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A CLUSTER APPROACH TO EVALUATING INVESTMENT SUPPORT ACROSS ECONOMIC SECTORS IN KAZAKHSTAN

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ABSTRACT

Research purpose. This study applies cluster analysis methods to identify homogeneous groups of economic sectors in Kazakhstan according to their level of investment support.

Methodology. To examine sectoral investment patterns, cluster analysis was conducted by grouping economic sectors based on indicators of investment activity. The K-means clustering algorithm was employed to classify the sectors into three distinct clusters. The analysis was carried out in a two-dimensional space using principal component analysis (PCA) with the first and second principal components serving as the axes.

Originality/Value of the Research. The findings provide a foundation for refining investment policy by aligning support measures with the specific needs and capacities of different sector clusters.

Findings. As a result of the cluster analysis, three group of sectors were identified, each internally homogeneous in term of the analyzed set of investment activity indicators. Cluster 0 primarily includes infrastructure-related industries characterized by high capital intensity and relatively low economic returns. Cluster 1 includes sectors that demonstrate high returns on investment but face capital shortages. Cluster 2 comprises the mining industry, which accounts for a significant share of investments and makes a substantial contribution to the country's economic development.

Keywords: investments, economic sectors, cluster analysis, investment efficiency, investment policy, industry approach

INTRODUCTION

In the context of Kazakhstan's efforts to modernize its economy and transition to a model of sustainable economic growth, the issue of effective investment support for economic sectors becomes particularly relevant. Investments play a key role in structural transformation, the development of human capital, the adoption of innovations, and the technological modernization of production – all of which form the foundation for increasing the competitiveness of the national economy.

Despite positive economic growth dynamics - Kazakhstan's GDP grew by 4.8% in 2024 – current measures aimed at economic regulation and business stimulation have proven insufficient to address a number of systemic challenges. These include the economy's high dependence on oil revenues, accelerating inflation, procyclical fiscal policy, declining real incomes, and others macroeconomic imbalances [1].

Under these conditions, the need for a more effective investment policy becomes evident - one that not only ensures current economic stability but also lays the groundwork for sustainable long-term growth. To successfully transform its economic model, Kazakhstan requires large-scale and well-targeted investment inflows, primarily from the private sector, aimed at diversifying the economy, developing non-oil industries, expansion of innovation, and implementing environmentally sustainable technologies.

At the same time, it is essential to ensure a balanced allocation of investment resources – aligned with both the actual needs and growth potential of each sector. Such an approach is critical for achieving high-quality economic growth and strengthening the national economy's resilience to internal and external shocks.

According to the Investment Policy Concept of the Republic of Kazakhstan until 2029, one of the strategic priorities is the implementation of a sectoral approach to attracting investments, based on identifying sectors

with the greatest competitive advantages [2]. A similar emphasis is found in the National Development Plan of the Republic of Kazakhstan until 2029, where significant growth in investments in capital-intensive and strategic sectors is seen as a key condition for accelerated economic development [3].

The relevance of this study is defined by the persistent issues in the investment sphere and the need to explore new approaches to managing investment flows. One such approach is cluster analysis - a tool that makes it possible to identify homogeneous groups of industries with similar characteristics in terms of investment support.

While the academic literature has accumulated substantial experience in analyzing investment activity using econometric and statistical methods, the application of cluster analysis in the context of Kazakhstan's sectoral economic structure remains underexplored.

This study aims to fill this gap. Its objective is to identify homogeneous groups of economic sectors in Kazakhstan based on the level of their investment support using cluster analysis methods. This, in turn, will help improve the efficiency of investment allocation and enhance the rationale behind investment policy.

Literature review. Investment support plays a crucial role in economic development. The efficiency of investment allocation directly affects GDP growth, employment levels and the overall competitiveness of a national economy. In Kazakhstan, the provision of investment to various sectors has been actively studied by numerous researchers. As Petrovskaya (2024) notes, Kazakhstan has developed its own model of investment policy over the past three decades. The country has consistently undertaken reforms aimed at improving the investment climate and removing barriers for investors [4]. Several studies have examined the regional aspects of investment processes within Kazakhstan [5-8].

