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Risks of managing financial resources of the agricultural sector of Ukraine in the zone of military conflict: Challenges, threats, ways of counteraction

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► **Abstract.** This study was aimed at identifying the risks that affect financial management in the agro-industrial sector of Ukraine during military operations in order to develop effective countermeasures. The research methodology included an analysis of the main risks, such as exchange rate fluctuations, inflation, disruption of supply chains and political instability, as well as an assessment of strategies to minimise these risks. The main stages of risk management are identified as identification, assessment, and monitoring of risks, as well as development of appropriate strategies, such as investment diversification, insurance, and hedging. The study results showed that the key factors for ensuring stability are the introduction of technological innovations, government support, creation of reserve funds and diversification of funding sources. In particular, the development of modern agricultural technologies, subsidies, soft loans and investments in infrastructure significantly increase the resilience of the agricultural sector to crisis conditions. It is also important to plan cash flows to maintain liquidity and meet financial obligations in a timely manner. The experience of several countries, such as Israel and Georgia, which have faced similar challenges, was reviewed and analysed to see how they managed the financial resources of their agricultural sectors. The experience

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of these countries has shown that successful management of the financial resources of the agricultural sector in the context of military conflict requires a comprehensive approach that includes technological innovation, government support, financial planning and human capital development to ensure sustainable development of the agricultural sector in times of war. This approach allows not only preserving but also developing the agricultural sector, ensuring food security and economic stability of Ukraine

▸ **Keywords:** risk management; agriculture; instability; investment; exports

▸ Introduction

Ukraine's agricultural sector faces many challenges, including difficulties in financial management, which have been exacerbated by the ongoing hostilities. Businesses suffer from exchange rate volatility, high inflation, supply chain disruptions and complications in accessing finance. Effective management of financial resources is critical to ensure the survival and development of the agricultural sector in times of war. Studying these aspects will help to develop new approaches to financial planning and risk management.

Many researchers, both in Ukraine and abroad, have been paying attention to the issues of financial management in the agricultural sector. Their research provides valuable information on risks, challenges, and ways to counteract them. M. Khudaykulova *et al.* (2022) studied the impact of the military conflict on the Ukrainian economy, in particular on the agricultural sector, and pointed to a significant increase in financial risks due to the rising cost of credit, exchange rate instability, and logistical problems. S. Williams & R. Karen (2019), in turn, proposed the creation of state support programmes for agricultural enterprises and the development of specialised financial instruments to minimise risks, including those caused by the war. M.V. Soomiyol & O. Fadairo (2020) analysed the cases of agricultural enterprises that were able to adapt to the conditions of military conflict by optimizing costs, diversifying sources of income and introducing new technologies. M. De Rosa *et al.* (2019) pointed out that agribusinesses that implement diversification strategies and actively use risk insurance demonstrate greater resilience to crisis situations. V. Liashenko *et al.* (2022) analysed the role of international organizations in supporting agribusinesses in conflict situations.

A. Faqih *et al.* (2020), in turn, argued that cooperation with international donors and financial institutions can significantly reduce financial risks and contribute to the stabilization of the sector. A. Rijanto (2021) emphasised the importance of introducing modern financial technologies, such as blockchain and financial platforms, to increase transparency and efficiency in financial resource management. M. Hamulczuk *et al.* (2023) studied the impact of military conflicts on global agri-food supply chains. M.A. Arias *et al.* (2019) also noted that international cooperation and support can help reduce the negative impact of conflicts on agricultural markets and ensure the stability of food supplies. K. Brockova *et al.* (2021) drew attention to the importance of innovation and technological development as key factors that allow agribusinesses to remain competitive even in difficult conditions.

The studies of the previous authors provide valuable theoretical and practical material for analysing the risks of financial resource management in the agro-industrial complex of Ukraine. They confirm the importance of an integrated approach to risk management, cooperation with international institutions, and the introduction of modern technologies to ensure financial sustainability and development of the sector in the context of military conflict. Despite a considerable amount of research, some aspects of financial resource management in the agro-industrial complex in times of war remain insufficiently studied. There is a need to study the adaptation of successful international financial management practices to the specific conditions of the Ukrainian agricultural sector in the context of the conflict.

The purpose of this study was to identify the risks affecting financial management in the Ukrainian agricultural sector during the war in order to identify effective countermeasures. The objectives of the study included: assessing the impact of conflicts on the global financial strategies of Ukrainian agribusinesses; developing and implementing innovative financial instruments to reduce risks and improve management efficiency; and studying the role of government and non-government institutions in maintaining the financial stability of agricultural enterprises during the war.

