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EFFECTIVENESS OF FINANCIAL MANAGEMENT AND INTERNATIONAL SUPPORT FOR THE AGRICULTURAL SECTOR

Eficacia de la gestión financiera y apoyo internacional al sector agrícola
Eficácia da gestão financeira e do apoio internacional ao sector agrícola

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ABSTRACT
The research aims to is to evaluate the effectiveness of financial management in Ukraine, Poland, and Kazakhstan, identify the main determinants of financial stability, and assess the impact of state support, investment activity, and digital technologies on the performance of agricultural enterprises. The methodology includes financial performance analysis, comparative analysis of financial strategies, evaluation of government aid mechanisms, analysis of investment activity, and economic-mathematical modeling using correlation analysis to determine the strength and direction of relationships between financial indicators. The results reveal that Poland demonstrates higher efficiency due to EU integration and access to stable funding, Ukraine shows potential for improvement through optimized government support and digitalization, while Kazakhstan faces challenges with financial accessibility and technology implementation. The practical significance of the study lies in providing recommendations to enhance financial management, strengthen investment policies, and promote the adoption of digital tools to increase the sustainability and competitiveness of the agricultural sector.

KEYWORDS
Agricultural sector, financial management efficiency, digital technologies, government support, sustainable development.

RESUMEN
El objetivo de la investigación es evaluar la eficacia de la gestión financiera en Ucrania, Polonia y Kazajistán, identificar los principales determinantes de la estabilidad financiera y analizar el impacto del apoyo estatal, la actividad inversora y las tecnologías digitales en el desempeño de las empresas agrícolas. La metodología incluye el análisis del desempeño financiero, el análisis comparativo de estrategias financieras, la evaluación de los mecanismos de ayuda gubernamental, el análisis de la actividad inversora y la modelización económico-matemática, mediante análisis de correlación para determinar la fuerza y la dirección de las relaciones entre los indicadores financieros. Los resultados revelan que Polonia demuestra una mayor eficiencia gracias a la integración en la Unión Europea y el acceso a una financiación estable; Ucrania muestra potencial de mejora mediante la optimización del apoyo gubernamental y la digitalización, mientras Kazajistán se enfrenta a desafíos en cuanto al acceso a la financiación y la implementación de tecnología. La importancia práctica del estudio radica en proporcionar recomendaciones para mejorar la gestión financiera, fortalecer las políticas de inversión y promover la adopción de herramientas digitales para aumentar la sostenibilidad y la competitividad del sector agrícola.

PALABRAS CLAVE
Sector agrícola, eficiencia en la gestión financiera, tecnologías digitales, apoyo gubernamental, desarrollo sostenible.

RESUMO
O objetivo da pesquisa é avaliar a eficácia da gestão financeira em Ucrânia, Polônia e Cazaquistão países, identificar os principais determinantes da estabilidade financeira e avaliar o impacto do apoio estatal, da atividade de investimento e das tecnologias digitais no desempenho das empresas agrícolas. A metodologia inclui análise do desempenho financeiro, análise comparativa de estratégias financeiras, avaliação dos mecanismos de auxílio governamental, análise da atividade de investimento e modelagem econômico-matemática utilizando análise de correlação para determinar a força e a direção das relações entre os indicadores financeiros. Os resultados revelam que a Polônia demonstra maior eficiência devido à integração à União Européia e ao acesso a financiamento estável, a Ucrânia mostra potencial de melhoria por meio do apoio governamental otimizado e da digitalização, enquanto o Cazaquistão enfrenta desafios com a acessibilidade financeira e a implementação de tecnologia. A importância prática do estudo reside em fornecer recomendações para aprimorar a gestão financeira, fortalecer as políticas de investimento e promover a adoção de ferramentas digitais para aumentar a sustentabilidade e a competitividade do setor agrícola.

PALAVRAS-CHAVE
Setor agrícola, eficiência da gestão financeira, tecnologias digitais, apoio governamental, desenvolvimento sustentável.

Introduction

Financial management plays a crucial role in the effective functioning of agricultural enterprises, contributing to food security, rural development, and overall economic stability. Scholars emphasize that financial resilience is vital for long-term development, especially under macroeconomic instability. According to Shpykulyak et al. (2022), limited access to credit and the need for efficient allocation of financial resources are major challenges. Moldavan et al. (2023) highlights the importance of incorporating modern tools like financial technologies (FinTech), which facilitate capital access and risk minimization.

Global market integration calls for updated financial strategies using innovative financing, risk management, and investment tools. Myniv y Khrystenko (2024) note that countries utilizing both public and private financing show greater productivity and resilience. Institutions such as the World Bank, International Monetary Fund, and European Investment Bank support agriculture by providing long-term funding (Otoo, 2024). Meanwhile, digitalization and technologies like blockchain, smart contracts, and agricultural receipts enhance transparency and reduce risks.

Ivashkiv et al. (2020) and Ng'ambi et al. (2023) argue that digital financial tools, including AI and big data, improve efficiency, forecasting, and income optimization in agriculture. These developments require new approaches grounded in international experience and technological innovation.

