UDC 336.77:338.43
JEL classification: : D81, Q14
DOI: https://doi.org/10.17721/1728-2667.2025/226-1/12

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CURRENCY RISK MANAGEMENT IN THE GRAIN MARKET: THE CASE OF UKRAINE

Background. *Ukraine is one of the important participants in the global grain market, playing an important role in ensuring global food security. Businesses in Ukraine that are involved in the grain trade and have transactions in foreign currencies need to protect these financial transactions effectively. However, most research works about currency risk management are focused on the context of risk management of financial institutions, not trading companies. The purpose of the study is to develop an algorithm and identify the characteristics of currency risk management on the Ukrainian grain market.*

Methods. *The article employs common research methods, including analysis and synthesis, statistical methods, comparative analysis, case studies, and expert evaluation. The use of these methods allowed to conduct an in-depth study of currency risk for Ukrainian grain market entities, to identify the current trends on currency market in terms of its volatility, and to develop the recommendations on currency risk management methods.*

Results. *The study confirms that managing currency risk on the Ukrainian grain market is a complex process involving several stages. The first stage is the qualitative identification of currency risk. Different types of currency risks faced by grain companies are described and justified. It was determined that an essential part of the next stage in currency risk management for a grain company is calculating the net currency position. The study emphasized that the quantitative assessment of currency risk is influenced by economic factors such as fluctuations of the US dollar on the foreign exchange market, NBU exchange rate decisions and the volume of the foreign currency reserves, and Ukrainian trade balance. It was found that, at the third stage of currency risk management, the primary objective is to select a management method aimed at eliminating or minimizing the impact of currency fluctuations on a grain company financial indicators.*

Conclusions. *It was determined that each of the currency risk management methods studied for the grain market has its own advantages and disadvantages. The use of currency forward and option contracts is proposed as currency risk management methods, tailored to different economic scenarios. It was concluded that the key stage is monitoring of the effectiveness of these currency risk management methods to continuously evaluate and adjust the approach in the dynamic currency environment by grain companies.*

Keywords: *risk management, currency risk, hedging, grain market, derivatives.*

Background

Currency risk is one of the most important challenges affecting a company profit on the grain market. This is especially relevant for companies operating on the Ukrainian grain market, as Ukraine exports about 70 % of its total grain products annually. Since domestic market pricing is usually linked to the US dollar, currency fluctuations have a direct impact on the revenues, costs and financial results of the companies in the industry.

Ukrainian companies operating in the grain sector operate in a challenging economic and political environment, which has a significant impact on their operations. The military conflict in Ukraine creates serious logistical barriers, including restrictions on exports through seaports, increased transport risks and higher cargo insurance costs. Efficient grain exports are also hampered by port blockades, destruction of infrastructure, lack of wagons and congestion on rail and road routes. The war is creating an additional level of uncertainty in the financial sector, making it more difficult to predict currency fluctuations and to hedge against currency risks.

In conditions of macroeconomic instability, Ukrainian agricultural enterprises often face difficulties in attracting credit resources. High interest rates, limited access to international financing and increased requirements for securing loans limit the development opportunities of grain companies. In addition, state restrictions on currency transactions, tax policy, customs regulation and state support programs can both facilitate and complicate the work of agricultural business. This creates additional difficulties in forecasting income and managing currency risks.

The current state of the grain market in Ukraine is directly influenced by international commodity markets. Ukraine is one of the largest grain exporters, so domestic prices largely depend on world price quotations. Changes in the global economy, trade restrictions, and geopolitical factors directly affect the profitability of the grain market. Due to the high extent of dollarisation of the market, grain prices are formed on the basis of international currencies, making Ukrainian producers vulnerable to fluctuations of the hryvnia exchange rate. Changes in exchange rates have a direct impact on companies operating profits and financial stability. Exchange rate fluctuations, particularly when combined with time lags between signing of the contracts and the maturity dates, can be a significant risk for companies operating in more than one currency. In view of the challenges outlined above, the effective currency risk management is critically important for ensuring the stability of business and competitiveness of Ukrainian grain companies.

The purpose of the study is to develop an algorithm and identify the specific characteristics of currency risk management on the Ukrainian grain market.The study is aimed to develop recommendations for improving approaches to currency risk management in the agricultural sector of Ukraine, in particular by studying the impact of

macroeconomic factors on exchange rates and the experience of using financial hedging instruments.

Literature review. In today's conditions of globalization and increasing volatility of financial markets, the problem of currency risk management has become especially relevant for grain business. One of the most effective methods of financial risk management, including currency risk, is the use of hedging instruments, which, due to their relatively low cost and high efficiency, have become widely used in international practice. Some of Ukrainian works cover the issues of currency risk management, emphasizing that the issues connected with the methods for assessing the currency security of small enterprises are unresolved (Naumenkova, & Mishchenko, 2018; Aleskerova, Tarasenko, & Marunych, 2023). In addition, to ensure currency stability of Ukrainian business, the role of national banks should be increased to implement government programs to support small businesses, and a strategy to develop highly specialized banks, affiliated financial institutions, regional funds, and insurance organizations should be established.

In the work of Yavors'ka (Yavors'ka, 2022) it is emphasized that the successful operation of enterprises in agrarian market environment is impossible without the introduction of a hedging system for risk management. According to the results of M. Krasnova (Krasnova, 2022), despite the attractiveness and relevance of risk hedging instruments, they are not well used in Ukraine. On the other hand, (Dykha, M. & Dykha, V., 2024) proved the importance of using hedging instruments in Ukraine and proposed measures to intensify the functioning of derivatives on the agricultural market, the implementation of which is extremely important especially for the post-war development of Ukraine.

