

**Analysis of the financial derivatives for risk management  
in the context of financial market instability**

**Hanna Tkachuk\***

*PhD in Economics*

*Zhytomyr Polytechnic State University  
10005, 103 Chudnivska Str., Zhytomyr, Ukraine  
<https://orcid.org/0000-0001-6188-3028>*

**Igor Burachek**

*PhD in Economics*

*Zhytomyr Polytechnic State University  
10005, 103 Chudnivska Str., Zhytomyr, Ukraine  
<https://orcid.org/0000-0003-0549-6917>*

**Volodymyr Vyhovskyi**

*PhD in Economics*

*Zhytomyr Polytechnic State University  
10005, 103 Chudnivska Str., Zhytomyr, Ukraine  
<https://orcid.org/0000-0001-5642-0774>*

**Anhelina Sotnyk**

*PhD in Economics*

*Zhytomyr Polytechnic State University  
10005, 103 Chudnivska Str., Zhytomyr, Ukraine  
<https://orcid.org/0000-0002-0217-988X>*

**Iryna Tsaruk**

*PhD in Economics*

*Zhytomyr Polytechnic State University  
10005, 103 Chudnivska Str., Zhytomyr, Ukraine  
<https://orcid.org/0000-0002-9628-3257>*

---

Received: 10.09.2024, Revised: 06.12.2024, Accepted: 27.12.2024

**Suggested Citation:** Tkachuk, H., Burachek, I., Vyhovskyi, V., Sotnyk, A., & Tsaruk, I. (2024). Analysis of the financial derivatives for risk management in the context of financial market instability. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(4), 81-92. doi: 10.52566/msu-econ4.2024.81.



Copyright © The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (<https://creativecommons.org/licenses/by/4.0/>)

\*Corresponding author

**Abstract.** The study aimed to analyse the possibilities and efficiency of financial derivatives as instruments for hedging and minimizing risks in financial markets. The research methodology included the classification of financial derivatives according to various criteria, including their structure and underlying assets. The main types of derivatives were identified: futures, forwards, options and swaps used to hedge risks in the commodity and financial instruments markets. The results of the study indicate that financial derivatives are substantial in reducing the impact of negative changes in the market, opening new opportunities for investors and companies in the context of hedging, speculation and arbitrage. The study determined that the evolution of financial derivatives was driven by the need to adapt to constantly changing market conditions, especially during crises and periods of volatility. The study also addressed the impact of financial technologies (fintech) and blockchain technologies on the derivatives market, emphasising the importance of automation and increased transparency of transactions. As noted, the derivatives market had undergone significant changes due to the introduction of new technologies that had improved the availability and speed of trading. Particular attention was devoted to the analysis of the Ukrainian derivatives market, where economic and political instability creates a need for effective risk management. A separate element of the study was the development of a model for the effective use of financial derivatives for risk management based on the example of Kernel. The model included the stages of risk assessment, selection of appropriate financial instruments, as well as monitoring and adjustment of strategies. The findings of the study emphasize that the derivatives market in Ukraine is still in the development stage, which is due to the limited understanding of these instruments among market participants

**Keywords:** hedging; currency fluctuations; blockchain; economic stability; interest rates

## Introduction

Financial markets are inherently characterised by constant change and volatility, which can pose significant risks to investors, corporations and government institutions. In times of economic crises or heightened volatility, these risks become particularly pronounced, requiring the introduction of effective tools to manage them. One of the most popular and effective mechanisms for reducing risks in financial markets is the use of financial derivatives.

Financial derivatives, such as options, futures, swaps and forwards, allow investors and companies to hedge their exposure to fluctuations in asset prices, change their capital management strategies and generate additional income through speculation. These instruments are especially important in volatile markets when traditional risk management methods do not always provide adequate protection. The use of derivatives allows for fixing the value of assets or liabilities, preventing their further negative impact on the financial results of market participants.

The research relevance is determined by global financial markets becoming increasingly exposed to various risks due to factors such as political instability, changes in central bank monetary policy, currency fluctuations, as well as the effects of pandemics and military conflicts. In such circumstances, risk management is of particular importance to all market participants. The ability to effectively use financial derivatives allows not only to minimise losses but also to gain competitive advantages. However, despite the widespread use of derivatives, there are also several problems associated with their complexity and risks. For instance, the improper use of derivatives can lead to an increase in risks rather than a decrease in them. In addition, due to their complex structure, these instruments may not be accessible to small investors or companies with limited resources.

The use of financial derivatives for risk management has become one of the key topics in financial science, as

market volatility requires new approaches to risk management. For instance, M. Balcilar *et al.* (2021) investigated how futures contracts help reduce risks in commodity markets, especially in conditions of increased volatility. Their conclusions confirm that hedging with futures is an effective tool for price stabilisation, although an incorrect risk assessment can result in additional losses for companies. A.N. Slobodanyk *et al.* (2021) analysed the use of options to hedge currency risks, drawing attention to the flexibility of these instruments, which allow for adjusting strategies depending on the market situation.

Similarly, G. Vuilleme (2019) investigated how interest rate swaps are used to manage interest rate risks in the banking sector. The author shows that these instruments become especially useful in times of fluctuating central bank rates when banks are forced to look for ways to minimise losses. Meanwhile, S. Kolbari (2019) highlighted the challenges faced by small and medium-sized enterprises in using derivatives. The author argued that the complexity of these instruments and lack of awareness often become obstacles to their successful implementation. S. Fu *et al.* (2021) analysed the role of forward contracts in the agricultural sector, emphasising their effectiveness in fixing commodity prices, which can reduce the risks associated with market fluctuations. D.H. Vo *et al.* (2019), studying the impact of financial derivatives during the global financial crises, emphasised that although these instruments partially contributed to the development of the crisis, their proper use allowed many companies to stabilise their positions after the crisis.

D.K. Tarullo (2019) addressed the regulatory changes in the use of derivatives that occurred after the financial crises. The author notes that increased regulation has reduced risks to the financial system, but at the same time has limited access to derivatives for some market players. At the same time, V.M. Oliinyk *et al.* (2019) studied the role

of derivatives in the economy and concluded that futures and swaps are key instruments for stabilising market prices in times of instability. S.B. Seo & J.A. Wachter (2019) added that corporations often use options as an additional layer of insurance against market fluctuations, which allows them to reduce risks in the face of unpredictable changes in the markets. Z. He & A. Krishnamurthy (2019) highlighted the systemic risks associated with the use of derivatives. They warned that the uncontrolled use of complex derivatives can lead to chain reactions in the markets, increasing risks for the entire financial system.

