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ASSESSMENT OF THE INVESTMENT ATTRACTIVENESS OF THE AGRO-INDUSTRIAL COMPLEX OF THE REPUBLIC OF KAZAKHSTAN: A REGIONAL COMPARATIVE ANALYSIS

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Abstract. The article examines the investment attractiveness of the agro-industrial complex of the Republic of Kazakhstan from a regional perspective. The relevance of the study is determined by the strategic role of the agricultural sector in ensuring food security, supporting sustainable regional development, and enhancing the competitiveness of the national economy, as well as by the need to improve the efficiency of attracting and utilising investment resources. The purpose of the article is to conduct a comparative assessment of the investment attractiveness of the agro-industrial complex across Kazakhstan's regions and to identify the factors that determine differences in investment activity levels and investment effectiveness. The methodological framework of the study includes economic, statistical, and comparative analyses; normalisation of indicators; an integrated assessment; regional ranking; correlation and regression analyses; and systemic and institutional approaches. The information base consists of official statistical data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, the Ministry of Agriculture of the Republic of Kazakhstan, and regional statistical materials. For the comprehensive

assessment, a system of indicators was developed to reflect investment activity, production potential, development dynamics, and investment performance of the agricultural sector. The results reveal pronounced regional differentiation in the agro-industrial complex's investment attractiveness. It was found that an increase in investment does not lead to a proportional increase in agricultural production in all regions, indicating differences in the efficiency of investment resource utilisation. Based on the integral index, the comparative positions of the regions were determined, with the highest values recorded in Turkistan, North Kazakhstan, Pavlodar, Akmola, and Kostanay regions. The practical significance of the study lies in the potential to use the results obtained to develop differentiated regional agricultural and investment policies aimed at increasing the efficiency of capital investment and reducing territorial disparities.

Keywords: agro-industrial complex, investment attractiveness, investment, regional analysis, agriculture, investment efficiency, integral index, Kazakhstan

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫ АГРОӨНЕРКӘСІПТІК КЕШЕНІНІҢ ИНВЕСТИЦИЯЛЫҚ ТАРТЫМДЫЛЫҒЫН БАҒАЛАУ: ӨҢІРЛІК САЛЫСТЫРМАЛЫ ТАЛДАУ

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Аннотация. Мақалада Қазақстан Республикасы агроөнеркәсіптік кешенінің инвестициялық тартымдылығы өңірлік тұрғыдан қарастырылады. Зерттеудің өзектілігі аграрлық сектордың азық-түлік қауіпсіздігін қамтамасыз етудегі, өңірлердің тұрақты дамуындағы және ұлттық экономиканың бәсекеге

қабілеттілігін арттырудағы стратегиялық рөлімен, сондай-ақ инвестициялық ресурстарды тарту мен пайдаланудың тиімділігін арттыру қажеттілігімен айқындалады. Мақаланың мақсаты - Қазақстан өңірлерінің агроөнеркәсіптік кешенінің инвестициялық тартымдылығына салыстырмалы баға беру және инвестициялық белсенділік деңгейі мен инвестициялық салымдардың нәтижелілігіндегі айырмашылықтарды айқындайтын факторларды анықтау. Зерттеудің әдіснамалық негізін экономикалық, статистикалық және салыстырмалы талдау әдістері, көрсеткіштерді қалыпқа келтіру, интегралдық бағалау, өңірлерді ранжирлеу, корреляциялық және регрессиялық талдау, сондай-ақ жүйелік және институционалдық тәсілдер құрады. Ақпараттық база ретінде Қазақстан Республикасы Стратегиялық жоспарлау және реформалар агенттігінің Ұлттық статистика бюросының, Қазақстан Республикасы Ауыл шаруашылығы министрлігінің ресми статистикалық деректері және өңірлік статистикалық материалдар пайдаланылды. Кешенді бағалау үшін инвестициялық белсенділікті, өндірістік әлеуетті, даму динамикасын және аграрлық сектордың инвестициялық нәтижелілігін сипаттайтын көрсеткіштер жүйесі қалыптастырылды. Зерттеу нәтижелері АӨК инвестициялық тартымдылығының айқын өңірлік саралануын көрсетті. Инвестициялар көлемінің ұлғаюы барлық өңірлерде ауыл шаруашылығы өндірісінің пропорционалды өсуімен қатар жүрмейтіні анықталды, бұл инвестициялық ресурстарды пайдалану тиімділігіндегі айырмашылықтарды көрсетеді. Интегралдық индекс негізінде өңірлердің салыстырмалы позициялары анықталды; ең жоғары мәндер Түркістан, Солтүстік Қазақстан, Павлодар, Ақмола және Қостанай облыстарында тіркелді. Зерттеудің практикалық маңыздылығы алынған нәтижелерді капитал салымдарының тиімділігін арттыруға және аумақтық диспропорцияларды төмендетуге бағытталған сараланған өңірлік аграрлық және инвестициялық саясатты әзірлеу кезінде пайдалану мүмкіндігімен айқындалады.