Despite a significant number of studies dedicated to the application of financial derivatives to the management of currency risk, still there are certain unstudied moments in this sphere. In particular, some studies demonstrate a tendency to generalize models used for both financial risk analysis and currency risk assessment, which may affect the accuracy of the results obtained. Moreover, there is a need for new research that takes into account modern challenges and changes in the conditions of foreign exchange markets, especially for developing countries, e.g., Ukraine.

The over-simplification of models is due to the fact that too many variables are used to describe the currency risk a company faces. A large number of parameters makes it difficult to include them all in a currency risk management model, so the majority of researchers have used only a few parameters in their studies. Some scholars have developed complex models to describe currency risk, including the one proposed by (Allayannis et al., 2001), which decomposes the currency risk factor into six different regional exchange rate indices. However, this model is still not considered to be comprehensive enough by other scholars, as it assumes that the currency risk faced by the company will only affect its sales in various areas. Obviously, this approach is too simplified. Although many other variables have been shown to affect the currency risk a company faces, no one has created a model that can combine all of these variables together. In addition, most researchers use a linear model, although real conditions may be more complex. Koutmos and Martin (Koutmos, & Martin, 2007) also noted that a simple linear model may not be sufficient to consider all the variations. Therefore, they added a dummy variable to the mean equation of their GARCH model in order to incorporate into their study the finding that asset returns respond asymmetrically to currency appreciation and depreciation. However, until now, this model has not found practical application in the studied field.

The theoretical gaps in terms of the currency risks on the grain market may also be the result of insufficient resources of scientists researching the specified subject. The above-mentioned workss focus on a number of specific areas, in particular on non-financial companies, but they do not provide a comparison between financial and non-financial organizations. Although in reality non-financial institutions usually request suggestions from financial companiess on how to hedge against their currency risks. Therefore, it is important to compare methods of hedging of different types of entities. In addition, some studies focus only on specific currency pairs, such as the study by (Hendrawan, 2017), which focuses only on the INR-USD pair, and Turvey and Yin (Turvey, & Yin 2002), which provides a rationale for the agriculture sector option pricing model in the pair CAD-USD. On the other hand, Haigh and Holt (Haigh, & Holt 2000) consider the use of futures contracts on the grain market, considering them as a mechanism for identifying and reducing potential risk. It is important to note that findings on currency risk on the global grain market can lead to several key conclusions. For instance, in developing countries' grain markets, volatility plays a significant role, creating the need for hedging against risk only when exports dominate over domestic demand (Ceballos et al., 2017). Grain market volatility can also be caused by changes on adjacent markets and negative news in the region, making risk hedging models be a fundamental requirement for trade and food security (Urak et al., 2022; Luo, & Tanaka, 2021). the realization of food security in developing countries is possible under the condition of combining currency risk hedging instruments and transformation of their own domestic grain markets (Guo, & Tanaka, 2020). Over the past decade, the use of new-generation grain contracts (NGGC) has become increasingly justified, as they protect the interests of grain suppliers by being tailored to the specific conditions of their operations (Elliott et al., 2020). Other studies focus only on specific industries such as the research of MuchokiMwangi and Mohamed (MuchokiMwangi, & Mohamed, 2019), which focuses only on risk management for oil companies. Others have focused on specific derivatives in their research. For example (Ben-David, 2013), focuses only on futures in his research study. Thus, the main problem in this area of research is that the existing works are too generalized.

Nevertheless, studies that focus only on a specific type of companies, industries, currencies, or derivative instruments remain too narrow. Thus, this gap in the existing literature requires studying the instruments of currency risk management on the grain market, taking into account the situation in Ukraine.

Methods

The methodological basis of the study is based on common research methods of cognition. To conceptualize currency risk for different participants in the Ukrainian grain market and to define the net currency position, we used the method of analysis and synthesis. In order to describe the features of currency risk on the grain market, in particular, to study the current state of volatility of the Ukrainian currency market, we used a statistical method that helps to identify trends on the currency market. Moreover, we used the method of comparative analysis to determine effective strategies for currency risk management. The case method was applied to provide specific cases of currency risk management in grain business companies and illustrate the effectiveness of different methods. The expert opinion method was used to provide recommendations for further research of the currency risk

management strategies on the grain market under the conditions of the modern economy of Ukraine.

Results

Currency risk arises as a result of the influence of exchange rate fluctuations on the financial performance and stability of the company on the grain market. It reflects possible losses caused by the exchange rate differences in the period between sighning of the contract and the maturity date. The process of currency risk management includes several stages. Fig. 1 shows the algorithm for managing currency risk on the grain market.

Firstly, it is necessary to conduct a qualitative identification of currency risk, which in companies operating on the grain market depends on the type of their business, the impact of price currency fluctuations and contract terms. One of the main currency risks that are typical for grain companies is transaction risk, which can change the value of contracts based on foreign currencies. On the grain market, transaction risk appears when carrying out currency transactions, in particular, when grain exporters receive payments in foreign currency or importers purchase agricultural raw materials in return of foreign currency. In the period between signing a contract and receiving payment, the losses and profits of the grain companies depend on the exchange rate volatility. The uncertainty in financial planning for the grain business increases with transaction risk.