The aim of this study is to compare the effectiveness of financial management in the agricultural sectors of Ukraine, Poland, and Kazakhstan, focusing on the key factors influencing financial stability, profitability, and enterprise development. The research involves analyzing the impact of investments on agricultural performance, evaluating the effectiveness of state support mechanisms, exploring financing instruments and aid tools, and comparing financial strategies to identify the most effective approaches to financial management in the agricultural sector

The novelty of this study lies in the comparative analysis of investment processes and support mechanisms for the agricultural sector in Ukraine, Poland, and Kazakhstan, which enables the identification of specific features of agricultural enterprise financing. For the first time, the analysis of the study is aimed at identifying and comparing the effectiveness of financial management in the agricultural sector of Ukraine, Poland and Kazakhstan, as well as assessing the impact of economic, investment and technological factors on the development of agriculture in these countries. Additionally, investment barriers are identified, and mechanisms are proposed to overcome them in order to improve the investment climate in these countries.

Effective financial management is essential for the profitability, investment activity, and adaptability of agricultural enterprises. Ostapenko (2021) defines it as the

process of planning, analyzing, and controlling financial resources for sustainable development. Mustafa et al. (2023) emphasize the need for strategic management, investment attraction, and the integration of digital tools alongside traditional approaches.

Financial stability is a key performance indicator, influenced by income diversification, credit access, and cost efficiency (Zalewski et al., 2022). Long-term strategies help mitigate risks from global price shifts and climate volatility (Mang'ana et al., 2023). Humeniuk (2021) stress the importance of combining traditional instruments (loans, subsidies, grants) with innovations like crop insurance and agricultural receipts.

Investment capital ensures modernization and innovation in agriculture. International financing promotes productivity and technological advancement (Chen et al, 2021), while state support (Radchenko, 2020) and private ESG investments stimulate sustainable development.

FinTech expands opportunities for financial management in agriculture. Digital platforms ease loan access, insurance, and cash flow management, while blockchain and smart contracts improve transparency and reduce transaction costs (Vanhuyse et al., 2021).

Given the sector's high risk exposure, comprehensive financial risk management including crop insurance, diversification, and financial derivatives is critical (Humeniuk, 2021). Government support for insurance and credit guarantees is vital for small and medium farms (Omobitan y Khanal, 2022).

International cooperation enhances financial resilience. Participation in global projects provides access to innovative tools and technical support. Organizations such as the World Bank, International Monetary Fund, and FAO offer grants and loans to promote sustainable agriculture. European Union programs like Horizon Europe fund R&D in agricultural innovation.

However, gaps remain in adapting international practices to national contexts, applying digital technologies, and exploring alternative financing tools like green bonds and crowdfunding. Further research is needed to improve financial strategies and boost global competitiveness in agriculture.

Methods

Research design

The study was based on a quantitative analysis of the financial indicators of the agricultural sector and an international comparison of financial management efficiency across three countries: Ukraine, Poland, and Kazakhstan. The three countries

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— Ukraine, Poland and Kazakhstan — were chosen for comparison because they share a number of historical, structural and economic similarities in agricultural development, but differ in their institutional environment and financial management systems, making them ideal for comparative analysis. Statistical methods were used to assess the impact of financing on the economic outcomes of the agricultural sector and to identify key trends and risks in agribusiness financial management. These methods enabled the identification of relationships between financial variables such as investments, government support, enterprise profitability, and competitiveness.

Research stages

The research consisted of several stages. The first stage involved a theoretical analysis, including a review of academic literature, international reports, and legal and regulatory documents to determine current approaches to financial management in the agricultural sector. The next stage involved the collection and processing of statistical data, including the analysis of financial indicators of the agricultural sector and the use of official data from international organizations and national statistical agencies. The data set covered the period from 2010 to 2024, allowing for the identification of long-term trends and the assessment of changes in financial management practices over time. This time span covers both pre-crisis and post-crisis fluctuations, as well as the effects of digitalization and modernization policies implemented in recent years. The following stage was a comparative analysis, which examined financial management mechanisms in different countries, identifying effective strategies and their potential adaptation to national contexts. The final stage was a statistical analysis to evaluate the influence of financing, investments, and government support on the financial stability and competitiveness of the agricultural sector.

Research methods

Several methods were used to assess the impact of financial mechanisms on the development of the agricultural sector in Ukraine, Poland, and Kazakhstan. The first method was an analysis of financial indicators, including profitability, return on assets, investments, debt levels, and liquidity, which allowed for the assessment of the financial condition of agricultural enterprises. Financial strategies and mechanisms of government support — such as subsidies, grants, and loans — were analyzed to evaluate their impact on business stability. Investment activity and its influence on economic performance were examined separately. A systems approach was used to conduct a comprehensive analysis of the interaction between financial factors, government support, and investment.

Economic and mathematical modeling of the influence of economic factors on the development of the agricultural sector

Correlation analysis was used to assess relationships, helping to identify the degree and direction of influence of such factors as investments, spending on technologies, government subsidies, and inflation levels on the performance indicators of the agricultural sector in the three countries: Poland, Kazakhstan, and Ukraine.

