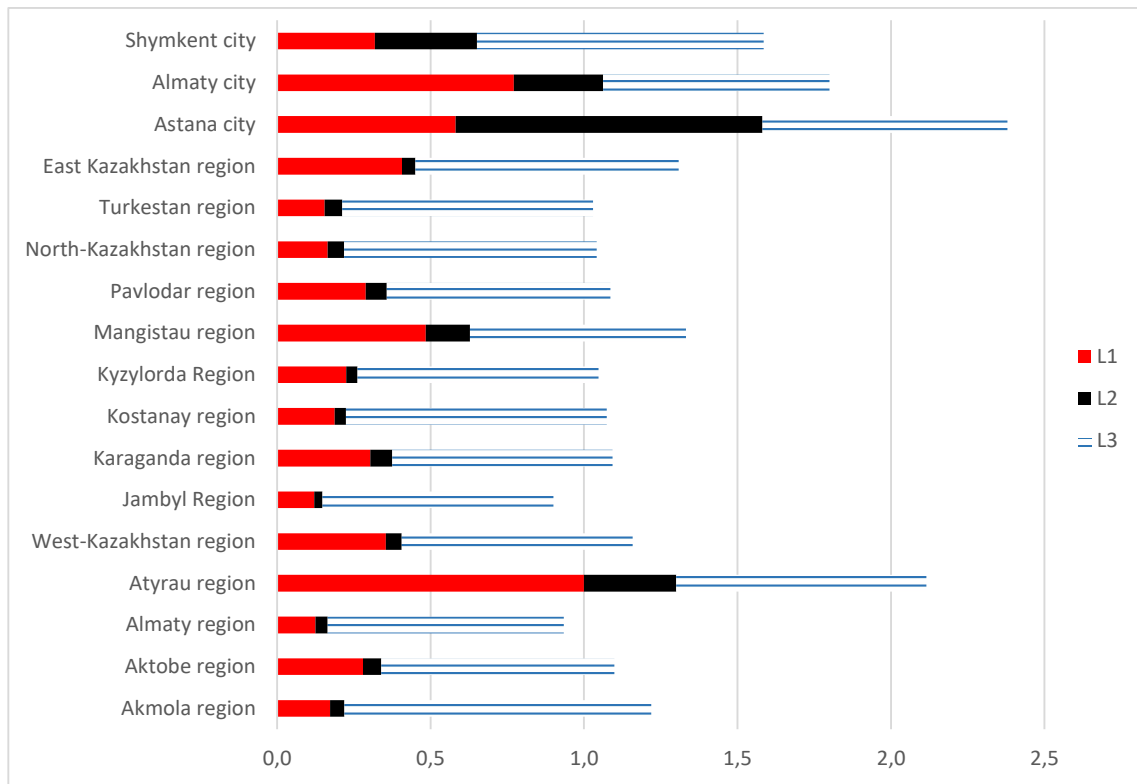


Figure 2 - Comparison of regions by labor potential

Note - Compiled by authors

In terms of labor productivity (GVA per employee) the highest result was in Atyrau region, Almaty, Astana, the lowest in Almaty and Zhambyl regions. By the share of unproductive employed in the total number of observed, the best result (minimum value) is observed with a large margin from all regions in Astana, the worst result in Zhambyl region. The lowest level

of unemployment on average for the analyzed period is observed in Akmola region, the regions differ slightly in this indicator.

The conducted comparative analysis showed that in terms of the summary indicator of industrial potential, the undisputed leaders are the city of Almaty, Atyrau region, and the lowest indicators are in the Turkestan and Zhambyl regions (see Figure 3).