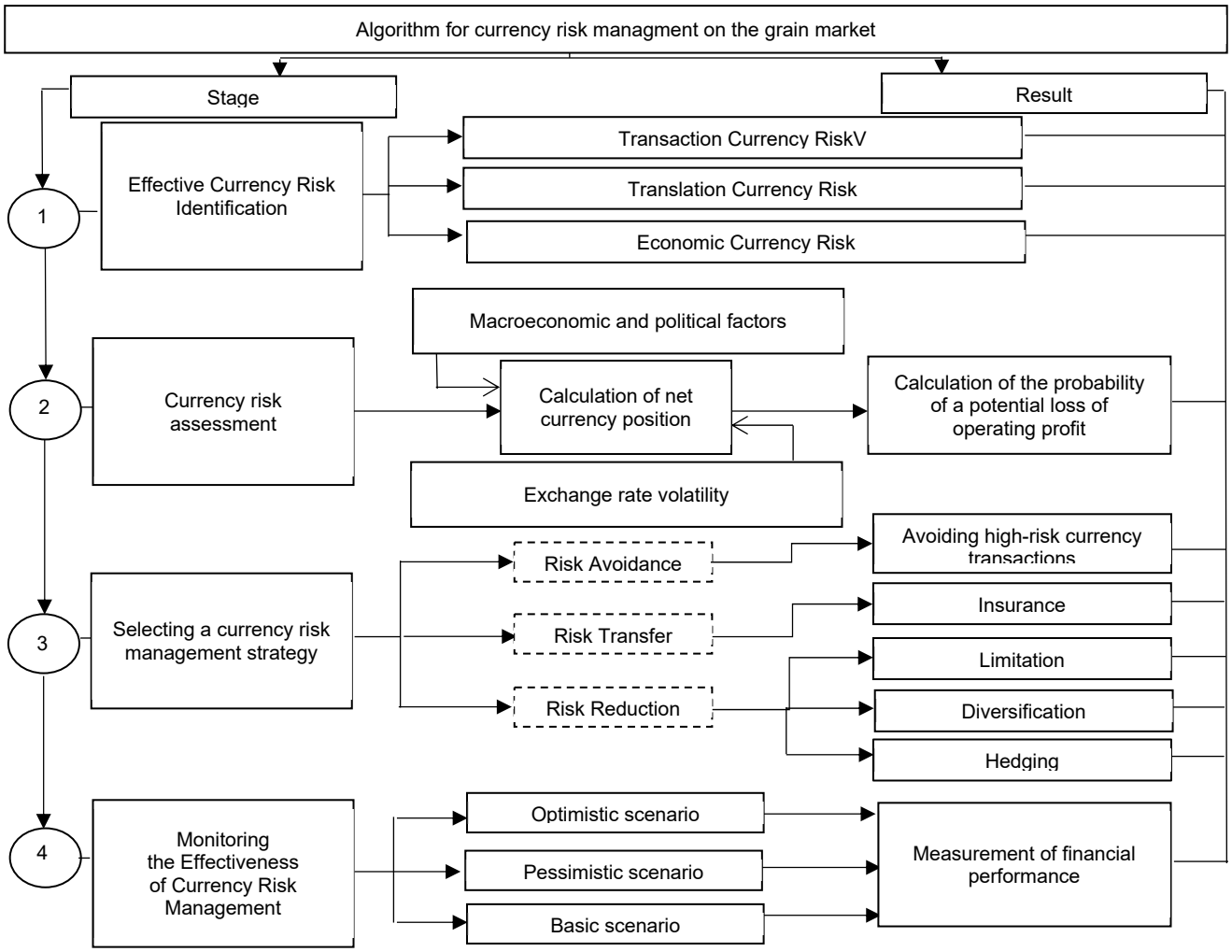

Fig. 1. Currency Risk Management Algorithm for the Grain Market

Source: created by authors.

Translation currency risk is currently particularly relevant for international grain trading companies or agricultural holdings that have subsidiaries in different countries. Translation risk arises from the need to consolidate the financial statements of the parent company in the grain business in a single currency, which can lead to discrepancies in profit, value of assets and liabilities due to fluctuations of the exchange rates. In particular, large grain trading companies that have representative offices in Ukraine, such as Bunge, Louis Dreyfus, ADM and Cargill, as well as large agricultural holdings that operate in international markets through a non-resident subsidiary, regularly face translation risk due to conducting operations in different currencies.

Another type of currency risk that is typical for grain companies is economic risk. Economic currency risk is the long-term risk caused by the impact of exchange rate changes on the company competitiveness. Economic currency risk directly affects the fundamental profitability of the business through changes in the purchasing power of the currency, the cost structure, the competitive environment and the financial strategy of the grain company. Economic currency risk affects all grain companies. Even those enterprises that do not export grain are affected by currency fluctuations due to changes in the prices of imported fertilizers, fuel, spare parts for agricultural machinery. Long-term changes in the exchange rate can

change consumer demand for grain, because of changes of the price for the customers (Perevoznyk, 2021).

The next stage in currency risk management is quantification. To assess the level of currency risk, the company has to calculate its net currency position. This position reflects the difference between assets and liabilities denominated in foreign currency, allowing the company to determine the extent to which exchange rate fluctuations impact its financial position. In currency risk management, foreign exchange earnings represent the total financial resources received by a company over a specific period, and are critically important for ensuring company's liquidity, regardless the exchange rate changes. Expenses in foreign currency are an integral part of the company outgoing cash flow and their amounts may flactuate due to changes in currency values, which in turn impact the company overall cost structure and financial stability. To assess the probability of currency risk, in addition to analyzing the net currency position and daily monitoring of exchange rate volatility, it is also necessary to take into account that the level of currency risk assessment of a grain company is also affected by the level of foregn reserves of the National Bank of Ukraine (NBU) and the trade balance (Dodd, Fernández-Pérez, & Sosvilla-Rivero, 2024).