In recent years, industry-focused research has gained increased relevance. Vertakova et al (2022) identified the most investment-attractive sectors capable of generating a “propulsive effect” that stimulates the growth of related enterprises, industries and entire regions [9]. Zhakupova (2024) highlighted the issue of low diversification in the distribution of investments across Kazakhstan and neighboring countries, noting a persistent bias toward the extractive sector. According to her, this trend exacerbates the resource-dependent nature of these economies [10].

Other scholars emphasize the need for balance in investment flows across sectors. Al-Banna et al [11] argue for finding an optimal equilibrium between overinvestment risks and the dangers of underinvestment. Supporting this perspective, Muazu and Alagidede (2018) assert that “different sectors of the economy must grow in the right proportion to one another” to achieve balanced and sustainable development [12].

Despite growing interest in the topic, research specifically addressing sectoral investments in Kazakhstan remains limited. This study seeks to address that gap by contributing to the understanding of investment allocation patterns across Kazakhstan’s economic sectors.

Cluster analysis has emerged as a valuable tool for identifying hidden patterns in investment flows and grouping sectors based on similar investment characteristics. In economic research, cluster analysis is widely applied for studying structural and dynamic processes. The existing literature based on cluster analysis can be categorized into three main groups.

The first group includes studies focusing on specific industries or sectors. Baculakova (2018), for instance, employed cluster analysis to examine the creative industries in Slovakia [13]. Reiff et al. (2018) applied the method to identify structural differences in the agricultural and food sectors across EU countries, using Ward’s minimum variance criterion for clustering [14]. Nuo Liao and Yong He (2018) combined cluster analysis with a panel regression model to explore energy efficiency in the industrial sector and its driving factors [15].

The second group includes studies that apply clustering to economic sectors with specific objectives. For example, Putra and Pratiwi (2019) clustered the economic sectors of Kalimantan into four groups using 13 socio-economic indicators, aiming to identify potential leading sectors for regional development [16]. Bagnara and Goodarzi (2023) used a cluster-based approach to group companies by economic sector, arguing that such grouping facilitates more effective investment strategies [17].

The third group comprises studies that apply clustering at a regional or global scale. Hejduková et al. (2020), for instance, used cluster analysis to classify EU countries according to the dynamics of Industry 4.0 development indicators [18].

While these studies offer valuable insights, research focused specifically on clustering industries by their level of investment support remains scarce. Thus, despite the growing body of literature on investment analysis, there is a noticeable lack of comprehensive studies employing multivariate statistical methods, particularly cluster analysis, to systematically classify Kazakhstan's economic sectors based on investment provision. This study aims to fill that gap and contribute to the development of more informed and targeted investment policies.

MAIN BODY

Methodology

To analyze sectoral investments, a cluster analysis method was employed, based on grouping economic sectors according to indicators of investment activity. The K-means clustering algorithm was used to classify the sectors into distinct clusters. The choice of K-means is justified by its computational efficiency, good interpretability, compatibility with the structure of the data, and adaptability to economic analysis tasks following preliminary dimensionality reduction of the feature space. The presence of compact and relatively spherical clusters aligns well with the assumptions of the K-means algorithm, making it more suitable compared to DBSCAN. Furthermore, unlike hierarchical clustering, K-means performs efficiently on large datasets, offering acceptable execution times and stability across multiple runs.

In this study, sectors were grouped based on the following indicators: capital intensity, sectoral contribution to GDP, share of sectoral investment in total fixed capital investment, growth rates of sectoral investment and output, as well as the degree of depreciation and the renewal rate of fixed assets. The results of the clustering were visualized using Principal Component Analysis (PCA). PCA allows for the representation of sectors in a reduced feature space, enabling a clearer view of how similar or different the sectors are from one another. For this study, a two-dimensional PCA space was used, with PCA1 (the first principal component) and PCA2 (the second principal component) serving as the axes. Python code was utilized for the calculation of coefficients, sector clustering, and visualization of the results.

