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BILATERAL TRADE PATTERNS IN THE EUROPEAN UNION-UKRAINE AGRI-FOOD SECTOR

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Abstract. The present study aims to quantify the agricultural trade patterns in the agri-food sector between the European Union and Ukraine. To this end, the following indices will be measured: the Trade Intensity Index, the Export Similarity Index, the Grubel-Lloyd Index, the Weighted Grubel-Lloyd Index, the Cosine Similarity Index, the Herfindahl-Hirschman Index, and the Export Diversification Index. An analysis was conducted of EU agri-food exports to Ukraine and EU agri-food imports from Ukraine by product group during the period 2020-2024. A comparative analysis was then made of their agri-food export structure, the results of which revealed a pattern of moderate similarity alongside significant differences. An analysis of the structure of bilateral agri-food trade reveals that, while the trade relationship between the EU and Ukraine has deepened in terms of volume and institutional linkage, structural convergence in agricultural exports remains limited. The EU and Ukraine continue to specialise in distinct agri-food segments. Ukraine's exports are dominated by arable crops and plant-based products, whereas the EU's exports to Ukraine exhibit greater diversification across product groups, with a strong emphasis on processed and value-added goods. This phenomenon can be interpreted as indicative of a complementary relationship between the EU and Ukraine, as opposed to a competitive one, wherein trade patterns are driven by disparities in production structures. Ukraine remains a significant agri-food partner for the EU, while the EU continues to be Ukraine's dominant trading counterpart. Ukraine's agricultural exports are more intensive towards the EU. This high level of trade intensity is indicative of the geographical proximity, preferential access granted by the DCFTA, and complementary resources of both partners. The study recommends a number of actions for the promotion of structural upgrading, including alignment with EU standards, investment in processing capacity, and innovation in agricultural value chains. These actions could foster greater diversification and increase the share of intra-industry trade.

Keywords: agri-food sector, export structure, integration, intra-industry trade, patterns, primary agri-food products, trade intensity, trade relations, value-added agricultural products.

JEL Classification: Q13, Q17, Q18

1. Introduction

The process of Ukraine's integration into global and regional trade systems has undergone a profound transformation over the past two decades. Following the ratification and implementation of the Deep and Comprehensive Free Trade Area (DCFTA) between Ukraine and the European Union (EU) in 2016, there has been an observable increase in the reflection of the dynamics of economic alignment, market liberalisation, and structural adaptation to EU standards in agricultural trade flows (Van der Loo, 2016).

The European Union, as one of the world's largest agri-food markets, represents both an opportunity and a challenge for Ukrainian producers. To consider, firstly, the question of whether preferential access to the EU market fosters export diversification and competitiveness. Secondly, whether such access exposes structural disparities in product composition, quality standards, and production efficiency. It is imperative to comprehend the intensity of trade integration and the degree of export similarity between Ukraine and EU member states in order to assess the real depth of economic convergence and the potential for further market integration. Despite the increase in trade volumes, there are still questions regarding the extent to which Ukraine's agricultural export structure is aligned with that of the EU and whether trade integration has led to greater complementarity or competition.

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The quantification of trade intensity and export similarity provides an analytical basis for the evaluation of these relationships, the identification of comparative advantages, and the formulation of evidence-based trade and agricultural policies.

The present study aims to analyse the agricultural trade integration intensity and export similarity between Ukraine and the European Union during the post-DCFTA period. The present study employs a range of indices, including the Trade Intensity Index, Export Similarity Index, Grubel-Lloyd Index, Weighted Grubel-Lloyd Index, Cosine Similarity, Herfindahl-Hirschman Index, and Export Diversification Index, in order to reveal structural patterns, measure convergence tendencies, and assess the implications for Ukraine's agricultural competitiveness within the EU market. The findings contribute to the broader discourse on regional economic integration, structural transformation in agri-food trade, and the challenges of aligning national export profiles with those of advanced economic blocs.