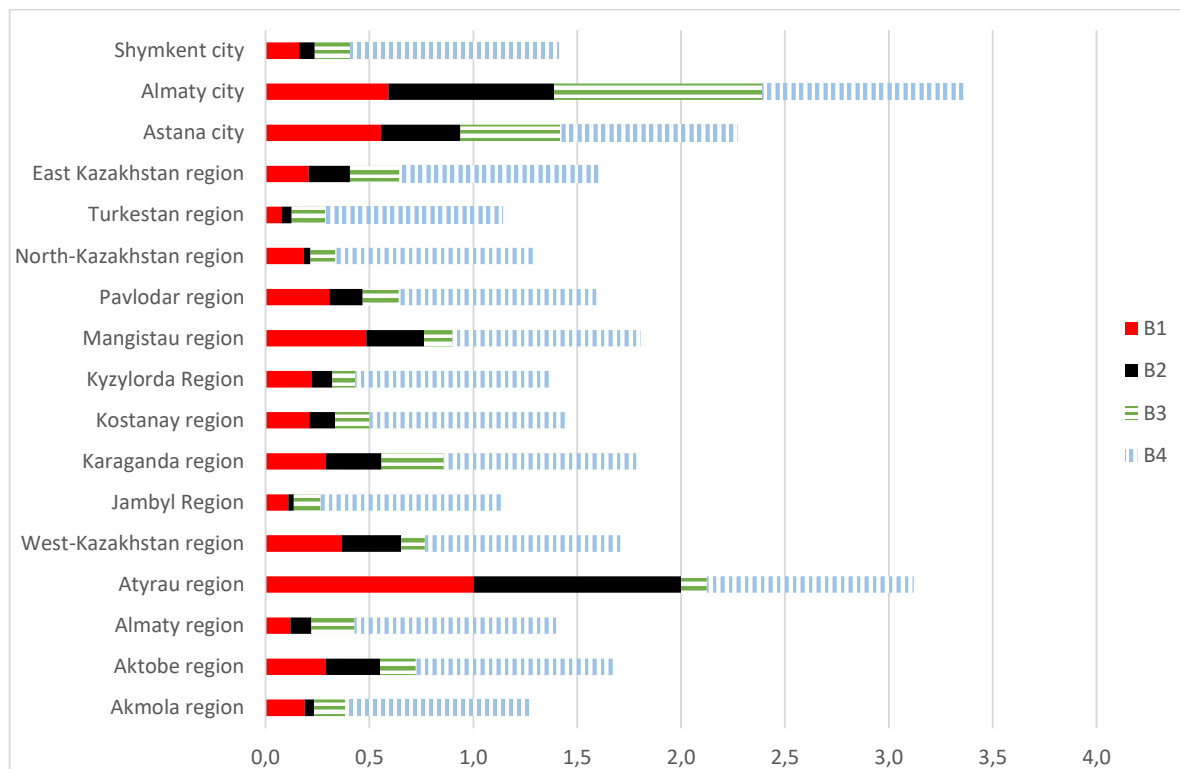


Figure 3 - Comparison of regions by industrial potential

Note - Compiled by authors

Regarding GRP per capita, Atyrau region leads by a wide margin of population, followed by the cities of Almaty and Astana, the lowest rates are in Turkestan and Zhambyl regions. The highest indicators of foreign trade turnover are in Atyrau region, the cities of Almaty and Astana, the lowest in Zhambyl and North Kazakhstan regions. The maximum number of operating legal entities is observed in Almaty, Astana, in general, there is no strong variation of this feature in other regions. The index of the physical volume of industrial production also does not have a significant variation among the regions of Kazakhstan.

In general, according to the summary indicator of investment potential, the reference is the Turkestan region, the lowest level is observed in the West Kazakhstan region (see Figure 4).

According to the geometric mean value of the index of the physical volume of investments in fixed assets for the analyzed period, the leader is Turkestan region, Shymkent, North Kazakhstan region, the lowest indicator is West Kazakhstan region.