Data sources

The study used statistical data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (BNS RK) for the period 2000–2024. The choice of the 2000-2024 time interval ensures the representativeness of the analysis, reflects the key stages of the country's socio-economic development and allows for the formulation of well-founded conclusions for investment policy. The data are classified by types of economic activity in accordance with the General Classifier of Economic Activities (NACE RK 03-2019). For the analysis, data from nine sectors were selected: agriculture (including forestry and fisheries), mining and quarrying, manufacturing, electricity supply (including gas, steam, hot water, and air conditioning supply), water supply (including sewerage, waste collection, treatment and disposal and pollution remediation activities), construction, trade (wholesale and retail), transport and storage, information and communication.

Results

At the initial stage of the study, a set of criteria was calculated to group Kazakhstan's economic sectors.

The first criterion was the ratio of fixed capital investment to output (goods and services production) by sector, which reflects the capital intensity of each sector. The most capital-intensive sectors were water supply, electricity supply and transport. These three sectors require continuous infrastructure investment, such as pipelines, power grids and transport corridors. Significant capital investments are also required in mining and manufacturing. However, these sectors are also characterized by high output volumes. On the other hand, sectors such as trade, construction and agriculture demonstrated low investment-to-output ratios, indicating relatively low capital intensity. In the case of trade, this is explained by the sector's ability to operate and grow without substantial investment in long-term fixed assets. However, in agriculture and construction, a low investment-to-output ratio may indicate limited access to capital and underinvestment.

The calculated correlation coefficients show a statistically significant positive relationship between fixed capital investment and output in most sectors. The strongest correlations were observed in manufacturing,

agriculture, water supply, electricity supply and trade ($R^2>0.9$; $p<0.05$). A moderate positive correlation was identified in the transport and mining sectors ($R^2>0.7$; $p<0.05$). Weaker correlations were found in information and communication and construction ($R^2<0.7$; $p<0.05$).

The second criterion was the sector's contribution to GDP, calculated as the ratio of sectoral output to Kazakhstan's total GDP. An analysis of statistical data for the period 2000–2024 showed that the largest contributors to GDP were mining, manufacturing and trade. A moderate level of contribution was observed in construction, transport and agriculture. Sectors with a low contribution to GDP included water supply, electricity supply and communication.

The third criterion was the sectoral share of total investment, calculated as the ratio of investment in a specific sector to total fixed capital investment in Kazakhstan. The results showed significant variation in investment shares across sectors. Over the 2000–2024 period, mining consistently accounted for the largest share of investments (more than 30% on average), although this share has declined substantially in recent years. Transport received over 14% of total investments, while manufacturing accounted for around 10%. All other sectors combined received less than 20% of the total investment.

Correlation analysis revealed that for most sectors, the relationship between investment share and contribution to GDP was either absent or negative. In the mining, manufacturing and transport sectors, correlation coefficients were close to zero and statistically insignificant ($R^2<0.1$; $p>0.05$). Negative correlations were found in trade, electricity supply, construction, water supply and agriculture ($r<–0.5$; $R^2>0.2$; $p<0.05$), suggesting that as the investment share in these sectors increases, their relative contribution to GDP actually decreases. This may reflect declining returns on investment or structural characteristics of these industries. The only sector that exhibited a strong, statistically significant positive correlation was information and communication ($r=0.7961$; $R^2=0.6338$; $p<0.05$). This indicates that an increase in the investment share of this sector is accompanied by a noticeable rise in its contribution to the economy. This result may reflect the growing importance of digitalization and communication technologies in Kazakhstan's economic development.

The fourth and fifth criteria calculated in the study were the growth rates of sectoral investment and growth rates of sectoral output. During the period from 2001 to 2024, the growth rates of fixed capital investment were uneven across years. Some periods exhibited a positive investment dynamic, while others showed a decline.

The highest average annual growth rates of investment (exceeding 20%) were observed in the electricity supply**,** water supply**,** agriculture and transport and storage sectors. The highest average annual growth rates of output (also over 20%) were found in construction and transport and storage.

