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Trading in Derivative Financial Instruments in Agribusiness: A Development Vector under Military Instability and Integration into the European Economic Space

Abstract. Introduction. The article examines the directions of development of trading in derivative financial instruments in agribusiness under the influence of military challenges, structural transformation of the agricultural sector, and integration of the national market into the European Economic Space. It has been established that Russia's full-scale military aggression against Ukraine has intensified the use of futures contracts, forwards, options, currency and interest rate swaps as instruments for hedging price, currency, credit, and operational risks.

Purpose. The purpose of the study is to investigate the directions of development of trading in derivative financial instruments in agribusiness as a factor in increasing the sustainability of agricultural entities and integrating the national market into the European economic space.

Results. The current state of the use of derivative financial instruments in agribusiness is analyzed and the directions of their application in the production of grain, oilseeds, sugar beets and export activities are determined. It is substantiated that under modern conditions, derivatives are no longer simply instruments of stock speculation, but are transformed into a strategic mechanism for managing the financial risks of agricultural enterprises, ensuring income stabilization and increasing the investment attractiveness of agribusiness. The state of the use of derivative financial instruments in agribusiness is analyzed and the directions of their application in the production of grain, oilseeds, sugar beets and export are determined. It is proven that trading in derivative financial instruments in Ukraine is significantly inferior to the level of development of the markets of EU countries, the effectiveness of which is constrained by the low liquidity of the exchange segment, a limited range of standardized derivative contracts and the lack of a comprehensive state policy for the development of an organized futures market.

Conclusions. It is substantiated that derivatives are transformed into a strategic mechanism for managing financial risks of agribusiness entities, ensuring income stabilization and increasing the investment attractiveness of agribusiness. It is proven that commodity derivatives on grain crops, integrated with international exchange platforms, in particular the Euronext markets, have the potential for development. A model for using derivative financial instruments in agribusiness is proposed based on deepening cooperation with EU financial institutions, developing digital trading platforms, improving institutional infrastructure and mechanisms for guaranteeing exchange transactions. In-value trading in agricultural derivatives is able to ensure the financial stability of agribusiness entities in the process of post-war recovery.

Keywords: derivative financial instruments, agribusiness, futures, forwards, options, hedging, financial risks, exchange trading, agricultural market.

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Торгівля похідними фінансовими інструментами в агробізнесі: вектор розвитку в умовах воєнної нестабільності та інтеграції до європейського економічного простору

Анотація. У статті досліджено напрями розвитку торгівлі похідними фінансовими інструментами в агробізнесі під впливом воєнних викликів, структурної трансформації аграрного сектору та інтеграції національного ринку до європейського фінансового простору. Встановлено, що повномасштабна військова агресія проти України суттєво посилила рівень ризиковості функціонування агробізнесу через руйнування логістичних маршрутів, блокування морських портів, зростання валютної нестабільності, коливання світових цін на зернові культури та збільшення вартості виробничих ресурсів, що сприяло суттєвому використанню ф'ючерсних контрактів, форвардів, опціонів, валютних та процентних свопів як інструментів хеджування цінкових, валютних, кредитних та операційних ризиків. Проведено аналіз стану використання похідних фінансових інструментів в агробізнесі, визначено на-прями їх застосування у виробництві зернових, олійних культур, цукрового буряку та експорту. Доведено, що торгівля похідними фінансовими інструментами в Україні істотно поступається рівнем розвитку ринків країн ЄС, ефективність яких стримується низькою ліквідністю біржового сегмента, обмеженим спектром стандартизованих похідних конт-рактів та відсутністю комплексної державної політики щодо розвитку організованого строкового ринку. Обґрунтовано, що деривативи трансформуються у стратегічний механізм управління фінансовими ризиками суб'єктів агробізнесу, забезпечуючи стабілізацію доходів та підвищення інвестиційної привабливості агробізнесу. Доведено, що потенціал розвитку мають товарні деривативи на зернові культури, інтегровані з міжнародними біржовими платформами, зокрема ринками Euronext. Запропоновано модель використання похідних фінансових

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інструментів в агробізнесі на основі поглиблення співпраці з фінансовими інституціями ЄС, розвитку цифрових торговельних платформ, удосконалення інституційної інфраструктури та механізмів гарантування біржових операцій. Повноцінна торгівля аграрними деривативами спроможна забезпечити фінансову стійкість суб'єктів агробізнесу в процесі повоєнного відновлення.