In terms of the geometric average value of the index of the physical volume of investments in housing construction in fixed assets for the study period, the Turkestan region, North Kazakhstan region are also in the lead, the Zhambyl region has the lowest indicator

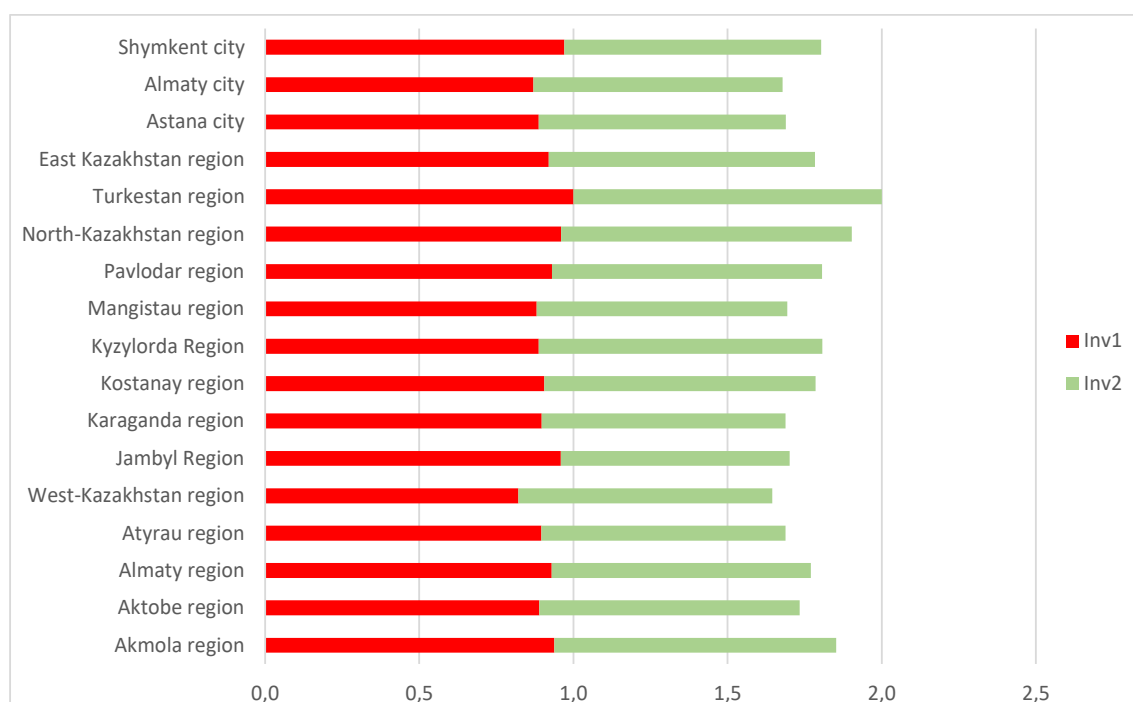


Figure 4 - Comparison of regions by investment potential

Note - Compiled by authors

According to the summary indicator of social potential among the regions of Kazakhstan, the cities of Shymkent and Astana lead by a margin, followed by the city of Almaty, the lowest level is in the North Kazakhstan and Akmola regions (Figure 5).

The highest proportion of the population with incomes below the subsistence level is observed in the Turkestan region, Mangistau region, the lowest proportion in the cities of Astana, Almaty, followed by indicators of the Karaganda region.

According to the geometric mean value for the analyzed period of the index of real money incomes, the leader is Almaty region, the lowest indicator is in Almaty. Here it is worth noting the slight variation of this feature among the regions.

In terms of the depth of poverty, Shymkent and Astana have the best results, Atyrau, Almaty and Akmola regions have the worst results.

The Gini coefficient shows the differentiation of incomes of the population, the largest gap in the level of incomes of the population is observed in East Kazakhstan and North Kazakhstan regions, and the smallest differentiation of incomes is in Shymkent.

