

**Primary Sector Economics**

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**THE REVALUATION POTENTIAL
OF UKRAINIAN AGRICULTURAL EXPORTS
IN THE CONTEXT OF MARTIAL LAW
AND POST-WAR RECOVERY**

Abstract

The paper highlights the immediate and delayed impact of certain factors on the exchange rate dynamics in Ukraine. It is proved that exports of food products and raw materials for their production can significantly strengthen the national currency in the long run. Continuous growth in food exports helps to slow down exchange rate appreciation, which ultimately leads to a stronger national currency. Thus, a strategy of focusing on increasing food exports can play an important role in strengthening the Ukrainian currency in the long run, having a positive impact on exchange rate dynamics and contributing to overall economic stability. The study reveals the understanding of the complex relationship between war, food security, and economic stability. Furthermore, the analysis adds a new dimension to the debate on the strategic importance of the agricultural sector for foreign exchange reserves and foreign exchange accumulation. Understanding the relationship between export volumes, world prices, and exchange rate fluctua-

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tions can help to better predict and manage currency fluctuations and to determine the extent to which Ukraine's revolving fund capacity can be built.

Key Words:

agricultural exports; revaluation potential; exchange rate; export potential; global food security; export restrictions.

JEL: Q17; F31; O24.

5 figures, 6 tables, 24 references.

Problem Statement and Literature Review

Over the years of its independence, Ukraine has established itself as a country whose development is driven by the agricultural sector of the economy. This is especially true for the export of agricultural products, which forms a foreign exchange channel for replenishing the country's balance of payments. However, Russia's military aggression has made its own adjustments to the formation of the country's export component from the perspective of the agricultural sector.

Before the Russian-Ukrainian war, the parties to the conflict were the largest producers of agricultural products and food in the world. Before the invasion, 55% of Ukraine's territory was used for agriculture. In this extremely fertile country, agriculture employed 14 percent of the population and accounted for 45 percent – or \$22.2 billion – of its export earnings (ITA, 2023). Furthermore, Ukraine is now one of the most food secure countries in the world, despite being one of the world's largest exporters of crops such as corn, barley, and wheat before the war.

Russia's military aggression against Ukraine is aimed at destroying the Ukrainian economy, in particular the agricultural sector, with the aim of causing panic in the global grain market, as before the war, Ukraine was considered one of the world's largest exporters of agricultural products. Foreign exchange earnings from grain exports are used by the monetary regulator to support the national

currency, finance the technical re-equipment of agricultural producers and improve the socio-economic situation of workers. This is the process of ensuring the currency security of the national economy.

Today, the importance of increasing the volume of agricultural exports is also due to the fact that there is an urgent need to restore agricultural areas and cover losses from the full-scale invasion of Russia. According to estimates by the KSE (2024), as of February 2024, losses and damages in the agricultural sector amounted to USD 80 billion. In particular: the total value of destroyed assets amounted to USD 10.3 billion; losses, including shortages of goods and services. The losses, including lost income of agricultural producers and increased production costs, amounted to USD 69.8 billion. These losses amounted to USD 69.8 billion and almost doubled compared to 2023. Total reconstruction and rehabilitation need over the next 10 years amount to USD 56 billion. Priority needs for 2024 amount to USD 435 million. Most of these needs have already been covered by donor funding.

The main problems that require transformation of the export mechanism of agricultural products include restoration of sown areas and soil conditions, solving logistics issues, resolving issues related to the raw material component of agricultural exports, and reducing the industry's import dependence.

The study of various aspects of the interdependence of exchange rate changes and exports of agricultural products and raw materials is in the field of view of both economists and practitioners. For instance, in the Kassouri & Altıntaş (2020) article, the authors study the impact of terms of trade shocks on the real effective exchange rate for 23 commodity exporting countries in Africa. The overall conclusion is the necessity to compensate for the loss of external competitiveness associated with real exchange rate appreciation by coordinating monetary and fiscal policies to effectively absorb the huge additional foreign exchange reserves and ensure an equilibrium exchange rate level that will bring macroeconomic stability to commodity exporting countries.

The article by Iyer (2020) analyses the situations with the most appropriate choice of exchange rate regime in agricultural exporting countries. It is proved that the advantage of exchange rate flexibility depends on the degree of development of labour and product markets. Given the low level of development of labour and product markets in most agricultural exporting countries, exchange rate targeting is advisable in developing agricultural countries.

The impact of real exchange rate shocks on processed agricultural exports in Turkey was studied by Çınar et al. (2015). Using a vector autoregression model, the authors proved an existing significance of relationship between real exchange rates and exports of processed agricultural products.