▸Materials and methods

The study is based on data from the State Statistics Service of Ukraine, in particular on economic indicators of the agricultural sector for the period from 2013 to 2023. Data on gross domestic product (GDP), production in agriculture, forestry and fisheries, exports of agricultural products, and capital investments in the agricultural sector are included. The statistics used cover key indicators that affect the financial stability of agricultural enterprises, including the impact of the military conflict on economic activity. The economic accounts of agriculture in Ukraine and the volume of capital investment in agriculture were allocated only until 2022 due to the lack of up-to-date data in the State Statistics Service of Ukraine.

The research methodology includes several key stages: risk identification, risk assessment, consideration of risk management strategies, risk monitoring and control, financial planning in an uncertain environment, innovation and strategic management. The main sources of risks that may threaten the financial stability of agricultural enterprises during military conflict were identified. For this purpose, data and current trends affecting the agricultural sector were analysed.

The identified risks were quantified. A statistical method was used to assess the impact of each factor on the financial performance of agricultural enterprises. For this purpose, the potential losses from negative factors were analysed. Risk management strategies were considered. Different approaches to minimizing or avoiding risks, such as investment diversification, insurance, hedging and other financial instruments, were considered. The advantages and disadvantages of each approach were analysed, taking into account the specifics of agricultural enterprises.

A system of risk monitoring and control was considered. This included continuous monitoring of risks and the effectiveness of the measures taken. The results of monitoring were analysed to detect changes in the risk environment in a timely manner and adjust management strategies. Financial strategies were explored to help businesses adapt to rapidly changing conditions. This encompasses the creation of reserve funds, diversification of funding sources, adaptation of budgets and cash flow planning. Innovative technologies in production, logistics and management, as well as human resource management, were considered to assess their impact on the sustainability and competitiveness of agricultural enterprises during the crisis.

To assess the impact of various factors on the financial stability of agricultural enterprises, authors analysed key aspects such as agricultural production, production and logistics costs, financial investments in development, and exports. This allowed quantifying the risks and their potential impact on financial results. Statistical methods were used to analyse historical data and identify trends. Data before and after the military conflict were compared to identify changes in the financial performance of agricultural enterprises. This allowed determining the main impacts of the war on economic activity.

Examples of risk management in other countries, such as Israel and Georgia, were studied (Israel: Country file…, n.d.; Georgia: From reformer…, 2018; Countering economic dependence…, 2022). A comparison of risk management strategies applied in Israel and Georgia was conducted. The analysis covered technological innovations, government support, creation of reserve funds and insurance mechanisms.

▸ Results

Risk management is a key component of financial resource management, especially in times of crisis and military conflicts. Its main goal is to identify, assess and minimise potential risks that may adversely affect the operations of agribusinesses. Risk management helps businesses prepare for possible uncertainties and challenges, ensuring their financial stability and competitiveness even in the most difficult conditions. In the context of the war in Ukraine, risk management is of particular importance as it helps businesses prepare for uncertainties and challenges, ensuring their financial stability and competitiveness even in the most difficult circumstances. The first and most important stage of risk management is risk identification. This process involves identifying possible risk factors that may threaten the financial stability of the enterprise (Bilal & Baig, 2019). In the context of the war in Ukraine, these factors include currency fluctuations, rising inflation, disruption of supply chains, political instability, as well as the destruction of infrastructure and production facilities. For example, sharp changes in the exchange rate can lead to significant losses for businesses with foreign trade contracts. Disruptions in supply chains can complicate the supply of raw materials and sales of finished products, which also affects financial results.

Developing a risk management strategy involves choosing approaches to minimise or avoid risks. Such approaches include investment diversification, insurance, hedging and other financial instruments. In the context of the war in Ukraine, investment diversification may involve the distribution of financial resources between different assets or projects both in the country and abroad, which reduces dependence on one source of income and mitigates risks. Insurance helps to cover potential losses in the event of insured events, such as the destruction of production facilities. Hedging involves the use of financial instruments, such as forward contracts or options, to protect against unfavourable market movements (Robles, 2021). The choice of specific risk management strategies depends on the specifics of the company's activities, its financial condition and market conditions.

Monitoring and controlling risks are the final stage of risk management, which involves constant monitoring of risks and the effectiveness of the measures taken. In Ukraine, during the war, this allows for timely detection of changes in the risk environment and adjustment of management strategies. For example, if there is an increase in inflation, a company may increase its reserves or revise its lending terms. Monitoring and control also include regular risk reports and analysis of the effectiveness of measures, which allows the company's management to make prompt and informed decisions. Monitoring and control also include regular risk reports and analysis of the effectiveness of measures, which allows the company's management to make prompt and informed decisions.