Research sample

The study analyzed the agricultural sector in three countries: Ukraine, Poland, and Kazakhstan. The sample was formed based on key indicators of financial management efficiency and the agricultural potential of these countries, allowing for a comprehensive comparison and identification of major trends and differences. A stratified sampling method was used, which made it possible to consider the specifics of financial management and the level of government support for the agricultural sector in each country. The selected sample is representative, as it includes three countries with different economic and financial conditions and encompasses key indicators that allow for meaningful conclusions about the effectiveness of financial management.

Results and discussion

The agricultural sector in Ukraine, Poland and Kazakhstan remains a key element of economic development and food security. Its effectiveness is determined by a combination of state support, access to financial resources and the implementation of digital technologies that ensure increased sustainability and competitiveness of the industry (Table 1).

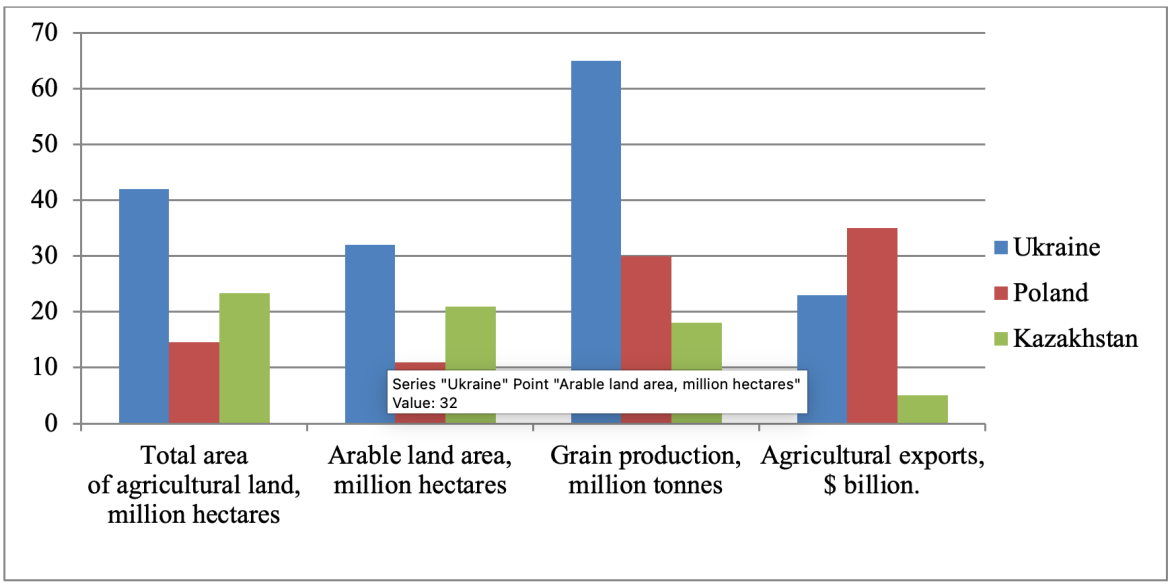
Table 1. Comparative analysis of financial management in the agricultural sector of Ukraine, Poland, and Kazakhstan
Tabla 1. Análisis comparativo de la gestión financiera en el sector agrícola de Ucrania, Polonia y Kazajstán

Indicator	Ukraine	Poland	Kazakhstan
State support	High but uneven	Very high (via EU)	High, with state control
Access to loans	Limited	High	Limited
Investment climate	Medium	High	Medium
Use of digital technologies	Developing	High	Limited
Export orientation	High	High	High

Source: Compiled by authors based on (Suieubayeva, 2022; Vanhuyse, 2021; Zalewski, 2022; Humenyuk, 2021; Ostapenko, 2021). Fuente: Compilado por los autores sobre la base de (Suieubayeva, 2022; Vanhuyse, 2021; Zalewski, 2022; Humenyuk, 2021; Ostapenko, 2021).

An analysis of the agricultural sectors of Ukraine, Poland, and Kazakhstan reveals significant differences in their agricultural potential. Ukraine has the largest agricultural land area — 42 million hectares — which significantly exceeds the land area of Poland (14.6 million ha) and Kazakhstan (23.3 million ha). This supports a high level of grain production, with Ukraine leading at 65 million ton, compared to Poland (30 million ton) and Kazakhstan (18 million ton). In terms of agricultural exports, Ukraine reaches $23 billion, though Poland leads with $35 billion thanks to EU integration, while Kazakhstan exports only $5 billion (Figure 1).

Figure 1. Agricultural potential by key indicators, 2024
Figura 1. Potencial agrícola por indicadores clave, 2024



Source: Compiled by authors based on Suieubayeva (2022), Vanhuyse (2021), and Zalewski (2022).
Fuente: Compilado por los autores sobre la base a Suieubayeva (2022), Vanhuyse (2021), and Zalewski (2022).

Farm structures vary significantly across Ukraine, Poland, and Kazakhstan. In Ukraine, the average farm size is 500 hectares, indicating medium-scale farming. In Poland, the average size is only 30 hectares, reflecting a large number of small and medium-sized farms. In Kazakhstan, the average farm size reaches 2.000 hectares, reflecting the dominance of large farms.