A separate scientific contribution on the raised issue concerns the impact of the Russian-Ukrainian conflict on food security. Kozielc et al. (2019) analysed

the impact of this war on food security in the Middle East and North Africa (MENA) region. Since Ukraine is recognized as one of the world's largest grain producers and exporters, the conflict is seen as a serious challenge for the countries of the MENA, which are heavily dependent on grain imports from Ukraine. In this context, the paper emphasizes the importance of global food supply chain linkages and their impact on regional food security. The study highlights how these disruptions have affected global supply chains, prices and availability of agricultural products, with a particular focus on the MENA region's food security challenges, exacerbated by conflict, climate change and import dependence. The study concludes that the MENA region's growing dependence on food imports, coupled with climate and political fluctuations, underscores its increasing vulnerability to disruptions in global supply chains and the need for robust strategies to address these challenges.

An undoubted scientific contribution is the issue raised in the scientific article by Radionova et al. (2022), in which the authors of the article found that global food security is under threat from the Russian-Ukrainian war. Due to the fact that the parties to the conflict are the world's largest grain exporters, there is a risk of a deepening global food crisis. The authors of the article argue that in order to avoid the catastrophic consequences of this crisis for Ukraine and the world, countries need to take a number of measures, namely: «ensure transparency of the agricultural market and global financing of food imports; refrain from imposing export restrictions; find alternative suppliers for states that are dependent on Ukrainian and Russian agricultural products» (Radionova et al., 2022). In this context, a study conducted by Herasymchuk (2023) is noteworthy, as he identified challenges and threats to the agricultural sector in Ukraine, «...lack of access to land, loss of access to water resources, increased production costs and risk to agricultural security». Author identifies the need to form comprehensive economic security measures for agriculture through the development of key areas, such as investment and credit support for domestic farmers, development of export potential and support for farms as essential prerequisites for neutralizing the presented threats.

According to Petryk (2022), «...the foreign exchange market as such is practically absent in Ukraine. The vast majority of currency transactions are non-market transactions. Therefore, it is difficult to hope for a real equilibrium exchange rate under the influence of supply and demand, and exchange rate flexibility will not be able to help price competitiveness much, given the current decline in output and energy as well as logistical constraints».

Therefore, it should be assumed that the revaluation potential of the state depends on ensuring the economic security of the agricultural sector, in particular the development of the export potential of this industry.

The study conducted by Myskiv et al. (2024), who identified strategic directions for the development of agricultural exports under martial law, is noteworthy. The authors emphasize that strategic priorities for the growth of agricultural ex-

ports should be based on the principles of food security, namely, «...development of the food security sector of Ukraine; systematic and integrated, gradual and phased; consideration of the interests of different groups of the population and stakeholders in the process of addressing food security issues; introduction of innovative technologies in production; sustainability and environmental protection; international cooperation; strategic planning; social responsibility and efficient use of natural, financial and human resources».

A critical analysis of the presented studies allowed the author to conclude that the volume of agricultural exports has a greater impact on food security in different territories. If we consider the dilemma of how agricultural exports affect exchange rate fluctuations, it has not been studied enough. Most research papers have focused on the impact of exchange rate changes on the pricing of agricultural exports. Therefore, the authors of the article tried to prove the hypothesis of how agricultural exports affect the exchange rate equilibration as a factor in the formation of Ukraine's revaluation potential, which in turn requires a separate study.

Despite the extension of martial law in Ukraine, agricultural exports remain a key source of replenishment of the country's foreign exchange reserves. Therefore, the introduction by the state of an effective mechanism of financial support for the agricultural sector in terms of increasing agricultural exports is an urgent need from the point of view of forming the revaluation potential in Ukraine. This led to the further **goal of the study**: to develop theoretical and methodological approaches to substantiating the promising areas of export potential of agricultural products as a factor in ensuring the revaluation potential in Ukraine.

Methodology

The objectives of this study are as follows: to identify the main trends in agricultural exports based on the analysis of publications by Ukrainian and foreign scientists; to assess the impact of key factors on the formation of the export potential of agricultural products and its impact on exchange rate formation using economic and mathematical modelling methods; to propose promising areas for increasing agricultural exports as a factor in the formation of the revaluation potential in Ukraine.

In this context, with regard to agricultural exports, attention should be paid to the study by Segal (2023), who believes that one of the main functions of diplomacy and foreign policy between governments is to facilitate economic trade, promoting exports and imports for the benefit of all trading parties. Other scholars (Myskiv et al., 2024) have shown that to stimulate the export potential of agricultural products, it is advisable to take a holistic approach rather than an isolated

one, and to consider all its characteristics. Since export potential is a complex system with interconnected elements, it is important to take into account that the impact on individual elements affects the entire structure.

This study is based on the main findings of previous publications which also examined the impact of a major export commodity on the exchange rate, mainly oil (Das, 2021), electricity (Butt et al., 2024), and gold (Chen et al., 2022) price shocks. In most cases, it is necessary to estimate both short- and long-term impacts, including measuring the speed of convergence of exchange rate deviations to their long-run equilibrium. Such econometric analysis requires cointegration of the series of the dependent and explanatory variables.