2. Literature Review

A plethora of scholars have examined issues related to agricultural exports and trade integration. The EU-Ukraine agri-food trade has expanded rapidly, with the EU becoming Ukraine's main trading partner following the implementation of the DCFTA and subsequent autonomous trade liberalisation measures. Nivievskyi and Bogonos (2024) identify a structurally asymmetric bilateral trade pattern, in which Ukraine predominantly supplies raw and semi-processed commodities. This reflects differences in productivity, value-chain integration, and regulatory alignment. In general, although there has been a considerable increase in bilateral trade volumes, the pattern remains sensitive to EU safeguard mechanisms and regulatory constraints affecting specific product groups (Bogonos & Chmil, 2023; Nivievskyi & Bogonos, 2024). In their 2018 study, Dankevych et al. investigated Ukraine-EU trade relations by employing clustering methods. The researchers concluded that diversification and closer integration could enhance Ukraine's agricultural trade resilience. Studies by Fediv and Fediv (2020) and Gagalyuk et al. (2022) emphasise that modernisation, investment and institutional support are essential for expanding Ukraine's agricultural export potential. Galunets (2019) builds on this, demonstrating how enterprise-level restructuring and resource endowments have enabled Ukraine to become a leading agri-food exporter. However, data limitations restrict insights after 2022. Countryman et al. (2025) assess the impact of the war on agricultural exports, finding that export disruptions have significantly affected global food security and price stability. Meanwhile, Belkin et al. (2025) emphasise the importance of sustainability-oriented marketing and innovation for improving competitiveness in international grain markets. Meanwhile, Horská et al. (2023) identify industrial structure, border proximity and firm-level capabilities as the main factors influencing regional export activity in the early stages of the 2022 conflict. Earlier research by Karasova (2016) mapped Ukraine's comparative advantages, emphasising cereals and oilseeds as core strengths. In contrast, Kravchenko (2014) explored managerial approaches for Ukrainian firms entering EU markets, stressing institutional adaptation and certification.

As posited by Kryukova et al. (2018), competitiveness is contingent on structural modernisation and market diversification. Conversely, Lupenko et al. (2018) emphasise the significance of targeted investment for achieving deeper agricultural integration. In a similar vein, Melnyk et al. (2021) proposed a composite index to measure export potential, identifying human capital, infrastructure, and institutional quality as pivotal factors.

Moroz et al. (2017), and subsequently Nagyova et al. (2018), examined Ukraine-EU trade through a Visegrad perspective, highlighting both opportunities for co-operation and the regulatory barriers that were identified. Ostashko et al. (2022) assessed the DCFTA's influence, showing evidence of trade creation alongside adjustment costs for vulnerable producers. As asserted by Sardak et al. (2019), diversification and institutional reform were identified as being of paramount importance for the attainment of sustainable export growth. The evolving geopolitical landscape has further shaped research priorities. Shubravska and Prokopenko (2022) discussed the challenges facing Ukrainian agriculture before and after the war, emphasising the importance of restoring logistics and ensuring access to resources for recovery. Shubravska et al. (2024) built on this by analysing the opportunities arising from EU enlargement and the associated compliance costs. Comparative studies, such as that by Szajner et al. (2024), reveal that although Ukraine has significant resource potential, structural inefficiencies and war-related disruptions hinder its ability to be self-sufficient. Totska (2022) demonstrated that export value growth is still dominated by raw commodities rather than processed products. Verzun et al. (2023) and Urba et al. (2023) emphasise that transport infrastructure, logistics integration, technological innovation and institutional stability are key to enhancing Ukraine's agricultural competitiveness.

Overall, the literature consistently emphasises that Ukraine's success in exporting agricultural products depends on modernisation, diversification, sustainable marketing and closer integration with EU markets. Given the critical role of agriculture as a source of foreign exchange and fiscal stability, these factors are vital for ensuring economic resilience, particularly during wartime and the subsequent recovery period.