A panel scatter plot showing the relationship between investment growth and output growth across sectors is presented in Figure 1.

This figure illustrates the correlation between investment and output growth across various sectors of the economy. In most cases, a positive correlation is observed: an increase in investment tends to be accompanied by an increase in output. However, a statistically insignificant linear relationship was found in mining**,** manufacturing**,** agriculture and electricity supply, as indicated by low coefficients of determination ($R^2<0.1$) and high p-values ($p>0.05$). The strongest statistically significant positive correlation was identified in the transport sector ($R^2=0.1704$, $p=0.045$). Weak positive correlations were found in the water supply and communication sectors. A slight negative correlation was observed in the construction sector ($r = –0.009$; $R^2=0.0001$; $p=0.96683$), indicating virtually no meaningful relationship.

The next criterion was the degree of depreciation of fixed assets across the analyzed sectors. The high demand for capital investment by Kazakhstani enterprises is confirmed by the significant wear and tear of fixed assets. The highest levels of depreciation were observed in electricity supply (over 70%), mining (59.1%), information and communication (over 48%), construction (48%), manufacturing (41.4%). A high level of depreciation poses a critical challenge for these sectors, as it reduces technical capacity, increases costs related to maintenance and repairs and limits production growth potential.

The seventh criterion is the renewal rate of fixed assets across sectors. During the period from 2000 to 2024, the lowest average renewal rates (below 7%) were observed in the electricity supply and water supply sectors. Low renewal rates (below 15% on average) were also characteristic of the transport and storage, mining and manufacturing sectors. In the remaining sectors, the renewal rate did not exceed an average of 21%. The rate of asset depreciation in Kazakhstan outpaces the rate of renewal, indicating a critical need for modernization and replacement of outdated capital assets.