To fulfil the purpose of the study and solve the tasks set, both general scientific and special methods of cognition were used, namely: systemic and dialectical approaches in determining the degree of influence of agricultural exports on the formation of the exchange rate; factor analysis in determining the features of the current state of agro-industrial foreign trade; calculation-analytical and coefficient analysis – in studying the main economic indicators of agricultural exports, changes in prices and exchange rates; autoregressive analysis, Dickey-Fuller and Engle-Granger tests – in assessing the impact of various factors of agricultural exports on exchange rate changes; comparative analysis and synthesis – in developing promising directions for improving the mechanism of accumulation of the export potential of agricultural products; logical generalization – in substantiating the conclusions of the article and formulating proposals; tabular and graphical – for visualizing the results. The information basis of the study is made up of scientific publications of both Ukrainian and foreign authors, official materials of the Center for Food and Land Use Research, the National Bank of Ukraine, the Food and Agriculture Organization of the United Nations, Economic Data of the Federal Reserve, the Ministry of Foreign Affairs of Ukraine, electronic publications and Internet resources on the issues.

Research Results

Current state of the export potential of agricultural products in Ukraine

In order to conduct further research, it is necessary to form an empirical basis. First, let us analyse the dynamics and structure of Ukraine's merchandise exports (Table 1).

Table 1

Dynamics and structure of Ukraine's merchandise exports in 2021-2023

Export commodity groups	2021		2022		2023	
	Million U.S. \$	Specific weight, %	Million U.S. \$	Specific weight, %	Million U.S. \$	Specific weight, %
Agricultural products	27 687	43,9	23 380	57,2	22 001	63,4
Mineral products	7 874	12,5	4 109	10,0	2 262	6,5
Chemical substances	3 173	5,0	1 668	4,1	1 329	3,8
Timber and wood products	2 491	3,9	2 118	5,2	1 719	5,0
Industrial goods	946	1,5	569	1,4	557	1,6
Ferrous and non-ferrous metals	15 719	24,9	5 881	14,4	3 888	11,2
Machinery and equipment	3 819	6,1	2 281	5,6	2 150	6,2
Other	1 404	2,2	893	2,2	772	2,2
Sum	63 113	100,0	40 899	100,0	34 678	100,0

Source: Authors' calculations based on (NBU, 2024).

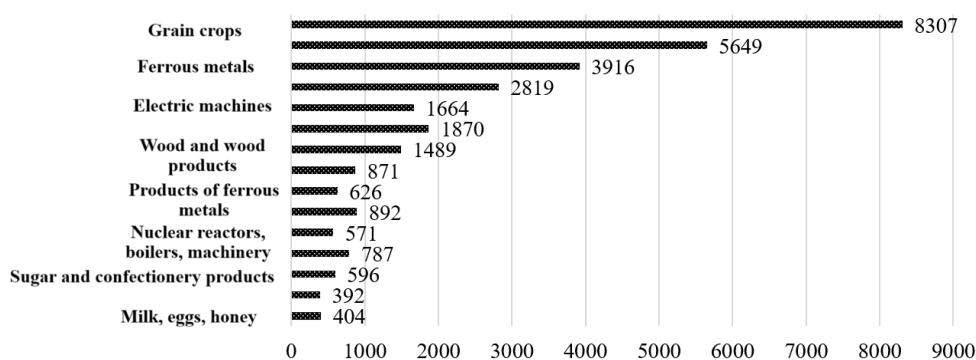
As shown in Table 1, despite the two-year period of martial law, the share of agricultural exports in the structure of total exports from Ukraine has been steadily increasing. Thus, in 2023, agrarian exports accounted for 63.5% of the total structure, which is 19.5% more than in pre-war 2021. As a result, it can be

stated that the agricultural sector of Ukraine has become strategic in terms of replenishing foreign exchange reserves and accumulating foreign exchange.

Considering the top 15 commodity groups in Ukraine's export structure, it should be noted that the volume of exports of agricultural products is five times higher than the export of metallurgical products, although for decades they have been fairly equal channels of foreign exchange to Ukraine. At the same time, grain exports account for the largest share (Figure 1).

Figure 1

TOP 15 commodity groups of Ukraine's exports in 2023, million USD



Source: compiled by the authors according to (SSSU, 2024).

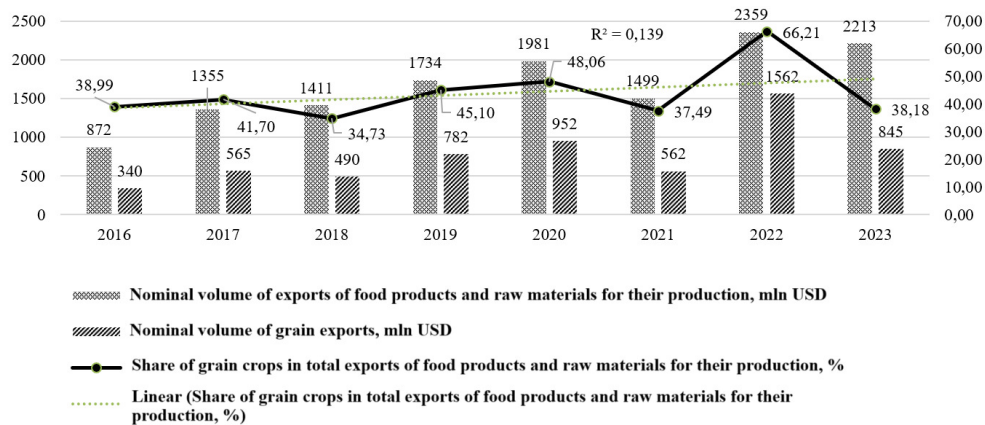
If we consider the share of grain exports in total food exports, we can observe their sufficient share (Fig. 2).