The Financial Stability Report of the NBU for June 2024 emphasizes the critical importance of a sufficient level of foreign reserves to maintain the stability of the national currency and reduce currency risks for businesses. For grain companies that are heavily dependent on currency transactions, the level of foreign reserves directly affects currency risks and methods of managing them (National Bank of Ukraine, 2024a).

Figure 2 shows the supplies of Ukrainian gold and foreign currency reserves. To better understand historical trends, we analyzed the volume of foreign reserves of the NBU over a long period of time. The analysis was based on data for the past 20 years, which allows us to track long-term trends and cycles associated with economic and political changes. This time span allows us to take into account the impact of significant events, such as financial crises, changes in government policy, as well as external shocks that significantly affected the volume of reserves.

During the period under research, Ukrainian foreign reserves fluctuated significantly, reflecting both positive trends and serious challenges. The NBU's foreign reserves declined in 2014 and 2022 due to factors such as military conflicts, territorial annexation, economic instability, high demand for foreign currency, the use of reserves by the NBU to cover its liabilities, a decline in exports, and insufficient foreign currency inflows to Ukraine (National Bank of Ukraine, 2024b).

On the other hand, in 2023, the NBU's foreign exchange reserves reached a record high, increasing by 42 % – from USD 28.51 billion in 2022 to USD 40.51 billion in 2023 – due to substantial financial aid from international partners. This high level of international reserves demonstrates the country's capacity to maintain currency stability. It indicates a positive outlook for currency risk assessment and suggests a reduced probability of national currency devaluation in the coming periods.

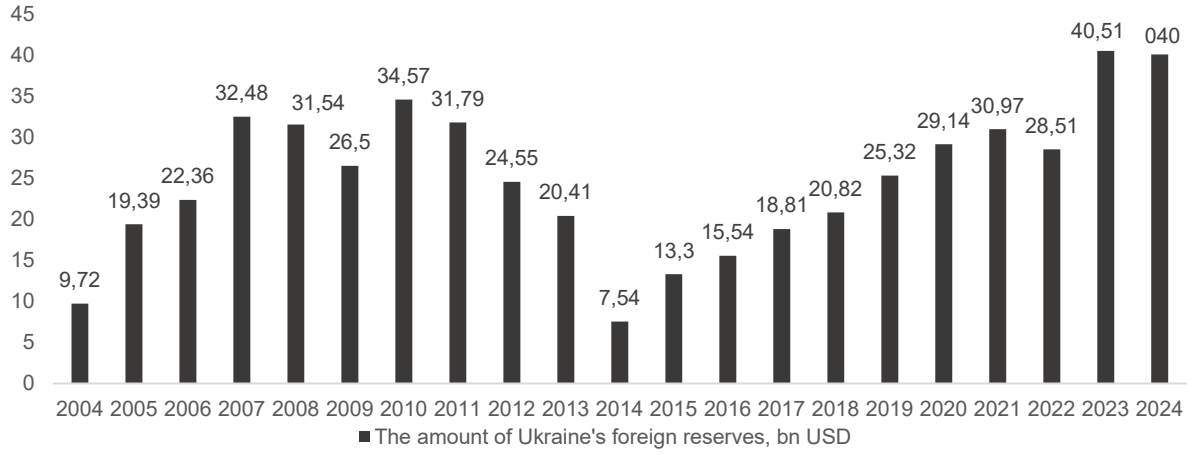

Fig. 2. The amount of reserve assets of Ukraine for 2004–2023, billion dollars

Source: created by authors based on (World Bank Open Data, 2024).

Therefore, monitoring the NBU's foreign reserves, among other things, is a necessary tool for managing currency risks in the grain business. Using NBU reporting data, grain companies can timely adjust their financial strategy depending on the level of international reserves, use appropriate management methods to minimize currency risks, assess the impact of possible devaluation processes on business profitability, and plan credit liabilities, taking into account potential currency fluctuations. Another important factor in assessing currency risk for companies in the grain market is Ukraine's trade balance. To analyze the trade balance, we examined a 10-year period to gain a more detailed understanding of Ukrainian economic trends. As shown in Fig. 3, a trade surplus was recorded only in 2015, primarily due to a significant reduction in imports –particularly natural gas and oil – resulting from Russia's military aggression.

Notably, despite the positive trade balance and relative stability of Ukrainian exports in 2015, this did not lead to an appreciation of hryvnia or a decrease of the dollar value, due to various internal and external factors. These factors included high demand for foreign currency to service external debt, capital outflows from the country, and heightened uncertainty due to political and economic risks, which limited foreign investment (Fomenko, & Ihnatenko, 2023). Depreciation pressure on hryvnia was further fueled by domestic inflation trends and devaluation expectations, which increased public demand for foreign currency. Thus, it can be concluded that a trade surplus alone is not a definitive indicator of national currency stability. In 2023, the gap between exports and imports widened in almost 2.5 times. It is important to note that achieving balance in the trade account will be likely to take years following the onset of the full-scale invasion, making further devaluation of hryvnia probable in the future.