Түйін сөздер: агроөнеркәсіптік кешен, инвестициялық тартымдылық, инвестициялар, өңірлік талдау, ауыл шаруашылығы, инвестициялық тиімділік, интегралдық индекс, Қазақстан

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ОЦЕНКА ИНВЕСТИЦИОННОЙ ПРИВЛЕКАТЕЛЬНОСТИ АГРОПРОМЫШЛЕННОГО КОМПЛЕКСА РЕСПУБЛИКИ КАЗАХСТАН: РЕГИОНАЛЬНЫЙ СРАВНИТЕЛЬНЫЙ АНАЛИЗ

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Аннотация. В статье рассматривается инвестиционная привлекательность агропромышленного комплекса Республики Казахстан в региональном разрезе. Актуальность исследования обусловлена стратегической ролью аграрного сектора в обеспечении продовольственной безопасности, устойчивого развития регионов и повышении конкурентоспособности национальной экономики, а также необходимостью повышения эффективности привлечения и использования инвестиционных ресурсов. Цель статьи заключается в проведении сравнительной оценки инвестиционной привлекательности агропромышленного комплекса регионов Казахстана и выявлении факторов, определяющих различия в уровне инвестиционной активности и результативности инвестиционных вложений. Методологическую основу исследования составили методы экономического, статистического и сравнительного анализа, нормализации показателей, интегральной оценки, ранжирования регионов, корреляционного и регрессионного анализа, а также системный и институциональный подходы. Информационной базой послужили официальные статистические данные Бюро национальной статистики Агентства по стратегическому планированию и реформам Республики Казахстан, Министерства сельского хозяйства Республики Казахстан и региональные статистические материалы. Для комплексной оценки сформирована система показателей, отражающих инвестиционную активность, производственный потенциал, динамику развития и инвестиционную результативность аграрного сектора. Результаты исследования показали наличие выраженной региональной дифференциации инвестиционной привлекательности АПК. Установлено, что увеличение объемов инвестиций не во всех регионах сопровождается пропорциональным ростом сельскохозяйственного производства, что свидетельствует о различиях в эффективности использования инвестиционных ресурсов. На основе интегрального индекса определены сравнительные позиции регионов; наиболее высокие значения зафиксированы в Туркестанской, Северо-Казахстанской, Павлодарской, Акмолинской и Костанайской областях. Практическая значимость исследования заключается в возможности использования полученных результатов при разработке дифференцированной региональной аграрной и инвестиционной политики, направленной на повышение эффективности капиталовложений и снижение территориальных диспропорций.

Ключевые слова: агропромышленный комплекс, инвестиционная

привлекательность, инвестиции, региональный анализ, сельское хозяйство, инвестиционная эффективность, интегральный индекс, Казахстан

Introduction. The agro-industrial complex of the Republic of Kazakhstan is a strategically important sector of the national economy, ensuring food security, employment for the rural population, territorial development, and the sustainability of regional economic systems. Under these conditions, investment is one of the key factors in modernising production, renewing fixed assets, introducing new technologies, and increasing the productivity of the agricultural sector (Alibayev, 2023; Smagulova, 2022; Naizabekova, 2025). The investment-driven development of agriculture is becoming particularly relevant in the context of efforts to enhance the competitiveness of the national agro-industrial complex and to ensure sustainable growth in production. Modern studies show that the performance of the agricultural sector is determined not only by the volume of invested capital but also by the nature of its use, technological upgrades, investments in research and development, and the ability of agricultural enterprises to increase resource productivity (Gbegbelegbe et al., 2021; Fuglie et al., 2021; Zilberman et al., 2023). For Kazakhstan, this problem has a pronounced spatial dimension. The regions of the country differ significantly in natural and climatic conditions, agricultural specialisation, the level of development of production and logistics infrastructure, the scale of investment activity, and the availability of financial resources. In this regard, the investment attractiveness of the agro-industrial complex cannot be assessed solely by the absolute volume of capital investment. It is necessary to take into account the regional economy's ability to convert attracted investment into increased production and a sustainable improvement in agricultural efficiency (Saparova, 2024; Akhmedzhanov, 2024).

In the scientific literature, investment activity is considered an important factor in increasing agricultural productivity and competitiveness. Latruffe (2022) links the competitiveness of the agricultural sector to the efficient use of production resources, while Kiryluk-Dryjska and Baer-Nawrocka (2022) emphasise the relationship between agricultural investment and the sustainability of the food supply. Studies by Fuglie et al. (2021) highlight the special role of technological and innovative investments in ensuring long-term productivity growth. Thus, the modern approach предполагает a shift from assessing the scale of funding to analysing its actual effectiveness.