The blockade of the land borders with the European Union, especially on the Polish side, remains one of the main challenges for Ukraine's economy. Exports of agricultural products by trucks account for only 1% of agricultural exports (compared to the summer of 2022, when it exceeded 15%).

When studying the issue of agricultural exports, the price mechanism for exports plays an important role (Figure 3).

Figure 2

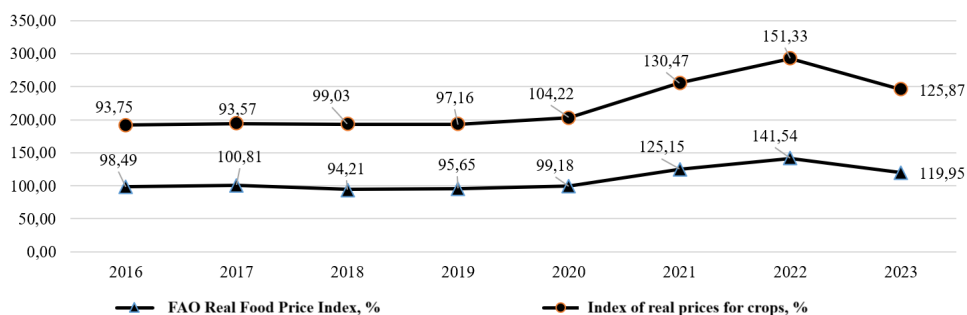
Cereals share dynamics in total exports of food products and raw materials for processing in 2016-2023



Source: compiled by the authors according to (FAO, 2024; FRED, 2024).

Figure 3

Dynamics of FAO price indices for food products and cereals in 2016-2023.



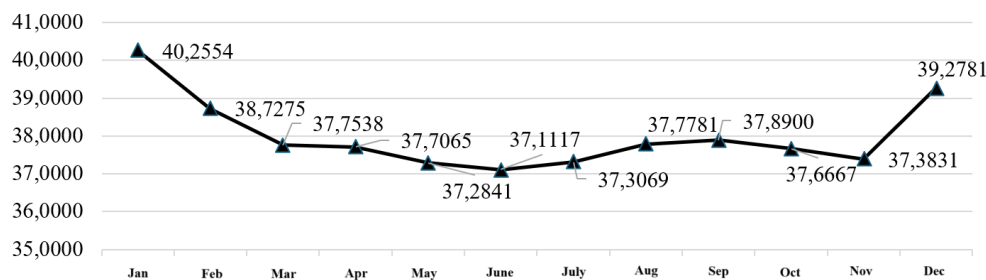
Source: compiled by the authors according to (FAO, 2024).

FAO price indices for food and cereals are an indicator of monthly changes in international prices. We analysed the changes in these indices by determining their weighted average value by year. According to Figure 3, we can observe that the largest increase in these indices occurred in 2022, which indicates disruptions in exports from Ukraine and problems with global food security. Based on the goal of the study, it is advisable to investigate changes in the exchange rate.

Under the pressure of complicated export logistics, there was a decrease in the supply of foreign currency for client transactions, which provoked the devaluation of the national currency to the level of UAH 39.28 per US dollar at the end of 2023 (Fig. 4).

Figure 4

Dynamics of the weighted average hryvnia exchange rate in the cash market in 2023, UAH / USD



Source: compiled by the authors according to (NBU, 2024).

The difference between the official and cash exchange rate of the national currency against the US dollar was observed in March-June 2022. The spread also increased to 28.5% during this period. The NBU's system of measures helped minimize the difference between the official exchange rate and the cash and grey market rates during the first three quarters of 2023. However, the negative information environment, which became a determining factor in the growth of volatility in the cash segment, manifested itself in a weakening of the cash exchange rate and a widening of the spread between the official and gray market rates. In some periods, the spread exceeded 5% yet remained significantly lower than in the fall of 2022.

A set of measures at the beginning of the full-scale Russian invasion and international assistance made it possible to contain the devaluation of the national

currency, stabilize the foreign exchange market, and switch to a regime of managed exchange rate flexibility in October 2023. Given the stable market situation, the NBU continued to ease currency restrictions, updating and refining certain measures.

Assessment of the impact of Ukrainian agricultural exports on exchange rate dynamics

The study of the impact of agricultural exports on exchange rate dynamics requires a rational choice of the initial time series that can optimally represent the economic phenomena being modelled.