Labor productivity is highest in Poland — $25.000 per person — due to a high level of mechanization and technological equipment. In Ukraine, this figure is $10.000, and in Kazakhstan $8.000, indicating lower efficiency. The level of mechanization also varies: Poland has 12 units of machinery per hectare, Ukraine 5, and Kazakhstan only 3, which hampers efficient land use. Wheat yield is highest in Poland 5.5 ton/ha, followed by Ukraine 4.2 ton/ha, and Kazakhstan 1.25 ton/ha, due to unfavorable climate conditions and low mechanization levels (Table 2).

Table 2. Comparison of the agricultural sector across countries
Tabla 2. Comparación del sector agrícola de los distintos países

Indicator	Ukraine	Poland	Kazakhstan
Average farm size, ha	500	30	2.000
Labor productivity in agri sector, $/person	10.000	25.000	8.000
Agricultural machinery per 1 ha	5	12	3
Average wheat yield, ton/ha	4.2	5.5	1.25

Source: Compiled by authors based on Suieubayeva (2022), Vanhuyse (2021), and Zalewski (2022).
Fuente: Compilado por los autores sobre la base a Suieubayeva (2022), Vanhuyse (2021), and Zalewski (2022).

It is worth noting that international cooperation in the agricultural sectors of Ukraine, Poland, and Kazakhstan contributes to the development of financial management and increases the efficiency of agricultural enterprises. International organizations such as the World Bank, the Food and Agriculture Organization of the United Nations, the United States Agency for International Development, and the European Union provide grant funding, technical assistance, and knowledge exchange. Grants allow farmers to modernize production; technical assistance facilitates the introduction of modern technologies, while experience exchange provides access to best global practices. Notably, the "Agricultural Innovations" projects in Ukraine, "Financial Accessibility" in Poland, and "Sustainable Agricultural Development" in Kazakhstan have proven the effectiveness of such approaches.

Thanks to the support of international organizations, countries can adapt advanced solutions to local conditions and address key issues in the agricultural sector. For example, FAO projects in Ukraine helped increase crop yields by 25%; in Poland, United States Agency for International Development programs provided access to microloans for farmers; and in Kazakhstan, European Union initiatives facilitated the adoption of environmentally friendly technologies. This cooperation strengthens the financial stability of enterprises and enhances their competitiveness in the global market (Humeniuk et al., 2021).

To analyze the effectiveness of financial management in the agricultural sectors of Ukraine, Poland, and Kazakhstan in greater detail, key financial indicators are examined, allowing assessment of the stability, profitability, and support level in each country. The current ratio in Ukraine ranges from 1.2 to 1.5, indicating a moderate liquidity level that can cover short-term liabilities, though there is room for improvement. In Poland, this figure is higher — between 1.8 and 2.2 — reflecting a stronger ability to meet obligations. Kazakhstan shows a ratio of 1.3-1.6, which is relatively stable but notably lower than Poland's.

The share of loans in agricultural enterprise financing in Ukraine is 25-30%, reflecting limited access to credit resources. Poland has a significantly higher rate — 40-45% — due to a more stable financial system and greater trust from banks. In Ka-

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zakhstan, the share of loans is 20-25%, indicating greater reliance on alternative financing sources. Return on assets (ROA) in Ukraine ranges from 3% to 5%, suggesting relatively low efficiency in asset use. In Poland, the ROA is 6-8%, reflecting more efficient resource utilization. Kazakhstan's ROA stands between 4% and 6%, which is average among the three countries.

Profitability of Production in Ukraine is between 10-15% — this is a relatively high indicator of product profitability. However, in Poland, this figure is even higher — ranging from 15% to 20%, indicating greater production efficiency. Kazakhstan demonstrates a profitability level of 12-18%, which can be considered average. State support for the agricultural sector in Ukraine amounts to 1.0% of GDP, which represents significant support, though not the highest among the countries compared. In Poland, state support reaches 1.5% of GDP, providing substantial assistance to agriculture within the framework of EU policy. Kazakhstan has the lowest level of government support, at just 0.8% of GDP, indicating lower state involvement in supporting the agricultural sector. The share of agricultural exports in Ukraine is 40-45%, reflecting the importance of the agricultural sector to the national economy. In Poland, this figure is significantly lower — 15-20%, which reflects a more diversified economy. Kazakhstan's share of agricultural exports is 35-40%, also pointing to the significance of agriculture in its foreign trade (Table 3).