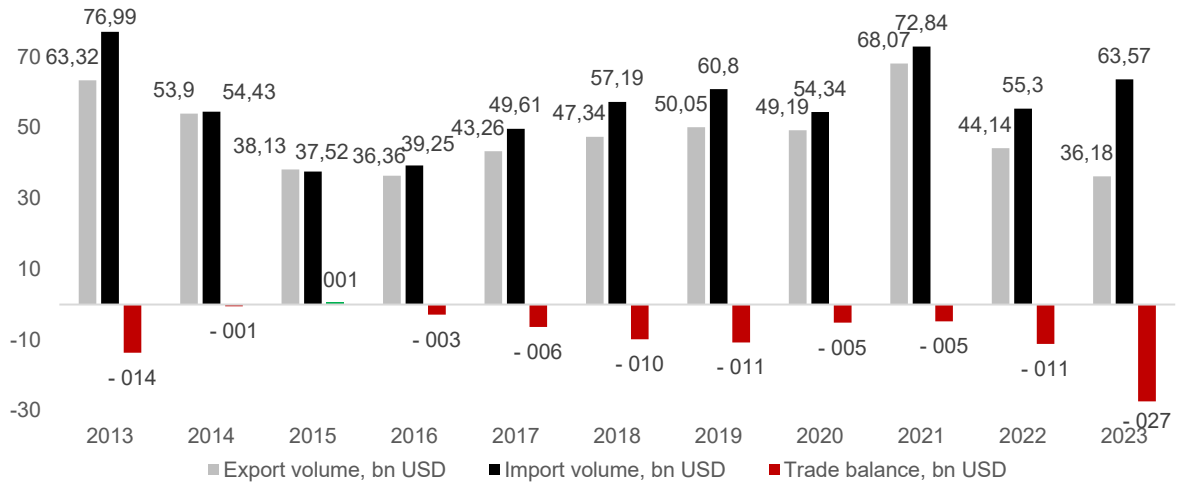

Fig. 3. Trade balance of Ukraine for 2013-2023, billion dollars

Source: complied based on (State Statistics Services of Ukraine, 2024).

A positive trend in the trade balance for the first nine months of 2024 is the gradual increase in exports, particularly of food and grain products. Compared to 2023, exports of all types of goods and services rose by 6 % in 2024. However, according to IMF forecasts, the negative trade deficit may increase by 5.8 % by the end of 2024, from a deficit of $27.39 billion in 2023 to $29 billion in 2024. This increase may signal future currency fluctuations and economic instability, as well as heightened currency risk for companies on the grain market (Ministry of Agrarian Policy…, 2024; National Bank of Ukraine, 2024c; Pro-consulting, 2024). Therefore, analyzing Ukrainian trade balance is crucial for companies, as it aids in assessing currency risk and enables more informed financial decision-making. Grain companies that rely on the stability of the national currency can utilize trade balance data to evaluate currency risks effectively.

The result of assessing the significance of currency risk is the probability of loss of operating profit, that is calculated as a result of conducting a qualitative and quantitative risk analysis. At the third stage of currency risk management, it is necessary to develop an action plan to eliminate or minimize currency risk. After a qualitative and quantitative assessment, it is necessary to choose a currency risk management strategy and then apply appropriate management methods. The main task of the company management is to choose a currency risk management method that would provide the optimal ratio of risk and profitability.

Table 1 summarizes five methods of currency risk management that can be applied depending on the selected risk management strategy: risk avoidance, risk transfer, and risk reduction. These strategies include such methods as avoiding high-risk currency transactions, insurance, limitation, diversification, and hedging, each with its advantages and disadvantages.

The result of assessing the significance of currency risk is the probability of loss of operating profit, that is calculated as a result of conducting a qualitative and quantitative risk analysis. At the third stage of currency risk management, it is necessary to develop an action plan to eliminate or minimize currency risk. After a qualitative and quantitative assessment, it is necessary to choose a currency risk management strategy and then apply appropriate management methods. The main task of the company's management is to choose a currency risk management method that would provide the optimal ratio of risk and profitability. Table 1 summarizes five methods of currency risk management that can be applied depending on the selected risk management strategy: risk avoidance, risk transfer, and risk reduction. These strategies include such methods as avoiding high-risk currency transactions, insurance, limitation, diversification, and hedging, each with its advantages and disadvantages.

There are various strategies for managing currency risk. The first strategy is risk avoidance, namely the situation, when the company management decides to avoid high-risk currency transactions. This method is a conservative one, but in some cases quite justified and effective. In the context of the grain market avoiding high-risk transactions can play a crucial role in preserving capital and maintaining solvency of the company and its high credit rating. By avoiding high-risk investments and unstable markets, grain companies can avoid significant financial losses, which could have jeopardized their solvency and reputation. Such a conservative approach to financial management not only stabilizes the organization financial environment, but also instils confidence among investors, stakeholders and customers. In the context of the grain market, eliminating the source of currency risk plays a crucial role in preserving capital and gaining access to credit.

In addition, by avoiding high-risk foreign currency exchange transactions under the conditions of highly volatile markets, grain companies can achieve significant protection from adverse currency fluctuations. However, this strategy also imposes significant limitations, including limited access to international markets, reduced competitiveness, and operational flexibility. Consequently, based on recent research, we can state that while risk avoidance is crucial to effective risk management, a balanced strategy that includes multiple methods is necessary to manage the complexities of today's dynamic risk environment (Majka, 2024).