Since the methods available to the authors are limited to the first order of integration, the following indicators were chosen as the estimated ones:

- index of the weighted average exchange rate of the hryvnia to the US dollar in the cash market (RATE), calculated as the ratio of the current exchange rate to the rate of the same month last year.
- index of nominal exports of food products and raw materials for their production, deflated for consumer inflation to the United States (FOOD), calculated as the ratio of the current exchange rate to the exchange rate of the same month last year.
- FAO Real Food Price Index (FOODPR), calculated as the ratio of the current exchange rate to the exchange rate of the same month of the previous year.
- the US consumer inflation-deflated nominal exports of cereals (CERL), calculated as the ratio of the current exchange rate to the same month of the previous year.
- FAO Real Grain Price Index (CERLPR), calculated as the ratio of the current exchange rate to the same month of the previous year.

The sample is represented by monthly data from 2015 to 2023. Descriptive statistics of the time series are presented in Table 2.

Table 2 shows that in the period under review, the exchange rate mostly increased by an average of 7% per month. An upward trend was also observed in food exports in general (by 6%) and grain exports in particular (by 9%), although exports of the latter often remained stable (the median value of the series is about 1.0). Global real food and grain prices grew at almost synchronized rates (3.8% and 4%, respectively), although the upward trend in grain prices was more noticeable (2.8%).

Table 2

Descriptive statistics of variable series

Variable	RATE	FOOD	FOODPR	CERL	CERLPR
Average	1,074218	1,058994	1,037842	1,093450	1,040736
Median	1,032227	1,048491	1,008770	1,008933	1,028078
Maximum	1.572567	2,788009	1.383852	2,851636	1,350412
Minimum	0,851611	0,415507	0,771656	0,282381	0,732285
Standard deviation	0,161471	0,308285	0,134240	0,476412	0,138046
Skewness coefficient	1,591976	1,939418	0,526042	1,329607	0,210082
Coefficient of kurtosis	5,228730	12,52678	2,947660	5,908016	2,809696
Harke-Bera test	60,41914	423,2195	4,438484	62,11191	0,851014
Probability	0,000000	0,000000	0,108691	0,000000	0,653438

Source: calculated by the authors based on (NBU, 2024; FAO, 2024; FRED, 2024).

An important step in identifying the long-term relationship between the dependent and explanatory variables is to assess the order of integration of the series using the Dickey-Fuller test (Table 3).

Table 3

Results of testing variables for unit root

Variable	Intersection	Trend	Statistics of ADF test for:		Integration order
			primary level	1st variable	
RATE	+	+	-3,414057***	-5,966447*	I (0)
FOOD	+	–	-5,552371*	-11,83334*	I (0)
FOODPR	+	–	-1,844762	-7,071440*	I (1)
CERL	+	–	-4,443527*	-10,44458*	I (0)
CERLPR	+	–	-1,733083	-8,653702*	I (1)
LN_FOODPR	–	–	-1,795208***	-7,163750*	I (0)
LN_CERLPR	–	–	-1,682116***	-8,675936*	I (0)

Note: *, *** – significant at 1% and 10% significance levels

Source: calculated by the authors based on (NBU, 2024; FAO, 2024; FRED, 2024).

The interpretation of the Dickey-Fuller test, the results of which are presented in Table 3, suggests that the dependent variable and most of the independent variables have the similar order of integration (at the same level). In order to be able to compare the results of modelling the impact of export volumes with the impact of world price dynamics, modified series calculated as natural logarithms of the original values (LN_FOODPR and LN_CERLPR) with the required integration were introduced instead of the corresponding variables FOODPR and CERLPR.

The next stage of the econometric analysis is to determine the existence of long-term cointegration relationships between the explained and explanatory variables, using the Engle-Granger method with automatic specification of lags according to the Schwarz criterion (Table 4).

Table 4

**Results of testing variables for cointegration
(with RATE as the dependent variable)**

Variable	tau-statistics	z- statistics
FOOD	-4.044281*	-23.17401**
LN_FOODPR	-3.202217***	-26.67505*
CERL	-4.053544*	-23.29406**
LN_CERLPR	-3.108087***	-24.25990**

Note: *, **, *** – significant at the 1%, 5% and 10% significance levels

Source: calculated by the authors based on (NBU, 2024; FAO, 2024; FRED, 2024).

The values of the tau- and z-statistics presented in Table 4 are compared with the critical values according to McKinnon. The results of the Engle-Granger test indicate the existence of cointegration between the exchange rate as the dependent variable and all explanatory variables. It is worth noting that the long-term impact of food and grain exports is statistically more significant in terms of cointegration than the impact of world prices for these goods.

To assess the short- and long-term impact of the selected factors on exchange rate dynamics, it is advisable to apply an autoregressive distributed lag (ARDL) model, which, in the presence of cointegration of variables, allows to obtain both a short-term form with an error correction coefficient and a long-term form. To determine the maximum number of dependent lags and independent variables used in the automatic selection of the best ARDL model, a criterion for selecting the order of lags was implemented. The input number of lags, the final forms of ARDL models and their main characteristics are presented in Table 5.