An analysis of the studies of various authors demonstrates that financial derivatives are effective risk management tools, but their use requires a high level of competence, strategic planning and compliance with regulatory requirements. Despite numerous studies, several aspects remain unexplored. Insufficient attention was devoted to the analysis of the effectiveness of derivatives for small and medium-sized enterprises, which often face barriers to their use due to limited resources and knowledge. In addition, the study of the impact of new technologies, such as financial technologies and blockchain, on the derivatives market is at an early stage, which creates a need to investigate their role in changing approaches to risk management. The study aimed to analyse the use of financial derivatives for risk management in crises in financial markets. The objectives of the study were to analyse the peculiarities of the use of financial derivatives by small and medium-sized enterprises in conditions of instability, as well as to investigate the impact of new technologies on the financial derivatives market and their role in changing risk management strategies.

## Materials and Methods

The research methodology included the following stages: systematic literature review, analysis of market data, selection and study of Ukrainian exchange platforms, and development of a specialised risk management model for a Ukrainian company. Each of these stages used different methods of scientific knowledge, including analysis, synthesis, generalisation and induction. The first stage involved a systematic review of the literature on financial derivatives. Academic articles, reports, analytical reviews and other sources covering the classification, features and functions of derivatives in financial markets were analysed. The focus was on the types of derivatives, such as futures, forwards, options and swaps. The method of analysis and comparison, highlighted the specific characteristics of each type of instrument, enabling management of different types of risks. This review also identified the key issues and challenges associated with the use of financial instruments, as well as how these instruments can contribute to risk mitigation.

The next step was to quantitatively analyse market data to identify global trends in the use of derivatives. Using data from the Statista platform (Largest derivatives exchanges worldwide..., 2024), the Group analysed statistics on the world's largest derivatives exchanges by number of trading contracts in the period from 2020 to 2023. The method of

quantitative analysis made it possible to identify the peculiarities of derivatives trading at the global level and compare this data with the situation in the Ukrainian market. The analysis also considered the impact of new technologies, such as fintech and blockchain, on the functioning of the derivatives market. This step determined how digital innovations are changing trading and risk management processes, which was made possible by applying induction to generalise the impact of technology.

A separate stage of the study was devoted to the analysis of Ukrainian exchange (2008), First Stock Trade System (PFTS) (2024) and the Perspektiva Stock Exchange. The comparative analysis method was used to collect and evaluate data on the volume of trading in financial instruments on these exchanges, taken from the National Securities and Stock Market Commission (Analytical data on..., 2024), for the period from 2019 to 2023. The information obtained revealed trends in the development of the derivatives market in Ukraine, as well as the impact of internal and external economic factors on trading volumes. The market's reaction to political instability and macroeconomic changes was also investigated, using a generalisation method to identify key patterns.

The final stage was the creation of a model for the effective use of derivatives for risk management. For this purpose, analysis and modelling methods were used to structure the process of selecting derivatives depending on the specifics of the company's risks. In particular, the model included the stages of selecting the type of derivative, assessing the capabilities of specific exchanges for concluding transactions and developing risk management strategies. The main goal of this model is to optimise risk management processes for more efficient use of financial instruments, which was made possible by combining quantitative and qualitative approaches.

## Results

Financial derivatives are an integral part of modern financial markets and are substantial in managing risk and providing stability for market participants. They are contracts that are based on the price or value of another asset, called an underlying asset. This can be stocks, currencies, bonds, indices, commodities or other financial instruments. Thus, derivatives allow investors and companies to hedge against unpredictable changes in the markets, while providing opportunities for speculation and risk diversification. One of the key concepts related to financial derivatives is hedging. This process involves the use of derivatives to protect against losses due to changes in the value of the underlying assets. Another important function of derivatives is speculation, where investors buy or sell derivatives in the hope that the value of the underlying asset will change to make a profit. The third function, arbitrage, is to profit from differences in the prices of identical or related assets in different markets without risk (Carbonneau & Godin, 2021).

Financial derivatives are classified according to various criteria. First, there are several main types of derivatives

depending on their structure and underlying assets. The most common of these are futures, forwards, options and swaps. Futures are standardised contracts to buy or sell an asset in the future at a predetermined price. Futures are widely used to hedge risks in commodity markets, such as oil, gold, and grain, and financial instruments, such as foreign exchange rates or interest rates (Sosoo *et al.*, 2021). Forwards are contracts to buy or sell an asset at a predetermined price in the future, but unlike futures, forwards are not standardised and are usually concluded between two parties on the over-the-counter market. They provide more flexibility but carry higher risks due to the lack of regulation and standardisation (Balakrishnan, 2020). Options are financial contracts that give the right, but not the obligation, to buy or sell an asset at a fixed price in the future. Options are divided into call options (the right to buy) and put options (the right to sell). This is one of the most flexible instruments, as investors can exercise the right only if it is profitable, which allows for more efficient risk management (Schwarcz, 2020). Swaps are contracts under which two parties agree to exchange cash flows or liabilities. The most common are interest rate swaps, where companies or financial institutions exchange fixed and floating interest rates to reduce the risks associated with rate fluctuations. Another common type is currency swaps, which allow market participants to reduce currency risks (Yu *et al.*, 2022).

In addition to the main types, financial derivatives can also be classified according to their market environment. Exchange-traded derivatives are traded on regulated exchanges, which provides a high level of transparency and security for participants. They are standardised in terms of contract size, terms and conditions, and maturity. Over-the-counter (OTC) derivatives are less regulated and have greater flexibility as contract terms can be tailored to the needs of the parties, but they carry greater credit risk as the participants are responsible for fulfilling their obligations to each other. Given the wide range of instruments and opportunities, financial derivatives play an important role in risk management in modern markets. They not only help to reduce the impact of negative market changes but also open new opportunities for investors and companies in the context of hedging, speculation and arbitrage. However, their complexity, as well as the possible risks associated with their misuse, require a high level of financial literacy and regulatory control. The evolution of financial derivatives was driven by the need to adapt to constantly changing market conditions, especially in times of instability. Since their inception, derivatives developed from simple commodity futures transactions to complex financial instruments used to manage a wide range of risks. In times of crisis and high volatility, derivatives have become particularly important as they have become important instruments to protect against unpredictable market fluctuations and losses. Their evolution has always been influenced by market conditions, technological progress and regulatory changes.

The formal development of derivatives markets began in the 19<sup>th</sup> century when standardised futures contracts

for agricultural commodities appeared on the Chicago and London stock exchanges. These early derivatives were simple in nature and were used primarily to hedge risks in commodity markets. Over time, financial markets became increasingly complex, leading to the need to create new types of derivatives to manage risks in a more volatile environment. In the mid-twentieth century, financial futures and options, on indices and currencies, began to develop rapidly, reflecting the growing globalisation and integration of global financial markets. In the 1970s, when global markets began to move to floating exchange rates after the collapse of the Bretton Woods system, currency derivatives gained particular importance (Pauletto, 2012). Their emergence protected companies and investors from currency fluctuations that became a regular feature of global markets.