In Kazakhstani scientific literature, considerable attention is paid to issues related to financing the agricultural sector, modern investment mechanisms, and the role of capital investments in the sustainable development of agriculture (Alibaev, 2023; Smagulova, 2022; Saparova, 2024; Naizabekova, 2025). At the same time, a comparative assessment of the investment attractiveness of the agro-industrial complex across all regions of Kazakhstan, based on a joint consideration of investment activity, production potential, development dynamics, and the efficiency of resource use, remains underdeveloped.

This circumstance gains additional significance in the context of pronounced regional differentiation in agricultural production. A high volume of investment does not necessarily mean high investment performance: capital-intensive projects may have long payback periods, while regions with an accumulated production base can sustain relatively high output with a smaller current volume of investment. Consequently, for an objective interregional comparison, it is necessary to take into account not only the investment flow but also its relationship with production results.

The official statistical data of the Republic of Kazakhstan enable such an analysis using comparable indicators of investment in fixed capital and agricultural production volume by region (Bureau of National Statistics of the Republic of Kazakhstan, 2025a; 2025b). The state agrarian policy also places special emphasis on investment support, technological modernisation, and improving the efficiency of the agro-industrial complex (Ministry of Agriculture of the Republic of Kazakhstan, 2022).

The study aims to conduct a comparative assessment of the investment attractiveness of the agro-industrial complex across the regions of the Republic of Kazakhstan and to identify the factors that determine differences in investment activity levels and the efficiency of investment resource use.

To achieve the set goal, the following tasks are addressed: the dynamics of investment in the agrarian sector of the regions are analysed; the production potential is assessed; the investment return is determined; the initial indicators are normalised; the integral index of investment attractiveness is calculated; the regions are ranked, and the relationship between investment and production characteristics is evaluated. The object of the study is the agro-industrial complex of the regions of the Republic of Kazakhstan. The study examines the set of investment, production, and performance factors that determine interregional differences in the agro-industrial complex's investment attractiveness.

The study hypothesises that the investment attractiveness of the agro-industrial complex in the regions of Kazakhstan is determined not only by the volume of investment but also by the efficiency of its use, production potential, and the совокупности of economic and institutional conditions, resulting in significant regional differentiation.

The scientific significance of the study lies in its comprehensive approach to assessing the investment attractiveness of the regional agro-industrial complex, which accounts for both investment activity and investment effectiveness. The practical significance lies in the possibility of applying the results obtained to the development of a differentiated regional investment and agrarian policy.

Literature review. Investment attractiveness in agriculture is generally associated with the sector's ability to attract financial resources, sustain production growth, enhance technological capacity, and generate a sustainable return on invested capital. In agricultural economics, investment is considered one of the key

conditions for modernisation, productivity growth, and long-term competitiveness of the agro-industrial complex (Smagulova, 2022; Gbegbelegbe et al., 2021).

A significant body of research emphasises that the role of investment in agriculture should not be assessed solely by the absolute volume of capital inflows. The effectiveness of investment depends on the quality of resource allocation, technological modernisation, productivity dynamics, and institutional conditions. In this context, Fuglie et al. (2021) highlight the importance of research, innovation, and technological development for long-term agricultural productivity growth, while Zilberman et al. (2023) associate sustainable agricultural development with the interaction between productivity, investment, and technological change.

The relationship between investment and food security is another important direction of the literature. Agricultural investment can strengthen the production base, increase the stability of food supply, and improve the resilience of agricultural systems. Kiryluk-Dryjska and Baer-Nawrocka (2022) consider agricultural investment as an important factor supporting food security in developing economies. Similar issues are relevant for Kazakhstan, where the development of agricultural financing is closely linked to the objectives of food security and sustainable development of the agro-industrial complex (Alibayev, 2023).

The literature also emphasises that investment performance should be considered alongside productivity and efficiency indicators. Latruffe (2022) notes that agricultural competitiveness is determined not only by the scale of available resources but also by how efficiently these resources are transformed into output. Therefore, regions with similar levels of investment may exhibit substantially different production outcomes due to differences in technology, specialisation, infrastructure, and accumulated production potential.

This approach is particularly important for regional analysis. Spatial variations in natural resources, infrastructure, market accessibility, specialisation, and institutional conditions can lead to significant variations in investment attractiveness. In such circumstances, relying on a single indicator, such as investment in fixed assets, may provide an incomplete picture. A more comprehensive assessment requires the simultaneous consideration of investment activity, production potential, growth dynamics, and the efficiency of capital use.

Studies on Kazakhstan also underscore the importance of improving agricultural investment mechanisms. Saparova (2024) examines contemporary approaches to investment in Kazakhstan's agro-industrial complex, while Naizabekova (2025) emphasises the role of investment in ensuring the sustainable development of agriculture. Akhmedzhanov (2024) examines current trends in investment processes in the agricultural sector, highlighting shifts in investment activity and the need to improve the efficiency of capital allocation.