Another management strategy is to transfer currency risk to third parties. Insurance as a method of managing currency risk allows you to transfer the risk to an insurance company through the conclusion of a contract that provides coverage for losses associated with the performance of foreign economic contracts. One benefit of insurance is its ability to reduce uncertainty for grain companies when planning future operations. Another advantage is the involvement of financial consultants from insurance companies, who bring expertise in risk assessment and management.

Table 1

Methods of currency risk management

Method Description	Methodological Implementation	Advantages	Disadvantages
Avoiding high-risk currency transactions	Implementation of the specific measures to avoid high-risk currency transactions on the voletile markets.	Preventing losses and safeguarding the organization's resources.	Development and implementation of specific measures to avoid identified sources of currency risk.
Insurance of foreign economic contracts	Signing the insurance contracts for commercial transactions ensures full coverage of the insured amount if an unexpected event occurs.	The insurance contract provides mandatory compensation for tangible harm. Standard insurance premiums are assessed and budgeted accordingly.	Determining insurance coverage can be challenging. Uncertainty in amounts and probability of losses may lead to the payment of high premiums, making insurance uneconomical.
Limitation of currency positions	Establishing clear risk parameters for foreign exchange earnings and capital across various scenarios by the company management.	Engaging financial intermediaries is free. This method provides an opportunity for the company to eliminate currency risk by covering specific operations or addressing a contrarian situation.	An incorrect identifying the limits can lead to ineffective management of currency risks or can result in financial losses for the company.
Diversification of the company's currency basket	Building the company financial portfolio from several types of currencies for operational and investment activities.	Avoiding the concentration of capital in a single currency helps to mitigate risks. If one asset incurs losses, other assets may remain stable or generate profits, thereby reducing the overall risk of the currency portfolio.	The number of types of currency risk that need to be managed is increasing.
Hedging currency positions	The use of natural and special hedging methods through forward and futures contracts, options, swaps, and other financial instruments.	Combining opposing positions on different currency instruments allows us to create an effective management method that is optimised both in terms of profit and risk.	There is no guarantee of execution for OTC financial instruments. Purchasing of the financial instrument requires initial costs Underdeveloped stock market of Ukraine.

Source: complied based on (Hnatkivs'kyj, 2021; Prymostka, 2014; Sholojko, 2022).

However, insurance as a method of managing currency risk has its disatvantages. Each company on the grain market is unique, making it difficult to determine appropriate insurance coverage. In each case, company management should assess the feasibility of purchasing an insurance policy, as it is likely that the cost of insurance premiums will exceed the cost of covering currency losses.

Risk reduction, as a currency risk management strategy, involves the implementation of methods such as limitation, diversification, and hedging. Limitation of currency risk involves determining the maximum permissible one-time loss that will not disrupt the company operations. The advantage of this method is that the limitation functions as a natural hedge, require no additional costs. Companies on the grain market often operate with relatively low profitability due to intense competition and fluctuating grain prices, resulting in low profits and limited financial resources. Meanwhile, a weakness of the limitation method in currency risk management is that the maximum allowable loss amount is based on historical analysis or expert estimates that cannot be considered as accurate forecasting methods. The effectiveness of diversification as a method to manage a currency risk is based on executing a variety of unrelated transactions to reduce potential losses associated with dependence on a single transaction type.

Diversification is an effective method for constructing a portfolio of financial assets to manage a currency risk. Its effectiveness is based on executing a variety of unrelated transactions to reduce potential losses associated with dependence on a single transaction type. Diversifying a grain company's currency portfolio has the following advantages: reducing volatility and unpredictability of earnings, increasing resilience to external shocks, and spreading currency risks, which provides more stable capital growth. A disadvantage of diversification in the context of currency risk management is that it requires a company or investor to allocate more time, effort, and resources to monitor and manage transactions across multiple currencies and markets.

Hedging is considered the most effective method for managing currency risk in international practice, particularly on the grain market. Hedging with derivatives has both advantages and disadvantages. It helps to to reduce uncertainty and enhance income stability, which is especially critical for grain market companies that are heavily influenced by commodity prices and exchange rates. Another advantage of this approach is flexibility in instrument selection: numerous financial instruments are available for hedging, allowing companies to choose the most suitable option for their specific needs. Additionally, hedging positively impacts investor and creditor confidence, as it helps to prevent unexpected losses and supports financial stability of companies (Kovalenko et al., 2023).

The disadvantage of hedging is the cost of using derivatives, which may include broker commissions, exchange fees, option premiums, and intermediary service costs for entering into swaps. Secondly, the stock market in Ukraine is underdeveloped, resulting in a lack of appropriate financial instruments for hedging. Access to global financial markets remains difficult due to the limited expertise of national financial managers and restrictions in Ukrainian currency legislation. As a result, Ukrainian companies are unable to fully leverage global financial exchanges without resorting to offshore companies. Unfortunately, Ukraine lacks a comprehensive derivatives market, and currency derivatives are primarily offered by banks, which are the only viable channel for hedging operations. In this study, we focused on Non-Delivered Forwards and option contracts, which can be utilized by companies on the Ukrainian grain market.

In recent years, a Non-Deliverable Forward (NDF) has become widespread to manage a currency risk in the grain

market. NDF currency forward means a contract for the sale or purchase of currencies (USD, EUR) that does not require the delivery of the contract currency amount. On the settlement date, the actual exchange rate of hryvnia is compared to the previously agreed NDF rate, and the resulting difference (either profit or loss) is paid out (Ivaschenko, Debych, & Karpikov, 2023).