Table 3. Effectiveness of financial management in the agricultural sector
Tabla 3. Eficacia de la gestión financiera en el sector agrícola

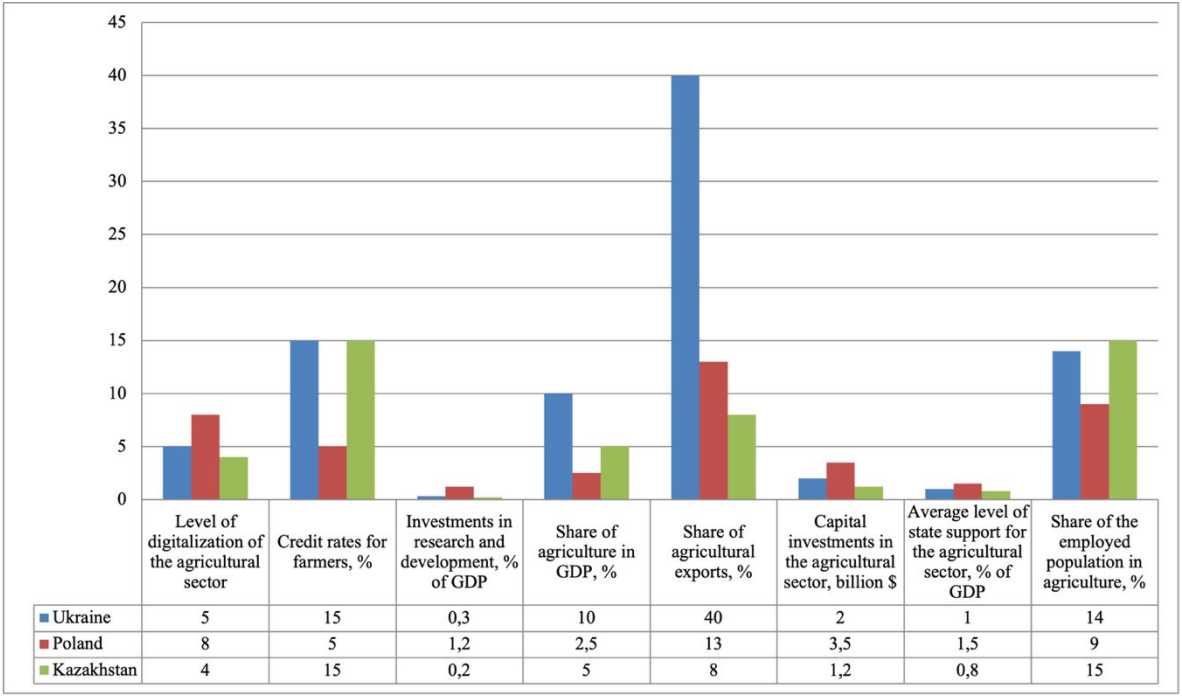
Indicator	Ukraine	Poland	Kazakhstan
Current liquidity ratio	1.2-1.5	1.8-2.2	1.3-1.6
Financial independence ratio	0.4-0.5	0.6-0.7	0.5-0.6
Share of loans in financing, %	25-30	40-45	20-25
Return on assets (ROA), %	3-5	6-8	4-6
Return on equity (ROE), %	6-10	10-14	7-11
Profitability of products, %	10-15	15-20	12-18
State support, % of GDP	1.0	1.5	0.8
Share of agricultural exports, %	40-45	15-20	35-40
Cost of 1 ton of wheat, $	120-150	160-180	130-160

Source: Compiled by authors based on Suieubayeva (2022), Vanhuyse (2021), Zalewski (2022), and Humenyuk (2021). Fuente: Compilado por los autores en base a Suieubayeva (2022), Vanhuyse (2021), Zalewski (2022), and Humenyuk (2021).

Thus, each of the three countries has its own advantages and challenges in financial management of the agricultural sector. Poland demonstrates high efficiency and stability, while Ukraine and Kazakhstan face limitations that require attention for improvement. Poland has the highest level of digitalization in the agricultural sector, which enhances efficiency and competitiveness, whereas Ukraine and Kazakhstan have potential for improving their technological base. Loan interest rates in Poland are significantly lower, easing access to financing, while high rates in Ukraine and Kazakhstan limit development opportunities. Investments in scientific

research are also higher in Poland, contributing to the implementation of new technologies. The share of agriculture in GDP is highest in Ukraine (10%), while Poland (2.5%) and Kazakhstan (5%) show lower figures, reflecting different levels of dependency on the agricultural sector. Poland provides the highest level of state support for agriculture (1.5% of GDP), while Ukraine and Kazakhstan have lower levels (1% and 0.8% respectively).

Figure 2. Economic and investment indicators of the agricultural sectors
Figura 2. Indicadores económicos y de inversión de los sectores agrícolas



	Level of digitalization of the agricultural sector	Credit rates for farmers, %	Investments in research and development, % of GDP	Share of agriculture in GDP, %	Share of agricultural exports, %	Capital investments in the agricultural sector, billion $	Average level of state support for the agricultural sector, % of GDP	Share of the employed population in agriculture, %
Ukraine	5	15	0,3	10	40	2	1	14
Poland	8	5	1,2	2,5	13	3,5	1,5	9
Kazakhstan	4	15	0,2	5	8	1,2	0,8	15

Source: compiled by authors based on Suieubayeva (2022), Statistics Poland (2025), Vanhuyse (2021), and Zalewski (2022). Fuente: compilado por los autores en base a Suieubayeva (2022), Statistics Poland (2025), Vanhuyse (2021) y Zalewski (2022)

Overall, Ukraine demonstrates high indicators in terms of the share of agriculture in the economy and agricultural exports, but it requires more attention to digitalization and innovation investment. Poland leads in technological development and investment in agricultural science, while Kazakhstan occupies an intermediate position in most economic indicators.