Ключові слова: похідні фінансові інструменти, агробізнес, ф'ючерси, форварди, опіони, хеджування, фінансові ризики, біржова торгівля, аграрний ринок.

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Formulation of the problem. Over the past decade, the agricultural sector of Ukraine has been under the influence of a set of systemic risks that significantly change the traditional model of agribusiness functioning. Before the start of the full-scale war, the main challenges for agribusiness entities were the instability of world prices for food products, currency fluctuations, dependence on imported material and technical resources, and insufficient development of financial infrastructure. After 2022, the risk environment has become significantly more complicated due to the destruction of production infrastructure, the loss of part of the land potential, restrictions on export opportunities, and increasing uncertainty about future incomes of enterprises.

The problem of price risk management is becoming particularly relevant, since Ukraine is one of the world's leading producers and exporters of grain crops, however, the significant dependence of agribusiness entities on the situation in world markets creates a high level of financial instability. Fluctuations in prices for wheat, corn, sunflower, and their processed products directly affect the profitability of producers, the ability to attract credit resources, and the fulfillment of contractual obligations.

In such conditions, derivative financial instruments form a new architecture of agribusiness risk management. Futures and option contracts allow enterprises to fix the future sales price of products, currency derivatives – to reduce the risks of export operations, and interest rate swaps – to optimize the cost of attracted financing. At the same time, the Ukrainian derivatives market remains underdeveloped compared to EU countries. Therefore, the formation of an effective system of trading in derivative financial instruments in Ukrainian agribusiness is a strategic task that should ensure not only the minimization of risks of individual enterprises, but also an increase in the competitiveness of the agricultural sector in the context of European integration.

Analysis of recent research and publications. The issue of using derivative financial instruments in agribusiness is actively studied by foreign and Ukrainian scientists. Modern research mainly focuses on issues of hedging commodity risks, development of exchange infrastructure and financial stability of agricultural enterprises and integration of derivatives markets. I. Grabynska, M. Kosarchin and A. Dombrovska investigated the processes of financialization of agricultural commodity markets and justified the need to develop a grain futures market in Ukraine. The authors

proved that the use of derivatives allows reducing the impact of price volatility and increasing the efficiency of income management of grain producers [13]. M. Dykha and V. Dykha studied the mechanisms of hedging risks in the agricultural and energy markets of Ukraine. Scientists proposed a systematization of price risk management instruments and determined the role of derivatives in ensuring the stability of enterprises' activities [1].

N. Prikazyuk, D. Stelmakh and I. Didenko investigated the problem of currency risk in the grain sector of Ukraine. The authors proposed the use of currency derivatives to protect the export operations of agricultural enterprises and reduce the impact of exchange rate instability [5]. N. Branger, M. Hanke and A. Weissensteiner investigated the informational role of futures and options contracts for wheat in the context of the Russian-Ukrainian war. It was found that the prices of derivatives reflect the expectations of market participants regarding geopolitical risks and future volatility of agricultural goods [6]. W.-X. Zhou, Y.-S. Dai, K. Duong and P.-F. Dai investigated the mechanisms of risk transfer between futures and spot agricultural markets after the beginning of the Russian-Ukrainian conflict. The authors proved the strengthening of extreme risk relationships between grain markets [16]. M. Krasnova investigated the possibilities of expanding the use of derivatives in the risk management system of Ukraine, proposing an algorithm for integrating derivatives into the corporate risk management environment [2].

