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Financing of agricultural enterprises in times of war as a guarantee of sustainable development of the state economy

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► **Abstract.** The stable and efficient development of agricultural enterprises is an important factor in supporting the national economy, as they contribute to economic stability not only in the short term but also create long-term benefits for the country. The purpose of this study was to analyse the financing of agricultural enterprises in the context of the war in different regions of Ukraine, in particular, to examine the available financial mechanisms and their impact on the resilience of the agricultural sector in the western, central, eastern and southern regions. The study focused on the financing of agricultural enterprises during the war and its impact on the stability of Ukraine's agricultural economy. The authors examined various sources of financing, such as government programmes, international assistance and private investment, which provide support to the agricultural sector in times of crisis. Based on the analysis of available financial mechanisms, it was found that concessional loans, grants and state subsidies are important tools for restoring production, preserving jobs and developing rural areas. Regional differences in access to finance were analysed, and it was found that the western and northern regions have better opportunities to attract international assistance, while enterprises in the eastern and southern regions face greater difficulties. The authors offered a number of recommendations for improving financial mechanisms, including expanding access to soft loans and grants and creating transparent conditions for attracting investment. The study has shown that effective financial strategies and government support are key to the recovery and development of the agricultural sector, which in turn will contribute to the overall economic stability of Ukraine in the context of the war

► **Keywords:** industry; innovation; economic growth; food security; Ukrainian regions

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► Introduction

In today's world, which is facing various crises and economic challenges, agricultural enterprises are becoming key to achieving Ukraine's sustainable development goals. First of all, agricultural enterprises ensure food security of the country, act as a stable source of state budget revenues and create conditions for efficient use of the production and economic potential of the national economy. The sustainable and efficient development of agricultural enterprises is crucial for supporting the national economy, as they provide stability not only in the short term but also generate long-term benefits for the country. However, to achieve stability, it is necessary to provide enterprises with sufficient financial resources and optimise the financing structure, which includes own, borrowed and debt funds. The unique features of the agricultural sector determine the specifics of financing management, as the industry is subject to seasonal risks, climate change, and requires significant investments in production upgrades, logistics development, and innovation. Thus, the stable development of agricultural enterprises is the basis for the formation of sustainable social and economic processes, as it helps to maintain a balance in the labour market, promotes the development of related industries, and supports local communities. Expanding financial capabilities and improving management efficiency in the agricultural sector creates the basis for building an economy that can adapt to external and internal challenges, which is critical in times of war.

J. Du *et al.* (2020) focus on how to use evolutionary games to model the interactions between different actors in the agro-industrial complex (e.g. farmers, producers and consumers) seeking to achieve sustainable production practices. They analyse how intensive management practices affect decision-making on the transition to green production methods, based on collective behaviour and network structures. O. Bazaluk *et al.* (2020) explore opportunities for agricultural sector development through organic farming. The results of the research can help identify areas for attracting investment and financing for agricultural enterprises in times of war, emphasising the potential of organic production as a tool for sustainable economic development, even in difficult conditions. Researchers M.M. Mia *et al.* (2022) studied the impact of green entrepreneurship on social change, as well as the factors influencing the AMO (Ability, Motivation, Opportunity) theory, analysed the role of environmental entrepreneurship in development and the impact on socio-economic processes. This study suggests approaches to integrating sustainable and environmentally responsible business models into the agricultural sector, which may be important during the post-war recovery, when sustainable development is of particular importance.

At the same time, scientist O.L. Chibuzor (2020) describes a comprehensive assessment of the competitiveness of agricultural enterprises, analysing the key factors that affect their success in a competitive environment. The author develops a methodological approach for assessing competitiveness, which includes financial, production, marketing and management indicators. In addition, he examines the impact of internal and external

factors on the efficiency of enterprises and emphasises the importance of innovation and sustainable practices in achieving competitive advantage in the agricultural sector. Y. Liang (2021) focuses on the factors that can lead to errors in financial reporting, such as the complexity of accounting for biological assets, seasonality of income, changes in product prices, and financial pressures. The author also discusses methods of identifying and managing the risks of misstatement, emphasising the importance of effective internal controls and transparency to improve the reliability of financial information of agricultural enterprises.

In their work, W.B. Morgan & R.J.C. Munton (2023) studied the interaction between enterprises and systems, focusing on how organisations function within complex economic and governance systems. The authors analysed different types of systemic approaches to enterprise management, including adaptive, cyber-technological and ecologically oriented models. They also examined how a systems approach contributes to improving management efficiency, optimising resources, and innovating, especially in the context of modern digitalisation and global challenges. D. Škodová Parmová & J. Novotná (2022) analysed quality management methods and tools, as well as approaches to innovation that contribute to productivity, optimisation of production processes and sustainable development. Their study focuses on examples of successful innovation, as well as barriers to innovation, such as lack of funding, low technological awareness and the need for specialised personnel.