It is important to note that Ukrainian companies already have experience using such currency forward contracts. The first agreement of this kind in Ukraine was signed in 2019 between ING Bank Ukraine and Kernel, a company operating on the grain market (Ukraine open for business, 2019).

As part of a research study, we modeled the use of a non-deliverable currency forward contract for a grain business that earns profits in hryvnias in order to manage currency risk. Table 2 presents the results of the net monetary position calculation after six months, based on the prevailing interbank exchange rate. The general model assumes the following conditions: after 6 months, the grain company is to pay USD 500,000 for equipment, while currency markets in Ukraine remain unstable and unpredictable. The Ukrainian grain company signed a USD/UAH NDF contract with the bank for a 6-month period at a contract rate of UAH 41.22 per USD, with a total contract amount of UAH 20,610,000. The company also paid the bank a deposit of 25 %, amounting to USD 125,000.

Table 2

Scenario of forecasting and calculations for the NDF currency forward contract

Scenarios	Spot rate (USD /UAH) on the settlement date	Calculations, USD	Amount of net currency position, USD	Comments
Scenario 1 (UAH depreciates)	41.40	$\frac{(41.40-41.22)\cdot 5000.000.00}{41.40}$	2,173.93	The bank pays the company USD 2,173.93
Scenario 2 (exchange rate remains stable)	41.22	$\frac{(41.22-41.22)\cdot 5000.000.00}{41.22}$	-	There is no movement of funds
Scenario 3 (UAH appreciates)	41.05	$\frac{(41.05-41.22)\cdot 5000.000.00}{41.05}$	2,070.64	The bank receives USD 2,070.64 from the company

Source: calculated by authors

As the part of this study, we examined a case of a hedging operation using a put option. Ukrainian companies can employ this strategy on the grain market to mitigate losses from a declining exchange rate. For example, we simulate a scenario in which, three months from now, a Ukrainian company is set to receive USD 1,000,000 for goods shipped to its Chinese partner, with the current spot rate of the U.S. dollar to the hryvnia at 41.16. During this period, hryvnia may either appreciate or depreciate, exposing the company to currency risk. The Ukrainian exporter has two available options, summarized in Table 3.

In the first scenario, the company opts to accept the risk, choosing not to purchase an option contract and instead awaiting payment from its American partner. Should the hryvnia exchange rate decline by at least one percent – such that one USD equals UAH 40.75 – the company would incur losses totaling UAH 410,000.

In the second scenario, the company purchases a put option to sell USD 1,000,000.00 in exchange for hryvnias at a strike price of UAH 41,600,000.00 with an execution date in three months, and pays a premium of UAH 41,000.00. In the event of a weakening of the hryvnia, the Ukrainian exporter would exercise the option and sell the dollars at a rate of UAH 41.60. The Ukrainian exporter's loss is limited to UAH 41,000, the amount paid as the option premium. If the exchange rate on the option's exercise date remains unchanged or appreciates, the company will choose not to exercise the option and will instead sell the received currency at the higher spot rate.

Table 3

Forecast of the hedging scenario with a put option contract and the consequences of the lack of hedging

Scenarios	Spot exchange rate (USD/UAH) on the date of signing of the agreement	Option premium, USD	Exchange rate (USD/UAH) in 3 months	Calculation of financial losses, UAH	Amount of expenses, UAH
Scenario 1 (purchasing a put option)	41.16	0.001	40.75	41.16·0.001·1,000,000.00	41,000.00
Scenario 2 (no hedge)	41.16	–	40.75	(41.16–40.75)·1,000,000	410,000.00

Source: calculated by authors.

Consequently, hedging with options is an effective tool for managing currency fluctuation risks. However, option contracts present both advantages and disadvantages. Among the advantages, the company losses are limited by unfavorable market conditions, while its profits remain unrestricted if market conditions turn favorable. Additionally, once the option is purchased, there are no ongoing costs, and continuous market monitoring is unnecessary, unlike with futures contracts. The primary disadvantage of options is the initial cost required for their acquisition (Morina et al., 2020).

The final step of the developed algorithm involves evaluating the effectiveness of all stages of currency risk management. Currency risk is constantly evolving, influenced by numerous dynamic factors, both internal and external, such as economic conditions, political events, market fluctuations, and shifts in currency supply and demand. These factors can change rapidly, impacting exchange rates and, consequently, the effectiveness of the selected currency risk management strategy. Effective currency risk management evaluation should be based not only on monitoring current conditions but also on forecasting potential market scenarios.

This enables the company to prepare for various possible future outcomes, including both favorable and adverse currency fluctuations. Such forecasts encompass an analysis of macroeconomic indicators, political stability, market trends, and external factors impacting exchange rates.

It is important to measure the financial result based on which scenario occurs. Furthermore, it is necessary to develop several forecast scenarios: optimistic, pessimistic, and baseline, in order to assess how each of them may impact the company financial performance. This approach enables the company to adjust the methods of managing currency risk in advance in an unstable economic environment in the grain market.

Discussion and conclusions

Currency risk management among grain industry companies in Ukraine is becoming increasingly relevant and is in the early stages of gradual implementation. The primary objective of managing foreign currency exchange risk is to create conditions that enable effective responses to future events with currently uncertain outcomes. The research conducted confirms that the primary causes of currency fluctuations in Ukraine are economic instability, military conflicts, and public panic. The process of currency risk management begins with effective risk identification, namely setting up the risk management process in the company, determining the specifics of the business and relevant types of currency risk, studying external and internal factors that affect the activities of grain market participants.