The financial crisis of 2008 marked a turning point in the history of derivatives (Babayev & Sabzaliyev, 2024). Until then, derivatives had been actively used not only for hedging but also for speculative purposes, leading to a significant increase in their volumes on the market. One of the factors that led to the crisis was the excessive use of complex derivatives, such as credit default swaps (CDS) and securitised assets, which were poorly understood by many market participants. After the crisis, derivatives became associated with increased risks, which triggered a wave of regulatory changes. Authorities in many countries introduced stricter requirements for transparency, settlement and risk management in the derivatives market (Bryan & Rafferty, 2014). In response to these developments, significant changes in the structure and use of derivatives have occurred since the 2008 financial crisis. Regulators introduced new requirements for centralised clearing and reporting of OTC derivatives, which reduced risks to financial systems and increased market transparency. This improved market risk assessment and determination of the value of derivatives, reducing the likelihood of a recurrence of systemic crises.

However, the evolution of derivatives did not stop. The derivatives markets have been actively influenced by the latest technologies, such as fintech and blockchain. The introduction of digital platforms for derivatives trading, as well as the development of algorithmic trading, have changed the speed and accessibility of derivatives transactions (Makedon *et al.*, 2022). Today, blockchain technologies and smart contracts are opening new opportunities for the development of derivatives markets, offering greater automation and security, which is especially important in the context of growing market volatility. Table 1 shows the world's largest derivatives exchanges by number of trading contracts.

The National Stock Exchange of India (NSE) showed the largest increase, indicating the rapid growth of the Indian derivatives market, which can be explained by the growing demand for financial instruments in the rapidly developing country. The B3 exchange (Brazil) also showed stable trading volumes. This indicates a certain stabilisation of the market after significant growth. CME Group, one of the world's largest exchanges, showed moderate but steady growth. This confirms its role as a key player in the



global derivatives market. Other exchanges, such as the Bombay Stock Exchange, showed significant growth, indicating that the Indian stock market is picking up. The CBOE Holding exchange has also shown steady growth, reflecting the high demand for risk-hedging instruments. Among the Chinese exchanges, the Zhengzhou Commodity Exchange has shown a noticeable increase in the number of contracts. This may indicate increased activity in

commodity derivatives. The Nasdaq, Intercontinental Exchange, Dalian Commodity Exchange, Shanghai Futures Exchange and Korea Exchange have shown stable results over the past four years, with only minor fluctuations. Eurex and Miami International Holdings showed modest growth or a slight decline in trading volumes, which may reflect lower demand for derivatives in these regions or market consolidation.

**Table 1.** Largest derivatives exchanges in the world in 2020-2023 by number of trading contracts, million

|                                  | 2020 | 2021  | 2022  | 2023  |
|----------------------------------|------|-------|-------|-------|
| National Stock Exchange of India | 8850 | 17255 | 38114 | 84807 |
| B3                               | 6343 | 8756  | 8314  | 8315  |
| CME Group                        | 4821 | 4943  | 5846  | 6099  |
| Bombay Stock Exchange            | 848  | 1435  | 1417  | 5827  |
| CBOE Holding                     | 2614 | 3096  | 3476  | 3708  |
| Zhengzhou Commodity Exchange     | 1702 | 2582  | 2398  | 3533  |
| Nasdaq                           | 2661 | 3293  | 3148  | 3204  |
| Intercontinental Exchange        | 2789 | 3318  | 3435  | 2910  |
| Dalian Commodity Exchange        | 2207 | 2364  | 2275  | 2508  |
| Borsa Istanbul                   | 1517 | 2018  | 2727  | 2086  |
| Shanghai Futures Exchange        | 2129 | 2446  | 1843  | 2061  |
| Korean stock exchange            | 2185 | 2282  | 2058  | 2038  |
| Eurex                            | 1861 | 1703  | 1956  | 1915  |
| Miami International Holdings     | 827  | 1338  | 1299  | 1587  |

**Source:** compiled by the authors based on Largest derivatives exchanges worldwide from 2020 to September 2024, by number of contracts traded (2024)

Financial technology has made derivative transactions more accessible and faster. Fintech companies offer platforms for electronic trading in derivatives, automate contract execution processes and reduce costs associated with intermediaries. These technologies help to optimise derivatives operations, which is especially important for real-time risk hedging (Alsahlawi, 2021). One example of how fintech is being used is through automated trading platforms such as Tradeweb or MarketAxess. They allow market participants to execute derivatives transactions on electronic platforms, which significantly reduces transaction times and makes the market more liquid. Before the introduction of such platforms, participants had to rely on manual trading or complex transactions through brokers, which was slower and more expensive. Automation also reduces the risk of errors that can occur during the execution of transactions. Fintech helps to solve the problem of the complexity of settling derivative contracts. Previously, this process was very labour-intensive and risky due to numerous transactions and intermediaries. The introduction of clearing platforms that use automated data processing systems helps speed up settlements and reduce credit risks. LCH Clearnet platform for derivatives is a notable example of how automation reduces complexity and improves settlement efficiency.

Blockchain is opening new horizons for financial markets, especially in the derivatives sector (Spytska, 2023). This technology creates decentralised, tamper-proof ledgers that can significantly improve transparency and reduce

fraud risks. Derivatives that are recorded on the blockchain become fully traceable as all transactions are recorded in a distributed database. This allows both market participants and regulators to track who concluded a transaction, when and under what conditions (Zhang *et al.*, 2020). One example of the use of blockchain for derivatives is the Axoni platform, which works on projects in the field of credit derivatives. By using blockchain, Axoni enables automatic contract execution through smart contracts and improves tracking of ownership and settlement. Smart contracts allow derivatives to be automatically executed when certain conditions are met, eliminating the need for intermediaries and reducing the risk of default. It also reduces the time to execute transactions, increasing the speed and reliability of operations. Another significant contribution of blockchain to the derivatives industry is the reduction of transaction costs. OTC derivatives are typically complex and require a significant amount of paperwork and manual coordination between the parties. Blockchain automates this process, reducing the amount of administrative work and ensuring that all contract pages are synchronised in real-time.