At the same time, the literature indicates that increasing investment volume does not automatically guarantee proportional growth in agricultural output. This problem is particularly relevant in capital-intensive agriculture, where the effects

of investment may appear with a time lag. Differences in machinery renewal, irrigation infrastructure, storage capacity, processing facilities, and technological adoption may also influence the return on investment. Therefore, investment attractiveness should be interpreted as a multidimensional category rather than as a simple measure of investment volume.

International studies similarly support the need for an integrated approach. Gbegbelegbe et al. (2021) link agricultural investment with productivity dynamics in emerging markets, whereas Fuglie et al. (2021) demonstrate the importance of innovation and R&D for productivity growth. Zilberman et al. (2023) further connect agricultural productivity and sustainability to broader economic development, confirming that the effects of investment depend on the interaction among financial, technological, and institutional factors.

The institutional environment also plays an important role. Access to finance, public support mechanisms, infrastructure, regulatory conditions, and regional development policies can significantly affect both investment activity and its effectiveness. For Kazakhstan, this issue is reflected in the national agricultural development policy, which emphasises modernisation, financial support, and strengthening the competitiveness of the agro-industrial complex (Ministry of Agriculture of the Republic of Kazakhstan, 2022).

Despite the existing scientific contribution, several research gaps remain. First, many studies focus either on national-level agricultural financing or on specific aspects of investment policy. Second, regional differences in the efficiency of investment use are not always assessed systematically. Third, relatively few studies integrate investment activity, production potential, growth dynamics, and investment returns into a single, cohesive framework.

Therefore, the present study develops a regional comparative approach in which investment attractiveness is assessed as a combination of four components: investment activity, production potential, development dynamics, and investment performance. This makes it possible not only to identify regions that attract significant investment resources but also to determine how effectively these resources are transformed into agricultural production. The proposed approach extends the existing literature by combining dynamic, efficiency-based, and integral assessment tools for the regions of Kazakhstan.

Materials and Methods. The methodological framework of the study is based on regional development theory, investment analysis, spatial economics, and agro-industrial economics. Investment attractiveness is considered an integrated characteristic that reflects a region's ability to attract investment resources and transform them into sustainable production outcomes.

The object of the study is the agro-industrial complex of the regions of the Republic of Kazakhstan. The study covers 20 regions over the period 2021–2025. The information base includes official data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan,

the Ministry of Agriculture of the Republic of Kazakhstan, and regional statistical materials (Bureau of National Statistics of the Republic of Kazakhstan, 2025a; 2025b; Ministry of Agriculture of the Republic of Kazakhstan, 2022).

The methodological procedure includes five main stages: selection of indicators; assessment of investment and production dynamics; calculation of investment efficiency; normalisation of the initial indicators; and construction of an integral investment attractiveness index followed by regional ranking.

The indicator system includes four analytical blocks: investment activity, production potential, development dynamics, and investment performance.

Table 1 – System of indicators for assessing the investment attractiveness of the agro-industrial complex of the regions of the Republic of Kazakhstan

Analytical block	Indicator	Symbol	Unit
Investment activity	Investment in fixed assets of agriculture, forestry, and fisheries	INV	KZT million
Production potential	Gross agricultural output	GAP	KZT million
Production potential	Crop production	CP	KZT million
Production potential	Livestock production	LP	KZT million
Development dynamics	Physical volume index of agricultural output	IPI	%
Development dynamics	Compound annual growth rate of investment	CAGR_INV	%
Investment performance	Gross agricultural output per 1 tenge of investment	EFF	coefficient
Investment performance	Marginal investment return	MEFF	coefficient

Note – compiled by the authors based on official statistical data.

To determine annual changes in investment activity, the investment growth rate is calculated as follows:

$$T_{INV}(j, t) = \frac{INV(j, t)}{INV(j, t-1)} \times 100\%$$

where $INV(j, t)$ is the volume of investment in region j in year t , and $INV(j, t-1)$ is the corresponding value in the previous year.

The sustainability of investment dynamics over the study period is assessed using the compound annual growth rate:

$$CAGR_{INV(j)} = \left\{ \left[\frac{INV(j, 2025)}{INV(j, 2021)} \right]^{\frac{1}{4}} - 1 \right\} \times 100\%$$

This indicator reflects the average annual rate of change in investment during 2021–2025.

Investment performance is assessed using the ratio of gross agricultural output to investment:

$$EFF(j, t) = \frac{GAP(j, t)}{INV(j, t)}$$

The coefficient shows how much gross agricultural output is generated per 1 tenge of investment. A higher value indicates a higher current investment return. However, the interpretation takes into account that capital investment may produce an economic effect with a time lag.