Despite significant scientific achievements in the field of the functioning of the derivatives market, financial risk management and the development of the agricultural sector, a number of theoretical and applied aspects remain insufficiently researched. Most scientific works are devoted to general issues of the functioning of the derivatives market, the features of their use in international markets or individual aspects of hedging price risks. At the same time, the specifics of the use of derivatives in agribusiness in conditions of military instability and deepening integration processes with the European Union are covered fragmentarily.

Formulation of research goals. The purpose of the study is to investigate the directions of development of trading in derivative financial instruments in agribusiness as a factor in increasing the sustainability of agricultural entities and integrating the national market into the European economic space.

To achieve this overarching aim, the study sets the following specific objectives:

- to analyze the current state and dynamics of renewable energy use in agriculture in Ukraine and globally, with emphasis on the potential of solar, wind, biogas, and biomass technologies;
- to identify the key environmental, economic, legal and technological factors that influence the adoption of renewable energy in rural regions;
- to examine successful European Union practices and policy frameworks for promoting renewable energy in the agricultural sector, considering their applicability in Ukraine;
- to assess the role of renewable energy in enhancing rural development, food security and energy independence, particularly in the context of climate change;

- to develop strategic recommendations for improving national energy policy, institutional support, and investment mechanisms aimed at stimulating the green energy transition in agriculture.

By achieving these goals, the research will contribute to the development of a scientifically grounded vision for Ukraine's agricultural transformation that is aligned with EU environmental and energy strategies.

Presentation of the main research material. The Ukrainian derivatives market has historically been characterized by a low level of development compared to EU countries. The main part of the operations was carried out in the form of bilateral forward contracts between agricultural producers and traders. The most common derivative instruments in the Ukrainian agricultural sector are given in Table 1.

Table 1 Main derivative financial instruments of Ukrainian agribusiness and their role in the risk management system

Type of instrument	Economic characteristics	Hedged risks	Scope of application in agribusiness	Market participants
Forward contracts	Over-the-counter agreements for the purchase or sale of agricultural products in the future at a fixed price	Price, credit	Sale of grains, oilseeds, sugar beets, rapeseed	Agricultural producers, grain traders, agricultural holdings, banks, international financial organizations
Futures contracts	Standardized exchange contracts for the delivery or purchase of an underlying asset in the future Price	Price	Export of grain crops, oilseeds, sunflower oil, corn, wheat	Agricultural holdings, exporters, investment companies, brokers
Options	Contracts that give the right (but not the obligation) to buy or sell an asset at a specified price	Price, currency	Large agricultural export operations	Agricultural holdings, banks, international traders
Currency swaps	Agreements for the exchange of currency flows between the parties	Currency	Export-import operations, servicing currency loans	Banks, agricultural holdings, exporters
Interest rate swaps	Contracts for the exchange of interest payments on credit resources Interest rate	Interest rate	Investment lending, modernization of production	Banks, international financial institutions, large agricultural holdings
Weather derivatives	Financial contracts whose profitability depends on whether indicators (temperature, precipitation, humidity, etc.)	Climatic, production	Crop growing, horticulture, vegetable growing	Insurance companies, agricultural enterprises, international financial institutions

Source: summarized by the author based on data [3; 4; 11; 7; 9; 14; 15; 14]

Trading in derivative financial instruments in Ukrainian agribusiness in 2018-2024 was characterized by a complex risk management system, which includes international exchange mechanisms, digital trading platforms and structured finance instruments.

Until 2022, the main driver of the use of derivatives was the export activity of large agricultural holdings, which used forward contracts to attract working capital and fix the future sales price of products. After the start

of a full-scale war, the role of derivatives expanded significantly, as they became one of the mechanisms for compensating for uncertainty associated with the blocking of logistics routes, currency fluctuations and instability of global commodity markets. The study found that the total volume of transactions with derivative financial instruments related to agricultural products increased from UAH 32.4 billion in 2018 to UAH 75.4 billion in 2024, i.e. 2.3 times (Table 2).

