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Challenges and opportunities for the development of Ukrainian agriculture in the context of EU enlargement

Comprehensive assessment of challenges facing Ukraine on its path towards EU accession must inevitably include identification of those faced by the Ukrainian agricultural sector. Here, it is necessary to adapt to the rules, norms, and standards of the European Union, especially in the cases of the Common Agricultural Policy and the European Green Deal, as well as to identify ways to expand mutually beneficial cooperation between all connected parties within agricultural value chains. Analysis of Ukraine's Input-Output tables and turnover of goods and services undertaken by the authors of this paper reveals deep integration of Ukrainian agriculture within the global economy. Dynamics of Ukrainian agri-food exports in 2014-2023, analysed according to the product structure and geographical directions, demonstrate stability of volumes and shares of exports to the EU, both in the pre-war period and currently – in conditions of a full-scale war. Furthermore, the study confirms the economic implausibility of most of the claims made recently by Eastern European farmers regarding the extreme influx of Ukrainian agri-food products. Among the anticipated benefits for Ukrainian agricultural sector accruing from joining the EU are the sector's potential greening and diversification, as well as the likely development of domestic agri-food processing and increase of financing and innovations.

Keywords: agri-food production, exports, sustainable development, war, EU, Ukraine

JEL classifications: F14; Q17; Q18

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Introduction

Agriculture in Ukraine is one of the leading and most resilient sectors of the national economy, even during a period of full-scale war. Ukrainian agricultural business demonstrates a high level of integration into the global economy, mainly as an exporter of agricultural raw products (corn, wheat, oilseeds), as well as sunflower meal and sunflower oil.

Following the Revolution of Dignity in 2014, Ukraine approved its official course towards the European integration. Subsequently, the Association Agreement was signed (Cabinet of Ministers of Ukraine, 2014), active from September 1, 2017. During the period 2014-2021, reorientation of Ukraine's foreign trade away from the Russian Federation (RF) and the Commonwealth of Independent States (CIS) towards the European Union (EU) occurred, with the total agri-food exports growing by 1.6 times, reaching 7.7 billion USD in 2021. This was facilitated, among other, by implementation of European safety standards in Ukrainian production (including food processing), opening the way to the demanding European market.

Ukraine applied to join the EU on the fifth day of the RF's full-scale invasion (February 28, 2022). On June 23 of the same year, the European Council granted Ukraine the candidate status for the EU membership. The decision was based on the EU members' unity on strategic objectives and security concerns in sight of the ongoing war of RF against Ukraine (Bourguignon *et al.*, 2022). This situation altered the cost-benefit equation in favour of new members, providing the EU with a geopolitical incentive to resume enlargement (Karjalainen, 2023). Despite the rapid approval of Ukraine's European integration intentions, it is evident that this will not result in an equally accelerated process of

actual EU membership. Certain criteria must be met, which are challenging even for countries that are not engaged in a full-scale war. In this context, it is anticipated that one of the greatest challenges will be encountered in the coordination of Ukraine and the EU positions in the field of agricultural production.

One of the key concerns of EU member states, particularly those that have joined the European community since 2004, is the potential reduction in their share of CAP financing due to the accession of Ukraine, the country being a significant agricultural producer and exporter. They are also concerned about the increased competition that will ensue in the common European market. It is evident that the enlargement of the EU will require clarification of the objectives of its extension, the criteria for joining it, and the corresponding adjustments of the CAP (Economides *et al.*, 2024). The experience of Poland, which joined the EU in 2004 on terms which included a gradual period of introduction of agricultural payments, may be viewed as beneficial in this regard.

One of the significant challenges for Ukraine and its agricultural sector in the context of accession to the EU is the fulfilment of conditions within the thematic cluster "Resources, agriculture & cohesion", including, in particular, Chapter 11: Agriculture & rural development and Chapter 12: Food Safety, Veterinary and Phytosanitary Policy (Stanicek *et al.*, 2023). The new drivers for the development of Ukrainian agricultural production can be seen primarily in the country's export capacity based on global food demand. This is being achieved by attracting foreign investments in the field of deep processing of agricultural products and by increasing the presence of Ukrainian producers in the global value chains (GVCs). The efficiency of transport logistics is being expanded, innovative resource-saving practices are

being introduced, and the condition of natural resources for agricultural production are being improved.

There is also a negative sentiment of European farmers towards the intensification of Ukraine's European integration. In this context, it is important to conduct in-depth analysis of the mutual agri-food trade Ukraine and key EU importers. It is necessary to outline possible positive developments for the economies of these countries from the expansion of trade and economic cooperation with the agricultural sector of Ukraine. Consequently, this article aims to assess the challenges and opportunities for Ukrainian agriculture in the context of accession to the EU, as well as to identify the starting points in the area of harmonisation of interests of both Ukrainian and European agricultural producers.

Methodology

The time series of exports covering the period of 2014-2023 are analysed from the point of view of the commodity structure. It is based on the Ukrainian Classification of Goods of Foreign Economic Activity (UCGFEA), whereas we have considered the correspondence between the UCGFEA positions and positions of the Combined Nomenclature (CN), which is the primary nomenclature used by the EU Member States to collect and analyse data concerning their trade. It is based on the Harmonised Commodity Description and Coding System (managed by the World Customs Organisation).

The volume of Ukrainian agrarian foreign trade flows is estimated in United States dollars (USD). The authors also used the data of the State Statistics Service of Ukraine Ministry of Agrarian Policy and Food of Ukraine, EUROSTAT, Directorate-General for Agriculture and Rural Development of the European Commission.

The research encompasses an estimation of the impact of international fragmentation of production on trade and production, with a particular focus on the last decade. The time series of Ukraine Input-Output tables provide a comprehensive map of transactions of goods and services. The value of these flows is estimated in Ukrainian national currency – hryvnia (UAH).

Results

The role of Ukrainian agriculture in the national economy and on the global food market - The impact of full-scale hostilities.