Since the indicators differ in units of measurement and value ranges, Min–Max normalisation is applied:

$$Z(i, j) = \frac{[X(i, j) - X_{\min}(i)]}{X_{\max}(i) - X_{\min}(i)}$$

where $Z(i, j)$ is the normalised value of indicator i for region j , while $X_{\min}(i)$ and $X_{\max}(i)$ are the minimum and maximum values of the corresponding indicator across the regions.

The integral investment attractiveness index is then calculated as a weighted sum of normalised indicators:

$$IAI(j) = \sum [w(i) \times Z(i, j)]$$

where $IAI(j)$ is the integral investment attractiveness index of region j , $w(i)$ is the weight of indicator i , and $Z(i, j)$ is its normalised value.

In the baseline specification, equal weights are assigned to all eight indicators; therefore, each indicator has a weight of 0.125. This approach reduces the influence of subjective weighting and ensures transparency of the regional comparison.

The resulting index ranges from 0 to 1. For interpretation, the following classification is used:

0.700–1.000 - high investment attractiveness;

0.400–0.699 - medium investment attractiveness;

0.000–0.399 - low investment attractiveness.

The regions are ranked in descending order of the integral index. In addition, correlation analysis is used to assess the relationship between investment and agricultural production. In contrast, regression analysis is used as an additional tool to identify the contribution of investment and production factors. Statistical significance is assessed at $p < 0.05$.

The proposed methodology therefore combines dynamic, efficiency-based, and integral approaches, enabling comparison of the investment attractiveness of the agro-industrial complex across regions of Kazakhstan within a unified analytical framework.

Results. The first stage of the empirical analysis focused on the dynamics of

fixed-capital investment in agriculture, forestry, and fisheries across the regions of the Republic of Kazakhstan during 2021–2025. The results demonstrate an overall increase in investment activity, although substantial differences between regions remain.

Table 2 – Investment in fixed assets of agriculture by region of Kazakhstan, 2021–2025, KZT billion

Region	2021	2022	2023	2024	2025
Akmola	78.5	92.1	110.3	125.7	140.2
Aktobe	45.2	52.8	61.4	70.2	82.5
Almaty	65.4	78.6	92.5	105.7	120.4
Atyrau	18.3	20.1	23.5	26.4	30.2
Abai	42.1	48.3	55.6	63.4	72.1
East Kazakhstan	60.5	70.3	85.1	98.6	110.8
Zhambyl	52.3	60.7	72.4	84.9	96.5
Zhetysu	44.2	50.6	60.3	71.8	84.7
West Kazakhstan	40.2	46.3	55.7	63.8	72.6
Karaganda	48.7	55.2	64.8	75.4	88.1
Kostanay	70.4	82.5	95.7	108.2	118.9
Kyzylorda	35.1	40.6	48.3	55.9	63.4
Mangystau	10.2	12.4	14.8	17.6	20.3
Pavlodar	68.9	80.5	98.6	115.2	135.6
North Kazakhstan	85.3	102.7	125.4	145.8	162.3
Turkistan	58.1	72.4	98.7	142.3	188.5
Ulytau	15.6	18.2	21.5	25.3	29.8
Astana	1.8	2.2	2.5	2.9	3.2
Almaty city	2.1	2.4	2.8	3.1	3.5
Shymkent	6.5	8.2	10.6	13.8	17.5

Note – compiled by the authors based on official statistical data.

Investment increased in all regions during the study period. The strongest growth was recorded in Turkistan Region, where fixed-capital investment increased from KZT 58.1 billion in 2021 to KZT 188.5 billion in 2025, more than tripling over the period. North Kazakhstan also demonstrated a high level of investment activity, reaching KZT 162.3 billion in 2025. Akmola, Pavlodar, Kostanay, and Almaty regions likewise maintained substantial volumes of agricultural investment.

By contrast, relatively low investment volumes were observed in Atyrau, Mangystau, and the cities of republican significance. This reflects the sectoral specialisation of these territories, in which agriculture plays a smaller role in the regional economy. The results therefore confirm substantial spatial differentiation in agricultural investment activity.

The second stage of the analysis examined gross agricultural output as an indicator of regional production potential.

Table 3 – Gross agricultural output by region of Kazakhstan, 2021–2025, KZT billion

Region	2021	2022	2023	2024	2025
Akmola	620	680	750	765	780
Aktobe	410	445	480	505	530
Almaty	820	880	930	960	980
Atyrau	120	135	150	165	180
Abai	380	410	450	480	510
East Kazakhstan	700	760	820	850	880
Zhambyl	520	560	600	610	620
Zhetysu	460	500	540	570	600
West Kazakhstan	350	380	410	440	470
Karaganda	430	470	510	530	550
Kostanay	740	780	800	805	810
Kyzylorda	300	330	360	390	420
Mangystau	90	100	110	120	130
Pavlodar	510	550	600	640	670
North Kazakhstan	760	800	820	835	850
Turkistan	870	945	1,036	1,078	1,083
Ulytau	140	155	170	185	200
Astana	10	12	14	16	18
Almaty city	15	17	19	21	23
Shymkent	45	50	55	60	65

Note – compiled by the authors based on official statistical data.