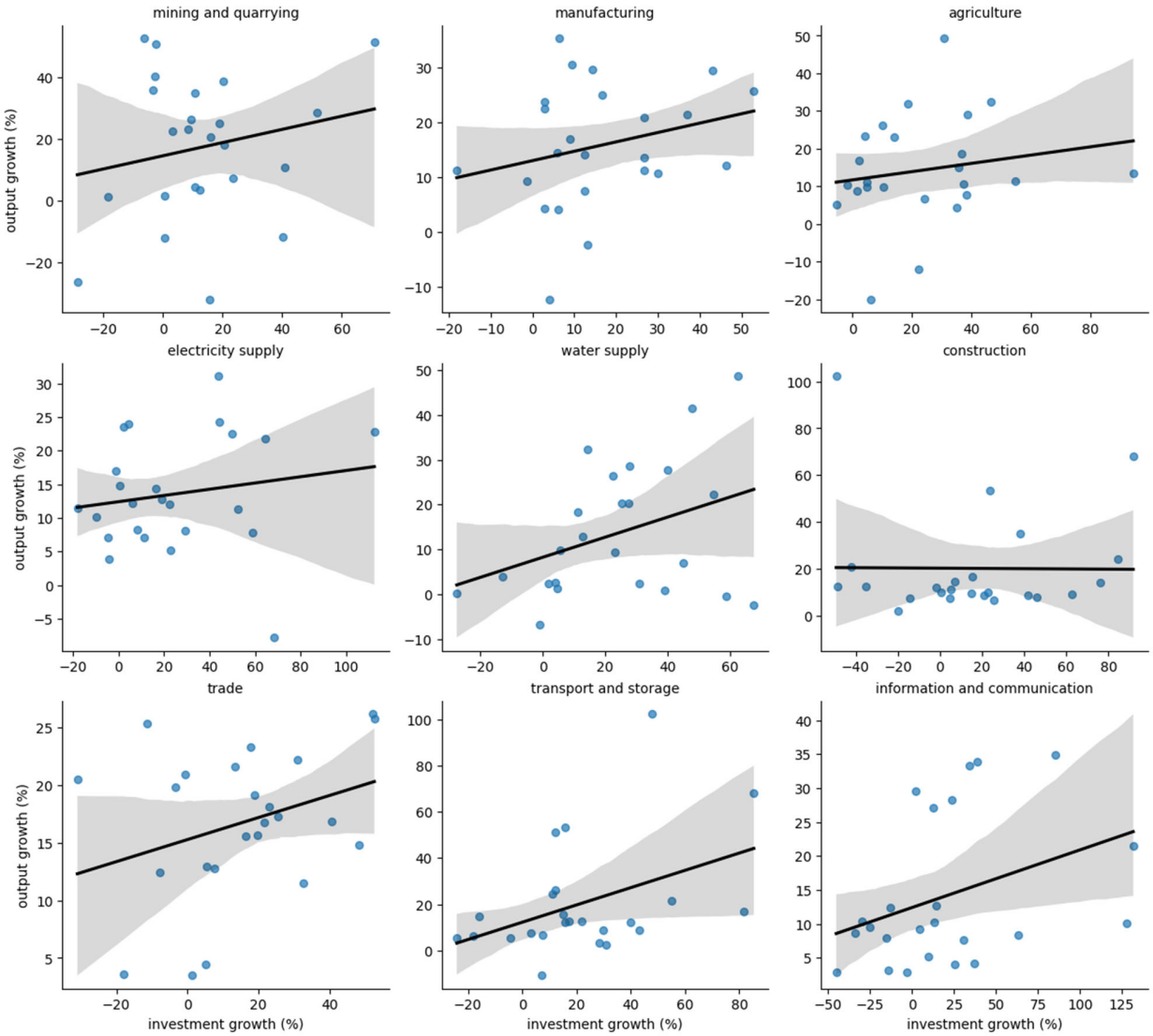

Figure 1 - Faceted Scatter Plot showing the relationship
between investment growth and output growth across sectors
Note: compiled by the authors based on data from the BNS RK

The correlation analysis between the degree of depreciation and the renewal rate of fixed assets revealed a negative relationship in most sectors. This suggests that a high level of depreciation is often accompanied by slower renewal of assets, which may signal a lack of investment resources or inefficient capital investment policies.

The strongest negative correlations ($R^2>0.45$; $p<0.05$) were found in agriculture, information and communication, construction and electricity supply. Significant negative relationships were also recorded in mining, manufacturing and water supply. However, in the trade and transport sectors, correlation coefficients did not show any statistically significant relationship between depreciation and asset renewal.

At the second stage of the analysis, economic sectors were clustered based on their level of investment support, using the K-means clustering algorithm and Principal Component Analysis (PCA). The distribution of sectors across clusters along with the values of the two principal components (PCA1 and PCA2) is presented in Table 1.

Table 1 – Clustering Indicators for the Economic Sectors of the Republic of Kazakhstan

Economic sectors	**Cluster**	**PCA1**	**PCA2**
electricity supply	0	-5.05794573	4.73693222
water supply	0	-10.21686177	11.66459323
transport and storage	0	1.36035926	2.10238677
information and communication	0	-4.67097766	0.45829032
agriculture	1	-3.17410377	-10.4994587
manufacturing	1	5.27436386	-1.97071994
construction	1	-1.93790819	-4.36348411
trade	1	0.59894081	-8.64818282
mining and quarrying	2	17.8241332	6.51964303
Note - calculated by the authors			

The clustering results indicate the formation of three distinct clusters.

Cluster 0 includes capital-intensive sectors with moderate or low investment levels: electricity supply, water supply, transport, and information and communication. These sectors exhibit high investment growth rates (approximately 20% on average over the 2001–2024 period), high or medium levels of asset depreciation, and low to medium renewal rates of fixed assets.

Cluster 1 consists of sectors with moderate capital intensity and low or medium investment shares. It includes agriculture, manufacturing, construction, and trade. A common feature of these sectors is a relatively high renewal rate of fixed assets combined with low or medium depreciation levels.

Cluster 2 is represented solely by the mining sector, which stands out due to its significant contribution to the national economy, high volumes of investment, high capital intensity, substantial asset depreciation, and a medium renewal rate.