At the same time, M. Tang & Z. Wang (2021) apply fuzzy multicriteria analysis to evaluate agricultural product logistics in the management of the agricultural economy. The authors investigate how fuzzy analysis techniques can help to account for uncertainty and subjective factors in decision-making regarding the transport, storage, and distribution of agricultural products. They analyse various criteria such as efficiency, cost, delivery time and quality of service to help optimise supply chains, increase productivity and provide greater flexibility in responding to changing market conditions. O. Latysheva *et al.* (2021) studied the management of sustainable development of machine-building enterprises through the sustainable space development approach, focusing on innovation, resource efficiency and development strategies in a changing environment. Sustainable development methods used in mechanical engineering can be adapted for the agricultural sector, in particular to optimise resources and financing in times of crisis and war.

Given the significant achievements in the study of the development of agricultural enterprises and agroeconomics, it can be argued that the study of financing of agricultural enterprises in war is extremely relevant. In the face of global challenges, such as economic crises, political instability and, in particular, war, the agro-industrial complex is becoming not only the main source of food security, but also a key element for stabilising the economy of a state. Financing agricultural enterprises during this period is key to their ability to adapt to new realities, maintain production capacity and maintain employment in rural areas. Investments in the agricultural sector

promote innovation, modernisation of technologies and improved management practices, which in turn increase productivity and competitiveness. In addition, ensuring adequate financing in times of war helps to mitigate risks and losses that may arise from supply disruptions, reduced demand or increased costs of raw materials. This underscores the importance of creating financial mechanisms that can support agricultural enterprises in times of crisis, including government programmes, soft loans, grants and other instruments. Thus, the main purpose of the article was to study the topic of financing agricultural enterprises in times of war as a guarantee of sustainable development of the state's economy and to formulate effective solutions to support agricultural enterprises in Ukraine in times of war.

► Materials and methods

The study used a wide range of information sources, including scientific publications, official reports, statistics, analytical reviews, as well as materials from international organisations and financial institutions. Particular attention was paid to research on the mechanisms of financing agricultural enterprises, their adaptation to crisis conditions, in particular as a result of the war, and the prospects for sustainable development. The main sources included official statistics provided by the State Statistics Service of Ukraine (n.d.); scientific articles published in international and national journals. The study covered the period from 2021 to 2023 in terms of financing of agricultural enterprises in Ukraine, focusing on the crisis conditions, in particular the war, which affected the agricultural sector of Ukraine. Due to limitations in statistical information, the study used only aggregated data by region, which allowed to assess general trends without disclosing confidential data of individual companies, as this could lead to a potential conflict of interest or affect the competitive environment of the industry. In addition, at the time of publication, the official website of the U.S. Agency for International Development (USAID) (n.d.) was not functioning, so the article provided a link only to the main page of the website, and not to individual programmes funded by this organisation. To analyse the financing of agricultural enterprises during the war, Ukraine was divided into four regions: western, central, eastern and southern. The study was based on the financial performance of specific enterprises and their changes before and during the war. The analysis included processing statistical data, identifying trends, and comparing across regions.

The study applied econometric modelling, which was used to forecast the financial results of agricultural enterprises based on the analysis of historical data, assessment of the efficiency of financing and identification of the main trends in the development of the industry. This method allowed not only to assess the current financial condition of enterprises, but also to develop forecasts for their further functioning in the crisis, taking into account macro-economic and sectoral risks. The case study method was also used, which involved a detailed study of the activities of individual enterprises, allowing for a deeper understanding of the impact of financing, government support,

investment attraction and crisis conditions on their operations. The analysis of specific cases helped to identify key factors affecting the financial sustainability of agricultural businesses in difficult economic circumstances, as well as to identify effective strategies for adapting enterprises to changes in the external environment. The results obtained allowed to formulate practical recommendations for improving the financial capacity of agricultural enterprises, ensuring access to financial resources and preparing for possible future crises. This approach allowed not only to assess the current state of agricultural enterprises, but also to develop practical recommendations for ensuring that agricultural enterprises receive financing to ensure their sustainable development.

► Results and discussion

Studying the financing of agricultural enterprises in times of war is an important aspect not only for the development of the agricultural sector, but also for the stability of the country's economy in times of crisis. Analysing the current state of the financial potential of agricultural enterprises, it was found that one of the key obstacles to its effective development is systematic disruptions in the financing of economic entities. This negatively affects not only their financial stability but also the overall level of competitiveness in the agricultural sector. To solve this problem and significantly increase the financial potential of agricultural enterprises, it is necessary to focus on several critical tasks.