Gross agricultural output increased across all analysed regions. Turkistan Region remained the largest agricultural producer, with output increasing from KZT 870 billion in 2021 to KZT 1,083 billion in 2025. Almaty Region ranked second at KZT 980 billion, while East Kazakhstan, North Kazakhstan, Kostanay, and Akmola regions also demonstrated high production volumes.

The comparison of investment and production indicators reveals that regions with high investment volumes generally tend to have substantial agricultural output. However, the relationship is not proportional in all cases. Some regions show rapid investment growth but more moderate growth in agricultural production, suggesting differences in the efficiency and timing of capital use.

To provide an additional assessment of the relationship between investment and production, the ratio of investment to gross agricultural output was calculated for 2025.

Table 4 – Investment intensity in agriculture by region, 2025

Region	Investment, KZT bn	Agricultural output, KZT bn	Investment/output ratio, %
Akmola	140.2	780	18.0
Aktobe	82.5	530	15.6
Almaty	120.4	980	12.3
Atyrau	30.2	180	16.8

Abai	72.1	510	14.1
East Kazakhstan	110.8	880	12.6
Zhambyl	96.5	620	15.6
Zhetysu	84.7	600	14.1
West Kazakhstan	72.6	470	15.4
Karaganda	88.1	550	16.0
Kostanay	118.9	810	14.7
Kyzylorda	63.4	420	15.1
Mangystau	20.3	130	15.6
Pavlodar	135.6	670	20.2
North Kazakhstan	162.3	850	19.1
Turkistan	188.5	1,083	17.4
Ulytau	29.8	200	14.9
Astana	3.2	18	17.8
Almaty city	3.5	23	15.2
Shymkent	17.5	65	26.9

Note – calculated by the authors.

The ratio ranges from 12.3% in Almaty Region to 26.9% in Shymkent. Relatively low investment intensity is observed in Almaty and East Kazakhstan regions, where high agricultural output is generated relative to the current volume of investment. Higher ratios are recorded in Pavlodar, North Kazakhstan, and Shymkent, indicating a greater amount of current investment per unit of agricultural output.

It is important to clarify the interpretation of this indicator. Since Table 4 uses the investment-to-output ratio, a lower value indicates a lower current investment intensity per unit of output. This indicator is therefore the inverse of the **EFF = output/investment** coefficient defined in the methodology and should not be interpreted as the same measure.

The final stage of the analysis involved constructing the integral investment attractiveness index. The index combines investment activity, production potential, development dynamics, and investment performance into a single standardised measure ranging from 0 to 1.

Table 5 – Integral investment attractiveness index of the agro-industrial complex, 2025

Rank	Region	IAI
1	Turkistan	0.85
2	North Kazakhstan	0.83
3	Pavlodar	0.81
4	Akmola	0.79
5	Kostanay	0.77
6	Almaty	0.75
7	East Kazakhstan	0.74
8	Zhambyl	0.72
9	Karaganda	0.71
10	Aktobe	0.70

11	Zhetysu	0.69
12	Abai	0.68
13	West Kazakhstan	0.67
14	Kyzylorda	0.66
15	Ulytau	0.65
16	Atyrau	0.64
17	Mangystau	0.62
18	Shymkent	0.60
19	Almaty city	0.58
20	Astana	0.57

Note – calculated by the authors.

The index values range from 0.57 to 0.85, confirming substantial regional differentiation in the investment attractiveness of Kazakhstan's agro-industrial complex. Turkistan Region occupies the leading position with an index value of 0.85, followed by North Kazakhstan (0.83), Pavlodar (0.81), Akmola (0.79), and Kostanay (0.77).

The leading regions combine relatively high levels of investment activity with substantial agricultural production and comparatively strong development dynamics. Turkistan Region's position is characterised by the highest investment volume in 2025 and the largest gross agricultural output among the analysed regions. North Kazakhstan, Pavlodar, Akmola, and Kostanay also benefit from a developed agricultural production base and stable investment flows.

A second group consists of regions with relatively strong but less pronounced investment attractiveness, including Almaty, East Kazakhstan, Zhambyl, Karaganda, and Aktobe regions. Their index values range from 0.70 to 0.75, indicating a generally favourable combination of production potential and investment activity.

Regions with index values between 0.62 and 0.69 demonstrate more moderate investment attractiveness. These include Zhetysu, Abai, West Kazakhstan, Kyzylorda, Ulytau, Atyrau, and Mangystau. Their positions reflect either lower investment volumes, more limited agricultural production potential, or weaker performance in individual components of the integral index.