Figure 2 illustrates the positioning of sectors in the feature space, based on the results of the principal component analysis.

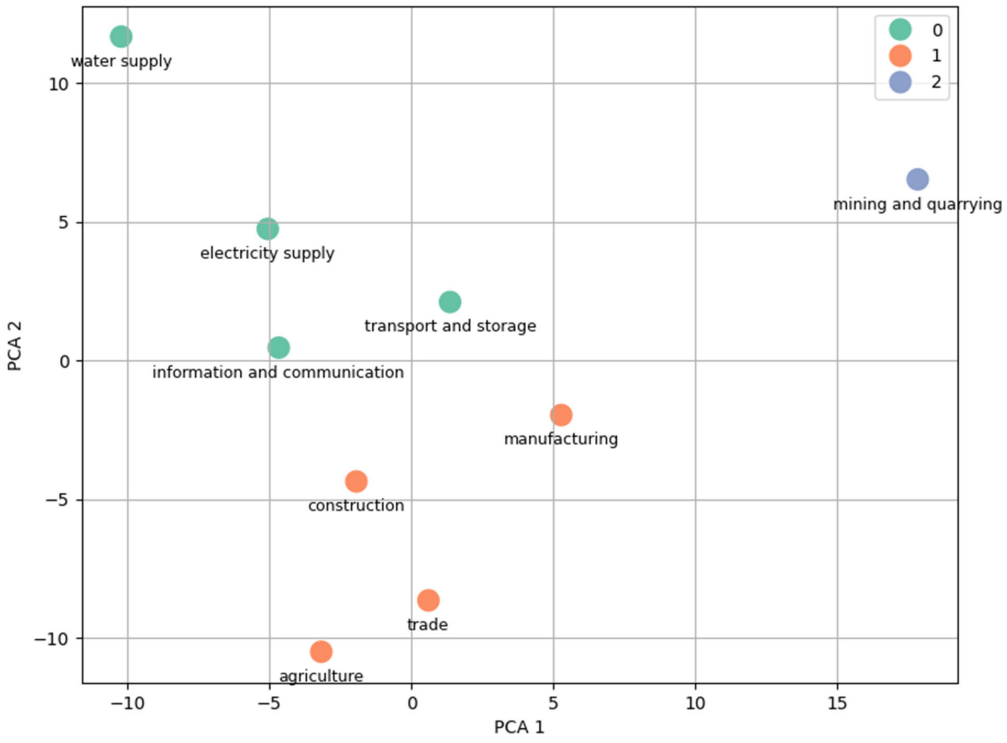

Figure 2 - Positioning of sectors in the feature space

Note: compiled by the authors

As shown in Figure 2, Cluster 0 (orange) includes sectors located in the negative PCA2 zone. Cluster 1 (green) comprises sectors concentrated in the positive PCA2 area. The spatial proximity of sectors on the graph indicates similar investment characteristics and development trends among those industries. Cluster 2 (blue) includes a single sector with positive values on both PCA1 and PCA2. Its significant distance from the other sectors highlights the unique investment profile of the mining industry and confirms its distinct role in the country's investment structure.

The results of the Principal Component Analysis (PCA) show that the first component (PCA1) is primarily shaped by indicators related to the sector's contribution to GDP and the share of sectoral investment in total fixed capital investment, particularly during the 2004–2014 period. The second component (PCA2) reflects the current condition and dynamics of fixed assets, as well as the investment-to-output ratio (capital intensity), especially over the 2020–2024 period. As a result, PCA1 can be interpreted as an axis of economic significance and weight in the investment structure, while PCA2 serves as an axis of the current state of fixed assets and investment renewal activity.

The average values of key metrics by cluster are presented in Table 2.