Financial planning in the context of the war in Ukraine is critical to the viability of agricultural enterprises. It includes the development of financial strategies that help businesses adapt to rapidly changing conditions. The main elements of financial planning are aimed at ensuring flexibility, resilience, and efficiency in financial decision-making, which is especially important in the context of economic and political uncertainty caused by the war (Srebro *et al.*, 2021). One of the key elements of financial planning is the creation of reserve funds. In times of war, such reserves can be used to cover operating expenses, pay salaries, purchase necessary resources, or eliminate the consequences of destruction and losses caused by hostilities. Adaptation of budgets is necessary to meet new economic conditions. Regular budget reviews allow businesses to respond quickly to market changes, including cost-cutting and optimizing operations (Onyiriuba *et al.*, 2020). This includes analysing costs and revenues, identifying priority areas for funding, and reducing inefficient costs.

Strategic management in the agricultural sector involves long-term planning and implementation of measures aimed at ensuring the sustainability and competitiveness of enterprises. In the context of military conflict, strategic management is of particular importance, as it allows enterprises to adapt to new challenges and ensure sustainable development. Implementation of innovations is one of the key aspects of strategic management (Saiz-Rubio & Rovira-Más, 2020). In Ukraine, this may include agrotechnologies, digital platforms for financial management, and other innovative solutions that help to adapt to new conditions. For example, the introduction of automated management systems can optimise production processes, reduce labour costs and improve product quality. Human resource management is also an important element of strategic management. In Ukraine, providing training and support to staff, professional development and introducing incentive programmes helps to retain key personnel and ensure high levels of productivity. Investing in human resource development contributes to improving the quality of products and services, which allows businesses to remain competitive in the market (Baharin *et al.*, 2020).

The war that started in Ukraine in 2014 has become one of the biggest threats to Ukraine's economic development, as it covers all spheres of public life and has a profound impact on macroeconomic indicators, business activity, investment climate, labour markets, and the financial system. The military conflict has taken a toll on GDP. A sharp decline in production, destruction of infrastructure, losses in agriculture and industry, and investment outflows have significantly reduced economic growth. Figure 1 shows the level of GDP and the share of agriculture in GDP.

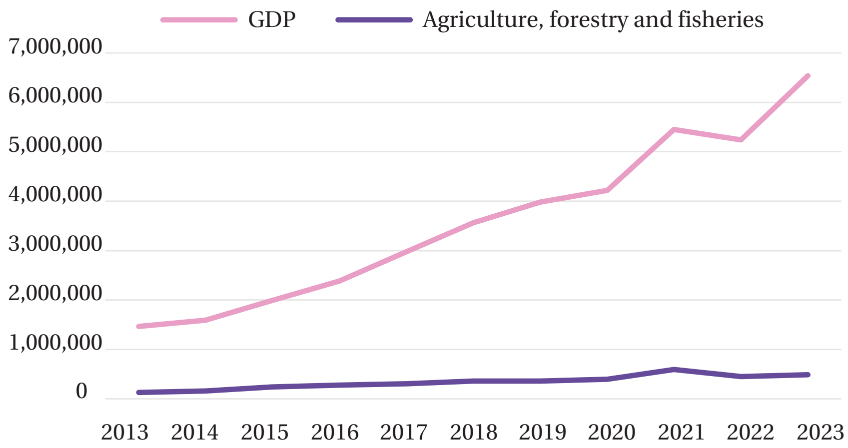

Figure 1. GDP and the share of agriculture in it from 2019 to 2023, million UAH
Source: developed by the authors on the basis of data from the Economic accounts of agriculture (n.d.)

The war affected Ukraine's economy, causing a slight decline in GDP and production in agriculture, forestry, and fisheries in 2022. However, a partial recovery was observed in 2023, indicating that the economy is adapting, and the international community is supporting it. Further development will depend on the stabilization of the situation in the country and the successful implementation of recovery measures.

Ukraine's agricultural sector showed steady growth until 2021. However, the war that started in 2022 had a significant impact on production volumes, especially in the grain and industrial crops sectors. Despite these difficulties, some sectors, such as vegetable and livestock production, have shown resilience and even growth in the face of the crisis. This underscores the importance of supporting and investing in the agricultural sector for its recovery and sustainable development in the future. One of the most catastrophic consequences of the war is the massive destruction of infrastructure. The fighting has destroyed roads, bridges, railways, energy facilities, buildings, and other important infrastructure. Restoration of this infrastructure will require significant financial resources and time, which puts additional pressure on the state budget and economic development of the country. The war has caused a significant outflow of people from the war zones. Large-scale migration flows have created complex challenges for socio-economic systems. This has led to a shortage of labour, especially skilled workers, which complicates economic recovery and production development. In addition, significant losses among the population, including military personnel, affect the demographic situation in the country (Parkulab & Shikerynets, 2024).