Table 5

Characteristics of the ARDL models of the impact of export volumes and world food and grain prices on the hryvnia exchange rate

Independent variable	Order of lags (p=q)	Selected model (p, q)	R ²	F-statistics	DW criteria	Test of relationships (F-stat.)
FOOD	3	(3, 2)	0.8977	125.8254*	2.1253	6.8172**
LN_FOODPR	8	(8, 8)	0.9483	75.5851*	2.1539	14.2964*
CERL	5	(4, 1)	0.9117	146.3497*	2.2139	7.4221**
LN_CERLPR	4	(3, 2)	0.8918	118.1148*	2.1711	4.9370***

Note: *, **, *** – significant at the 1%, 5% and 10% significance levels

Source: calculated by the authors based on (NBU, 2024; FAO, 2024; FRED, 2024).

The characteristics of the obtained models presented in Table 5 indicate their high adequacy (the coefficient of determination is above 85%), statistical significance of the coefficients (the values of the Fisher's criterion correspond to the 1% level of significance) and the absence of autocorrelation (the Durbin-Watson statistic is close to 2.0). In addition, the results of the frontier test (Pesaran et al., 2001) confirm the existence of long-term cointegration relationships, which allows us to construct short-term and long-term forms of these models. The «half-recovery» period, during which the exchange rate is able to approach its long-run equilibrium value by 50%, is calculated as the ratio of the natural logarithm of $\frac{1}{2}$ to the natural logarithm of the ECT index (Table 6).

The coefficients of the regressors presented in Table 6 give an idea of the immediate and delayed impact of the selected factors on the exchange rate dynamics, which in most cases are multidirectional. For example, the statistically significant direct impact of food exports appears in a month and devalues the hryvnia by 0.04% with an increase in foreign trade by 1%. However, in the long run, exports of food and raw materials for their production significantly strengthen the national currency of Ukraine: each additional percentage point of exports slows the growth of the exchange rate by 0.6%. With this effect, six months is enough to halve the deviation of the exchange rate from its equilibrium value. As for global food prices, their short-term impact is manifested in 3-7 months and is quite controversial. This situation can be explained by the duality of this indicator, which affects not only the value of Ukrainian exports but also the price level in the country, which provokes a devaluation effect through the channel of consumer inflation. This is evidenced by the direct long-term impact of this factor: for every 1% increase in global prices, there is a 0.8% positive exchange rate trend in foreign currencies against the hryvnia. However, the rate at which short-term exchange rate shocks return to their long-term equilibrium is also higher: it takes no more than 3 months to halve deviations.

Table 6

Cointegration forms of the estimated ARDL models of the impact of export volumes and world food and grain prices on the hryvnia exchange rate

Independent variable	Short-term form			Long-term form		Half recovery time
	Lag	Coefficient	ECT	Coefficient	Crossing	
FOOD	0	0.0002	-0.1183*	-0.5620**	1.6700*	6 months
	1	0.0423**				
LN_FOODPR	0	-0.1698	-0.2001*	0.8153*	1.0278*	3 months
	1	-0.3162				
	2	0.2911				
	3	-0.3717***				
	4	0.5671**				
	5	-0.1505				
	6	0.3881***				
7	-0.6054*					
CERL	0	0.0074	-0.1250*	-0.1897***	1.2723*	5 months
LN_CERLPR	0	-0.0175	-	0.9442***	1.0331*	7 months
	1	-0.1157	0.1001**			

Note: *, **, *** – significant at the 1%, 5% and 10% significance levels

Source: calculated by the authors based on (NBU, 2024; FAO, 2024; FRED, 2024)

The estimated model with the volume of grain exports did not reveal statistically significant dynamics in a short time interval. This may indicate the adaptation of the foreign exchange market and the mood of economic agents to the seasonality and rhythm of foreign trade in such goods. However, in the long run, grain exports have a clear appreciation effect: a 10% increase in grain exports can strengthen the national currency by 2%. It will take up to 5 months for the model with grain exports to halve the deviation of the exchange rate from its equilibrium value. The impact of global grain prices generally follows the same pattern as food prices (since it is a component of them), but in the long run it has a significant impact on the devaluation of the hryvnia – in fact, for every percentage point of price growth, there is a percentage point of depreciation. This can be explained by the fact that grains are a component of many processed foods and feeds, the import of which raises domestic prices and significantly accelerates exchange rate dynamics. The speed at which the exchange rate returns to its long-term equilibrium after short-term shocks is slower in this model compared to the others: it takes at least 7 months for the gap to be halved.

**Perspective directions for increasing exports
of agrarian products as a factor in the formation
of Ukraine's revaluation potential
and discussion issues**

As the authors of the article have already shown, exports of agrarian products affect the strengthening of the national currency and the balancing of exchange rate dynamics with a lag of 3 months.

Therefore, we can state the fact that the increase in exports allows monetary regulators to predict changes in the exchange rate with the closest accuracy. However, current circumstances of agricultural business development, a clear and balanced strategy for accumulating export potential is required.