For decades, agriculture has been one of the most dynamically developing areas of Ukrainian economic landscape. The pre-war year of 2021 was characterised by high average profitability of production by agricultural enterprises (41.9%), considerable investments (10.1% of the total domestic investments), and significant innovative activity. Even during periods of considerable turbulence (such as the crisis of 2008-2009, hostilities of 2014-2021, and the full-scale RF invasion in 2022), the agricultural sector demonstrated a higher level of resilience compared to other sectors of Ukrainian economy, keeping the provision of agri-food products to satisfy both domestic and foreign demand.

Despite the active hostilities, in 2022 agricultural output decreased only by 25%, caused by a 20% decrease in cultivated areas and loss of over 10% of livestock and poultry. The whole economy's output, at the same time, reduced by 30.4%. In addition, agricultural enterprises have maintained production profitability (21% in 2022). Typically, Ukrainian agri-food production satisfies 80% of the domestic food demand, and even during the war, it annually exports more than 22 billion USD worth of products, contributing to half of the total export revenue of Ukraine.

This determines the leading position of agricultural sector in Ukrainian economy and the high degree of its integration into the global economy. In 2021, the share of agri-food in Ukrainian GDP was close to 16%. Ukraine supplied more than 14% of the global food market (FAOSTAT, 2024), including 12.5% of the world exports of wheat and 12.8% of corn, as well as 47% of the world trade in sunflower oil and 54% of sunflower meal (USDA, 2024). According to the USDA estimates, in the last year before the full-scale war (2021), Ukraine was the fourth largest corn exporter in the world (after the USA, Brazil, and Argentina). By the end of 2021, Ukraine was the fourth supplier of food to the EU with value of 6.93 million EUR (European Commission, 2023b).

The high level of Ukrainian agricultural business integration into the global economy is also confirmed by the increase in indicators of its involvement in GVCs, demonstrated by a dynamic growth of the index of participation of Ukrainian agriculture in such chains (GVC participation rate). To verify this statement, we calculated indicators based on the Input-Output tables (Table 1) for 5 consecutive pre-war years. While it is difficult to identify the export streams that will be included in GVCs, the table shows data on exports of products of section A (Agriculture, forestry, and fishing), which are essentially raw products and require further processing, and therefore the exported volumes of these products with a high probability will be directed to further processing and will become a component of foreign GVCs.

Table 1: Global value chain participation rate for agriculture, forestry, and fishing (at basic prices, million USD).

Indicators	2017	2018	2019	2020	2021
Use of goods and services for exports	9,185	9,829	12,846	11,587	15,857
Output	27,328	32,024	33,720	33,654	51,214
GVC participation rate	0.336	0.307	0.381	0.344	0.310

Note: calculated at the average annual exchange rate of the National Bank of Ukraine (NBU) for 2017 (26.62 UAH/USD), 2018 (27.23 UAH/USD), 2019 (25.69 UAH/USD), 2020 (27.21 UAH/USD), and 2021 (27.27 UAH/USD).

Source: own elaboration and calculations based on (State Statistics Service of Ukraine, 2024).

In 2022, the full-scale war unleashed by the RF in Ukraine brought destruction and losses in all sectors of Ukrainian economy. According to the Kyiv School of Economics (KSE Agrocentre), conducted jointly with the World Bank, Ukrainian agricultural sector has suffered at a scale of more than 80 billion USD in direct losses, this being solely the result of the RF full-scale invasion. In particular, 10.3 billion USD represents the value of destroyed assets, and 69.8 billion USD – foregone income of agricultural producers and increased

production costs (losses caused by lower production, lower domestic prices for main agricultural crops, higher production costs and expenses for the reclamation of deteriorated lands) (Neyter *et al.*, 2024). Losses of agricultural machinery are estimated at 5.8 billion USD, the damage caused by theft or destruction of already produced cereals and oilseeds – ca. 2.0 billion USD. Grain storage facilities were damaged in the amount of 1.8 billion USD, perennial plantations – ca. 0.4 billion USD, and livestock losses reached 0.3 billion USD. Moreover, 56 billion USD will be needed for reconstruction and restoration of Ukrainian agriculture over the next decade (Neyter *et al.*, 2024).

The ongoing hostilities, occupation, and mining of Ukrainian territory have resulted in a significant loss of arable land. According to recent estimates, Ukraine has lost 19.3% (over 5 million hectares) of its arable land, with the total damage to the soil exceeding 900 billion UAH (Ukrinform, 2024), which amount to 24.42 billion USD at the average annual exchange rate of the National Bank of Ukraine for 2023 (36.86 UAH/USD). According to the State Forestry Agency of Ukraine estimates, the total area of forests affected by the war is approximately 3 million hectares (almost 30% of all forests in Ukraine). About 0.5 million hectares of forests of the State Forestry Agency of Ukraine require demining. The estimated damage to forestry is 20 billion UAH (State Forestry Agency of Ukraine, 2024), or 0.54 billion USD. Reduction of agricultural production resulting from the full-scale hostilities led to a decrease in agricultural exports in 2022 by 15.6%, and in 2023 by another 6%. Although trade routes have changed, the main directions of Ukrainian agricultural exports have practically stayed the same.

In the first year of the war, the situation with export-import logistics was especially critical. Farmers felt an acute shortage of imported production resources (plant protection products, seeds, and fertilisers), which led to a shortfall in harvest and an increase in production costs. The blockade of the Black Sea ports and the resulting inability to export most of the 2021 harvest to traditional markets led to a decline in prices on the domestic market and a sharp reduction in farmers' incomes. Ukrainian products were sold at prices below production costs, one of the reasons being the increased costs of logistics. Thus, solving the problem of exporting Ukrainian cereals and oilseeds has become a matter of survival not only for agricultural sector, but of the entire economy. This can be evidenced indirectly by the fact that in 2023, the country's agri-food exports constituted a significantly high proportion of its total exports, reaching over 60%. In such conditions, the functioning of the Black Sea grain corridor and EU-Ukraine Solidarity Lanes provided life-saving support to Ukrainian agri-food exports.