The war has had a negative impact on the investment climate in Ukraine. Instability, risks, and uncertainty associated with the conflict scare away both foreign and domestic investors. Capital outflows, suspension of investment projects and a decline in foreign direct investment significantly limit opportunities for business development and economic modernization. Investors demand guarantees of security and stability, which are difficult to provide in a time of war. Figure 2 shows capital investments in agriculture.

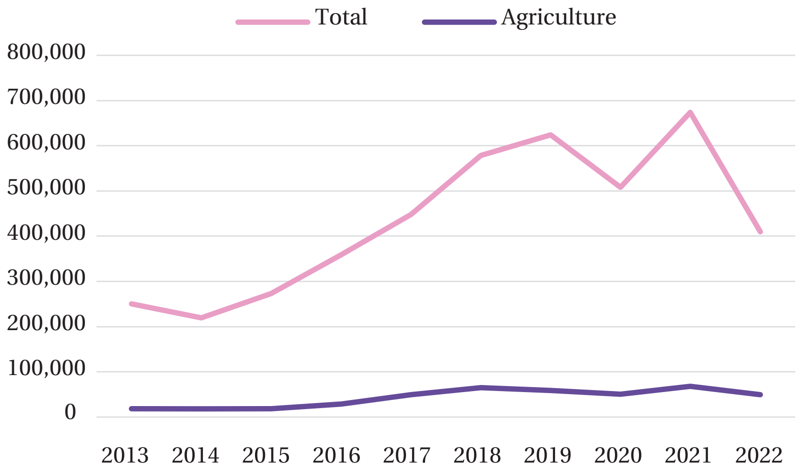

Figure 2. Capital investments in agriculture in Ukraine from 2018 to 2022, million UAH
Source: developed by the authors on the basis of data from the Capital investments (n.d.)

The analysis of the data shows that capital investment in the Ukrainian economy and agriculture in particular has experienced significant fluctuations during the period under review. In 2014, there was a slight decline in investment due to the outbreak of the military conflict. After a period of growth in 2018-2019, the COVID-19 pandemic in 2020 caused a significant decline in investment.

The recovery in 2021 was followed by a sharp drop in 2022 due to the full-scale war, which significantly affected investment activity. This highlights the economy's vulnerability to external shocks and the importance of a stable environment for attracting investment. The war has disrupted logistics chains, while rising energy prices, reduced production, and increased defence spending have created inflationary pressures. This is leading to higher prices for goods and services, a decline in the purchasing power of the population, and increased social tensions. In addition, the country's financial system is experiencing severe shocks, including rising public debt, budget deficits and currency instability. The war has also affected Ukraine's foreign trade. The blockade of ports, the destruction of transport infrastructure, and the loss of traditional markets and logistics routes have led to a significant decline in exports and imports. This has a negative impact on foreign exchange earnings, trade balance and economic stability of the country. Key industries such as agriculture, metallurgy, and machine building have been particularly affected. Table 1 shows the volume of agricultural exports.

Table 1. Exports of agricultural products from 2019 to 2023, million USD

Products	2019	2020	2021	2022	2023
Live animals, products of animal origin	1.277	1.188	1.345	1.472	1.363
Products of plant origin	12.915	11.883	15.538	13.473	11.717
Fats and oils of animal or vegetable origin	4.732	5.747	7.037	5.949	5.649
Prepared food products	3.220	3.361	3.788	2.497	3.272
All agricultural products	22.144	22.179	27.708	23.391	22.001
All exports	50.055	49.192	68.072	44.136	36.183

Source: developed by the authors on the basis of data from the Economic statistics/Foreign economic activity (n.d.)

The table shows that the war in Ukraine has had a significant negative impact on agricultural exports. Despite some recovery in certain categories in 2023, the overall trend points to a decline in exports due to disruptions in logistics, infrastructure destruction and other military activities. This situation underscores the importance of adapting the agricultural sector to the new environment and finding alternative ways to support exports. Positive changes in Ukraine's position on certain products were mainly driven by the recovery in production and exports, as well as improved access to the European market. In 2022, global market prices for most agricultural products remained high, so the decline in exports in monetary terms was less significant than in physical terms. The share of agricultural exports to European countries increased due to the blockade of ports and changes in logistics routes, which resulted in products being shipped to neighbouring countries first rather than directly to the end consumer. In the marketing year 2022/23, 74.4% of agricultural products were transported by sea, compared to 98% before the war.