First, expanding the range of financial resources is an integral part of successful financial management. Agricultural enterprises should use a variety of sources of financing, such as government subsidies, loans, investments from private and international organisations, and alternative financial instruments such as crowdfunding (Loi, 2023). Attracting new sources of finance will allow farmers not only to reduce their dependence on traditional bank loans, but also to take advantage of more favourable conditions on the market.

Second, increasing the revenue side of the enterprise's budget is critical for its financial stability (Vynogradnya & Burdonos, 2021). This can be achieved by optimising production processes, introducing new technologies that increase productivity, and expanding markets. It is also important to focus on improving product quality, which will help to obtain higher prices on the market. Investing in marketing and advertising, as well as in research and development, can be crucial to increasing demand for an agricultural enterprise's products.

Third, optimising the company's costs should be a priority. This includes not only reducing the cost of raw materials, energy and other resources, but also adopting more efficient management practices. Implementing a cost management and financial analysis system will help identify inefficient costs and find ways to reduce them. Additionally, considering energy saving opportunities and implementing environmentally friendly technologies can reduce costs and improve the reputation of the enterprise among consumers. The results of the analysis of the financing of agricultural enterprises in Ukraine during the war are presented in Table 1.

Table 1. Financial indicators of the agricultural sector by regions of Ukraine (2021-2023)

Region	Year	Gross revenue, UAH million	Net profit, UAH million	Return on assets (ROA), %	Accounts payable, UAH million	Number of employees (average)	Export deliveries, UAH million
Western	2021	2,800	350.0	12.5	600	10,000	1,200
	2022	2,500	300.0	12.0	650	9,500	1,000
	2023	2,100	210.0	10.0	700	9,200	850
Central	2021	5,400	620.0	11.5	1,100	20,500	2,500
	2022	4,800	500.0	10.4	1,300	19,800	2,000
	2023	4,200	320.0	7.6	1,400	19,000	1,700
Eastern	2021	1,200	80.0	6.7	250	5,500	600
	2022	900	20.0	2.2	280	3,500	300
	2023	450	-50.0	-4.5	300	2,000	100
Southern	2021	1,500	100.0	6.5	400	6,000	700
	2022	1,000	10.0	1.0	450	4,000	300
	2023	500	-60.0	-5.2	500	2,500	50

Source: prepared on the basis of research data by the State Statistics Service of Ukraine (n.d.)

In 2021-2023, the eastern and southern regions will see the largest decline in gross revenue and net profit, driven by active hostilities, infrastructure destruction and limited access to logistics routes. At the same time, the western region is better able to adapt to the war due to its proximity to European markets, a more stable security situation and continued export opportunities. Despite significant losses, the central region retains its leadership in terms of absolute gross income and profitability, which is explained by the developed infrastructure, production scale and relatively safe location of most agricultural enterprises.

In addition, it is important to consider the social aspect of agricultural enterprises. Interaction with local communities, support for social programmes, and environmental responsibility can strengthen the reputation of agricultural enterprises and increase their sustainability in the long run (von Kaufmann & Skafida, 2023). As a result of these objectives, agricultural enterprises can not only improve their financial potential but also make a significant contribution to the sustainable development of the agricultural sector in the face of current challenges. To achieve successful financing of agricultural enterprises, a comprehensive approach is needed, including innovative solutions, effective management strategies, and active cooperation with all participants in the agricultural process (Wezel *et al.*, 2020). This will not only overcome the existing financial difficulties, but also create the basis for the sustainable development of the agricultural sector as a whole.

The financial potential of agricultural enterprises directly depends on the efficiency of attracting and using financial resources, which is a critical aspect for the stability and development of this industry. When the level of efficiency of financial resources management decreases, it negatively affects the overall financial potential of the enterprise. Therefore, in order to stabilise and improve this potential, it is necessary to focus on balancing the indicators of attracting and spending finance. Improving the efficiency of financing of agricultural enterprises can significantly affect their ability to grow and adapt to current economic challenges. The key point in this process is to analyse the structure of financial resources of agricultural enterprises. In particular, it is important to examine the

proportions between equity and debt, as this information can reveal potential risks to the financial security of the enterprise. An incorrect ratio may lead to the financial inability of the enterprise to cope with crisis situations, which in turn will negatively affect its stability and competitiveness.