Ukraine's foreign agri-food trade with the EU countries – Economic component of the conflict

Until 2022, Ukrainian agri-food products expanded their presence annually both in the EU market and markets of Asia and Africa. Shares of agricultural exports to the EU oscillated around a quarter of total Ukrainian exports. Key exported products were sunflower oil, cereals, rapeseed and soybeans, fruits, berries and nuts, poultry meat and eggs.

Key EU importers were the Netherlands, Spain, Poland, and Germany (Table 2). Since 2022, direction of export flows changed, with Romania becoming one of the largest importers (although a significant part of these exports is assumed to follow further to final destination markets).

Table 2: Dynamics of Ukraine's foreign agri-food trade with key EU importer countries (million USD).

Countries	Years					
	2014	2015	2017	2018	2021	2023
Romania	3.3	94.5	15.7	2.5	6.3	2,875.2
Spain	923.0	852.9	1,023.8	1,039.8	1,168.4	1,761.9
Poland	536.2	422.7	518.2	557.2	981.5	1,753.9
Netherlands	749.9	575.6	1,275.7	1,157.6	1,762.1	1,272.2
Italy	625.4	560.0	749.3	702.7	717.9	1,028.4
Germany	247.9	188.3	385.0	657.5	842.3	853.9

Source: Own calculations based on the data of the State Statistics Service of Ukraine

From a global perspective, the key importers of Ukrainian agricultural products in 2023 were Romania (13% of total agricultural exports), China (10%), and Turkey (9%), acquiring in total a third of all exported Ukrainian agricultural products.

Agricultural raw product exports dominate both the overall structure of exports and exports specifically to the EU (Table 3). This means increased risks of export profitability due to the high volatility of raw product market conditions. However, the share of processed products in exports gradually increased in the pre-war period, reaching 44.9% in 2021. Yet, with the outbreak of hostilities (largely due to the loss of processing capacity) it decreased again, while the share of processed agri-food imports showed an upward trend.

Countries in Eastern Europe that provided support to Ukraine from the beginning of the full-scale war took a significant responsibility for facilitating the exports of Ukrainian agricultural products. Considering that a certain part of products, for some reasons, ended up in domestic markets of these countries in 2022 and the beginning of 2023, the negative reactions of their farmers to national and regional price fluctuations is quite understandable.

From the middle of 2023, the grain corridor ceased to exist, and farmers of five EU countries – Ukraine's closest neighbours (Bulgaria, Poland, Hungary, Romania, and Slovakia) began to manifest demands to block Ukrainian agricultural exports. In September 2023, Poland, Slovakia, and Hungary announced restrictions on the imports of Ukrainian cereals after the European Commission decided not to extend the ban on imports to the five EU countries neighbouring Ukraine (which it previously introduced on June 5, 2023). Due to this, the Cabinet of Ministers of Ukraine approved a list of products, exports of which to Bulgaria, Romania, Slovakia, Hungary, and Poland were subject to licensing (Cabinet of Ministers of Ukraine, 2023b). This applies to wheat, corn, rapeseed, and sunflower.

Despite these circumstances, the situation along the western borders of Ukraine continued to deteriorate in 2024. At the beginning of January, the European Union's five above-mentioned eastern countries demanded that the EU impose import duties on Ukrainian cereals (as well as on the other

Table 3: Structure of Ukraine’s foreign agri-food trade with the EU countries by processed and unprocessed products (million USD).

Indicators	Years						Index (2023 vs. 2008), %
	2008	2014	2017	2020	2021	2023	
Exports							
Non-processed total (UCGFEA groups 1-14)	2,284.0	3,073.2	3,308.0	3,438.5	4,231.5	7,719.5	338.0
Processed total (UCGFEA groups 15-24)	902.4	1,692.3	2,340.8	2,699.0	3,442.5	4,935.2	546.9
Total agri-food exports	3,186.4	4,765.5	5,648.8	6,137.5	7,674.0	12,654.7	397.1
Share of non-processed (%)	71.7	64.5	58.6	56.0	55.1	61.0	85.1
Share of processed (%)	28.3	35.5	41.4	44.0	44.9	39.0	137.8
Imports							
Non-processed total (UCGFEA items 1-14)	1,262.4	1,208.6	798.8	1,232.0	1,412.2	1,292.4	102.4
Processed total (UCGFEA items 15-24)	1,250.0	1,270.5	1,215.0	1,940.0	2,351.9	2,338.8	187.1
Total agri-food imports	2,512.4	2,479.1	2,013.8	3,172.0	3,764.1	3,631.2	144.5
Share of non-processed (%)	50.2	48.8	39.7	38.8	37.5	35.6	70.9
Share of processed (%)	49.8	51.2	60.3	61.2	62.5	64.4	129.3

Source: own calculations based on the data of the State Statistics Service of Ukraine.

most sensitive agricultural products), citing unfair competition (Reuters, 2024) and claiming that “cheaper agricultural products from Ukraine are eating into their export markets”. The blockade of border checkpoints by farmers, especially in Poland, intensified, and the prices for freight trucking on the Ukrainian-Polish and Ukrainian-Romanian borders increased by 15-20%. The imposition of a border blockade has had a significant impact on the financial resources of Ukraine. According to Ukrainian experts, in November 2023, exports across the Polish-Ukrainian border decreased by 40%. As a result, the state budget of Ukraine lost 9.3 billion UAH (252 million USD at the average annual exchange rate of the National Bank of Ukraine for 2023 – 36.86 UAH/USD) of uncollected customs payments (Epravda, 2024). At the beginning of March 2024, the total losses of the Ukrainian economy from the blockade were estimated at 500 million USD (Agroportal, 2024).