In 2022, the demand for credit increased significantly. Farmers needed additional working capital to maintain their operating cycle. This was due to several main factors. Firstly, there was a decline in prices for agricultural products, which had a negative impact on producers' incomes. Second, logistics costs increased due to disruptions in transport chains and changes in logistics routes. Third, there were problems with sales due to restricted access to traditional markets. Additionally, the cost of inputs, including fertilisers and crop protection products (CPPs), increased significantly, which increased the financial burden on farmers. The destruction and damage to agricultural machinery, as well as the need for own transport to ensure the efficient operation of enterprises, have caused an additional need for investment financing. This also applies to the need to implement energy-efficient solutions to help reduce energy costs. In such a difficult situation, the most effective programme for Ukrainian farmers has been the State programme "Affordable loans 5-7-9%". The present programme is in great demand, as it reduces lending costs and provides the necessary financial resources for the stable operation of agricultural enterprises. Thanks to this programme, agrarians such as Myronivsky Hliboproduct, Kernel, Astarta and many others can access affordable financing, which is critical for their survival and development in the face of economic instability and war (Businesses have received…, 2023).

Although the country has faced significant challenges due to the military conflict, certain measures have proved to be quite effective. In particular, the use of state support, the creation of reserve funds, and the introduction of digital financial technologies have helped to ensure a certain level of financial stability in the agricultural sector. State support included concessional loans and subsidies that helped farmers secure the necessary working capital and investments. Electronic payment systems and digital platforms for managing financial flows allowed farmers to respond quickly to market changes and receive the necessary funds quickly. However, there is a need to further improve these strategies and develop new approaches to improve the situation.

Israel has many years of experience in agriculture in the face of constant military confrontation, which can be extremely useful for Ukraine, which also faces military challenges. Israel's experience shows that the agricultural sector can remain stable and productive even in difficult conditions thanks to several key strategies. Firstly, Israel has been actively implementing technological innovations. The use of advanced technologies, such as drip irrigation, hydroponics, and drones for field monitoring, has significantly increased the efficiency and productivity of the country's agricultural sector (Temper, 2009). For Ukraine, which also faces water supply problems, the introduction of such technologies could significantly increase the productivity and sustainability of the agricultural sector. In particular, drip irrigation could help Ukrainian farmers to use water resources more efficiently, while hydroponics could allow them to grow crops in limited areas.

Government support plays a significant role in the sustainability of Israeli agriculture. Agricultural enterprises such as Evogene, Afimilk, Aqua Moaf and others receive significant support from the government through subsidies, soft loans and insurance programmes (Kislev, 2013). There are programmes such as The Green Plan, which provides subsidies for investment in new technologies; the Fund for Encouraging Capital Investment in Agriculture, which provides soft loans for the purchase of agricultural equipment and technologies; and the Agricultural Insurance Fund, which provides protection against losses due to natural disasters, pests, or war (Countering economic dependence…, 2022). State support programmes include compensation for losses from military operations, which helps farmers to rebuild their farms after an emergency. Ukrainian farmers can adopt this approach, as support from the state during wartime is essential to preserve and restore the agricultural sector. Implementation of similar programmes in Ukraine could ensure stability and recovery of agricultural production even in the face of military conflict.

Georgia also has useful experience that can be applied in Ukraine. After the military conflict with Russia in 2008, which significantly affected the Georgian economy and agriculture, the government of Georgia actively invested in agriculture through development programmes. The Agriculture and Rural Development Project programme includes subsidies, soft loans and technical support for farmers. The creation of agricultural cooperatives helps farmers to share resources and increase production capacity (Asmus, 2010). For Ukraine, which is also facing military challenges, the creation of cooperatives could be an effective way to optimise resource use and increase productivity. In addition, Georgia has implemented land ownership reforms that have contributed to more efficient use of land and increased investment in agriculture. Similar reforms in Ukraine could ensure transparency and efficiency in the use of land resources, which is critical for the development of the agricultural sector in a time of war.