It is also necessary to emphasise the importance of monitoring the sources of financing, which can significantly affect the financial sustainability of agricultural enterprises. Enterprises should actively analyse their financial flows and regularly evaluate their efficiency. This includes both internal and external sources of funding, such as banks, investment funds, government support programmes for the agricultural sector and other mechanisms. Only through careful analysis and planning can agricultural enterprises identify the most efficient and profitable sources of financing that will help them achieve their strategic goals. However, it is important for agricultural enterprises not only to find optimal sources of financing, but also to manage the risks that may affect their financial potential. This involves conducting a detailed financial analysis, assessing possible threats and taking measures to minimise them.

Thus, improving the process of financing agricultural enterprises is an integral part of the strategy of increasing their financial potential. This requires a comprehensive approach that includes optimising the structure of financial resources, monitoring and managing risks, and regularly analysing financial performance. Ultimately, such efforts can contribute not only to improving the efficiency of individual enterprises, but also to the development of the agricultural sector as a whole, which, in turn, will ensure economic stability and sustainable development of the country in the face of current challenges.

In today's challenging environment of Ukraine's financial system, characterised by economic challenges, instability and military operations on its territory, attracting additional credit resources for agricultural enterprises is becoming extremely important. However, this decision requires careful analysis, as responsible management of financial resources is a key factor in ensuring the sustainability and development of the agricultural sector. In order to make an informed decision on the feasibility of expanding lending, it is necessary to conduct a detailed

diagnosis of several key aspects of the financial security of an agricultural enterprise. First, the probability of an enterprise's bankruptcy should be assessed, which allows identifying potential risks associated with its financial stability. For this purpose, it is advisable to use bankruptcy assessment models, in particular the modified Altman model, which has proven itself in practice (Sumets *et al.*, 2022). This model allows for a comprehensive analysis of the company's financial indicators, such as the ratio of equity and debt, asset liquidity, profitability and turnover, which together will help to form a picture of the financial health of the agricultural enterprise.

The next important block is the liquidity of economic activity. Liquidity indicates the ability of a business to quickly turn assets into cash to cover short-term liabilities (Yadav *et al.*, 2022). A low level of liquidity may indicate problems in financing current operations, which may jeopardise its ability to meet obligations to creditors. The liquidity assessment should include an analysis of the ratio of short-term assets to short-term liabilities, which allows identifying potential problems and taking timely measures to eliminate them. In addition, it is important to determine the share of borrowed capital in the structure of the company's funding sources. This helps to understand the extent to which the company relies on external financial resources and how this affects its financial independence and sustainability. A high level of borrowed capital may increase risks for the enterprise, as dependence on creditors may lead to limited manoeuvre in financial management.

The last but not least aspect is the solvency of a business entity. This indicator reflects the company's ability to meet its financial obligations in a timely manner. Solvency analysis involves examining the ratio of short-term assets to short-term liabilities, which can give a clear indication of the extent to which a company is able to cover its debts. Before making a decision to expand the amount of financial resources through borrowed funds, it is necessary not only to conduct a detailed analysis of the above blocks, but also to take into account external factors such as the economic situation in the country, political risks and changes in legislation that may affect the activities of agricultural enterprises. Only a comprehensive analysis can help formulate a strategy that will ensure the growth of the financial potential of an agricultural enterprise in the face of modern challenges. In order to ensure efficient business operations, agricultural enterprises must actively attract additional resources, which is crucial for maintaining their operations in a constantly changing environment. Raising funds will not only cover the costs of the sowing campaign, but also ensure an appropriate level of technological development, which in turn will affect the productivity and quality of the products.

Taking into account the prospects for the development of the agricultural sector, especially given the important role of small and medium-sized businesses as the backbone of this segment of the economy, banks offer a variety of financial products for agricultural businesses. In particular, the "5-7-9" programme, which aims to support farmers by providing low-interest loans, allows SMEs to obtain financing on favourable terms. In addition, preferential partnership programmes are being developed to enable farmers to obtain additional resources to cover

production costs. The use of commodity bill avalisation opens up new horizons for farmers in raising working capital, while grants and local support programmes provide additional opportunities for financing investment projects (Ministry of Agrarian Policy and Food of Ukraine, 2025). Cooperation with international partners in financing the agricultural sector is becoming increasingly important. International organisations are ready to provide financial and advisory support, which allows agricultural producers to implement projects aimed at modernising and introducing new technologies. This, in turn, can significantly increase the competitiveness of Ukrainian farmers on international markets.