Ukrainian requests for constructive dialogue to preserve the paths of Ukrainian economic survival were unsuccessful. In similar fashion, the European Commission’s proposals regarding the introduction of enhanced protective mechanisms in the markets of individual EU member states in the event that Ukrainian import flows exceed the average import volumes for 2022 and 2023 did not have the desired effect on European farmers. Currently, the European Commission has already adopted a decision regarding changes to the temporary agreement on extension of the suspension of import duties and quotas for Ukrainian exports to the EU until June 5, 2025. The Regulation, which will be in effect from June 6, 2024, to June 5, 2025, has been agreed and confirms the continuation of the suspension of all customs duties and quotas under Title IV of the EU-Ukraine Association Agreement. However, the Regulation will also include a safeguard mechanism that will oblige the Commission to re-impose tariff quotas if imports of poultry meat, eggs, sugar, oats, maize, groats, or honey exceed the arithmetic mean of quantities imported in the second half of 2021, as well as in 2022 and 2023 (Council of the EU, 2024).

It should be noted that Polish farmers are under pressure caused not only by the increase in the volume of Ukrainian imports but also by the simultaneous influence of several global market factors (primarily the decrease of global prices). It is significant that in 2022, the net entrepreneurial income of agriculture in Poland grew by a third compared to the previous year, and in 2023, it decreased by a quarter (EUROSTAT, 2024). However, farmers attributed this reduction not to the effect of several global and regional factors, but exclusively to Ukrainian imports.

It would be a mistake to consider imports from Ukraine to be solely responsible for the decrease in prices in Eastern Europe, since this had almost no effect on the price difference between the Ukrainian, European and American markets. In the current situation, there is considerable doubt as to the economic viability of the claims made by European farmers against Ukrainian agricultural exports. This applies both to the assertion that it is responsible for the decline in European prices and to the claim that those products are of poor quality. Neither of these accusations are supported by evidence.

In 2022, Ukraine was in third place (after Brazil and Great Britain) among the main exporters to the EU with a share of 7.7% (European Commission, 2023b). In 2022–2023, Ukrainian producers exported mainly cereals, sunflower oil, oilseeds, poultry meat and eggs, and sugar. These groups accounted for ca. 80% of all Ukrainian exports to the EU. Therefore, in the study we will focus on these product groups.

Agricultural market developments

Since 2022, Ukraine has significantly increased *cereals*’ exports to the EU countries. In particular, in the marketing years (MY) 2022/2023 and 2023/2024, Ukraine became the main supplier of wheat (with a share of 65% and 70% of all wheat imported into the EU, accordingly), barley (45% and 48%), maize (55% and 67%), sorghum (84% and 68%) (European Commission, 2024b). Export volumes of wheat

flour also increased (second place after Great Britain with a share of 26% and 28%, accordingly). It should be noted in particular that Ukrainian cereals affect only the European corn market, since the share of EU imports of this product from Ukraine in domestic consumption in 2022/2023 MY reached 20% (in the previous MY – 10%). The share of wheat increased from insignificant figures to 5.6%.

Polish farmers are also voicing claims to the transit flows of Ukrainian cereals due to its alleged domination in Polish ports, which hinders the export of Polish products. However, according to competent Polish sources, such information is incorrect (Farmer, 2024). The economic groundlessness of such Polish accusations regarding Ukrainian products is also confirmed by researchers from the Institute of Public Finance of Poland (Czubak *et al.*, 2024). In addition, due to the recent significant increase in transshipment of Ukrainian products through Black Sea ports, transit through Poland is losing its appeal. Thus, according to the Ministry of Agrarian Policy of Ukraine, in 2023, 76% of all agri-food exports were exported through ports, 17% by rail, 5% by road transport, and 2% by ferry, and in the three months of 2024, 87%, 10%, 2% and 1%, respectively (Ministry of Agrarian Policy and Food of Ukraine, 2024). Thus, only a small share of agricultural exports is exported by road transport, an amount which, moreover, is now tending to decrease.

Ukraine holds an important position in *the EU market of oil crops and products of their processing*. It is the main exporter of rapeseed with a share of 66%, sunflower meal with a share of 38%, sunflower oil with a share of 93%, rapeseed oil with a share of 35%, soya oil with a share of 40% (European Commission, 2024b). The USA and Brazil dominate the world soybean market, and Ukraine, unlike the sunflower market, does not affect prices there. In addition, supplies of rapeseed and sunflower oil to the European market are decreasing in the current marketing year.

In 2022/2023 MY, the most significant share among all oilseed products in domestic consumption of EU countries had the Ukrainian imports of rapeseed (10.5%), soybeans (8.3%), soybean oil (10%), and all sunflower products: sunflower seeds (16.4%), sunflower meal (18.5%) and sunflower oil (34.1%). The share of sunflower oil in comparison with the pre-war period remained virtually unchanged.

In the global *poultry meat market*, Ukraine is also not one of the main exporters (its share does not exceed 2.5%). However, during the war, with opening of the EU market and due to complicated logistics, Ukraine significantly increased exports to EU countries. In 2022, export volumes increased by 1.6 times, and in 2023 by 1.4 times compared to the previous year. Thus, in 2023, Ukraine became the second supplier of poultry meat to the EU countries after Brazil (European Commission, 2024b). Accordingly, in 2021, Ukraine's share in poultry meat imports to the EU was 13%, in 2022 – 19%, and in 2023 it increased to 26%. However, due to the insignificant volume of supplies to the global market, Ukraine, unlike Brazil, the USA, and the EU, has no influence on the level of the global poultry meat prices. Despite the growth of exports of poultry products to the European Union in 2023, the share of Ukrainian exports in the total consumption of poultry meat by EU countries was only 1.6%, and in the consumption of eggs - only 0.8%. Therefore, it is not confirmed

it has a potential to affect the European market of poultry products.