These approaches ensure stability, increase efficiency, and allow for quick recovery from crises, which is an important example for Ukraine. The implementation of Israeli strategies in agriculture can help Ukrainian farmers adapt to the conditions of military conflict, maintain productivity and ensure the country's food security. In the context of the military conflict in Ukraine, it is particularly important to find effective ways to counteract risks and ensure the financial stability of the agricultural sector. To achieve this goal, it is necessary to implement a comprehensive approach that includes technological innovations, government support, creation of reserve funds, diversification of funding sources and development of insurance mechanisms.

One of the main innovative technologies that can be effectively used to manage the financial resources of agricultural enterprises in Ukraine during the war is the introduction of digital financial management platforms. These platforms allow for the automation of financial processes such as accounting, cost management, budgeting and cash flow forecasting. It is recommended to introduce such systems, such as Enterprise Resource Planning (ERP) systems, which integrate all aspects of the enterprise into a single system. This will allow farmers to respond quickly to changes in market conditions, ensure transparency of financial transactions and reduce the risk of financial losses. The introduction of blockchain technologies is also gaining importance in the management of financial resources of agricultural enterprises. The use of blockchain allows ensuring transparency and security of financial transactions, reducing the risk of fraud and increasing trust between counterparties. It is recommended to develop and implement smart contracts for concluding agreements for the supply of agricultural products. This will automate payment and delivery processes, reducing the risk of default and ensuring transparency of financial transactions.

State support is crucial to ensure the stability of the agricultural sector in times of war. Specific measures could include the expansion of subsidy programmes for the purchase of seeds, fertilisers and fuel, as well as concessional lending to farmers. For example, the government could introduce special soft loans with low interest rates for small and medium-sized farmers to help them cover production and modernization costs. The creation of reserve funds is an effective way to ensure financial stability in times of crisis. It is proposed to create both public and private reserve funds that will provide quick access to financial resources in case of emergencies. For example, the state could create a special fund to help farmers affected by military operations to quickly compensate them for their losses. Diversification of funding sources is an important element of a financial stability strategy. Agricultural enterprises should actively attract various types of financing, such as bank loans, investments from international organizations, bonds and private equity. It is recommended to develop cooperation with international financial institutions, such as the World Bank or the European Bank for Reconstruction and Development, to obtain long-term loans on favourable terms. Insurance mechanisms are an important tool for minimizing financial risks in agriculture. Crop and property insurance programmes should be expanded. For example, compulsory crop insurance against hostilities and natural disasters could be introduced to provide farmers with financial protection in the event of unforeseen circumstances.

The war has significantly complicated the logistics of agricultural products due to the blockade of ports and the destruction of transport infrastructure. To mitigate risks, it is recommended to develop alternative logistics routes, for example, through Ukraine's western borders, and to invest in the restoration of damaged infrastructure. Cooperation with international logistics companies could help to address these issues. Training and development of human capital is important for increasing the resilience of the agricultural sector. It is proposed to organise trainings and seminars on the use of modern agricultural technologies, as well as to develop professional development programmes for farmers, agronomists and other specialists. For example, international experts could be engaged to conduct training programmes on the latest agricultural technologies. Countering risks and ensuring the financial stability of Ukraine's agricultural sector during the war requires a comprehensive approach that includes technological innovation, government support, creation of reserve funds, diversification of funding sources, development of insurance mechanisms, optimization of supply chains, innovations in financial planning and human capital training. Such an approach will not only preserve but also develop the agricultural sector, ensuring food security and economic stability of the country.

▶ Discussion

The results of the study underline the critical importance of risk management for the financial stability of agricultural enterprises in Ukraine, especially in times of crisis and military conflict. Effective risk management involves identifying, assessing and mitigating potential threats to financial sustainability and competitiveness. For agribusinesses in Ukraine, risks can arise from a variety of factors, including currency fluctuations, inflationary surges, supply chain disruptions and political instability. The context of the military conflict in Ukraine exacerbates these risks, highlighting the need for robust risk identification and assessment systems to ensure the sustainability of the agricultural sector.

A. Adelaja & J. George (2019) also focused on the impact of currency fluctuations on agricultural enterprises during military conflicts. Their study emphasises the need to develop financial management strategies that would reduce the risks of such fluctuations. Ö. Akinci & A. Queralto (2024), in turn, found that sharp currency fluctuations do indeed lead to significant financial losses, especially for enterprises that depend on imported inputs. The paper highlights the importance of implementing hedging and investment diversification mechanisms to reduce exposure to such risks. These results are consistent with the findings of the current study that currency fluctuations are a significant source of risk. The difference is that the authors propose the active use of foreign exchange forward contracts to hedge risks, while the current study focuses on a comprehensive approach, including diversification and insurance.