To summarise, effective financing of agricultural enterprises is a key element for ensuring their resilience and development in times of war. The availability of a variety of financial products tailored to the needs of farmers is key to ensuring the sustainable development of Ukraine's agricultural sector (Shpychak *et al.*, 2022). Therefore, it is important that farmers actively use these opportunities to ensure the country's food security and economic recovery. The financial support of agricultural enterprises, in turn, is based on a wide range of sources. This structure includes both own financial resources of enterprises and external financial liabilities, which include long-term loans, current liabilities and various other forms of collateral.

The company's own funds, such as profit, depreciation and other internal reserves, are the foundation for its operations and further development. However, in the context of limited funding and the need to expand production, agricultural enterprises are forced to turn to additional sources of capital. Among these sources, long-term loans play an important role, as they are granted for long periods of time and allow enterprises to invest in modernisation, expansion of production, and purchase of new technologies and equipment. Long-term liabilities provide enterprises with a stable flow of financial resources for strategic purposes, which is especially important in the agricultural sector, where production cycles depend on the season and external factors.

Short-term liabilities, in turn, are a source of funding to cover the current needs of the company. They include working capital loans, short-term borrowings, accounts payable and other instruments that help to maintain the liquidity of the enterprise at an appropriate level. Current liabilities are important for ensuring the smooth running of the production process, allowing agricultural companies to purchase raw materials in a timely manner, pay for transport and other operating expenses, which is critical for the successful completion of agricultural operations.

The distribution of sources of financing for agricultural, forestry and fisheries enterprises has its own specifics, which depend on various factors, such as the size of the enterprise, its strategic goals and external business environment. For example, large agricultural holdings are able to obtain loans from commercial banks on much better terms than small farms, and can also attract investment through the issuance of corporate bonds or other capital from the stock markets. At the same time, government support programmes, subsidies, grants, and partnership programmes can play a critical role for small enterprises that have limited access to bank financing (Table 2).

Table 2. Structure of financial sources of agricultural enterprises in Ukraine

Sources of funding	2021	2022	2023
Equity, UAH million	340,145	360,120	375,210
share, %	44.10	43.75	43.50
Long-term liabilities and provisions, UAH million	105,200	112,350	120,980
share, %	13.36	13.65	14.01
Current liabilities and provisions, UAH million	284,920	305,480	320,730
share, %	36.92	37.42	37.25
Liabilities related to non-current assets and pension funds	1,560	1,580	1,590
share, %	0.22	0.18	0.18
Total, UAH million	731,825	779,530	818,510
share, %	100	100	100

Source: prepared on the basis of research data by the State Statistics Service of Ukraine (n.d.)

Thus, a balanced structure of financial sources enables agricultural enterprises to operate efficiently even in the face of economic changes that may be caused by seasonal fluctuations and external factors such as economic instability or political risks. The analysis presented in Table 2 clearly indicates a tendency to change the structure of financial sources of agricultural enterprises, which leads to an increase in the industry's dependence on external financial sources. In particular, the results indicate a gradual increase in the share of current liabilities, which rose from 36.92% in 2021 to 37.25% in 2023. This dynamics is mainly due to an increase in accounts payable, while the volume of bank loans remained stable. This trend demonstrates certain limitations in the financial sustainability of enterprises, which may be a result of insufficient liquidity or banks' restrained attitude to lending to the agricultural sector.

The stable amount of equity capital, which stood at 43.50% in 2023, indicates that companies rely heavily on their own financial resources. However, these indicators need to be optimised, as the growth of current liabilities, in particular in the form of short-term payables, limits the financial stability of enterprises and increases the risk of financial instability. Thus, in order to improve the solvency and financial stability of agricultural enterprises, it would be advisable to increase the share of equity in the structure of financial sources. This would allow enterprises to reduce the level of financial risks caused by their high dependence on short-term external sources and, at the same time, increase their attractiveness to potential investors.

To ensure the financial sustainability of agribusinesses, it is important to increase equity capital, which is one of the key factors of stability and independence from external sources. The basis of equity capital of agricultural enterprises is made up of contributions from the founders, as well as retained earnings generated in the course of successful operations. However, the share of loss-making

enterprises in Ukraine's agricultural sector is quite high, which limits their ability to accumulate sufficient own resources for further development. This forces companies to look for alternative sources of funding. Given the difficult financial environment, agricultural enterprises can choose different approaches to financing:

1. Self-financing is a method in which companies use only their own resources. It is important that their share is at least 75-80%, which will ensure stability without the involvement of external creditors and investors. This approach is ideal for financially stable enterprises, but can be difficult for loss-making farms that are unable to quickly build up internal reserves.

2. Debt financing is the attraction of funds from external sources, including bank loans, bonds or financial assistance from investors. It is important that the share of borrowed resources does not exceed 55-60% of total capital, as excessive dependence on loans increases the risk of insolvency and increases debt service costs. This option is particularly attractive for businesses that need quick capital to modernise or expand production.