Determining the place of Ukraine in the EU's *egg market*, it should be emphasised that in the global egg market, where the top exporters are Turkey, China, the EU, and the USA, Ukrainian products do not play a significant role and do not affect the economic situation. However, since the beginning of the war, Ukrainian producers have increased exports of eggs to the EU, and in 2022–2023 Ukraine was the main supplier there (European Commission, 2024b). In 2022, export increased by 3.2 times compared to the previous year, in 2023, it increased by 2 times compared to 2022. In 2021, the share of Ukraine in the egg imports to the EU was 22.5%, in 2022 it was 51.4%, and in 2023 it increased to 60.8%. However, during this period the total egg imports into the EU increased in volumes, namely: in 2023 by 78% compared to 2022 and 2.5 times compared to 2021. Prices until the beginning of 2023 tended to gradually increase, and from the beginning of 2023 they stabilised. There was no sharp decline in prices following the increase in egg imports from Ukraine.

Ukraine has always been present in the EU *sugar market*, but the export volumes were insignificant. However, with the beginning of the war, the situation changed. According to Eurostat, in 2022/2023 the share of Ukraine in the imports of sugar to the EU countries equalled 16%, while, based on the balance sheets published by the EU, the share of this volume in consumption for the corresponding period was 3% (European Commission, 2024b). In the current marketing year, Ukraine is still the main supplier of sugar to the EU market with a share of 35%. Exports were mainly directed to Italy, Romania, Hungary, Bulgaria, and the Czech Republic (70% of all exports to the EU). Ukraine exports sugar ready for final consumption in the EU countries. Processing of raw sugar usually allows European sugar factories to earn additional funds. Therefore, such a situation can also be a factor in the dissatisfaction of European manufacturers with the appearance of Ukrainian products on their market. In addition, despite the increase in the import of Ukrainian sugar, its prices in the EU remain high against the background of the global deficit. Domestic prices for sugar are above 800 EUR per ton, the highest in ten years.

The possibility of the EU establishing quotas for the import of certain types of Ukrainian agricultural products from June 6, 2024, increases the uncertainty of exporters regarding sales markets, since the mechanism proposed by the EU is new and difficult to predict. In addition, it is not known whether it will be applied and how it will work. Thus, Ukrainian producers have huge losses not only due to lost acreage, low purchase prices, complex logistics, but also due to expected trade restrictions. And all this is against the background of the revival of trade between the RF and the EU. In 2023/2024 MY, RF flooded the European Union market with significant volumes of cereals. Notably, it became the top supplier of rye with a share of 96% and achieved a 21% share of the durum wheat market, as well as 24% of the sorghum market.

In the context of assessing the validity of the claims of European countries to Ukrainian agricultural products, it should also be mentioned that, for example, Bulgaria in

2022–2023 increased the volume of production and export of sunflower oil, largely obtained from Ukrainian seeds. Romania received a powerful incentive to develop export logistics capacities in the Black Sea. Livestock breeders and processing enterprises in Germany, the Netherlands, and Spain are interested in Ukrainian exports of agricultural products. This means that on its way to the EU, Ukraine will have to coordinate the development of agriculture and the agri-food sector with almost every country of the association, taking their specific interests and claims into account.

Some of the above arguments have already been repeatedly voiced at the level of Ukrainian agricultural associations, government representatives and scientists. In addition, in recent months, Ukraine, as noted, has managed to redirect its export flows almost completely towards sea and river ports. This has significantly reduced the scale of export of agricultural products across the Ukrainian–Polish border in particular, limiting such exports mainly to perishable goods. The European Commission also provided 230 million EUR in aid to Polish corn farmers to compensate them for damages caused by the Russian invasion of Ukraine (European Commission, 2023a). However, all this did not contribute to the unblocking of the Ukrainian–Polish border. Thus, the obvious conclusion from the above is that the significant role of the Ukrainian factor in the months-long large-scale protests of European farmers has not been confirmed.

Key issues and expected benefits for Ukraine’s agriculture due to joining the EU

As noted earlier, the greatest challenges for Ukrainian agriculture on its path to the EU are connected with the implementation of CAP guidelines in the national agrarian policy, as well as with the harmonisation of the interests of European and Ukrainian agricultural producers. The main positions on the reconciliation of farmers’ interests were detailed above. Therefore, let us discuss the challenges related to the application of EU norms, as well as give a brief assessment of the process of harmonisation of Ukrainian and European legislation in the sections “Agriculture and rural development” and “Food security, veterinary and phytosanitary policy”.

Ukraine’s accession to the EU is a challenge for both sides. This is first of all due to the size of the Ukrainian agricultural sector, which will require the allocation of significant

amounts of direct payments and payments for rural development from the EU budget. Thus, if Ukrainian producers receive the same direct payments per hectare that European producers now receive (250 EUR), this will amount to ca. 10 billion EUR annually, since the area of agricultural land in Ukraine exceeds 40 million hectares. In addition, there are other payments in the EU: from the European Regional Development Fund and Cohesion Fund. Understanding this already provokes resistance from the governments of the EU member states. The debate intensifies regarding the potential impact of Ukraine and other countries joining the EU. It is posited that this could result in certain countries experiencing a shift from being net recipients of EU benefits to becoming net donors. Preliminary estimates indicate Ukraine could potentially receive up to 18.9 billion EUR in annual payments from the EU in the event of immediate accession (Emerson, 2023). This amount is close to the amount of annual EU payments under the Ukraine Facility programme for the period from 2024–2027, some 12.5 billion EUR (50 billion EUR over four years), which should not lead to a significant overload of the EU budget.

Secondly, the challenge for Ukraine and the EU is the atypical structure of the Ukrainian agricultural sector compared to European countries. There are large agricultural enterprises and agricultural holdings as well as a significant number of households in which the non-commodity nature of production prevails and there is a potential for reformatting them into small family farms.

The advantages for Ukrainian farmers from joining the EU will be to receive payments for agricultural development and payments from The European Structural and Investment Funds, which depend on the size of the agricultural sector and the gap in living standards. It is worth noting that , Ukraine’s GDP at purchasing power parity per capita is only 26.3% of the EU average (for example, Poland – 77.9%, France – 104.3%) (Emerson, 2023).