The next step is currency risk assessment. The primary drivers of currency fluctuations in Ukraine are economic instability, military conflicts, and public panic. War damages infrastructure, reduces production and exports, and adversely affects the currency market. Investors, concerned about financial security, may withdraw capital from the country, raising demand for foreign currency and contributing to the devaluation of hryvnia. Psychological factors, like public panic during times of war or economic crisis, drive people to buy foreign currency for protection, boosting demand and causing its exchange rate to rise against the hryvnia. These factors collectively impact the foreign exchange market, resulting in increased volatility of the national currency.

The next phase involves developing and implementing currency risk management methods. To manage currency risks on the grain market, this paper provides recommendations for companies in the Ukrainian grain sector in terms of applying the following methods:

1) avoiding high-risk currency transactions;

2) diversifying the financial portfolio by utilizing multiple currencies for operational and investment activities;

3) establishing a maximum permissible limit for the foreign currency income-to-capital ratio, as determined by company management, to ensure optimal support for continuous operations;

4) entering currency insurance contracts to secure full compensation for commercial agreements in the event of an insured occurrence;

5) employing formalized hedging methods, such as forward and options contracts.

In Ukraine, the choice of methods for managing foreigncurrency exchange risks is constrained by limited access to hedging instruments. Additionally, grain companies, particularly small and medium-sized ones, often lack sufficient experience with hedging or a clear understanding of currency risk management. This limitation is due to underdeveloped market infrastructure and the need to enhance financial literacy among business entities.

Evaluating the effectiveness of the selected methods is the final stage of currency risk management, as it provides an objective assessment of how well these methods protect the business from currency fluctuations. Regular monitoring of currency risk management enables timely responses to economic changes that help to prevent significant financial losses and ensure long-term financial stability.

This study creates new opportunities for researchers to conduct further research focused on developing effective, integrated methods for currency risk management for companies on the Ukrainian grain market. A key area of interest is the exploration, development, and implementation of innovative approaches to managing currency fluctuation risks. Additionally, the problem of evaluating the effectiveness of currency trading contracts in terms of managing currency risks on Ukrainian grain market is not studied enough. A major challenge in researching Ukrainian currency derivatives market is the underdevelopment of the national stock market and limited access to reliable, comprehensive statistical data, which complicates accurate analysis. Future research should aim to build more extensive databases and identify ways to enhance currency risk forecasting through econometric models and analytical tools.

Authors' contribution: Natalia Prykazyuk – conceptualization, methodology, writing (review & editing); Diana Stelmakh – conceptualization, formal analysis, data validation, writing – original draft, Iryna Didenko – conceptualization, review and editing.

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Отримано редакцією журналу / Received: 01.10.24
Прорецензовано / Revised: 27.10.24
Схвалено до друку / Accepted: 07.11.24

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УПРАВЛІННЯ ВАЛЮТНИМ РИЗИКОМ НА РИНКУ ЗЕРНА: КЕЙС УКРАЇНИ

Вступ. ***Україна є одним із головних учасників світового ринку зерна, відіграючи важливу роль у забезпеченні глобальної продовольчої безпеки. Підприємствам, що залучені до зернового бізнесу в Україні і при цьому здійснюють торгові угоди в іноземній валюті, необхідно ефективно хеджувати такі фінансові операції. Проте більшість наукових досліджень щодо особливостей управління валютним ризиком зосереджені в контексті управління ризиками фінансових інститутів, а не торгових компаній. Метою дослідження є побудова алгоритму та ідентифікації особливостей управління валютним ризиком на українському ринку зерна.***

Методи. ***Використано загальнонаукові методи пізнання, серед яких методи аналізу та синтезу, статистичний метод, порівняльний аналіз, кейс-метод та метод експертного оцінювання. Використання цих методів дозволило дослідити сутність валютного ризику для суб'єктів зернового ринку України, визначити сучасні тенденції волатильності валютного ринку та надати рекомендації щодо методів управління валютним ризиком.***

Результати. ***Проведене дослідження підтверджує, що управління валютним ризиком на ринку зерна в Україні є необхідним комплексним процесом, що передбачає декілька етапів. Першим кроком є якісна ідентифікація валютного ризику. Охарактеризовано й обґрунтовано різні види валютних ризиків, що притаманні зерновим компаніям, які діють на ринку зерна. Визначено, що невід'ємною складовою наступного етапу управління валютним ризиком зернової компанії є розрахунок чистої валютної позиції. З'ясовано, що на третьому етапі управління валютним ризиком основним завданням є вибір методу управління, спрямованого на усунення або мінімізацію впливу валютних коливань на фінансовий стан зернової компанії.***

Висновки. ***Встановлено, що кожен із досліджених методів управління валютним ризиком на ринку зерна має свої переваги та недоліки. Запропоновано методи управління валютним ризиком за допомогою валютного форвардного та опціонного контракту з урахуванням різних сценаріїв економічного розвитку. Підсумовано, що ключовим етапом є контролінг ефективності методів управління валютним ризиком з метою постійного моніторингу та коригування методу управління ризиком в умовах динамічного валютного середовища зернових компаній.***

Ключові слова: ***управління ризиками, валютний ризик, хеджування, ринок зерна, деривативи.***

Автори заявляють про відсутність конфлікту інтересів. Спонсори не брали участі в розробленні дослідження; у зборі, аналізі чи інтерпретації даних; у написанні рукопису; в рішенні про публікацію результатів.

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.