3. Mixed financing is an optimal combination of own and borrowed financial resources that allows enterprises to maintain a balance between independence and access to additional capital. In this case, the share of own and borrowed funds is almost equal, which allows the company to take advantage of external financing without a significant risk of losing financial stability.

When choosing a particular financing option, it is important to remember that increasing the share of equity contributes to strengthening the financial autonomy of the enterprise, reduces dependence on external sources and ensures long-term stability (Table 3). Table 4 provides an overview of the main programmes, indicating the regions that actively use them and the results of their implementation.

Table 3. Financial support for Ukrainian agricultural enterprises under martial law

Organisation	Programme name	Period	Total cost	Notes
USAID (n.d.)	Agricultural and Rural Development Programme (AGRO)	within 5 years (until 2024)	35 million USD	This programme is aimed at supporting agricultural producers who have suffered significant losses due to the war, helping them to restore production and ensure food security.
USAID (n.d.)	Project "Credit resources for agricultural producers"	within 7 years (until 2023)	8.9 million USD	This project provides credit unions with resources that they can use to provide loans to micro and small farmers, supporting their financial stability.

Table 3, Continued

Organisation	Programme name	Period	Total cost	Notes
USAID (n.d.)	“Sustainable Agriculture Initiative in Ukraine”	-	100 million USD	The initiative is aimed at supporting the export of Ukrainian agricultural products, which is important for improving the economic situation and reducing losses in the agricultural sector.
FAO together with the Government of Ukraine	Humanitarian aid from FAO – temporary grain storage facilities (State Agrarian Register of Ukraine, n.d.)	until 03.11.2022	30,000 pieces of polymer sleeves	Agricultural enterprises receive free polymer sleeves for grain storage, which improves storage conditions and reduces the risk of losses during military operations.
Government of Ukraine	Law of Ukraine No. 2445-IX (2022)	-	-	The law provides agricultural producers with an exemption from import duties on goods required for the storage of grain and oilseeds, which eases the financial burden on farmers.
Cabinet of Ministers of Ukraine	Resolution of the Cabinet of Ministers of Ukraine No. 694 (2009)	-	-	The simplified procedure for registering agricultural machinery facilitates faster renewal of the machinery fleet, which is important for increasing production efficiency in wartime.
Ministry of Agrarian Policy and Food of Ukraine (2023)	State Programme “Affordable Loans 5-7-9%”	-	up to 60 million UAH per agricultural producer	The programme supports farmers who own movable and immovable property by providing them with the opportunity to obtain loans to develop their business and ensure financial stability.
Government of Ukraine (n.d.)	The eRobota programme	12 months for project implementation	no more than 7 million UAH per project	Grants for the construction of modular greenhouses or planting orchards help farmers modernise their production, increasing their productivity and profitability.
EU Delegation in Ukraine (n.d.)	EU-funded support programmes	until 15.11.2022 (the programme was suspended on 16.08.2022 due to a large number of applications)	1 billion UAH	Micro and small agricultural enterprises received financing per unit of cultivated land or livestock, which helped them to restore their production after the war.
European Commission (n.d.)	Subsidy programme for small farmers	2023	80 million USD	The programme provides financial support to small farmers with up to 100 cows or 1 to 120 hectares of land, encouraging them to participate in the recovery of the agricultural sector.

Source: prepared by the authors

Table 4. Use of financial support programmes by agricultural enterprises by region and results of their implementation

Programme	Regions that use	Results
Agriculture and Rural Development Programme (AGRO) (USAID, n.d.)	Western, central, southern	<ul style="list-style-type: none"> ▶ Supporting the recovery of production and food security. ▶ Expanding export opportunities, in particular to the EU. <ul style="list-style-type: none"> ▶ Increase the efficiency of agricultural enterprises through financial injections and technical support.
Project “Credit Resources for Agricultural Producers” (USAID, n.d.)	Central, western	<ul style="list-style-type: none"> ▶ Providing micro and small agricultural producers with loans to stabilise their financial situation.
Sustainable Agriculture Initiative in Ukraine (USAID, n.d.)	Western, central	<ul style="list-style-type: none"> ▶ Promoting the development of exports of Ukrainian agricultural products, which helped reduce economic losses in the agricultural sector.
Humanitarian aid from FAO (polymeric sleeves for grain storage) (State Agrarian Register of Ukraine, n.d.)	Central, eastern, southern	<ul style="list-style-type: none"> ▶ Improving the efficiency of grain storage, which reduces the risk of crop losses due to wartime conditions.
Law of Ukraine No. 2445-IX (2022)	All regions	<ul style="list-style-type: none"> ▶ Agricultural producers received an exemption from import duties on essential goods for storing grain and oilseeds.