Economic and mathematical modeling, in which the level of development of the agricultural sector was determined by the Gross Value Added (GVA) indicator, showed that investments in the agricultural sector have a positive impact on its development in all three countries (correlation coefficients 0.65-0.72). At the same time, the increase in food inflation has a negative impact (-0.60 to -0.68), which indicates that the development of the sector is constrained by rising prices. Technology spending has a strong positive impact (0.75-0.80), which confirms the crucial importance of investments in technological renewal. State subsidies have a mode-

rately positive effect (0.50-0.58), although their impact is less significant compared to investments and technological factors.

In Ukraine, state support is implemented through production and resource subsidies, soft loans, partial compensation for the cost of equipment, as well as livestock and farming development programs. In Poland, support is based on the mechanisms of the EU Common Agricultural Policy (CAP), which include direct payments to farmers, rural development programs, modernization grants, and environmental initiatives. In Kazakhstan, state aid includes subsidies, tax breaks, reduced interest rates on loans, investments in scientific research and agricultural infrastructure, as well as import substitution and export expansion measures.

High interest rates on loans negatively affect the development of the agricultural sector (-0.65 to -0.70), limiting opportunities to attract financing and investment (Table 4).

Table 4. Economic-mathematical modeling of the impact of economic factors on the development of the agricultural sector

Tabla 4. Modelado económico-matemático del impacto de los factores económicos en el desarrollo del sector agrícola

Indicator	Country	Correlation coefficient (r)	Significance (p-value)	Impact on the dependent variable
Investments in the agricultural sector (million UAH)	Poland	0.72	0.003	Positive, significant
	Kazakhstan	0.65	0.005	Positive, significant
	Ukraine	0.72	0.003	Positive, significant
Food inflation rate (%)	Poland	-0.68	0.004	Negative, significant
	Kazakhstan	-0.60	0.006	Negative, significant
	Ukraine	-0.65	0.007	Negative, significant
Technological expenditures (million UAH)	Poland	0.80	0.001	Strong positive impact
	Kazakhstan	0.75	0.002	Strong positive impact
	Ukraine	0.80	0.001	Strong positive impact
Government subsidies (million UAH)	Poland	0.58	0.015	Moderate positive impact
	Kazakhstan	0.50	0.020	Moderate positive impact
	Ukraine	0.58	0.015	Moderate positive impact
Cost of credit (%)	Poland	-0.70	0.005	Negative, significant
	Kazakhstan	-0.65	0.008	Negative, significant
	Ukraine	-0.70	0.005	Negative, significant

Fuente: elaboración propia. Source: own elaboration.

It is worth noting that correlation analysis only reflects statistical interdependence between variables, not causal relationships. Therefore, the results should be interpreted taking into account the potential influence of external factors not included in the model.

Therefore, the main factors that positively affect the development of the agricultural sector in Poland, Kazakhstan, and Ukraine are investments, expenditures on technology, and government subsidies. At the same time, food inflation and high interest rates on loans are limiting factors that negatively impact the agricultural economy. The study highlights the need to develop an effective financial strategy that takes into account both the positive and negative economic factors influencing the agricultural sector. The conducted research reveals key aspects of financial management in the agricultural sectors of Ukraine, Poland, and Kazakhstan, highlighting notable differences among these countries. The findings confirm the essential role of government support, access to financial resources, and the adoption of modern technologies in enhancing the efficiency and sustainability of agriculture. However, a number of challenges persist — particularly in Ukraine — where agricultural producers face more severe constraints than their counterparts in Poland and Kazakhstan.

One of the most pressing issues in Ukraine is the insufficient level of state support for the agricultural sector. Many farmers experience limited access to subsidies and financial assistance, significantly restricting their development potential. This observation is consistent with findings by Ivashkiv et al. (2020), who point out systemic inequalities in access to financial resources, undermining the performance of Ukrainian agriculture.

A related challenge concerns access to loans and investments. Small and medium-sized farms in Ukraine often lack adequate financial instruments for growth and innovation. In contrast, Poland has developed a more effective credit system, facilitating the uptake of new technologies and modern agricultural practices. Shpykulyak (2020) emphasize the importance of expanding financial instruments to improve the efficiency of farming operations. Similarly, while Kazakhstan's lending environment also presents difficulties, targeted state initiatives — such as subsidies and specialized credit programs — have begun to improve investment activity among farmers.

International organizations also play a critical role in promoting sustainable agriculture by offering financial, technical, and scientific support. As Cristian and Ivascu (2021) argue, institutions such as the FAO, World Bank, IFAD, and WFP contribute to the modernization of agricultural infrastructure, implementation of sustainable practices, and development of technical capacities. Additionally, the CGIAR system supports innovation through the introduction of climate-smart technologies and resilient crop varieties.

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Technical assistance provided through international cooperation helps align global best practices with local needs. In Ukraine, the focus is on introducing resource-efficient technologies and modernizing production to maintain sectoral viability amid economic instability. In Kazakhstan, efforts are centered on developing grain infrastructure, optimizing water use, and adapting to climate change, particularly via FAO and World Bank support. Poland leverages its European Union membership to accelerate digital transformation, improve international competitiveness, and align with sustainable development goals. Participation in international forums and programs further strengthens the capacity of these countries to adopt advanced financial, technological, and management tools.