Table 4 shows the level of support for farmers in some EU countries and Ukraine. The authors tried to assess the situation in Ukraine and, based on available information, calculated the indicators as close as possible to those given by the EU. Assessments were carried out for enterprises and farmers since the households received practically no support. Data for Ukraine indicates a low level and significant unevenness of this support. Per hectare, producers received 35 times less compared to Polish producers. Only 1.4% of agricultural factor income generated by Ukrainian producers went to support. Moreover, the amount of support per recipient is quite significant, which indicates that these funds were received mainly by a small number of large enterprises (in

Table 4: Indicators of support for agricultural producers in Ukraine and within the CAP in selected EU countries in 2021.

Indicators	Countries				
	France	Germany	Netherlands	Poland	Ukraine
Average income support per ha, EUR	289	282	373	246	7
Average income support per beneficiary, EUR	23,670	15,380	15,030	2,740	12,886
Share of direct support in agricultural factor income, %	22	31	9	29	1.4

Source: for the EU countries the data was derived from the European Commission; for Ukraine, the assessment was based on the data of the State Statistic Service of Ukraine and the Ministry of Agrarian Policy and Food of Ukraine.

2021, 11 thousand producers received support, and in total, while there were 70 thousand business entities in the agricultural sector, including individual entrepreneurs).

Ukraine should therefore assume that its accession to the EU will be preceded by an EU CAP reform. Taking the current discussions into account, it can be expected that the CAP change will head in the direction of linking direct payments to certain conditions (including environmental ones) and their differentiation depending on the size of producers. It is also likely that a transition period will be introduced for Ukraine before it is granted full access to all types of support, as previously happened in the cases of Poland and Romania.

The process of adaptation of Ukrainian legislation to EU norms began back in 1998 after the entry into force of the Partnership and Cooperation Agreement between Ukraine and the EU. This process significantly intensified after 2014 with the signing of the Association Agreement with the EU (Cabinet of Ministers of Ukraine, 2014). The biggest incentive to the process was given after the adoption by the European Council in 2022 of the decision to grant Ukraine the status of a candidate country for the EU membership. At the end of 2023, the government of Ukraine published a report on the results of the initial assessment of the state of implementation of EU legislative acts. It was found that the largest number of acts of the EU law, which are already fully implemented in Ukrainian legislation and are subject to further full and/or partial implementation, concerns the section "Food security, veterinary and phytosanitary policy" (Cabinet of Ministers of Ukraine, 2023a). It can be seen that in these areas, Ukraine is significantly closer to the relevant EU legislation. Within the framework of this section, 80 acts are fully implemented, and 311 are subject to implementation, and 93 of them are implemented partially. The main obstacles to accelerating the implementation process are the insufficient number of qualified personnel and the lack of translation of relevant acts of the EU law.

In the section "Agriculture and Rural Development", 11 acts are fully implemented, 84 are subject to implementation, of which 18 are implemented partially. Here, in addition to the same lack of relevant national specialists, the main factors constraining harmonisation are also recognised as the need for expert support for the project of international technical assistance, strengthening institutional capacity, the need for additional funding for the creation of new public authorities, etc.

Despite the presence of some objective obstacles and the expected severity and duration of the negotiation process, most domestic experts agree that the very beginning of the negotiations is already a landmark step towards agreeing on the positions of Ukraine and the EU.

Among the main challenges now facing the European (and in future – also Ukrainian) agricultural sector is the need to comply with somewhat strict European Green Deal (EGD) standards. All EU member states have committed to make the European Union climate-neutral by 2050. According to this, by 2030, greenhouse gas emissions should be reduced by at least 55% compared to the 1990 levels (European Commission, 2024a). To achieve this goal, specific objectives were formulated and measures envisaged in many sectors. These

included reducing the use of pesticides (by 50%) and mineral fertilisers (by 20%), expanding the organic farming sector (up to 25%), and implementing measures to improve biodiversity (10% of territories with a high level of biodiversity), ensuring proper conditions for livestock and poultry.

Adaptation to the EGD can become a challenge for Ukrainian agricultural producers not only in connection with the final accession to the EU, but also during this process. We can, in particular, expect a decrease in Ukrainian agri-food exports due to the announced European Union introduction of protective duties on imports of agricultural products from third countries (which is now Ukraine), created without taking into account the requirements of the European Economic Community (EEC). In the case of Ukraine's full membership in the EU, the need to implement the EEC guidelines in agriculture will undoubtedly entail changes in the volume and structure of Ukrainian agricultural production, which may affect its profitability. In this case, problems may arise primarily among small and medium-sized producers who will apply for appropriate support from European funds. Large producers, mainly those who are cereals - and oilseeds - oriented, will be able to avoid risks by fully focusing on trade with Asian and African countries since they will not need these payments from EU funds.

In addition, Ukraine will not prioritise the objective of increasing the share of organic agriculture to 25% within the near future. The expansion of agricultural land for organic production to the required share, that is, to more than 10 million hectares, will significantly exceed the real possibilities of marketing these products in Ukraine and the EU. Since within the framework of negotiations, there is a certain freedom of action to adapt the ambitious goals of EGD to Ukrainian opportunities and needs, the 3% level of such an indicator (or 1.2 million hectares) set by the Ukrainian government, which should be achieved by 2030, seems much more realistic (Cabinet of Ministers of Ukraine, 2022). Among the challenges for Ukraine's agricultural production from the EU accession, it is also necessary to mention the risk of significantly tightening competition on the domestic market due to the rapid increase in supply of European food and a high probability of skilled workforce outflow.