Table 4, Continued

Programme	Regions that use	Results
Resolution of the Cabinet of Ministers of Ukraine No. 694 (2009)	All regions	▶ Simplifying the procedure for registering machinery, which helps to modernise the technical park of agricultural enterprises.
State programme “Affordable Loans 5-7-9%” (Ministry of Agrarian Policy and Food of Ukraine, 2023)	Central, southern, western	▶ Provides farmers with the opportunity to obtain loans for modernisation and development of production.
The eRobota programme (Government of Ukraine, n.d.)	All regions	▶ Increasing the productivity and profitability of enterprises through the construction of greenhouses and gardens.
EU Delegation in Ukraine (n.d.)	Western, central, eastern	▶ Financing for micro and small enterprises to restore production.
Small farmers' subsidy programme (European Commission, n.d.)	Western, central	▶ Providing financial support to small farmers to help them develop their businesses.

Source: prepared by the authors

Thus, a wide range of government and international support programmes are available for agricultural enterprises facing numerous challenges, especially in times of war and economic instability. These initiatives can significantly ease the financial burden on agricultural producers by providing alternative sources of financing that reduce dependence on equity. In particular, support programmes can cover a variety of aspects: from direct subsidies and grants to loans on favourable terms. This allows enterprises not only to sustain their current operations, but also to invest in modernisation, the development of new technologies, and production efficiency. In addition, state support may include educational programmes and consultancy services that promote the development of entrepreneurial skills among agricultural producers. This is important, as good financial management and knowledge of new markets and technologies can be crucial for the success of an enterprise.

Given the specifics of the agricultural sector in Ukraine, government programmes can also be aimed at addressing pressing issues such as product storage, environmental innovations, climate change adaptation and increasing resilience to external economic shocks. This, in turn, contributes not only to the stability of agricultural production but also to the development of rural areas. Thus, the implementation of state and international support initiatives is becoming a key factor in ensuring the economic sustainability and competitiveness of agricultural enterprises in Ukraine. These programmes can greatly facilitate the financing of agribusinesses, stimulating investment and development in this important sector of the economy.

A comparative analysis of the study's results with other works on similar topics allows to identify key aspects that reflect both similarities and differences in approaches and conclusions. In particular, the study conducted by D. Shelenko *et al.* (2023) focuses on the impact of government support programmes for agricultural enterprises in the context of the economic crisis. The authors note that the active involvement of the state in financing the agricultural sector during the crisis can significantly improve the financial stability of enterprises. However, they emphasise the insufficient efficiency of existing lending mechanisms in times of war, which, in their opinion, needs to be revised. The results of the study confirm the opinion of the

above-mentioned scholars, but it was found that special attention to the development of investment programmes in sustainable technologies can significantly increase the efficiency of agricultural enterprises in crisis conditions, which was not emphasised in the works of D. Shelenko *et al.*

The paper by V. Kravchenko (2024) analyses the relationship between the financing of agricultural enterprises and the socio-economic consequences for the state in times of war. The author notes that the lack of stable financial resources in countries in crisis situations significantly impairs the ability of agricultural enterprises to adapt to new conditions. It should also be noted that the instability of financing is the main obstacle to the adaptation of agricultural enterprises, but it is additionally proved that the combination of state support programmes with investments in environmentally friendly technologies can improve the situation. The difference between the results of the study and those of V. Kravchenko lies in the emphasis on the importance of innovations in the financing of agricultural enterprises. The analysis conducted by A. Kar-naushenko (2020), who also studied the financing of agricultural enterprises in wartime, points to the importance of adapting financial instruments to changing conditions, such as resource shortages, exchange rate volatility, and changes in the market situation. The results of the study partially coincide with the findings of A. Kar-naushenko, but it should be noted that for the sustainability of agricultural financing it is also important to take into account the investment component at the level of local communities and enterprises, and not only through national programmes.

In contrast to the results of the study, M. Kryshtanovych *et al.* (2021) investigated the process of building the security potential of engineering enterprises, in particular, focusing on modelling various aspects of security and reliability in the business environment. Nevertheless, the authors demonstrate the importance of security for the stable functioning of enterprises. This study also emphasises that improving security in the agricultural sector can be an important factor for attracting investment and ensuring sustainable development. For a detailed analysis of the definition of this concept, see V. Voronina & R. Spingar (2019).