Despite the significant advantages of fintech and blockchain, their implementation is also accompanied by challenges. One of the main challenges is the scalability of the technologies, especially blockchain. Traditional exchanges and platforms can process millions of transactions per day, while blockchains face limitations in terms of transaction processing speed. While technologies such as Ethereum

2.0 are attempting to address this problem by updating the consensus mechanism, the issue of scalability remains open (Mosteanu & Faccia, 2020). Another challenge is the regulatory uncertainty surrounding blockchain derivatives. While technology creates opportunities to increase transparency and reduce risk, regulators are still trying to find the right balance between protecting market participants and supporting innovation. This is particularly important for OTC derivatives, where transactions are often complex and unpredictable. In practice, however, the introduction of these technologies is already yielding significant results. For example, ISDA's Common Domain Model (CDM) platform, which uses blockchain to standardise and automate derivatives contracts, has enabled banks to significantly reduce the time and cost of processing complex financial transactions. Market participants can see a reduction in errors and faster settlement through the integration of smart contracts and distributed ledger technology.

Financial derivatives are playing an increasingly important role in risk management in the Ukrainian market, where economic and political instability often affects businesses and financial institutions. In the face of constant fluctuations in the hryvnia exchange rate, changes in energy prices, and other macroeconomic factors, derivatives are becoming a tool that allows companies and investors to protect themselves from market risks (Kyfyak *et al.*, 2024). However, the use of these instruments in Ukraine is still at a developing stage, with many challenges and prospects related to the regulatory framework, limited market knowledge and product availability.

The derivatives market in Ukraine has not yet reached the level of development seen in Western countries. The main issue is the limited awareness of the instruments and their use among many market participants. Many companies and investors do not yet have sufficient experience to use derivatives effectively (Shuplat *et al.*, 2022). This results in insufficient demand for such products. It is also worth noting that Ukraine's regulatory framework, while constantly improving, does not yet fully meet the needs of the derivatives market. The absence of a clear and transparent infrastructure for derivatives trading and clearing may cause problems with market confidence, especially among foreign investors. Although the National Securities and Stock Market Commission (NSSMC) is working to create an effective regulatory platform for derivatives, this process will take time and require significant investment.

The derivatives market in Ukraine, although recently introduced, has significant potential for development. The

main exchanges involved in derivatives trading in Ukraine include the Ukrainian Exchange (UX), PFTS and Perspektyva Stock Exchange. The Ukrainian Exchange (UX), founded in 2008, is one of the key trading platforms on the Ukrainian stock market. It has quickly gained a reputation as an innovative and modern exchange, thanks to the introduction of an electronic trading system and the development of the derivatives market. The futures and options contracts offered on the exchange are the main instruments for managing financial risks, including currency, interest rate and commodity risks. The Ukrainian Exchange plays an important role in the formation and development of the derivatives market in Ukraine. One of the main advantages of UX is its high liquidity, which makes it attractive to both domestic and international investors. The exchange operates on a central counterparty (CCP) technology, which increases the reliability and security of derivatives trading.

PFTS is one of the oldest stock exchanges in Ukraine, founded in 1996. The exchange was initially a key player in the equity market but later expanded its capabilities to include derivatives in the list of financial instruments. The PFTS is known for its many years of experience and reliability, making it an important element of the country's financial infrastructure. Although the PFTS has experienced periods of reduced activity, the exchange continues to develop instruments for risk hedging and portfolio investment. The PFTS offers traders and investors access to futures contracts on currencies, indices and bonds, which allows them to effectively manage market risks. The exchange maintains high standards of reporting and transparency, which fosters trust among market participants.

Perspektyva Stock Exchange is one of the leading derivatives trading platforms in Ukraine. It has been actively developing since its foundation and is focused on innovative technologies and international standards in the field of financial instruments trading. The exchange pays particular attention to investors interested in hedging financial risks through futures and options contracts on commodities, shares and other assets. "Perspektyva" provides a wide range of products for risk management, especially in times of volatile financial markets. Its trading platforms are user-friendly and highly automated, making the trading process fast and efficient. The exchange also actively supports market transparency by cooperating with government regulators to improve the legal environment and develop the Ukrainian derivatives market. Table 2 shows the volume of financial instruments traded on organised capital market operators.

**Table 2.** The trading volume of financial instruments on organised capital market operators in 2019-2023, UAH billion

|                    | 2019  | 2020  | 2021  | 2022  | 2023  |
|--------------------|-------|-------|-------|-------|-------|
| PFTS               | 114.8 | 131.5 | 221.5 | 84    | 274.7 |
| Perspektyva        | 186.4 | 201.5 | 217.1 | 61.2  | 147   |
| Ukrainian Exchange | 3.8   | 2.4   | 13.3  | 15.4  | 14.8  |
| Total              | 305   | 334.4 | 452   | 160.6 | 436.4 |

**Source:** compiled by the authors based on Analytical data on stock market development (2024)

Trading volumes on exchanges underline the important role of financial instruments, including derivatives, in managing risk in volatile environments. The marked decline in trading volume in 2022 across all exchanges reflects the significant challenges faced by market participants due to the war. However, the growth in 2023 shows that financial market participants are adapting and trying to find tools to minimise risks. Derivatives, as hedging instruments, could become an important part of this strategy, allowing businesses and investors to reduce market uncertainty in the face of sharp fluctuations.

Effective risk management with the help of financial derivatives is extremely important for Ukrainian companies, especially in the context of instability caused by both internal and external factors. A model for the effective use of financial derivatives for risk management was developed, which consists of several steps. The first step is to identify the main risks that may affect the financial stability of the enterprise. These risks include currency risk associated with fluctuations in exchange rates, price risk arising from changes in global commodity prices, and interest rate risk arising from changes in market interest rates. The next step is to choose the best financial instruments to hedge the risks. For example, for currency risk, it is advisable to use futures and forward currency contracts. To hedge price risk, an effective solution is to enter futures contracts. To manage interest rate risk, it is useful to enter interest rate swaps. Here, it is essential to determine the choice of the exchange on which the transactions will be concluded. For example, a company can choose one of the major exchanges, depending on the specifics of its needs.

The model also provides for the development of a hedging strategy that integrates the selected financial instruments into the company's overall financial policy. This strategy includes regular monitoring of market conditions, exchange rates, agricultural commodity prices and interest rates. It is also necessary to use combinations of derivatives to cover different risks simultaneously, ensuring reliable protection of assets. Assessing the effectiveness of derivatives is another important step. To do this, financial resources saved can be analysed by comparing potential losses without hedging with actual losses after entering contracts. The volatility of the financial indicators of the company and their stability in the face of market fluctuations should also be assessed. The model should be flexible and include mechanisms for adjusting the strategy based on changes in market conditions. If new risks emerge or market conditions change, the company can adapt its strategy by changing the choice of financial instruments or the amount of hedging. The example of one of the leading agricultural companies in Ukraine, Kernel (2023), which exports agricultural products, provides a detailed look at the model of using derivatives to hedge currency, price and interest rate risks.