With regard to digitalization, Ukraine is still in the early stages. As Ostapenko (2021) notes, expanding access to digital technologies and technical knowledge is essential for progress. Poland's agricultural sector, supported by a consistent innovation policy, is already benefiting from digital tools that enhance productivity and reduce operational costs (Rodzinka et al., 2021). Kazakhstan is also making headway through government-backed digitalization programs, which have improved the efficiency of resource planning and monitoring (Suieubayeva et al., 2022).

Labor productivity remains a critical challenge in Ukraine due to widespread use of outdated machinery and limited mechanization, especially among small-scale farmers. In contrast, Poland has achieved higher productivity levels owing to better access to modern equipment, a trend emphasized by Zalewski et al. (2022). Although Kazakhstan still lags behind Poland in mechanization, recent investments in agricultural technology are beginning to yield positive results.

When considering agricultural exports, Ukraine possesses considerable potential, particularly in grain production. However, geopolitical instability and war-related disruptions pose major threats to export development. Moldavan et al. (2023) underscore both the strategic importance and vulnerability of Ukrainian agricultural exports. Kazakhstan also has strong potential, underpinned by vast land resources, yet underinvestment in infrastructure and limited technology access constrain full realization of this potential.

In summary, the comparative analysis shows that each country faces specific challenges and possesses distinct opportunities in the development of its agricultural sector. Ukraine needs to enhance government support mechanisms, expand access to financing, and accelerate the implementation of digital technologies to improve efficiency and resilience. Poland, on the other hand, leverages strong European Union support and a focus on innovation, which drives the dynamic development of its agricultural sector. Kazakhstan should concentrate its efforts on improving infrastructure and ensuring the widespread adoption of modern technologies in order to fully realize its agricultural potential.

Conclusions

The conducted research is limited by time constraints and focuses primarily on the current state of the agricultural sector and its development under the constantly changing economic and political conditions in Ukraine, Poland, and Kazakhstan. Future studies should expand the temporal and analytical scope to include long-term trends and the impact of digitalization on financial performance.

To improve the financial condition of agricultural enterprises in the analyzed countries, it is recommended to enhance government support programs, particularly for small and medium-sized farms. Expanding access to loans, investments, and subsidies will strengthen financial stability and competitiveness. The introduction of innovative financial instruments — such as green bonds and agricultural insurance products — should be prioritized to reduce risks and promote sustainable growth.

The comparative analysis revealed significant differences in financial management efficiency and agricultural potential among the three countries. Ukraine possesses the largest agricultural land area (42 million hectares), far exceeding that of Poland (14.6 million ha) and Kazakhstan (23.3 million ha), which gives it strong production capacity, especially in grain output (65 million ton in Ukraine versus 30 million in Poland and 18 million in Kazakhstan). However, in terms of agricultural exports, Poland leads with USD 35 billion due to EU integration, followed by Ukraine (USD 23 billion) and Kazakhstan (USD 5 billion). Labor productivity also varies markedly: USD 25,000 per person in Poland, USD 10,000 in Ukraine, and USD 8,000 in Kazakhstan.

The level of mechanization is highest in Poland (12 machinery units per hectare), compared with Ukraine (5 units) and Kazakhstan (3 units). Financial indicators reflect similar disparities: the liquidity ratio in Ukraine ranges from 1.2-1.5, in Poland 1.8-2.2, and in Kazakhstan 1.3-1.6. Financial independence ratios are 0.4-0.5, 0.6-0.7, and 0.5-0.6 respectively. The share of loans in agricultural financing is 25-30% in Ukraine, 40-45% in Poland, and 20-25% in Kazakhstan. Return on assets is 3-5% in Ukraine, 6-8% in Poland, and 4-6% in Kazakhstan; return on equity, 6-10%, 10-14%, and 7-11%; return on production, 10-15%, 15-20%, and 12-18%, respectively.

Ukraine demonstrates significant potential for improvement in financial management through expanded state support and the implementation of digital technologies based on GPS navigation, drones, satellite imagery, and sensors for optimizing sowing, fertilization, and irrigation. Poland's high efficiency results from European Union integration and access to financial resources, while Kazakhstan faces challenges with financing, mechanization, and technology adoption.

The practical value of this research lies in assessing the financial efficiency of the agricultural sectors in Ukraine, Poland, and Kazakhstan, as well as in formulating recommendations for improving financial management. Emphasis is placed on

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optimizing government support mechanisms and introducing digital solutions to enhance productivity and sustainability. Future research should address the role of agricultural cooperatives as instruments for expanding financial access, reducing production costs, and strengthening the competitiveness of national agricultural systems.

Contributor Role Taxonomy (CRediT)

Hennadii Mazur: Conceptualization, data curation, formal analysis, methodology, supervision, and writing — original draft.

Yusif Abulfat Humbatov: Conceptualization, investigation, methodology, project administration, resources, software, supervision, and writing — review and editing.