European integration of Ukraine could give a new incentive to the diversification of domestic agricultural production and the development of agricultural products processing. Thus, to harmonise the parameters of Ukrainian agricultural production development with norms of CAP and EGD, as well as to comply with the requirements of above-mentioned Ukrainian government regulation adopted in this context, significant changes can be expected in the agricultural sector. It should be borne in mind that such regulation would aim to optimise the structure of farmland and agrarian landscape, reduce by 5% the level of utilised agricultural land and by 10% the ploughed land, by 40–50% increase their productivity primarily through the rational use of fertilisers. It can be expected that the need to take the agri-ecological and climatic requirements of the EU and Ukrainian legislation into account will improve the state of natural resources of agricultural production and increase the volume of production grown in compliance with the European requirements. As noted, all of this should also lead to production structure

transformation, which until recently focused mainly on the cultivation (and exports) of cereals and oilseeds. Hence, we estimate that Ukraine can expect an increase in livestock and vegetable production, while the production and exports of corn and sunflower will decrease the most (Shubravska and Prokopenko, 2022). This would be facilitated by the presence of logistical problems of domestic agricultural exports described above, under the influence of which business is also increasingly relying on the development of agri-food processing. Primarily, this applies to biofuels, as well as animal feed. Biofuel production in Ukraine is already actively developing. Prospects for in-depth grain processing development depend on attracting large investments, most likely foreign, which could be obtained after the end of hostilities and accession of Ukraine to the EU. In the meantime, the lack of access to relevant technologies (due to their high cost or the reluctance to share them) and major problems with the availability and qualification of working personnel are the most significant factors hindering the establishment of these enterprises in Ukraine.

The expected positive consequence of Ukraine's accession to the EU should also be the intensification of innovation processes in the agricultural sector. It is assumed to be achieved through increased inflows of foreign direct investment and an inclusive European agrarian policy that addresses the interests of all groups of farmers, especially small ones. Before the beginning of the full-scale war in Ukraine, agricultural holdings and large agricultural enterprises actively introduced agricultural innovations and formed their research units. Thus, it is estimated that at least half of farms with an area of more than 2000 hectares to one degree or another used elements of precision agriculture or planned to work in this direction (Agrobusiness, 2022). In the EU countries, the share of farmers working on such technology is constantly growing, primarily due to CAP incentives (Zakupka, 2024). For Ukraine, such a support is especially relevant primarily for small producers who do not have the proper financial resources for implementation of modern innovative solutions and are deprived of the opportunity to receive appropriate state support.

One of the significant results of Ukraine's accession to the EU is expected to be an increase in Ukrainian exports. It is not the expansion of agricultural products onto the European market. Opportunities are seen primarily in the expansion of food exports to third countries due to the optimisation of European transit flows and the availability of European certificates (CE certificates) for exported products. That is, Ukrainian large producers, will be able to continue focusing on effective mass production and export to countries outside the EU. Relatively small and generally environmentally-oriented producers will be able to receive additional payments within the CAP.

Conclusions

The main challenges for Ukraine's agriculture in connection with its possible accession to the EU can be summarised as follows: first, the need to comply with the EU rules, norms and standards, as well as adjust to the EGD

and CAP expectations and obligations; second, to avoid the competition with European farmers on the EU market; third, to establish coordination of interests with the EU countries regarding the integration of Ukrainian agricultural products into the European GVCs; and fourth, to work towards the development of reliable and mutually beneficial European transit routes for exports to the world market. Additionally, there is a strong possibility for a rapid and straightforward integration of European businesses into the Ukrainian market, which could result in the loss of domestic market share on the part of Ukrainian producers and a significant outflow of qualified personnel and labour beyond Ukraine.

Opportunities for agriculture in the context of European integration are seen primarily in the diversification of production and export structure; development of agricultural processing; accelerating the transition to innovative resource-saving production technologies; regulation of transit flows; increasing exports to international markets; and growth in the share of agricultural products cultivated in Ukraine in compliance with EU's environmental and climate requirements.

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References

- Agrobusiness (2022): Точне землеробство за умов війни: сенс та економічна доцільність. [Precision farming under conditions of war: meaning and economic feasibility] Available at: <https://agrobusiness.com.ua/tochne-zemlerobstvo> (Accessed on 3 April 2024).
- Agroportal (2024): Названо втрати, які зазнала Україна від блокади польського кордону. [The losses suffered by Ukraine due to the blockade of the Polish border are named] Available at: <https://agroportal.ua/news/ukraina/nazvano-vtrati-yaki-zaznala-ukrajina-vid-blokadi-polskogo-kordonu> (Accessed on 20 March 2024).
- Bourguignon, J., Demertzis, M. and Sprenger, E. (2022): EU Enlargement: Expanding the Union and Its Potential. *Intereconomics*, **57**, 205–208. <https://doi.org/10.1007/s10272-022-1063-4>
- Cabinet of Ministers of Ukraine (2014): Association Agreement between the European Union and its Member States, of the one part, and Ukraine, of the other part. Available at: <https://www.kmu.gov.ua/storage/app/sites/1/uploaded-files/ASSOCIATION%20AGREEMENT.pdf> (Accessed on 8 April 2024).
- Cabinet of Ministers of Ukraine (2022): Decree "On approval of the Concept of the State-wide target program for the use and protection of land" of January 19, 2022, No. 70-p. Available at: <https://zakon.rada.gov.ua/laws/show/70-2022-%D1%80?lang=en#Text> (Accessed on 20 March 2024).