First, the company faces currency risks, as most of its export contracts are in foreign currencies, and business expenses are incurred in hryvnia (Zelisko et al., 2024). In times of war, when the hryvnia exchange rate against

foreign currencies can fluctuate sharply due to economic instability, this risk is particularly acute. For instance, if Kernel plans to enter a USD 50 million export contract with payment due in six months, the company may suffer significant losses due to a devaluation of the hryvnia or, conversely, its unexpected appreciation. To hedge such risks, it is advisable to use currency futures contracts. If the exchange rate is UAH/USD 42 at the time of the contract conclusion, Kernel can fix this rate through futures agreements. This helps to avoid unfavourable changes in the exchange rate and stabilise the company's revenue planning. If in 6 months the hryvnia/dollar exchange rate changes to UAH/USD 45, the company will lose on the contract price but will compensate for it by gaining on the futures contract. If, on the contrary, the exchange rate drops to UAH/USD 35, the additional market gains will be balanced by losses on derivative transactions, allowing the company to maintain its projected level of income.

Price risk associated with changes in global agricultural commodity prices is another significant challenge for Kernel. Global prices for commodities such as sunflower oil and grain can fluctuate significantly depending on supply, demand and geopolitical factors (Manachynska et al., 2024). In the event of a price decline, the company may suffer significant financial losses, which is why hedging with agricultural futures contracts is an optimal solution. For instance, if the price of sunflower oil is USD 900 per tonne at the time of contracting, the company can enter futures contracts to sell the future harvest at this price. If the world price falls to USD 800 per tonne in a few months, the company will retain its benefit through futures, which helps to avoid losses and stabilise its financial results. On the other hand, if the price rises to USD 950 per tonne, the company may lose potential profits from the price increase, but it receives predictable and stable income using derivatives. Such a strategy is extremely important in the face of unpredictable changes in global markets, which is further exacerbated by the military action in Ukraine, which affects international supply chains and demand.

Another important factor is interest rate risk, which arises from changes in the cost of credit. Companies like Kernel often take out loans to finance their operations, and if the interest rate on these loans changes, it can have a significant impact on the company's financial performance. For instance, if the company has floating-rate loans and interest rates in the market start to rise, this could lead to higher debt service costs. To avoid this risk, the company can enter interest rate swaps that allow it to fix interest rates at a certain level. For instance, Kernel can fix the interest rate on its loans at 5%, even if the market rate rises to 7%. This will help the company avoid an increase in its financial burden due to the rising cost of borrowed funds.

The effectiveness of derivatives in managing risk can be assessed using quantitative measures. For example, the cost of hedging can be compared to the actual losses that the company avoided by using futures, options or swaps. In the case of currency risk hedging, for example, it is

possible to calculate how much exchange rate changes could have affected the company's profitability without the use of derivatives and how much resources were saved due to the contracts. It is also essential to assess the extent to which the use of derivatives reduces the volatility of the company's financial performance and stabilises its profitability in difficult periods. Assessment of the profitability of derivatives helps to determine whether the costs of their use are justified and whether they lead to cost savings compared to potential losses. Thus, the developed model shows that companies that use derivatives to hedge currency, price and interest rate risks can significantly reduce the negative impact of market fluctuations, especially in times of crisis or war. The example of Kernel shows how a well-chosen strategy of using futures, options and swaps allows the company to remain competitive and protected from unpredictable changes in the market. This is an important step for business stability in the face of an unstable financial environment and global market challenges faced by Ukrainian companies due to the war and economic turmoil.

### Discussion

The results of the study demonstrate the importance of financial derivatives as instruments for risk management in times of economic instability in the example of the Ukrainian market. They emphasise that understanding the types of derivatives and their functions is critical for the effective use of these instruments. The classification of derivatives into futures, forwards, options, and swaps can be used to highlight the specifics of their use depending on market needs and individual company strategies. S.M. Bartram (2019) investigated the impact of derivatives on the stability of financial markets. The author found that the use of derivatives helps to reduce market volatility, as they allow participants to hedge risks. C. González Pedraz & A.V. Rixtel (2021), in turn, emphasise the importance of regulating and standardising derivatives to increase their efficiency. This correlates with the results of the current study, which also emphasises the importance of the regulatory environment for the development of the derivatives market. However, the authors put more emphasis on market stability, while the current study focuses on the specific risks faced by companies.

It is particularly important to analyse the difference between exchange-traded and OTC derivatives. Exchange-traded derivatives, which are highly standardised and regulated, provide greater security for market participants (Nogoibaeva *et al.*, 2024). At the same time, OTC derivatives offer more flexibility, although they are associated with increased risks due to the lack of centralised control. This feature may be important for Ukrainian companies seeking to adapt to rapidly changing market conditions. D.H. Vo *et al.* (2020) determined that derivatives are an effective tool for risk management in high inflationary environments. They conducted an analysis that showed that companies using financial derivatives were able to better adapt to inflationary challenges. This is consistent with the

results of the current study, however, the author focused more on inflationary risks, while the current study looks at currency and interest rate risks.

The growing importance of derivatives in times of economic instability is particularly evident in the context of the war in Ukraine (Semenenko *et al.*, 2024). The uncertainty of the exchange rate and fluctuations in interest rates highlight the need for hedging, which can be implemented using currency forwards and interest rate swaps. This creates new opportunities for Ukrainian companies to mitigate the risks associated with foreign economic activity. N.M. Leone *et al.* (2019) highlighted the use of derivatives in times of political instability. They noted that companies in underdeveloped and unstable countries are still not sufficiently aware of the use of derivatives to hedge political risks. This correlates with the findings of the current study, which also notes that many companies have limited experience in using these instruments. However, the author focuses more on political risks, while the current study also considers other types of risks, such as currency and interest rates.

G.M. Caporale *et al.* (2021) addressed the behaviour of investors in the derivatives market during economic instability. They conducted a comparative analysis of the use of derivatives in different regions of the world and concluded that investors tend to adopt different strategies during crisis periods. Compared to the current findings, the author not only examines specific instruments (futures, forwards, options, swaps) but also pays considerable attention to global trends and regional specifics, particularly in the context of the crisis.

The study also indicated that technological advances, such as the introduction of financial technology and blockchain, can significantly improve the efficiency of the derivatives market. Electronic platforms for trading derivatives can reduce the costs and time involved in executing trades, which can be critical in situations where the speed of response to changing market conditions is crucial. However, along with these advantages, new challenges arise related to the complexity of regulating new technologies. C. Chen (2020) studied the role of financial technology in the development of the derivatives market. The author noted that automation of trading and contract execution processes significantly increases market efficiency, reducing costs and time. E. Avgouleas & A. Kiayias (2019) also focused on the introduction of innovative technologies such as blockchain. The authors emphasised that blockchain-based smart contracts can provide security and transparency in the derivatives market by automatically fulfilling contract terms without intermediaries. This is consistent with current findings that also highlight the impact of fintech and blockchain on the availability and speed of derivatives transactions. However, the authors focused on the technical aspects and automation capabilities, while the current study focuses more on the regulatory and educational aspects.