Volodymyr Shevchuk: Conceptualization, project administration, validation, visualization, and writing — original draft.

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References

Chen, X., Ou, X., Dong, X., Yang, H., Ubaldo, C., and Yue, X.G. (2021). Impact of farmer organization forms on agricultural product quality from the perspective of technology adoption. *ACM International Conference Proceeding Series*, 92-99. DOI 10.1145/3480571.3480586

Cristian, P. and Ivascu, C. (2021). The impact of EU's financial support on the agriculture's development: A panel data analysis. *Management & Marketing, 16*(2), 86-100. DOI 10.2478/mmcks-2021-0006

Humeniuk, M.M., Nemish, D.V., Balanyuk, I.F., and Shelenko, D.I. (2021). Key factors for the effective functioning of small agricultural entrepreneurship. *Agricultural Science Bulletin, 9*(822), 80-88. DOI 10.31073/agrovisnyk202109-11

Ivashkiv, I., Kupalova, H., Goncharenko, N., Andrusiv, U., Streimikis, J., Lyashenko, O., Yakubiv, V., Lyzun, M., Lishchynskyi, I., and Saukh, I. (2020). Environmental responsibility as a prerequisite for sustainable development of agricultural enterprises. *Management Science Letters, 10*, 2973-2984. DOI 10.5267/j.msl.2020.5.028

Mang'ana, K., Ndyetabula, D.W., and Hokororo, S. (2023). Financial management practices and performance of agricultural small and medium enterprises in Tanzania. *Social Sciences & Humanities Open, 7*, 100494. DOI 10.1016/j.

ssaho.2023.100494

Moldavan, L., Pimenowa, O., Wasilewski, M., and Wasilewska, N. (2023). Sustainable development of agriculture of Ukraine in the context of climate change. *Sustainability, 15*, 10517. DOI 10.3390/su151310517

Mustafa, J. Ali, Marei, A., Al-Amarneh, A., and Al-Abbad, A. (2023). The role of fintech payment instruments in improving financial inclusion. *Information Science Letters, 12*(6), 2659-2670. DOI 10.18576/isl/120637

Myniv, R. and Khrystenko, O. (2024). Improvement of financial management tools of agricultural enterprises. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies Series Economical Sciences, 26*(103), 11-16. DOI 10.32718/nvlvet-e10302

Ng'ambi, G., Tembo, M. , Benard, S. and Kamtukule, V. (2023). Determinants of effective public finance management in the department of animal health and livestock development, Malawi. *Open Journal of Accounting, 12*, 131-141. DOI 10.4236/ojacct.2023.124009

Omobitan, O. and Khanal, A.R. (2022). Examining farm financial management: How do small US farms meet their agricultural expenses? *Journal of Risk and Financial Management, 15*, 133. DOI 10.3390/jrfm15030133

Ostapenko, S.O. (2021). Theoretical approaches to the formation of the economic foundations of state regulation of Ukraine's agricultural sector. *Effective Economy, 11*(56), 1-6. DOI 10.32702/2307-2105-2021.11.200

Otoo, F.N.K. (2024). Assessing the influence of financial management practices on organizational performance of small- and medium-scale enterprises. *Vilakshan XIMB Journal of Management, 21*(2), 162-188. DOI 10.1108/XJM-09-2023-0192

Radchenko, O., Semenyshena, N., Sadovska, I., Nahirska, K., and Pokotylska, N. (2020). Foresight development strategy of the financial capacity: Comparative study of the Ukrainian agricultural sector. *Engineering Economics, 31*(2), 178-187. DOI 10.5755/j01.ee.31.2.24340

Rodzinka, J., Skica, T., and Pomianek, T. (2021). Productivity and competitiveness of the agricultural sector in Poland. *Yearbook of Antitrust and Regulatory Studies, 14*(24), 139-158. DOI 10.7172/1689-9024.yars.2021.14.24.6

Suieubayeva, S., Denissova, O., Kabdulsharipova, A., and İdikut Özpençe, A. (2022). The agricultural sector in the Republic of Kazakhstan: Analysis of the state, problems and ways of solution. *Eurasian Journal of Economic and Business Studies, 4*, 19-31. DOI 10.47703/ejebs.v4i66.185

Shpykulyak, O.H., Shelenko, D.I., Alekseeva, O.V., Ksenofontova, K. Yu., and Sukhoviy, A.I. (2022). The role of the market and entrepreneurship in ensuring the sustainable development of rural areas. *Agrosvit, 20*, 3-12.

Statistics Poland (2025). *Statistics Poland. Central Statistical Office*. https://new.stat.gov.pl/en

Vanhuyse, F., Bailey, A., and Tranter, R. (2021). Management practices and the financial performance of farms. Agricultural Finance Review, 81(3), 415-429. DOI 10.1108/AFR-08-2020-0126

Zalewski, K., Bórawski, P., Żuchowski, I., Parzonko, A., Holden, L., and Rokicki, T. (2022). The efficiency of public financial support investments into dairy farms in Poland by the European Union. *Agriculture, 12*, 186. DOI 10.3390/agriculture12020186