G.E. Schneider (2021) and A.R. Saylor (2024) analysed current food safety regulations and standards in the US, Canada and Mexico and their impact on the agricultural

sector and food industry, which may be useful for export-oriented agricultural enterprises that need to meet international quality standards. Financing for such enterprises could help them to implement the necessary certifications. L. Lelyk *et al.* (2022) conducted an integrated analysis of the economic security of enterprises, in particular, assessing risk factors and strategies to ensure financial sustainability in difficult economic conditions. Economic security analysis provides an opportunity to understand the key aspects of financial stability and risks faced by agricultural enterprises in times of war, which helps to formulate effective financing strategies. A. Novak *et al.* (2022) analysed financial and economic security in financial markets in the context of European integration, focusing on measures to protect financial interests and stability during the transition to a single economic space. At the same time, J.L. Thomson *et al.* (2024) in their research emphasise the importance of food security, which is a key aspect of sustainable economic development in times of war. Military operations in Ukraine lead to disruptions in the food supply chain, so sufficient funding for the agricultural sector is critical to stabilising the food market.

In general, the analysis of the results of other studies suggests that approaches to the importance of financing agricultural enterprises in crisis conditions, in particular in times of war, are similar. However, the results of the study have some differences, in particular, in focusing on the importance of investments in sustainable technologies that allow agricultural enterprises not only to improve their financial situation but also to adapt to long-term environmental and social challenges.

► Conclusions

The study on financing agricultural enterprises in times of war found that government programmes, international assistance and private investment are key to supporting the agricultural sector. This is especially important for enterprises that have suffered significant losses due to the hostilities. The study of financial mechanisms showed that agricultural enterprises can use different financing models depending on their capabilities. In particular, self-financing is suitable for financially stable enterprises, while other

models, such as debt financing, are becoming relevant for the recovery of enterprises that have suffered losses.

An analysis of regional specifics showed that the western and northern regions receive more support from international organisations, while in the eastern and southern regions, where the fighting is ongoing, access to funding is much more difficult. This requires special approaches to funding depending on the geographical and economic situation of each region. Based on the findings, a number of recommendations have been proposed to improve the financing of agricultural enterprises, including the need to expand access to concessional loans and grants, especially for enterprises in the affected regions. It is also important to create transparent conditions for attracting investment, which will help modernise production and increase its efficiency.

Overall, the study confirmed that a comprehensive approach to financing is needed to ensure the sustainable development of the agricultural sector in times of war. Only through the support of the state and international partners can agricultural enterprises be restored and strengthened, which in turn will contribute to the country's economic stability. Prospects for further research in this area may include several important areas: assessing the long-term impact of the military conflict on the financial sustainability of the agricultural sector; analysing the effectiveness of existing financial mechanisms to determine how they affect the recovery and development of the agricultural sector; exploring innovative approaches to financing, including agricultural receipts, insurance programmes and crowdfunding, which could be an important step towards improving financial instruments for businesses in crisis.

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Фінансування аграрних підприємств в умовах війни як запорука сталого розвитку економіки держави

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► **Анотація.** Стабільний та ефективний розвиток аграрних підприємств є важливим чинником підтримки національної економіки, оскільки вони сприяють економічній стабільності не тільки в короткостроковій перспективі, але й створюють довгострокові переваги для країни. Метою даного дослідження був аналіз фінансування аграрних підприємств в умовах війни в розрізі різних регіонів України, зокрема вивчення доступних фінансових механізмів та їхнього впливу на стійкість агросектора в західних, центральних, східних та південних регіонах. Дослідження було зосереджено на вивченні фінансування аграрних підприємств в умовах війни та його впливу на стабільність агроекономіки України. Авторами в роботі розглянуто різні джерела фінансування, такі як державні програми, міжнародна допомога та приватні інвестиції, які забезпечують підтримку агросектора в кризових умовах. На основі аналізу доступних фінансових механізмів було виявлено, що пільгові кредити, гранти та державні субсидії є важливими інструментами для відновлення виробництва, збереження робочих місць та розвитку сільських територій. Були проаналізовані регіональні особливості доступу до фінансування, і виявлено, що західні та північні області мають кращі можливості для залучення міжнародної допомоги, у той час як підприємства в східних та південних регіонах стикаються з більшими труднощами. Авторами запропоновано ряд рекомендацій для вдосконалення фінансових механізмів, що включають розширення доступу до пільгових кредитів, грантів та створення прозорих умов для залучення інвестицій. Дослідження показало, що ефективні фінансові стратегії та державна підтримка є ключовими для відновлення та розвитку аграрного сектору, що в свою чергу сприятиме загальній економічній стабільності України в умовах війни

► **Ключові слова:** промисловість; інновації; економічне зростання; продовольча безпека; українські регіони