3. Materials and Methods

The research is based on the confirmation of the following empirical hypotheses:

Hypothesis 1. There is limited structural convergence between Ukraine's and the EU's agri-food export profiles, which show specialisation in different product segments. Ukraine's agri-food export profile is more concentrated, whereas the EU's is more diversified.

Hypothesis 2. The degree of trade between Ukraine and the EU within the agri-food sector is minimal, with the majority of trade being driven by inter-industry trade, resulting from complementary production structures.

The indices calculated include the Trade Intensity Index, Export Similarity Index, Grubel-Lloyd Index, Weighted Grubel-Lloyd Index, Cosine Similarity, Herfindahl-Hirschman Index, and Export Diversification Index. The present study employs a comparative analytical approach to investigate the export structure of the European Union and Ukraine. The data presented herein have been sourced from the State Statistics Service of Ukraine, Eurostat, and the European Commission, among other reliable sources.

4. Results

Ranking of EU main agri-food trade partners and Ukraine in 2024 is presented in Table 1.

An analysis was conducted of 15 leading EU agri-food exports to Ukraine from 2020 to 2024 (see Figure 1), as well as EU agri-food imports from Ukraine during the same period (see Figure 2).

Figures 1 and 2 clearly illustrate the differences in agricultural product structures between the EU and Ukraine. Ukraine mainly exports cereals, oilseeds, protein crops and vegetable oils, while the EU mainly exports coffee, tea, cocoa, spices, pet food and forage crops. Table 2 presents exports from the EU to Ukraine by product group.

EU agri-food imports from Ukraine by product groups in 2020-2024 are presented in Table 3.

The following indicators are calculated and presented in Table 4.

For assessment Trade Intensity Index (TII) for Ukraine-EU agri-food the authors calculate:

Ukraine's share in the EU in 2024:

$$\frac{E_{UA,EU}}{E_{UA,W}} = \frac{13094\, million\, EUR}{22804.67\, million\, EUR} = 0.5742.$$

Subsequently, an analysis is conducted to determine the EU's share in global agricultural exports for the year 2024.

$$\frac{E_{EU,W}}{E_{W}} = \frac{235407\, million\, EUR}{1848600\, million\, EUR} = 0.1273.$$

$$TII_{UA,EU} = \frac{0.5742}{0.1273} = 4.5106.$$

For assessment Trade Intensity Index (TII) for EU-Ukraine agri-food the authors calculate:

Share of EU exports to Ukraine in 2024:

Table 1
Ranking of the EU main agri-food trade partners and Ukraine in 2024

No.	Top destinations	Value, million EUR	% share extra-EU	Top origins	Value, million EUR	% share extra-EU
1	United Kingdom	53944	22.9	Brazil	17426	10.1
2	USA	30534	13.0	United Kingdom	15391	9.0
3	China	13242	5.6	Ukraine	13094	7.6
4	Switzerland	12272	5.2	USA	11947	7.0
5	Japan	8334	3.5	China	9154	5.3
6	Norway	6037	2.6	Turkey	7314	4.3
7	Russia	6010	2.6	Ivory Coast	6760	3.9
8	Turkey	5166	2.2	Argentina	5558	3.2
9	Canada	4809	2.0	Indonesia	5266	3.1
10	Saudi Arabia	4622	2.0	Switzerland	5048	2.9
11	South Korea	4271	1.8	India	3974	2.3
12	Australia	4170	1.8	Vietnam	3836	2.2
13	Ukraine	3634	1.5	Peru	3766	2.2
14	Morocco	3605	1.5	Morocco	3447	2.0
15	United Arab Emirates	3361	1.4	Malaysia	3279	1.9
16	Israel	2903	1.2	South Africa	2791	1.6
17	Algeria	2824	1.2	Ecuador	2764	1.6
18	Brazil	2812	1.2	Canada	2539	1.5
19	Serbia	2698	1.1	Colombia	2527	1.5
20	Mexico	2668	1.1	Serbia	2312	1.3
	Rest of the World	57491	24.0	Rest of the World	43692	25.1

Source: European Commission. Agri-food trade statistical factsheet (2025)