The ecological potential is assessed by a whole range of indicators and is determined by the level of the ecological balance of the

biosphere and its constituent components: the atmosphere (atmospheric air); hydrosphere (groundwater and surface waters); lithosphere (soil, earth, bowels); fauna (animal world); flora (plant world) (Zaitseva et al., 2015).

In this paper, we will confine ourselves to considering one aspect: pollution and purification of atmospheric air, since consideration of the entire complex of indicators of ecological potential is beyond the scope of this study. According to the values of the composite indicator of ecological potential, the leading position is occupied by Pavlodar region, the lowest indicator is occupied by Akmola and North Kazakhstan region (see Figure 6).

It is worth noting here that the selected criteria for ecological potential are aimed at assessing the orientation of regional policy towards air purification.

In terms of the average volume of financing for environmental protection for the study period, the leaders are Atyrau, Pavlodar, Karaganda regions, the least spend in Astana, Almaty and North Kazakhstan regions.

In terms of emissions into the atmosphere of pollutants from stationary sources, the least in Almaty, Turkestan and Kyzylorda regions, the largest emissions on average over the period were observed in Pavlodar and Karaganda regions.

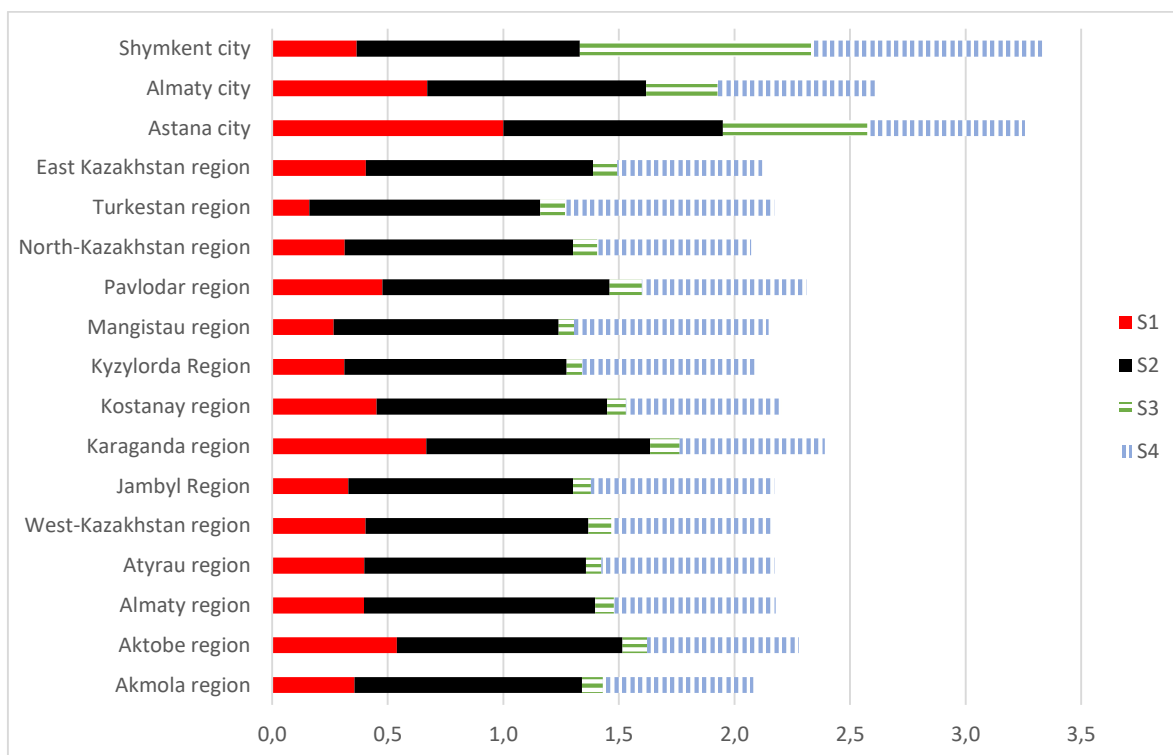


Figure 5. Comparison of regions by social potential

Note - Compiled by authors

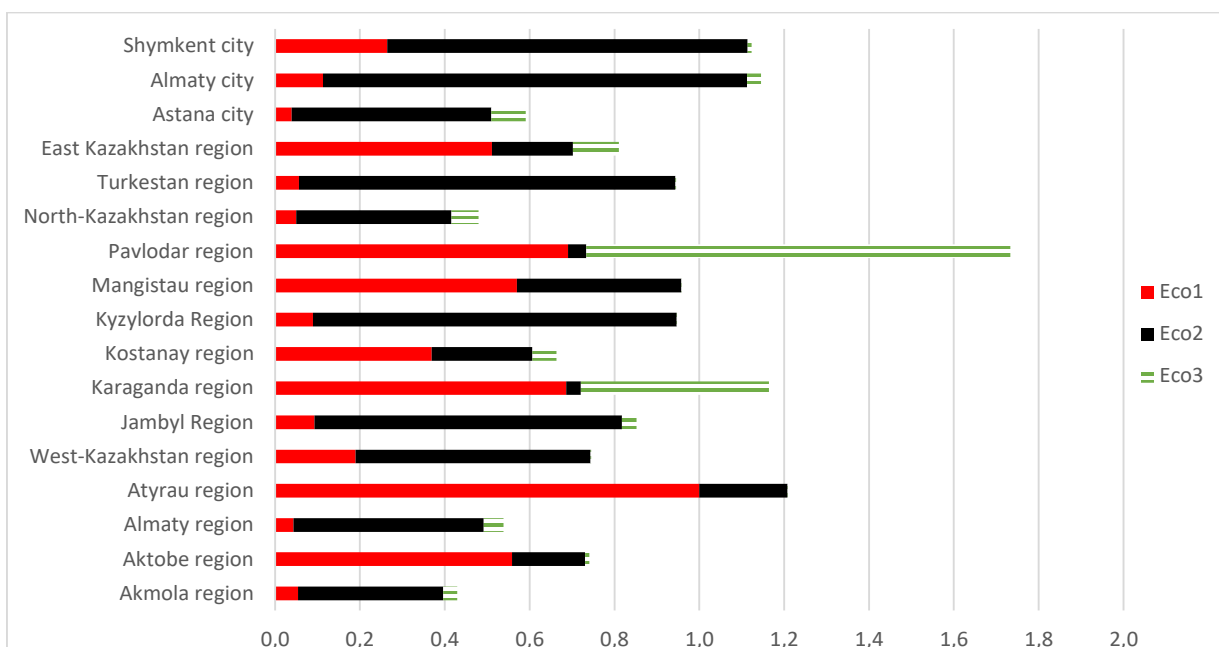


Figure 6 - Comparison of regions by ecological potential

Note - Compiled by authors

Pavlodar and Karaganda regions are leaders in terms of the amount of captured and neutralized pollutants.

The analysis made it possible to identify the strengths and weaknesses of the economy of each region of Kazakhstan. Figure 7 presents data on the summary indicators of each component.

The complex rating score is determined by the formula (2). Figure 8 presents the results of the rating assessment of the economic potential of the regions of Kazakhstan.