The development of effective risk management strategies is critical to mitigate the identified threats, especially in the current environment in Ukraine. The main approaches include allocating financial resources through investment diversification, protecting against risks through insurance, and reducing risks through hedging. Diversification of investments allows distributing capital among different assets or projects, which helps to reduce dependence on a single source of income. Insurance provides protection against specific risks, providing compensation in the event of unfavourable events. Hedging using financial instruments, such as forward contracts or options, protects against negative market movements. The choice of a particular strategy depends on the specifics of the company's business, its financial position and conditions in the domestic and foreign markets of Ukraine. E.D Lioutas & C. Charatsari (2021) examined the role of state support in ensuring the financial stability of agricultural enterprises during the crisis. They conclude that the most effective instruments are direct subsidies and concessional loans. The current study also supports the need for state support, but also puts an emphasis on the importance of creating reserve funds and using modern financial technologies. The authors focus more on traditional methods of state support.

Continuous monitoring and control of risks is critical to adapt to changing conditions during the military conflict in Ukraine. This means regularly tracking risk factors and assessing the effectiveness of mitigation measures. For example, during periods of rising inflation, businesses may need to adjust provisions or revise lending terms to reflect the war. Regular reporting and analysis allow for informed decision-making in a timely manner, which contributes to the effective management of financial risks in times of war. S.A. Khan *et al.* (2022) studied the impact of supply chain disruption on the agricultural sector. They found that the main problems arise from delivery delays and increased transport costs. X. Gao (2019), in turn, suggested creating alternative logistics routes and investing in infrastructure rehabilitation. One of the author's key recommendations was to focus on the introduction of modern technologies to improve the efficiency of logistics processes in the country. The current findings also emphasise the importance of logistics recovery and diversification of supply routes. However, the authors point out the importance of international cooperation for logistics recovery.

In Ukraine, careful financial planning is crucial to ensure the sustainability of agricultural enterprises. Key strategies include the creation of reserve funds, diversification of funding sources, adaptation of budgets and effective cash flow planning. Reserve funds are a financial reserve to cover unforeseen expenses or losses, ensuring the continuity of operations. Diversification of funding sources, such as bank loans, bonds and foreign investment, reduces dependence on a single source and ensures a stable flow of capital. Adapting the budget allows agricultural enterprises to respond quickly to changes in the market, optimizing costs and setting funding priorities. Effective cash flow planning ensures liquidity and timely fulfilment of financial obligations, which is important for maintaining financial stability in an uncertain environment. S.O. Adongo *et al.* (2020) focused on the impact of inflation on the financial planning of agricultural enterprises. They found that the creation of reserve funds and diversification of funding sources are key to protecting against inflationary risks. Similar to the current study, the importance of reserve funds and diversification is emphasised, but the authors also considered the use of international financial institutions, which makes their approach more global.

H. Friedmann (2021), in turn, highlights the importance of using international financial institutions to obtain additional resources. In the context of Ukraine, where the agricultural sector is facing significant challenges due to the military conflict, this approach can be critical to ensure access to finance and investment needed to support agricultural enterprises. Strategic management focuses on long-term planning and building resilience. In Ukraine's agriculture sector, innovation, infrastructure rehabilitation and human resource development are key. Technological advances in production and logistics can increase efficiency and reduce costs. Investments in human capital through training and incentive programmes are crucial to retain key personnel and ensure high levels of productivity. T.P. Tomich *et al.* (2019) and P. Frankelius *et al.* (2019) investigated the impact of technological innovation in the agricultural sector during military conflicts. Both studies found that process automation and the use of drones were key to maintaining productivity. Their research included case studies of how these technologies have been implemented at various enterprises. The current study also supports the use of innovative technologies, but provides a more general overview of the possibilities, while the authors provide specific examples.

The ongoing conflict in Ukraine has severely affected its economy, including the agricultural sector. The war has resulted in a significant drop in GDP and agricultural production, particularly of grain and industrial crops. However, certain sectors, such as vegetable and livestock production, have shown resilience. Destruction of infrastructure, labour shortages and a negative investment climate are some main consequences of the conflict. Studying the strategies of conflict-affected countries such as Israel and Georgia provides valuable insights. Israel's use of technological innovation, government support and reserve funds has maintained its agricultural stability. Georgia has promoted the creation of agricultural cooperatives that help farmers share resources, reducing costs and increasing production capacity. T. Ben Hassen & H. El Bilali (2022) also analysed the impact of the war on the agricultural sector. They found that the blockade of ports and the destruction of transport infrastructure are key problems. The authors suggest finding alternative markets and developing the domestic market as adaptation strategies. The current study also emphasises the importance of reopening logistics routes, but the author focuses more on finding new markets.