Table 2 Dynamics of the use of derivative financial instruments in Ukrainian agribusiness in 2018-2024

Year	Volume of transactions with agricultural derivatives, UAH billion	Share of forwards, %	Share of futures, %	Share of currency derivatives, %	Main influencing factors
2018	32,4	71,5	14,2	14,3	development of export contracts
2019	35,8	69,8	15,6	14,6	stabilization of grain exports
2020	38,6	67,4	16,8	15,8	pandemic instability
2021	45,9	63,2	19,5	17,3	rising world prices
2022	54,7	72,6	12,4	15,0	war risks, port blockade
2023	66,8	60,7	21,4	17,9	development of alternative logistics
2024	75,4	55,8	25,6	18,6	integration with international markets and adaptation to EU standards

Source: summarized by the author based on data [3; 4; 11; 7; 9]

The results of the study indicate a gradual structural reformatting of trading in derivative financial instruments in agribusiness. In 2018, forward contracts dominated (over 70% of all transactions), in 2024 their share decreased to 55.8%, while the role of standardized exchange instruments increased. This trend is natural, since Ukraine's integration into the European economic space requires a transition from local contract mechanisms to transparent exchange systems with centralized clearing and collateral management.

In 2022-2025, forward contracts were used for pre-export financing, provided predictability of income and were actively used with the support of the EBRD, IFC and international traders. For futures contracts, Ukrainian companies mainly use the international exchanges CME group and Euronext to hedge export contracts and minimize the risk of falling world prices [3; 4; 11; 7; 9].

Options were used mainly by large exporters to insure against adverse changes in market prices with the possibility of benefiting from favorable conditions. Currency swaps were used to reduce currency risks during the implementation of export contracts and servicing credit obligations in foreign currency, interest rate swaps were used mainly by large agricultural companies to stabilize the cost of long-term financing and reduce the risk of increasing interest rates. Weather derivatives are practically not used in Ukraine, but have significant development potential in conditions of climate change and increasing weather risks [3; 4; 11; 7; 9].

It should be noted that the grain sector is the most active segment of derivatives use. Ukrainian producers use wheat and corn futures, as well as put options and underlying contracts. The main reasons for their use are high dependence on international quotations, seasonality of production, significant costs until the harvest, the need to attract credit resources. Approximately 45-50% of large grain exporters use at

least one type of derivative instrument for risk management [3; 4; 11; 7; 9].

Ukraine is one of the key global exporters of sunflower oil. For agribusiness entities in this segment, the most relevant are commodity futures, currency forwards, and raw material price swaps, and their peculiarity is that the producer's risk is formed not only by the price of finished products, but also by the ratio between the selling price of oil, sunflower purchases, and the total costs of processing and logistics of products. Therefore, large processing enterprises use complex hedging of production margins [12; 8; 9].

In livestock farming, the use of derivatives is still limited, but has significant potential. Futures for feed, currency swaps, and weather derivatives are promising and are especially relevant for milk producers, poultry farms, and feed manufacturers. However, the main problem of their use in the industry is the lack of standardization of contracts and low liquidity of this segment [10].

Ukraine's European integration creates the prerequisites for a qualitative transformation of agricultural derivatives trading and the main strategic directions are: 1) integration with European exchange platforms Euronext Commodity Markets, European Energy Exchange, international clearing systems, which will increase liquidity, ensure transparent pricing, and attract international investors; 2) creation of a Ukrainian center for agricultural derivatives by implementing a specialized infrastructure – the "Ukrainian Agricultural Derivatives Hub", the functions of which should be standardization of contracts, clearing of transactions, guaranteeing the execution of agreements, digitalization of trades, and training of market participants; 3) use of guaranteed EU financial programs, EBRD financial instruments, export support programs, and military risk insurance mechanisms.