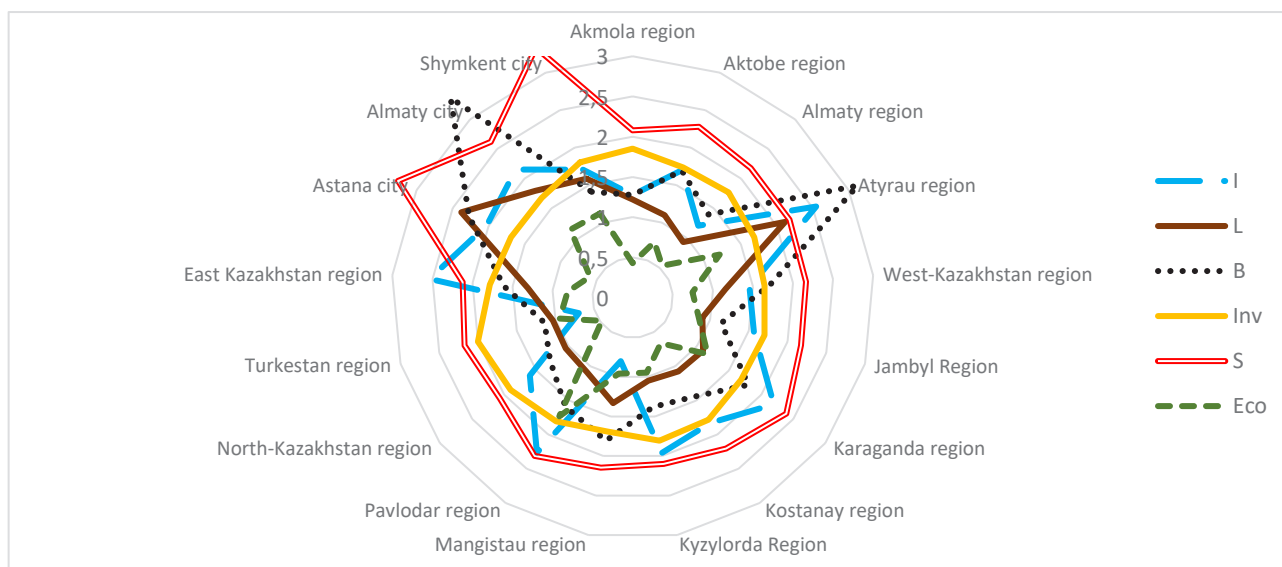


Figure 7 – Summary indicators of investment, labor, industrial, investment, social, ecological potential of Kazakhstan’s regions

Note - Compiled by authors

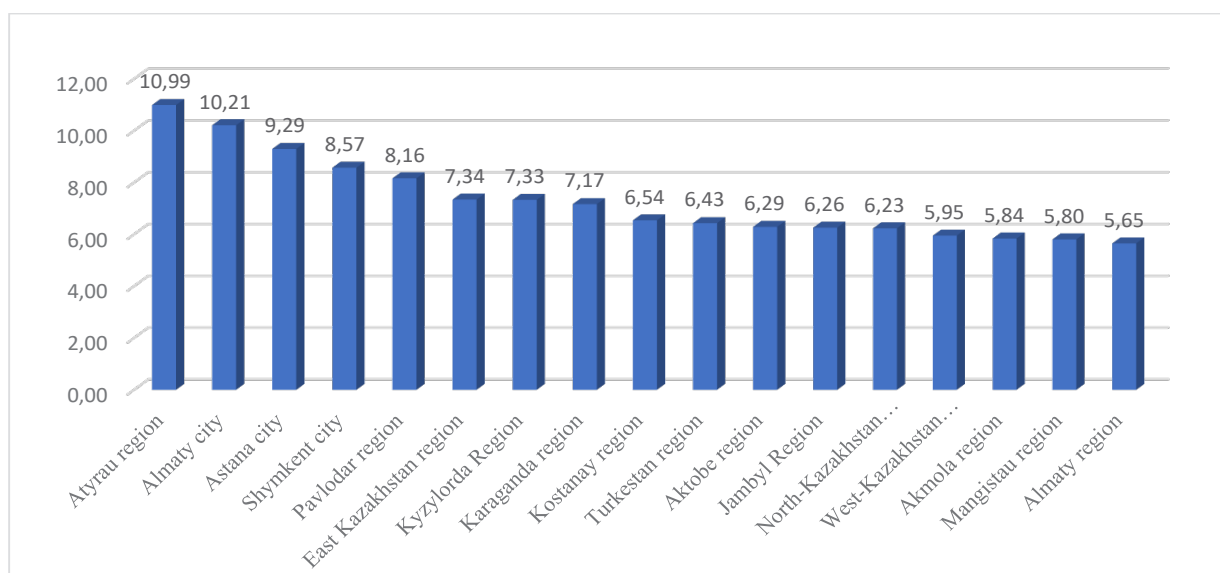


Figure 8 - The results of the rating assessment of the economic potential of Kazakhstan’s regions