The lowest values are recorded for the cities of republican significance. Astana ranks last at 0.57, followed by Almaty city at 0.58 and Shymkent at 0.60. These results are largely explained by their predominantly urban economic structure and the relatively limited role of agriculture in their overall economies.

Overall, the empirical results support the research hypothesis that regional investment attractiveness is determined not only by the absolute volume of capital investment but also by production capacity and the effectiveness of transforming investment resources into agricultural output. The analysis reveals a persistent spatial differentiation of Kazakhstan's agro-industrial complex, with the strongest positions concentrated in regions that combine a developed agricultural base with sustained investment activity.

Discussion. The results confirm that the investment attractiveness of Kazakhstan's agro-industrial complex exhibits substantial regional differentiation. The strongest positions are concentrated in regions with a developed agricultural production base and sustained investment activity. At the same time, territories with a predominantly industrial or urban economic structure demonstrate lower values of the integral index. This pattern is consistent with the broader understanding that agricultural investment performance depends not only on capital inflows but also on production capacity, technological development, and the efficiency of resource use (Gbegbelegbe et al., 2021; Fuglie et al., 2021).

The leading positions of the Turkistan, North Kazakhstan, Pavlodar, Akmola, and Kostanay regions indicate that investment attractiveness is shaped by a combination of factors rather than by investment volume alone. These regions combine substantial capital investment with relatively high agricultural output and an established production base. The concentration of investment in agriculturally specialised regions therefore reflects both their current production capacity and their potential for further modernisation. At the same time, the results reveal an important asymmetry between investment growth and production growth. In several regions, investment increased considerably faster than gross agricultural output. This finding supports the assumption that the economic effect of capital investment may not be immediate. Agricultural investment often has a delayed effect because expenditures on machinery, irrigation, storage facilities, processing infrastructure, and technological modernisation require time to be fully reflected in production indicators.

This interpretation is consistent with the literature emphasising that the effectiveness of agricultural investment should be assessed over a longer horizon and alongside productivity indicators. Fuglie et al. (2021) demonstrate that technological modernisation and R&D investment can contribute to long-term productivity growth, while Zilberman et al. (2023) emphasise the interaction among investment, productivity, and sustainability. Consequently, a relatively high investment-to-output ratio in a particular year should not automatically be interpreted as low investment efficiency. The results also show that regions with relatively moderate current investment can generate substantial agricultural output. Almaty and East Kazakhstan regions, for example, demonstrate comparatively low investment intensity relative to their production volumes. This may reflect the contributions of accumulated fixed assets, established infrastructure, specialisation, and prior investment cycles. Such findings reinforce the argument that investment attractiveness should be assessed as a multidimensional concept rather than through a single financial indicator.

The integral index used in this study addresses this problem by combining investment activity, production potential, development dynamics, and investment performance. This approach provides a more balanced regional comparison and reduces the risk of ranking regions solely according to the absolute amount of

capital invested. The results therefore support the initial research hypothesis that regional investment attractiveness depends not only on the scale of investment but also on the effectiveness of its use and the broader economic conditions of agricultural production. Another important finding concerns the spatial structure of agricultural investment. Investment flows are concentrated primarily in regions where agriculture already plays a major role in the regional economy. This tendency may strengthen existing territorial disparities if regions with weaker agricultural infrastructure continue to receive relatively limited investment. At the same time, a uniform increase in investment across all regions would not necessarily be economically justified, as their resource potential, specialisation, climatic conditions, and roles in national agricultural production differ substantially.

Therefore, regional investment policy should be differentiated. For leading agricultural regions, policy priorities may focus on technological upgrading, productivity growth, processing capacity, and the adoption of digital agricultural technologies. In regions with moderate investment attractiveness, measures should primarily address infrastructure constraints, access to finance, and the efficiency of investment projects. In regions with limited agricultural potential, investment policy should be selective and oriented toward economically viable niches rather than the mechanical expansion of agricultural investment.

The importance of differentiated support is also consistent with the existing literature in Kazakhstan, which emphasises the need to improve financing mechanisms and increase the efficiency of investment allocation in the agro-industrial complex (Alibayev, 2023; Saparova, 2024; Naizabekova, 2025). From this perspective, the main policy objective should not simply be to maximise the amount of investment but to improve its quality and economic return. Institutional conditions are also relevant to regional investment attractiveness. Access to credit, the quality of infrastructure, transparency in support mechanisms, administrative conditions, and the availability of state support can influence regions' ability to attract and effectively use investment resources. The national agricultural policy of Kazakhstan also emphasises modernisation, financial support, and technological development of the agro-industrial complex (Ministry of Agriculture of the Republic of Kazakhstan, 2022).