G. Abuselidze (2021) addressed the specifics of the use of financial derivatives in the agricultural sector, where many export-oriented companies face currency risks due to



exchange rate fluctuations. The author conducted an analysis that demonstrated that agricultural companies actively use currency forwards as a tool to protect their revenues from adverse changes in the exchange rate. N.V. Trusova *et al.* (2020), in turn, emphasised that companies, thanks to forwards, can fix the selling price of their products at the stage of concluding a contract, which allows them to avoid financial losses in the event of a sharp drop in the currency exchange rate. This is consistent with the current findings, however, the authors emphasised that agricultural companies receive real benefits from the use of forwards, which have helped them to increase their financial stability. At the same time, the current study only focused on general awareness of financial instruments.

Financial literacy among Ukrainian companies remains a significant barrier to the effective use of derivatives. Despite growing awareness of hedging opportunities, many companies still have limited experience with financial instruments. This suggests the need for further training and awareness-raising among market participants. The regulatory framework in Ukraine also needs to be improved to facilitate the development of the derivatives market. While there are efforts by government authorities to create a more transparent and efficient infrastructure, this requires time and resources. Initiatives to attract foreign investors are also important, as they can provide additional capital and expertise to develop the market.

M.A. Al Janabi (2022) addressed the impact of regulatory changes following the 2008 financial crisis on the financial derivatives market, highlighting that the new requirements increased market transparency but created barriers for small and medium-sized enterprises. The study noted a decline in transaction volumes among small players, reflecting their inability to adapt to the new regulations. In contrast to the current study, the author emphasises structural changes and their implications for the availability of derivatives. The results of the author and the current study demonstrate the need for effective use of derivatives and attention to structural barriers that impede market access.

Overall, the findings of the study highlight that financial derivatives can be an important tool for risk management in Ukraine, but their effectiveness depends heavily on market awareness, technological support and the appropriate regulatory environment. In the face of ongoing economic challenges, such as the war, companies should actively use these instruments to ensure their financial stability. The authors' results also highlight the importance of financial derivatives in various aspects of risk management, and many of these findings overlap with the current study. The derivatives market is multifaceted and requires a comprehensive approach to analysing and using these instruments for risk management.

## Conclusions

This study provides a detailed analysis of financial derivatives, their typology, evolution and role in modern markets. One of the key aspects of the study was the classification of

derivatives by structure and underlying assets, which can be used to identify the main instruments: futures, forwards, options and swaps. Futures are recognised as standardised contracts that are widely used to hedge risks in commodity and financial markets. Forwards, in contrast to futures, provide greater flexibility, but due to the lack of standards, they carry higher risks. Options, which give the right but not the obligation to buy or sell assets, have proved to be the most flexible instrument for effective risk management. Swaps, in turn, help to reduce risks associated with interest rates and currency fluctuations by exchanging cash flows between the parties.

The evolution of derivatives has been influenced by market conditions, technological developments and regulatory changes. In particular, the importance of derivatives grew during the financial crises, as they developed into an effective hedge against market volatility. The development of derivatives markets was particularly important after the 2008 financial crisis, which led to increased regulation and the introduction of new requirements for transparency, clearing and risk management. The volume of derivatives trading on global exchanges increased between 2020 and 2023. The analysis noted that the latest technologies, including financial technology and blockchain, have a significant impact on the development of the derivatives market. Thanks to fintech, derivatives transactions have become more accessible and faster, while the use of blockchain increases the transparency and security of transactions. Automation of trading processes and the introduction of smart contracts reduce the costs and risks associated with contract execution. However, the study also highlighted that technological advances have their challenges, particularly in the areas of regulation and scalability of blockchain solutions.

In the context of the Ukrainian derivatives market, the study noted that their importance is growing due to constant economic fluctuations, currency risks and inflation, which is especially relevant in times of war. Ukrainian companies are increasingly using currency forwards and other derivatives to hedge their risks, but the country's derivatives market is still underdeveloped due to low financial literacy and a limited regulatory framework. Kernel's model of effective use of financial derivatives for risk management demonstrates how an agricultural company can use futures and options to hedge grain price risks. The use of these instruments allows Kernel to lock in prices for future sales, reducing the impact of unpredictable market fluctuations on revenue. By properly managing derivatives, the company can ensure the stability of its financial results and reduce the risks associated with fluctuations in commodity prices.

The limitations of the study are related to the lack of data on the specifics of the use of financial derivatives in Ukraine and the limited level of their implementation compared to developed countries. Further research could focus on analysing the impact of new technologies, such as blockchain, on the development of the derivatives market in Ukraine and exploring opportunities to improve financial literacy among market participants.

**Acknowledgements**

None.

**Conflict of Interest**

None.