Note - Compiled by authors

According to the results of a multidimensional comparative analysis of the economic potential of regions, the leader was the Atyrau region, followed by the cities of Almaty and Astana, and the lowest points were scored by the Mangistau and Almaty regions.

Each region will be characterized in descending order by the complex indicator of EP.

The leader in economic potential Atyrau region has strong positions on innovation, labor, and industrial potential and has weak positions on investment and social potential. Almaty city also has good positions on innovation, labor, industrial potential, and there are weak positions on investment and social. Astana has a strong position on social potential and a weak position on ecological potential. Shymkent has a high position on social potential and an average position relative to other components. Pavlodar has a strong position on ecological potential and a weak position on labor potential. East Kazakhstan region has a strong position on innovation potential and a weak position on ecological potential. Kyzylorda, Kostanay, Aktobe, and West Kazakhstan regions have relatively average positions on all criteria. Karagandinskaya oblast has relatively good positions on social and innovative potential, the other criteria have average values. Turkestan region has a low index on the innovation potential, the rest of the criteria have average values. Zhambyl region has low indicators on labor, industrial and ecological potential. North Kazakhstan and Akmola regions have low ecological potential (most likely due to the low amount of funding for ecological protection in comparison with other regions). Akmola region also has relatively low innovation and industrial potential. Mangistau oblast has low innovation potential Almaty oblast has low values of innovation, labor, industrial and ecological potentials.

The issues of assessment and comparative analysis of the economic potential of the regions are relevant for Kazakhstan as a country with a variety of natural and climatic conditions and resource potential. An assessment of economic potential is necessary to improve the management of regions, as well as to develop and implement strategic plans and initiatives. To ensure stable socio-economic development in current conditions, it is necessary to periodically assess the strengths and weaknesses of the region's economic potential.

Conclusions

The article presents an overview of the methodological provisions relating to the definition and structure of the economic potential of the region. The authors singled out the investment, innovation, labor, production, social and environmental potentials as the main components of the EP. Criteria were defined for each component - socio-economic indicators averaged over the observation period.

The authors conducted a comparative analysis of the regions separately for each component, ranking the regions based on standardized coefficients. The analysis revealed that, in general, Atyrau, East Kazakhstan, and Pavlodar regions lead in terms of innovation potential, Astana, Atyrau region and Almaty in terms of labor potential, and Turkestan region in terms of industrial potential. in terms of investment potential, in terms of social potential - Shymkent, Astana, in terms of environmental potential (in terms of air purification) - Pavlodar region.

The multidimensional comparative analysis carried out by the authors made it possible to determine the values of the complex characteristics of the economic potential of each region of Kazakhstan, which made it possible to conduct a rating assessment. According to the results obtained, the highest values of the complex rating score of the EP are in Atyrau region, Almaty city, Astana city, and the lowest in Mangistau and Almaty regions.

A comparative analysis made it possible to identify the strengths and weaknesses of the development of the regions of Kazakhstan to determine what positions need to be worked on in each region. The results of the study can be useful in the development of plans and programs for the socio-economic development of the regions of Kazakhstan.

In subsequent studies, the authors plan to classify regions according to the level of economic potential based on the use of the cluster analysis method, which will allow the regions to be grouped by the level of economic development and develop a basis for a differentiated approach to groups of regions in the development of regional budgetary policy, programs for innovative, social, industrial development, programs for environmental protection.

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