The logistics of agricultural exports remains a problematic issue today. Yangulov & Kulmamadova (2022) suggested that this has limited Ukraine's integration into the international community through international transport corridors. A significant number of agrarian businesses, whose activities are heavily dependent on logistics, have found themselves on the verge of bankruptcy, as it takes a considerable amount of time to establish new supply chains. In this situation, the main programmatic goals of the EU-Ukraine Association Agreement, which envisaged the creation of a free trade area, should be revised or brought to a logical conclusion. This Agreement can play a key role in increasing the export potential of agricultural products and expanding the territorial boundaries of foreign trade in agricultural products. However, attention should be paid to the diversification of exports of domestic farmers, as new problems may arise due to increased competition from Western European agricultural producers.

Emphasis should be placed on government regulation and financial support for the development of priority areas of agricultural business, especially finished products. Since the beginning of the full-scale invasion, the Government of Ukraine has adopted several documents to support and restore the agricultural sector. One of these documents was the Grain from Ukraine program, which is a humanitarian food aid initiative launched by the President of Ukraine on November 26, 2022 (Ministry of Foreign Affairs of Ukraine, 2022). More than 30 countries and international organizations have joined this program and received USD 20 million.

Also in 2022, the Recovery Plan for Ukraine was launched, which contains five main principles: immediate start and gradual development; building equitable prosperity; integration into the EU; rebuilding better than before at the national and regional levels; and stimulating private investment (NCRU, 2022). Regarding the agricultural sector, the section «New Agricultural Policy» defines strategic goals for the next 10 years, including economic transformation of the agro-

industrial complex and development of agricultural infrastructure, promotion of the transition of the agri-food sector to green growth; development of processing capacities, stimulation and development of processing; return and restoration of agricultural land; development of cooperation and organic production, etc.

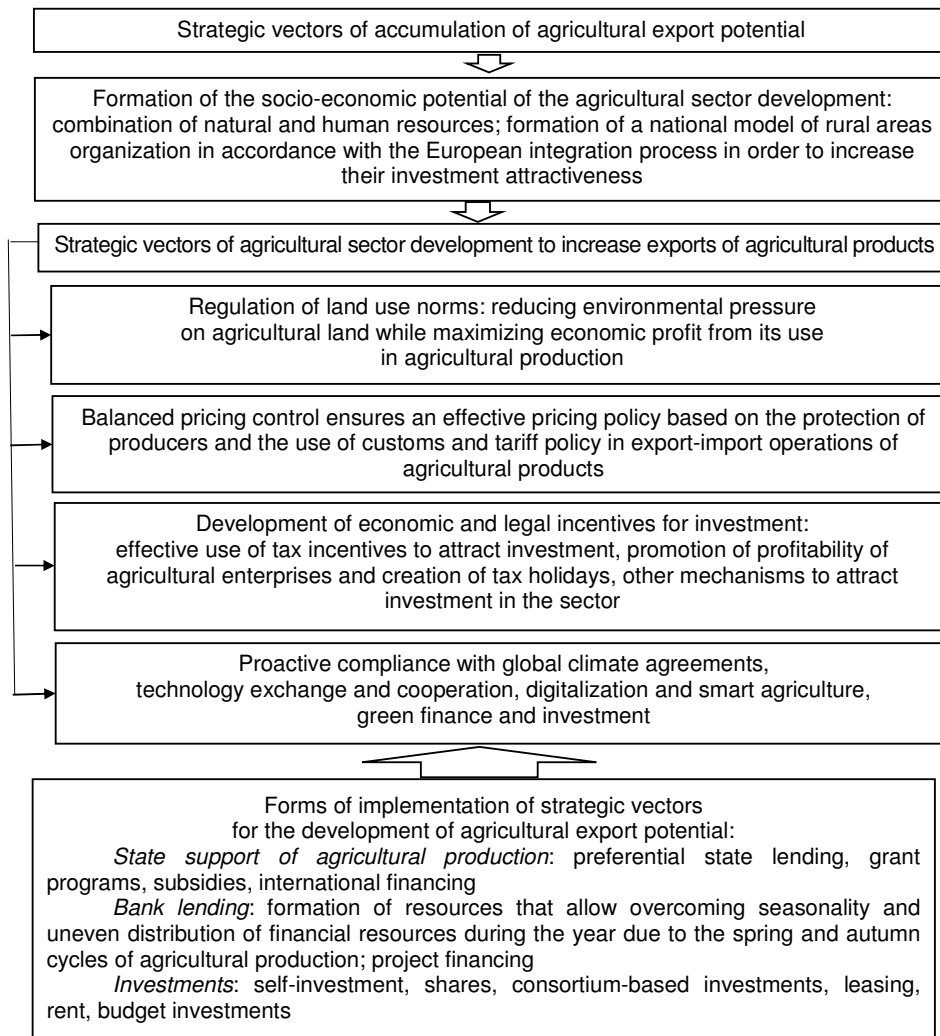
For 2024, key reforms in the field of agrarian and land policy have been identified, namely: adoption of the Strategy for the Development of Agriculture and Rural Areas until 2030; continuation of reforms in the field of agricultural land turnover; development and adoption of the Law on State Support for the Agricultural Sector; reform of the State Agrarian Register; development and adoption of the Irrigation Development Strategy until 2030; development and adoption of the Mine Action Strategy; European integration in the field of plant protection and security. Ukraine has determined grant support for the agricultural sector for 2024. Under the government's «eRobota» (Job) program, grants have been launched for starting a business, setting up a greenhouse, gardening, processing products, and for veterans and their families. With the support of USAID AGRO: a grant program for obtaining services for certification of organic producers, export control, laboratory testing and issuance of export certificates; a grant for the development of grain processing, drying and storage; grants for co-financing of pig breeding projects in Ukraine; grants for co-financing of modernization of reclamation infrastructure of water user organizations; an export-oriented program for processing of grains, oilseeds and legumes; complex instruments of mixed financing from the Embassy of the United States of America in Ukraine. Other grant programs include a grant to support export potential and innovative ideas (EU4Business); a program to support modular grain storage facilities, grant support for small agricultural producers and producers of products with geographical indications (FASH and the EU); SEED education grant, which helps small and medium-sized companies scale their business and take it to the next level (UN Global Compact, PepsiCo Foundation); grants for the development and implementation of food technologies EIT Food within EU Horizon Europe (EIT Food, EU) (KSE, 2024).