- Cabinet of Ministers of Ukraine (2023a): Опубліковано звіт за результатами первинної оцінки стану імплементації актів права ЄС [A report based on the results of the initial assessment of the state of implementation of EU legal acts was published] Available at: <https://www.kmu.gov.ua/news/opublikovano-zvit-za-rezultatamy-pervynnoi-otsinky-stanu-implementatsii-aktiv-prava-ies> (Accessed on 4 April 2024).
- Cabinet of Ministers of Ukraine (2023b): Resolution “On verification and approval of the export of certain agricultural goods to the Republic of Bulgaria, Romania, the Slovak Republic, Hungary and the Republic of Poland” of September 19, 2023, No. 1020. Available at: <https://zakon.rada.gov.ua/laws/show/1020-2023-%D0%BF#Text> (Accessed on 29 March 2024).
- Council of the EU (2024): Ukraine: Council backs the renewal of EU’s autonomous trade measures. Available at: <https://www.consilium.europa.eu/en/press/press-releases/2024/04/08/ukraine-council-backs-the-renewal-of-eu-s-autonomous-trade-measures/> (Accessed on 26 April 2024).
- Czubak, W., Kalinowski, S. and Pepliński, B. (2024): Ziarno niezgody: analiza protestów rolniczych. Warszawa: Instytut Finansów Publicznych. Available at: https://www.ifp.org.pl/wp-content/uploads/2024/03/IFP_raport_Ziarno_niezgody-analiza_protestow_rolniczych.pdf (Accessed on 26 April 2024).
- Economides, S., Featherstone, K. and Hunter, T. (2024): The Changing Discourses of EU Enlargement: A Longitudinal Analysis of National Parliamentary Debates. *JCMS: Journal of Common Market Studies*, **62**, 168–185. <https://doi.org/10.1111/jcms.13484>.
- Emerson, M. (2023): The Potential Impact of Ukrainian Accession on the EU’s Budget – and the Importance of Control Valves. Policy Paper. Tallin: International Centre for Defence and Security.
- Epravda (2023): Експорт через українсько-польський кордон скоротився на 40% – Гетманцев. [Exports across the Ukrainian-Polish border decreased by 40% - Hetmantsev]. Available at: <https://www.epravda.com.ua/news/2023/12/5/707328/> (Accessed on 20 March 2024).
- European Commission (2023a): State Aid SA.110984 (2023/N) – Poland. TCTF: Aid for the corn producer who is at risk of losing financial liquidity due to restrictions on the agricultural market caused by the Russian invasion of Ukraine. Available at: https://ec.europa.eu/competition/state_aid/cases/1/202406/SA_110984_0000838D-0100-C23F-B3EF-13939F04D-CA5_32_1.pdf (Accessed on 2 April 2024).
- European Commission (2023b): Agri-food trade statistical factsheet. European Union – Ukraine. Available at: https://agriculture.ec.europa.eu/document/download/80d34c28-dcd7-45b3-8c01-18756cf4cb26_en?filename=agrifood-ukraine_en_0.pdf (Accessed on 2 April 2024).
- European Commission (2024a): Delivering the European Green Deal. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en (Accessed on 26 April 2024).
- European Commission (2024b): Data and analysis. Market observatories. Available at: https://agriculture.ec.europa.eu/data-and-analysis/markets/overviews/market-observatories_en (Accessed on 15 April 2024).
- EUROSTAT (2024): Economic accounts for agriculture – agricultural income indicators. Available at: https://ec.europa.eu/eurostat/data-browser/view/aact_eaa06/default/table?lang=en&category=agr.aact.aact_eaa (Accessed on 15 April 2024).
- Farmer (2024): Marciniak: Jak duży jest transport zboża przez polskie porty? Available at: <https://www.farmer.pl/produkcja-roslinna/zboza/marciniak-jak-duzy-jest-transport-zboza-przez-polskie-porty,143417.html> (Accessed on 26 March 2024).
- FAOSTAT (2024): Data. Trade Indices. Available at: <https://www.fao.org/faostat/en/#data/TI> (Accessed on 4 April 2024).
- Karjalainen, T. (2023): EU enlargement in wartime Europe: three dimensions and scenarios. *Contemporary Social Science*, **18** (5), 637–656. <https://doi.org/10.1080/21582041.2023.2289661>
- Ministry of Agrarian Policy and Food of Ukraine (2024): Dashboard for export of agricultural crops. Available at: <https://export.gov.ua/719-agro-export-2022> (Accessed on 5 April 2024).
- Neyer R., Zorya S. and Muliar, O. (2024): Agricultural War Damages, Losses, and Needs Review. KSE Agrocenter. Available at: https://kse.ua/wp-content/uploads/2024/02/RDNA3_eng.pdf (Accessed on 26 March 2024).
- Reuters (2024): EU’s eastern members demand import duties on Ukraine grains. Available at: <https://www.reuters.com/markets/commodities/eus-eastern-members-demand-import-duties-ukraine-grains-2024-01-15/> (Accessed on 20 March 2024).
- Shubravska, O. and Prokopenko, K. (2022): The Agricultural Sector of Ukraine in the Global Food Market: Pre-war State and Post-war Prospects. *Research on World Agricultural Economy*, **3** (4), 1–11. <https://doi.org/10.36956/rwae.v3i4.693>
- Stanicek, B., Przetacznik, J. and Albaladejo, A.R. (2023): Enlargement policy: Reforms and challenges ahead. BRIEFING. European Parliamentary Research Service. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/757575/EPRS_BRI\(2023\)757575_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/757575/EPRS_BRI(2023)757575_EN.pdf) (Accessed on 12 April 2024).
- State Forestry Agency of Ukraine (2024): Ukraine is the most heavily mined country in the world, – according to UN estimates! Available at: <https://forest.gov.ua/news/za-otsinkamy-oon-ukraina-naibilsh-zaminovana-kraina-u-sviti> (Accessed on 26 March 2024).
- State Statistics Service of Ukraine (2024): Table Input-Output of Ukraine at basic prices 2015-2021. Available at: https://www.ukrstat.gov.ua/operativ/operativ2021/vvp/kvartal_new/tvv_oc/arh_tvv_oc_u.html (Accessed on 11 April 2024).
- Ukrinform (2024): В Україні близько 5 млн. га орних земель не використовуються через війну. [In Ukraine, about 5 million hectares of arable land are unused because of the war]. Available at: <https://www.ukrinform.ua/rubric-economy/3818267-v-ukraini-blizko-5-miljoniv-gektariv-ornih-zemel-ne-vikoristovutsa-cerez-vijnu.html> (Accessed on 20 March 2024).
- USDA (2024): Production, Supply and Distribution. FAS. Available at: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/downloads> (Accessed on 12 April 2024).
- Zakupka (2024): Точне землеробство в сільському господарстві: переваги, особливості застосування. [Precision farming in agriculture: advantages, features of application]. Available at: <https://zakupka.mez.com.ua/tpost/cb4y2hp3z1-tochne-zemlerobstvo-v-slskomu-gospodarst> (Accessed on 3 April 2024).