**References**

- [1] Abuselidze, G. (2021). Use of hedging instruments on example of grain market. In *20<sup>th</sup> international scientific conference engineering for rural development proceedings* (pp. 1655-1662). Jelgava, Latvia. [doi: 10.22616/erdev.2021.20.tf359](https://doi.org/10.22616/erdev.2021.20.tf359).
- [2] Al Janabi, M.A. (2022). Transformation of derivatives securities in emerging markets: Policy implications in light of the 2007-2009 global financial crisis and COVID-19 pandemic. In *Financial transformations beyond the COVID-19 health crisis* (pp. 757-786). London: World Scientific Publishing Europe Ltd. [doi: 10.1142/9781800610781\\_0026](https://doi.org/10.1142/9781800610781_0026).
- [3] Alsahlawi, A.M. (2021). [The role of hedging and derivatives techniques and fintech adoption on financial risk management in Saudi Banks](https://doi.org/10.22616/erdev.2021.20.tf359). *Cuadernos de Economía*, 44(126), 10-22.
- [4] Analytical data on stock market development. (2024). Retrieved from <https://www.nssmc.gov.ua/en/news/insights/>.
- [5] Avgouleas, E., & Kiayias, A. (2019). The promise of blockchain technology for global securities and derivatives markets: the new financial ecosystem and the 'holy grail' of systemic risk containment. *European Business Organization Law Review*, 20, 81-110. [doi: 10.1007/s40804-019-00133-3](https://doi.org/10.1007/s40804-019-00133-3).
- [6] Babayev, N., & Sabzaliyev, S. (2024). Methods of financial assessment of the intellectual assets of an enterprise and features of their reflection in accounting. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 11(2), 9-17. [doi: 10.52566/msu-econ2.2024.09](https://doi.org/10.52566/msu-econ2.2024.09).
- [7] Balakrishnan, J. (2020). Hedging strategies used in selection of "options" and "forward" contracts in derivative market. *Journal of Commerce*, 8(1), 1-12. [doi: 10.34293/commerce.v8i1.837](https://doi.org/10.34293/commerce.v8i1.837).
- [8] Balcilar, M., Gabauer, D., & Umar, Z. (2021). Crude oil futures contracts and commodity markets: New evidence from a TVP-VAR extended joint connectedness approach. *Resources Policy*, 73, article number 102219. [doi: 10.1016/j.resourpol.2021.102219](https://doi.org/10.1016/j.resourpol.2021.102219).
- [9] Bartram, S.M. (2019). Corporate hedging and speculation with derivatives. *Journal of Corporate Finance*, 57, 9-34. [doi: 10.1016/j.jcorpfin.2017.09.023](https://doi.org/10.1016/j.jcorpfin.2017.09.023).
- [10] Bryan, D., & Rafferty, M. (2014). Financial derivatives as social policy beyond crisis. *Sociology*, 48(5), 887-903. [doi: 10.1177/0038038514539061](https://doi.org/10.1177/0038038514539061).
- [11] Caporale, G.M., Karanasos, M., Yfanti, S., & Kartsaklas, A. (2021). Investors' trading behaviour and stock market volatility during crisis periods: A dual long-memory model for the Korean Stock Exchange. *International Journal of Finance & Economics*, 26(3), 4441-4461. [doi: 10.1002/ijfe.2024](https://doi.org/10.1002/ijfe.2024).
- [12] Carbonneau, A., & Godin, F. (2021). Deep equal risk pricing of financial derivatives with multiple hedging instruments. *ARXIV*. [doi: 10.48550/arXiv.2102.12694](https://doi.org/10.48550/arXiv.2102.12694).
- [13] Chen, C. (2020). Regulation of derivatives in Asia: When technology meets financial engineering. In *Research handbook on Asian financial law* (pp. 101-121). Cheltenham: Edward Elgar Publishing. [doi: 10.4337/9781788972208.00015](https://doi.org/10.4337/9781788972208.00015).
- [14] First Stock Trade System (PFTS). (2024). Retrieved from <https://pfts.ua/en/1-about-pfts-se>.
- [15] Fu, S., Zhan, Y., Ouyang, J., Ding, Y., Tan, K.H., & Fu, L. (2021). Power, supply chain integration and quality performance of agricultural products: Evidence from contract farming in China. *Production Planning & Control*, 32(13), 1119-1135. [doi: 10.1080/09537287.2020.1794074](https://doi.org/10.1080/09537287.2020.1794074).
- [16] González Pedraz, C., & Rixtel, A.V. (2021). *The role of derivatives in market strains during the COVID-19 crisis*. Madrid: Banco de España.
- [17] He, Z., & Krishnamurthy, A. (2019). A macroeconomic framework for quantifying systemic risk. *American Economic Journal: Macroeconomics*, 11(4), 1-37. [doi: 10.1257/mac.20180011](https://doi.org/10.1257/mac.20180011).
- [18] Kernel: Annual report. (2023). Retrieved from [https://www.kernel.ua/wp-content/uploads/2024/02/FY2023\\_Kernel\\_Annual\\_Report.pdf#page=47](https://www.kernel.ua/wp-content/uploads/2024/02/FY2023_Kernel_Annual_Report.pdf#page=47).
- [19] Kolbari, S. (2019). Investigating challenges and assessing managers' capabilities for risk management in small and medium-sized enterprises at the time of financial crisis in developing economies. *Revista Gestão & Tecnologia*, 19(1), 44-56. [doi: 10.20397/2177-6652/2019.v19i1.1524](https://doi.org/10.20397/2177-6652/2019.v19i1.1524).
- [20] Kyfyak, V., Kindzerskyi, V., Todoriuk, S., Klevchik, L., & Luste, O. (2024). The role of economics and management in the development of sustainable business models of agricultural enterprises. *Scientific Horizons*, 27(6), 152-162. [doi: 10.48077/scihor6.2024.152](https://doi.org/10.48077/scihor6.2024.152).
- [21] Largest derivatives exchange worldwide from 2020 to September 2024, by number of contracts traded. (2024). Retrieved from <https://www.statista.com/statistics/272832/largest-international-futures-exchanges-by-number-of-contracts-traded/>.
- [22] Leone, N.M., Manelli, N.A., & Pace, N.R. (2019). Commodity market and financial derivative instruments: Is there a cointegration. *Journal of Modern Accounting and Auditing*, 15, 185-202. [doi: 10.17265/1548-6583/2019.04.002](https://doi.org/10.17265/1548-6583/2019.04.002).