For Ukraine, adopting a comprehensive approach to risk management and financial planning is crucial. This includes attracting technological innovations, securing government support, creating reserve funds, diversifying funding sources and developing insurance mechanisms. Optimizing supply chains, using modern financial planning tools and investing in human capital are also important. Such an integrated strategy would not only reduce risks but also contribute to the recovery and sustainable development of Ukraine's agricultural sector.

In general, the results of studies by various authors confirm the importance of risk management in the agricultural sector during military conflicts, while focusing on different aspects and approaches to addressing these problems. Effective implementation of these strategies can significantly increase the resilience and stability of agribusinesses in conflict situations, ensuring their continued contribution to the economy and food security.

▸Conclusions

The study covers a comprehensive analysis of financial risk management in the agricultural sector in the context of military conflict. The study covered the stages of risk management, financial planning and strategic management, as well as an analysis of the impact of the war on Ukraine's economic performance.

The study found that the war in Ukraine has had a significant impact on the country's economy, causing a drop in GDP, a decline in agricultural production and a loss of investment. However, some sectors, such as vegetable and livestock production, have shown resilience to the crisis. This underlines the importance of supporting and investing in the agricultural sector for its recovery and sustainable development. Agricultural output declined from UAH 1,366 billion in 2021 to UAH 1,074 billion in 2022. Capital investment in agriculture also decreased from UAH 67 billion in 2021 to UAH 50 billion in 2022. Exports decreased from UAH 68 billion in 2021 to UAH 36 billion in 2023.

Based on the experience of other countries, such as Israel and Georgia, effective strategies for managing the agricultural sector in times of conflict were considered. Israel actively introduces technological innovations, provides significant state support and creates reserve funds. State support for the Georgian agricultural sector is mainly focused on financial support, subsidies for farmers and insurance programmes aimed at reducing financial risks in difficult conditions. To ensure the financial stability of Ukraine's agricultural sector during the war, a comprehensive approach should be implemented, including technological innovations, government support, creation of reserve funds, diversification of funding sources and development of insurance mechanisms. This will not only preserve but also develop the agricultural sector, ensuring food security and economic stability of the country.

The main limitation of the study is the lack of access to all necessary data due to limited openness of information and limited resources during the military conflict. Further research could focus on developing specific recommendations for the introduction of new technologies in Ukraine's agricultural sector during the crisis. It is also worth investigating the effectiveness of various financial instruments and state support programmes to ensure the stability of agricultural enterprises.

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▸Conflict of interest

None.

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Ризики управління фінансовими ресурсами аграрного сектору України в зоні військового конфлікту: виклики, загрози, шляхи протидії

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▸ **Анотація.** Метою цього дослідження було виявлення ризиків, які впливають на управління фінансами в агропромисловому секторі України під час військових дій, з метою розробки ефективних заходів протидії. Методологія дослідження включала аналіз основних ризиків, таких як коливання валютних курсів, інфляція, порушення ланцюгів постачання та політична нестабільність, а також оцінку стратегій мінімізації цих ризиків. Основними етапами управління ризиками визначено ідентифікацію, оцінку та моніторинг ризиків, а також розробку відповідних стратегій, таких як диверсифікація інвестицій, страхування та хеджування. Результати дослідження показали, що ключовими факторами забезпечення стабільності є впровадження технологічних інновацій, державна підтримка, створення резервних фондів та диверсифікація джерел фінансування. Зокрема, розвиток сучасних агротехнологій, субсидії, пільгові кредити та інвестиції в інфраструктуру значно підвищують стійкість аграрного сектору до кризових умов. Важливим також є планування грошових потоків для підтримки ліквідності та своєчасного виконання фінансових зобов'язань. Було розглянуто та проаналізовано досвід декількох країн, таких як Ізраїль та Грузія, які зіткнулися зі схожими викликами, щоб побачити, як вони управляли фінансовими ресурсами своїх аграрних секторів. Досвід цих країн показав, що успішне управління фінансовими ресурсами аграрного сектору в умовах військового конфлікту вимагає комплексного підходу, який включає технологічні інновації, державну підтримку, фінансове планування та розвиток людського капіталу для забезпечення сталого розвитку аграрного сектору в умовах війни. Такий підхід дозволяє не лише зберегти, а й розвивати аграрний сектор, забезпечуючи продовольчу безпеку та економічну стабільність України

▸ **Ключові слова:** управління ризиками; сільське господарство; нестабільність; інвестиції; експорт