Table 2 - The average values of key metrics by cluster

Key metrics	Cluster 0	Cluster 1	Cluster 2
capital intensity	50.41	6.63	25.42
sectoral contribution to GDP	3.74	13.63	27.89
share of sectoral investment in total fixed assets investment	6.20	5.31	32.44
growth rates of sectoral investment	22.69	17.56	12.97
growth rates of sectoral output	15.41	16.72	17.28
degree of depreciation	41.14	29.23	52.16
renewal rate of fixed assets	9.73	16.98	12.56
Note - calculated by the authors			

According to the data presented in Table 2, the sectors in Cluster 0 demonstrate a low contribution to GDP (3.74%) and moderate output growth rates (15.41%), high capital intensity (50.41%), and a low renewal rate of fixed assets (9.73%), while the degree of depreciation remains relatively high (41.14%). However, the investment growth rate in Cluster 0 sectors is notably high, averaging 22.69%.

The sectors in Cluster 1 are characterized by low capital intensity, a moderate contribution to GDP, a low share of sectoral investment, and moderate growth rates for both investment and output. The fixed assets in Cluster 1 are less depreciated compared to those in Clusters 0 and 2, and the renewal rate is significantly higher.

The average metrics for Cluster 2 which consists solely of the mining industry show a high contribution to GDP and a dominant share of investment, moderate capital intensity, and relatively high output growth. However, the investment growth rate in Cluster 2 is substantially lower than in the other clusters. In addition, this cluster is marked by a high degree of fixed asset depreciation and a low renewal rate, indicating structural investment challenges despite its economic significance.

CONCLUSION

As a result of the cluster analysis, three groups of industries were identified, each internally homogeneous based on the analyzed set of investment activity indicators. The distribution of sectors across clusters revealed that Cluster 0 mainly includes infrastructure sectors such as water supply, electricity supply, transport and storage, and information and communication. This cluster is characterized by a high investment-to-output ratio, limited economic return, a moderate share of total investment, and a low fixed asset renewal rate. At the same time, the sectors in this cluster show active investment inflows, as evidenced by their high investment growth rates.

Cluster 1 consists of agriculture, manufacturing, construction, and trade. This group is characterized by relatively high investment efficiency, a moderate contribution to GDP, average growth rates of investment

and output, moderate fixed asset depreciation, and a low share of total investment. The industries in Cluster 1 demonstrate strong returns on investment but remain underfunded, which hinders their development.

Cluster 2 consists solely of the mining industry. Historically, this sector has received a large share of investments, which has translated into a significant contribution to the economy. However, in recent years, both the rate of investment growth and the share of investment in the mining industry have declined. Despite its strategic importance, the sector remains highly capital-intensive, with considerable asset depreciation and relatively low returns on new investments.

Based on the results of the cluster analysis of investment support across sectors of Kazakhstan's economy, several recommendations can be made to improve investment policy, tailored to the specific features of each cluster. For Cluster 0, given the high capital intensity and limited economic returns, it is recommended to reassess the effectiveness evaluation mechanisms for investments in these sectors. Improvements should include tighter monitoring of fund allocation and evaluation of both the social and economic impacts of investment projects. In addition, it is important to stimulate asset renewal through the implementation of modernization requirements and technological standards. Public-private partnership (PPP) mechanisms could be particularly effective in transport and communication sectors, allowing for better risk sharing and increased investment efficiency.

The sectors in Cluster 1 demonstrate high investment returns but suffer from capital shortages. This highlights the need to prioritize these industries in the national investment policy. Their investment attractiveness can be improved through tax incentives, interest rate subsidies, and other fiscal tools. Special emphasis should be placed on supporting agriculture and manufacturing, as these are foundational sectors. Attracting private investment and improving investment efficiency will also require the production of more complex and high-tech goods. It would be appropriate to promote private investment through the creation of sector-specific investment funds, crowdfunding platforms, and other modern financing instruments.

Cluster 2, represented by the mining sector, shows a declining trend in investment activity and increasing asset wear and tear. Given the sector's capital intensity and limited returns from new investments, it is necessary to shift from an extensive to a more technology-driven, resource-efficient model. Policy measures should not focus solely on increasing investment volumes, but rather on modernizing equipment and infrastructure, stimulating deeper processing of raw materials, and implementing ESG standards.

Overall, investment policy in Kazakhstan should become more differentiated, leveraging a cluster-based approach. This involves supporting efficiency in capital-intensive industries, implementing targeted programs to stimulate investment in underfunded high-return sectors, and improving results in infrastructure industries.