- [23] Makedon, V., Krasnikova, N., Krupskiy, O.P., & Stasiuk, Y. (2022). [Arrangement of digital leadership strategy by corporate structures: A review](#). *Ikonomicheski Izsledvania*, 31(8), 19-40.
- [24] Manachynska, Yu., Luchyk, M., & Luchyk, S. (2024). Financial modelling of cash flow management for agribusiness security: Accounting and analytical aspect. *Scientific Horizons*, 27(4), 154-165. doi: 10.48077/scihor4.2024.154.
- [25] Mosteanu, N.R., & Faccia, A. (2020). [Digital systems and new challenges of financial management – FinTech, XBRL, blockchain and cryptocurrencies](#). *Quality – Access to Success*, 21(174), 159-166.
- [26] Nogoibaeva, E., Mamatova, N., Derkenbaeva, S., & Omurzakova, U. (2024). Integrated approach to risk analysis in financial statements to ensure economic security of the enterprise. *Economics of Development*, 23(2), 17-26. doi: 10.57111/econ/2.2024.17.
- [27] Oliinyk, V.M., Burdenko, I.M., Volynets, O., & Yatsenko, V.V. (2019). [Organized derivatives market and economical growth: Relationship and impact](#). *Periodicals of Engineering and Natural Sciences*, 7(2), 806-817.
- [28] Pauletto, C. (2012). *The history of derivatives: A few milestones*. Retrieved from <https://www.scribd.com/document/583371632/HistoryofDerivatives-AfewMilestonesKummerandPauletto>.
- [29] Schwarcz, S.L. (2020). [Regulating derivatives: A fundamental rethinking](#). *Duke Law Journal*, 70(3), 545-606.
- [30] Semenenko, O., Dobrovolskyi, U., Vasylenko, S., Yarmolchuk, M., & Tarhonskyi, V. (2024). Risks of managing financial resources of the agricultural sector of Ukraine in the zone of military conflict: Challenges, threats, ways of counteraction. *Ekonomika APK*, 31(3), 65-75. doi: 10.32317/2221-1055.2024030.75.
- [31] Seo, S.B., & Wachter, J.A. (2019). Option prices in a model with stochastic disaster risk. *Management Science*, 65(8), 3449-3469. doi: 10.1287/mnsc.2017.2978.
- [32] Shuplat, O., Shevchenko, V., Lutsiv, N., Nekrasov, S., & Hovda, H. (2022). Financing the fixed assets reproduction of woodworking enterprises: Innovation and investment aspect. *Financial and Credit Activity: Problems of Theory and Practice*, 4(45), 48-57. doi: 10.55643/fcaptop.4.45.2022.3801.
- [33] Slobodanyuk, A.N., Reznik, N.P., & Abuselidze, G.D. (2021). The analysis of hedging instruments on the exchange commodity market of Ukraine. In *The challenge of sustainability in agricultural systems* (pp. 379-385). Cham: Springer. doi: 10.1007/978-3-030-73097-0\_42.
- [34] Sosoo, V.E., Okorie, D.I., & Chen, H. (2021). Roles of commodity futures derivatives and financial crises in global food security. *Economic and Political Studies*, 9(3), 336-357. doi: 10.1080/20954816.2021.1872854.
- [35] Spytka, L. (2023). Prospects for the legalization of cryptocurrency in Ukraine, based on the experience of other countries. *Social and Legal Studies*, 6(4), 226-232. doi: 10.32518/sals4.2023.226.
- [36] Tarullo, D.K. (2019). Financial regulation: Still unsettled a decade after the crisis. *Journal of Economic Perspectives*, 33(1), 61-80. doi: 10.1257/jep.33.1.61.
- [37] Trusova, N.V., Tanklevska, N.S., Synchak, V.P., Prystemykyi, O.S., & Tereshchenko, M.A. (2020). State support of agro-insurance of agricultural risks in the market of goods derivatives of Ukraine. *Industrial Engineering & Management Systems*, 19(1), 93-102. doi: 10.7232/iems.2020.19.1.093.
- [38] Ukrainian exchange. (2008). Retrieved from <https://www.ux.ua/s111>.
- [39] Vo, D.H., Huynh, S.V., Vo, A.T., & Ha, D.T.T. (2019). The importance of the financial derivatives markets to economic development in the world's four major economies. *Journal of Risk and Financial Management*, 12(1), article number 35. doi: 10.3390/jrfm12010035.
- [40] Vo, D.H., Van Nguyen, P., Nguyen, H.M., Vo, A.T., & Nguyen, T.C. (2020). Derivatives market and economic growth nexus: Policy implications for emerging markets. *The North American Journal of Economics and Finance*, 54, article number 100866. doi: 10.1016/j.najef.2018.10.014.
- [41] Vuillemeij, G. (2019). Bank interest rate risk management. *Management Science*, 65(12), 5933-5956. doi: 10.1287/mnsc.2018.3125.
- [42] Yu, Y., Yang, X., & Lei, Q. (2022). Pricing of equity swaps in uncertain financial market. *Chaos, Solitons & Fractals*, 154, article number 111673. doi: 10.1016/j.chaos.2021.111673.
- [43] Zelisko, N., Raiter, N., Markovych, N., Matskiv, H., & Vasylyna, O. (2024). Improving business processes in the agricultural sector considering economic security, digitalization, risks, and artificial intelligence. *Ekonomika APK*, 31(3), 10-21. doi: 10.32317/2221-1055.2024030.10.
- [44] Zhang, S., Tang, J.A., Hu, Q., & Liu, F. (2020). Research on blockchain financial derivatives cluster. In *Proceedings of the 2020 3rd international conference on blockchain technology and applications* (pp. 40-46). New York: Association for Computing Machinery. doi: 10.1145/3446983.3446996.

## **Аналіз використання фінансових деривативів для управління ризиками в умовах нестабільності на фінансових ринках**

**Ганна Ткачук**

Кандидат економічних наук

Державний університет «Житомирська політехніка»

10005, вул. Чуднівська, 103, м. Житомир, Україна

<https://orcid.org/0000-0001-6188-3028>

**Ігор Бурачек**

Кандидат економічних наук

Державний університет «Житомирська політехніка»

10005, вул. Чуднівська, 103, м. Житомир, Україна

<https://orcid.org/0000-0003-0549-6917>

**Володимир Виговський**

Кандидат економічних наук

Державний університет «Житомирська політехніка»

10005, вул. Чуднівська, 103, м. Житомир, Україна

<https://orcid.org/0000-0001-5642-0774>

**Анжеліна Сотник**

Кандидат економічних наук

Державний університет «Житомирська політехніка»

10005, вул. Чуднівська, 103, м. Житомир, Україна

<https://orcid.org/0000-0002-0217-988X>

**Ірина Царук**

Кандидат економічних наук

Державний університет «Житомирська політехніка»

10005, вул. Чуднівська, 103, м. Житомир, Україна

<https://orcid.org/0000-0002-9628-3257>

---

**Анотація.** Дане дослідження направлене на аналіз можливостей та ефективності застосування фінансових деривативів як інструментів для хеджування та мінімізації ризиків на фінансових ринках. Методологія дослідження включала класифікацію фінансових деривативів за різними критеріями, зокрема за їхньою структурою та базовими активами. Визначено основні типи деривативів: ф'ючерси, форварди, опціони та свопи, що використовуються для хеджування ризиків на ринках товарів і фінансових інструментів. Результати дослідження свідчать про те, що фінансові деривативи займають важливу роль у зниженні впливу негативних змін на ринку, відкриваючи нові можливості для інвесторів та компаній у контексті хеджування, спекуляцій і арбітражу. Визначено, що еволюція фінансових деривативів значною мірою була зумовлена необхідністю адаптації до постійно змінюваних умов ринку, особливо під час криз і періодів волатильності. Робота також досліджує вплив фінансових технологій (fintech) і блокчейн-технологій на ринок деривативів, підкреслюючи важливість автоматизації та підвищення прозорості угод. Відзначено, що останніми роками ринок деривативів зазнав значних змін через впровадження нових технологій, які поліпшили доступність та швидкість торгівлі. Окрему увагу приділено аналізу українського ринку деривативів, де економічна та політична нестабільність створює потребу в ефективному управлінні ризиками. Окремим елементом дослідження була розробка моделі ефективного використання фінансових деривативів для управління ризиками на прикладі Kernel. Модель включала етапи оцінки ризиків, вибору відповідних фінансових інструментів, а також здійснення моніторингу та коригування стратегій. Висновки дослідження підкреслюють, що ринок деривативів в Україні ще перебуває на етапі розвитку, що пов'язано з обмеженим розумінням цих інструментів серед учасників ринку.

**Ключові слова:** хеджування; валютні коливання; блокчейн; економічна стабільність; процентні ставки

---