Based on the conducted research, strategic directions for the development of trading in derivative financial instruments in agribusiness in Ukraine have been identified, the implementation of which will contribute to the formation of an effective risk management system, increasing the financial stability of agribusiness entities and integrating the national market into the European economic space:

- Creation of a national exchange market for agricultural derivatives. The formation of a full-fledged organized exchange market for agricultural derivatives is a basic prerequisite for the development of a modern risk management system in agribusiness. Its creation involves the development of specialized trading platforms for concluding standardized futures and options contracts for the main types of agricultural products, in particular grains, oilseeds, sugar beets and other strategic agricultural assets. The functioning of such a market will ensure transparent pricing, increase the liquidity of operations, expand the capabilities of agricultural enterprises to insure price risks and reduce dependence on the instability of world commodity markets;

- Development of electronic platforms for trading in derivative financial instruments. Digitalization of the processes of concluding and executing transactions with derivatives is an important direction of modernization of the agricultural financial market. The introduction of modern electronic platforms will ensure prompt access of producers, traders, financial institutions and investors to the exchange infrastructure increase the speed of concluding transactions and reduce transaction costs. The use of digital technologies, electronic document management, Blockchain solutions and automated clearing systems will contribute to increasing the transparency of operations and building trust between market participants;

- Introduction of standardized contracts for Ukrainian agricultural assets. The development of the derivatives market requires the formation of a unified system of standard contracts adapted to the specifics of Ukrainian agricultural production. Such contracts should take into account the specifics of domestic products, quality characteristics, delivery terms, base prices and settlement mechanisms. Standardization will increase the attractiveness of Ukrainian agricultural derivatives for international investors, ensure their compatibility with European exchange-traded instruments, and facilitate Ukraine's inclusion in the global commodity risk management system;

- Formation of a system for guaranteeing derivatives transactions. The effective functioning of the derivatives market is impossible without the creation of a reliable counterparty risk management system. In this context, it is necessary to develop a central counterparty, clearing mechanisms, a margin provision system, and funds to guarantee the performance of exchange contracts. The introduction of such instruments will reduce the risk of

default, increase the confidence of market participants, and bring the Ukrainian derivatives infrastructure closer to European Union standards.

Thus, the implementation of the proposed strategic directions will allow Ukraine to form a modern institutional mechanism for the functioning of the derivatives market, which will become an important element of the financial security of agribusiness entities, increasing their adaptability to market instability, and integrating Ukrainian agribusiness into the European economic space.

Conclusions. The conducted research allowed forming a comprehensive vision of the role of derivative financial instruments in ensuring the financial stability of Ukrainian agribusiness in the conditions of military instability and European integration. The current stage of development of the agricultural sector is characterized by a qualitative transformation of the risk environment, when traditional mechanisms for managing uncertainty (insurance, reserving, and diversification of production) no longer provide a sufficient level of protection of the economic interests of agribusiness entities. Full-scale military aggression against Ukraine significantly increased the complexity of the risks of agricultural production, creating new challenges associated with the disruption of logistics chains, restrictions on export opportunities, fluctuations in world prices for agricultural products, currency instability and an increase in the cost of financial resources. In such conditions, derivative financial instruments acquire not only operational, but also strategic importance, as they provide the ability to forecast future cash flows, reduce income volatility and increase the investment attractiveness of agribusiness entities.

The most developed area of use of derivatives remains the grain sector, where the main instruments are forward contracts, wheat and corn futures, as well as put options. This is explained by the high export orientation of the industry, dependence on international quotations and significant seasonality of production. At the same time, a promising area is the expansion of the use of derivatives in the oil and fat complex, sugar production and livestock.

Further development of trading in derivative financial instruments in Ukraine should be carried out on the basis of deepening cooperation with European financial institutions and integration into the international exchange infrastructure. The main areas should be: adaptation of Ukrainian legislation to European standards for regulating the derivatives market; creation of a national clearing system and guaranteeing the execution of exchange contracts; development of digital platforms for trading in agricultural derivatives; involvement of support mechanisms of the EU, EBRD and international financial organizations; formation of a system for training agricultural market participants in the use of hedging instruments.

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