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ҚАЗАҚСТАН ЭКОНОМИКАСЫНЫҢ САЛАЛАРЫН ИНВЕСТИЦИЯЛЫҚ ҚАМТАМАСЫЗ ЕТІЛУІН БАҒАЛАУДЫҢ КЛАСТЕРЛІК ТӘСІЛІ

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АҢДАТПА

Зерттеу мақсаты – кластерлік талдау әдістерін пайдалана отырып, Қазақстан экономикасының салаларын инвестициялық қамтылу деңгейіне қарай біртекті топтарға жіктеу.

Әдіснамасы. Салалық инвестицияларды зерттеу үшін экономиканың салаларын инвестициялық белсенділік көрсеткіштері бойынша топтауға негізделген кластерлік талдау әдісі қолданылды. Кластерлеу алгоритмі ретінде салаларды үш кластерге бөлуге мүмкіндік берген K-means әдісі пайдаланылды. Зерттеуде PCA1 (бірінші компонент) және PCA2 (екінші компонент) атты екі компонентті өлшемділік қолданылды.

Зерттеудің бірегейлігі/құндылығы. Қорытындылар қолдау шараларын әртүрлі сектор кластерлерінің нақты қажеттіліктері мен мүмкіндіктеріне сәйкестендіру арқылы инвестициялық саясатты нақтылау үшін негіз болады.

Зерттеу нәтижелері. Кластерлік талдау нәтижесінде инвестициялық белсенділіктің зерттелген көрсеткіштері бойынша ішкі жағынан біртекті үш сала тобы анықталды. Кластер 0-ге негізінен капитал сыйымдылығы жоғары, бірақ экономикалық қайтарымы төмен инфрақұрылымдық салалар біріктірілгенін көрсетті. Кластер 1-ге инвестициялардан жоғары қайтарым көрсеткенімен, капитал тапшылығын сезінуде салалар кіреді. Кластер 2-ні ел экономикасын дамытуға елеулі үлес қосатын және инвестицияның айтарлықтай үлесін алатын тау-кен өнеркәсібі құрайды.

Түйін сөздер: инвестициялар, экономикалық секторлар, кластерлік талдау, инвестициялық тиімділік, инвестициялық саясат, салалық көзқарас.

КЛАСТЕРНЫЙ ПОДХОД К ОЦЕНКЕ ИНВЕСТИЦИОННОГО ОБЕСПЕЧЕНИЯ СЕКТОРОВ ЭКОНОМИКИ КАЗАХСТАНА

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АННОТАЦИЯ

Цель исследования. Выявление однородных групп отраслей экономики Казахстана по уровню их инвестиционного обеспечения с использованием методов кластерного анализа.

Методология. Для исследования отраслевых инвестиций был применен метод кластерного анализа, основанный на группировке отраслей экономики по показателям инвестиционной активности. В качестве алгоритма кластеризации был взят K-means, с помощью которого было осуществлено распределение отраслей по трем кластерам. В исследовании была применена размерность с двумя компонентами PCA1 (первая компонента) и PCA2 (вторая компонента).

Оригинальность/ценность исследования. Полученные результаты закладывают основу для совершенствования инвестиционной политики путем согласования мер поддержки с конкретными потребностями и возможностями различных кластеров.

Результаты исследования. В результате кластерного анализа было выявлено три группы отраслей, внутренне однородных по исследуемому комплексу показателей инвестиционной активности. В кластере 0 объединены в основном инфраструктурные отрасли с высокой капиталоемкостью и небольшой экономической отдачей. В кластер 1 вошли отрасли, которые показывают высокую отдачу от вложенных инвестиций, но испытывают недостаток капитала. Кластер 2 сформирован из горнодобывающей промышленности со значительной долей инвестиций и высоким вкладом в развитие экономики страны.

Ключевые слова: инвестиции, отрасли экономики, кластерный анализ, эффективность инвестиций, инвестиционная политика, отраслевой подход

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