Undoubtedly, all these initiatives require an effective mechanism of investment and credit support for the development of the agricultural sector of the national economy. In a previous study (Kovalenko et al., 2023), the authors identified the main components of the system of credit and investment support for the agricultural sector, including the subjects and objects of this process and forms of credit and investment support.

The study of the presented documents makes it possible to formulate strategic vectors for the development of the economy agrarian sector in terms of accumulating export potential (Fig. 5).

Figure 5

Strategic vectors of agricultural export potential development and forms of their realization



Source: developed by the authors based on the materials of (Kovalenko et al., 2023; Krysovaty, 2024; Myskiv et al., 2024)

Prospects for further research are to identify the main directions for implementing the concept of sustainable development in Ukraine through the development and restoration of the agricultural sector as a locomotive of foreign exchange earnings from agricultural exports. According to the authors, careful consideration should be given to the adoption of a mechanism for implementing «green banking». This issue has been partially studied in a scientific publication (Lutsiv et al., 2024; Naumenkova & Mishchenko, 2024). These scholars emphasize that «green banking» in practice is a bank management strategy aimed at minimizing the negative impact on the environment and efficient use of resources in the bank's daily operations. This strategy also includes the provision of credit resources to support environmental projects, the production of green technologies, and the creation and sale of environmental goods, products, and services. This concept lays down all the prerequisites for its implementation in the agricultural sector of the national economy. However, in Ukraine, it is more focused on energy and heat saving. The main tools of the green banking implementation mechanism include: biobanking, green investments, green insurance, green mortgages, debt securities, securitization and green bonds, partial loan guarantees for green projects, green credit swaps, etc.

Other issues that need to be addressed, include harmonization of legislation with EU legislation in the field of agriculture and rural development; completion of the National Strategy for the Development of Agriculture and Rural Areas for 2023-2030; monitoring and registration of farms in the State Agrarian Register and its use for financial support of agricultural producers.

Additionally, one should consider preparation for the establishment of payment agencies and farm accounting systems in accordance with EU requirements.

Conclusions

The research shows that exports of agricultural goods and food can strengthen the national currency in the long run through several mechanisms.

Firstly, such exports contribute to the formation of a positive trade balance, which leads to an increase in foreign exchange reserves and maintains the stability of the national currency.

Secondly, agricultural exports can increase economic stability and growth by generating revenues and stimulating agribusiness, which in turn can attract foreign investment, further strengthening the national currency.

The paper clarifies how food and grain exports affect exchange. The econometric analysis determines the long run cointegration relationships between the explanatory and explanatory variables related to export volumes and the dynamics of world food and grain prices with the hryvnia exchange rate. The study

showed that the long-term impact of food and grain exports on the exchange rate is statistically more significant than the impact of world prices for these commodities. The ARDL models proved the short- and long-term impact of the selected factors on the exchange rate dynamics, which is manifested through the immediate impact of a 1% increase in food exports on the devaluation of the hryvnia by 0.04%. In particular, in the long-run effects, each additional percentage point of food exports actually works to slow the exchange rate appreciation by 0.6%. These results are crucial for maintaining a stable economic environment and enhancing Ukraine's overall exchange rate security. Prospects for further research lie in the area of «green banking» as a promising tool for intensifying agricultural production with additional lending opportunities.

Another promising area of research is the harmonization of legislation within the framework of Ukraine's integration into the EU, mainly in terms of compliance with the legal framework for agribusiness and rural development.

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