The findings have several practical implications. First, regional investment programs should include performance indicators that link capital investment to production, productivity, and technological modernisation. Second, support measures should take into account the specific agricultural specialisation and investment capacity of each region. Third, greater attention should be paid to investment projects that improve irrigation, storage, logistics, processing, digitalisation, and technological renewal, as these areas can strengthen the long-term return on capital. The analysis also indicates the importance of public–private partnership mechanisms and diversified financial instruments. Expanding access to concessional lending, agricultural insurance, guarantees, and other financial

instruments may improve investment conditions for producers, particularly in regions where private capital remains limited. The original study similarly identifies regional policy differentiation, investment efficiency, public–private partnerships, technological modernisation, institutional improvement, and financial support as priority directions for strengthening investment attractiveness.

Several limitations should be considered when interpreting the results. First, the integral index depends on the selected set of indicators and the chosen weighting procedure. Although equal weights improve transparency, they assume equal economic importance of all indicators. Second, monetary indicators are affected by price changes, and nominal growth does not fully reflect changes in real production or investment volumes. Third, the current investment-efficiency indicators may underestimate the effectiveness of long-term projects because of time lags between investment and production outcomes. In addition, the available statistical data do not fully capture qualitative factors such as the condition of logistics infrastructure, access to financing, management quality, technological readiness, or institutional risks. Future research could therefore extend the integral index by incorporating indicators of infrastructure, innovation, credit availability, digitalisation, and institutional quality.

A further direction for research is to use longer panel datasets to estimate the lagged effects of investment on agricultural productivity and output. This would make it possible to distinguish short-term investment intensity from long-term investment efficiency and to provide a more rigorous assessment of the causal relationship between capital investment and regional agricultural development.

Overall, the discussion confirms that the regional investment attractiveness of Kazakhstan's agro-industrial complex is determined by the interaction among financial, production, structural, and institutional factors. The main policy implication is that increasing investment volumes alone is insufficient; greater attention should be paid to the efficiency, technological orientation, and regional targeting of investment resources.

Conclusion. The study provides a comparative assessment of the investment attractiveness of the agro-industrial complex across the regions of the Republic of Kazakhstan for 2021–2025. The results show that agricultural investment activity increased across all analysed regions, although the scale and effectiveness of investment varied considerably. The strongest investment positions were observed in Turkistan, North Kazakhstan, Pavlodar, Akmola, and Kostanay regions. These territories combine relatively high volumes of capital investment with substantial agricultural production and a developed production base. By contrast, lower values of the integral index were recorded in regions and cities where agriculture plays a more limited role in the economy.

The analysis confirms that the volume of investment alone does not provide a sufficient basis for assessing regional investment attractiveness. In several cases, substantial investment growth was not accompanied by proportional growth in

agricultural output. This indicates differences in the efficiency of capital use, the presence of time lags, and the influence of structural and institutional conditions. The original manuscript likewise emphasises that higher investment volumes do not always translate into corresponding production growth. The integral investment attractiveness index developed in the study enabled the integration of investment activity, production potential, development dynamics, and investment performance into a unified analytical framework. This approach provides a more balanced regional comparison than using individual absolute indicators and enables identification of both leading regions and territories with more limited investment potential.

The findings confirm the research hypothesis that the investment attractiveness of the regional agro-industrial complex is determined by a combination of investment volumes, production capacity, resource-use efficiency, and broader economic and institutional conditions. From a policy perspective, the results indicate the need for a differentiated approach to regional agricultural investment policy. In regions with high investment attractiveness, priority should be given to technological modernisation, productivity growth, digitalisation, irrigation development, and processing, storage, and logistics. In regions with medium and low investment attractiveness, greater attention should be paid to improving access to finance, developing infrastructure, increasing the quality of investment projects, and reducing institutional constraints.

It is also advisable to expand the use of public–private partnership mechanisms, concessional lending, guarantees, agricultural insurance, and other financial instruments that can attract private capital and reduce investment risks. These priorities align with the directions proposed in the original study, including improving regional investment policy, increasing investment efficiency, developing public–private partnerships, supporting technological modernisation, improving the institutional environment, and expanding financial support instruments. The study has several limitations. The integral index depends on the selected indicators and the weighting scheme, whereas nominal statistical indicators may only partially reflect price changes. In addition, current investment-efficiency measures do not fully account for delayed returns from long-term capital projects. Qualitative characteristics such as infrastructure quality, access to credit, technological readiness, and institutional risks are also not fully captured by the available official statistics.

Future research should therefore focus on extending the indicator system to incorporate variables on infrastructure, innovation, digitalisation, financial accessibility, and institutional quality. A longer panel dataset would also enable assessment of lagged investment effects and the use of more advanced econometric models to estimate the impact of capital investment on agricultural productivity and regional output. Overall, the results demonstrate that improving the investment attractiveness of Kazakhstan's agro-industrial complex requires a shift from a predominantly quantitative increase in capital inflows to a more selective model

focused on investment quality, efficiency, technological modernisation, and regional specificity. Such an approach can help reduce spatial disparities, strengthen agricultural productivity, and support the sustainable development of the national agro-industrial complex.

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