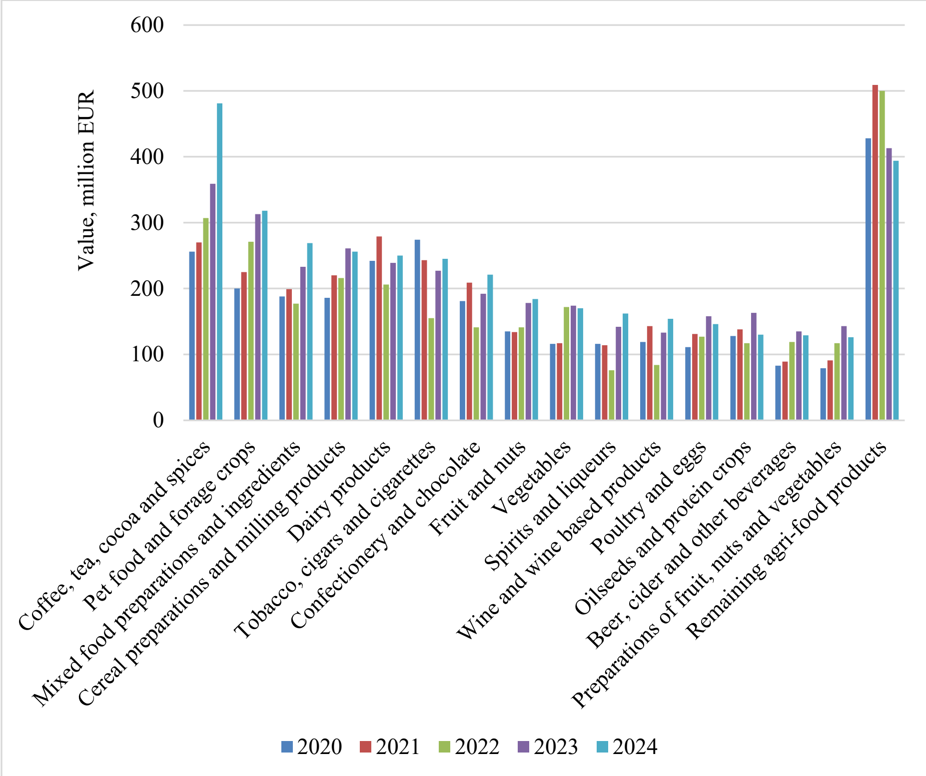

Figure 1. Top EU agri-food exports to Ukraine in 2020-2024

Source: own processing based on European Commission. Agri-food trade statistical factsheet (2025)

Table 2
Exports from the EU to Ukraine by product groups

No.	Product group	Value, million EUR					Share in all agri
		2020	2021	2022	2023	2024	2024
	Agri-food	2841	3109	2924	3461	3634	100
1	Animal products	515	615	585	575	543	15.0
2	Arable crops and plant based products	459	511	495	547	507	14.0
3	Fruit, vegetables and olive oil	362	379	450	526	516	14.2
4	Wine, beverages and food preparations	687	755	597	835	934	25.7
5	Coffee, tea, cocoa and spices	256	270	307	359	481	13.2
6	Non-edible	561	579	491	619	652	17.9

Source: own processing based on European Commission. Agri-food trade statistical factsheet (2025)

Table 3
EU agri-food imports from Ukraine by product groups

No.	Product group	Value, million EUR					Share in all agri
		2020	2021	2022	2023	2024	2024
	Agri-food	5837	6927	13215	11839	13094	100
1	Animal products	296	345	691	713	756	5.8
2	Arable crops and plant based products	4881	5731	11626	10226	11145	85.1
3	Fruit, vegetables and olive oil	301	444	493	354	602	4.6
4	Wine, beverages and food preparations	207	270	224	318	369	2.8
5	Coffee, tea, cocoa and spices	20	27	14	13	17	0.1
6	Non-edible	131	110	167	214	203	1.5

Source: own processing based on European Commission. Agri-food trade statistical factsheet (2025)

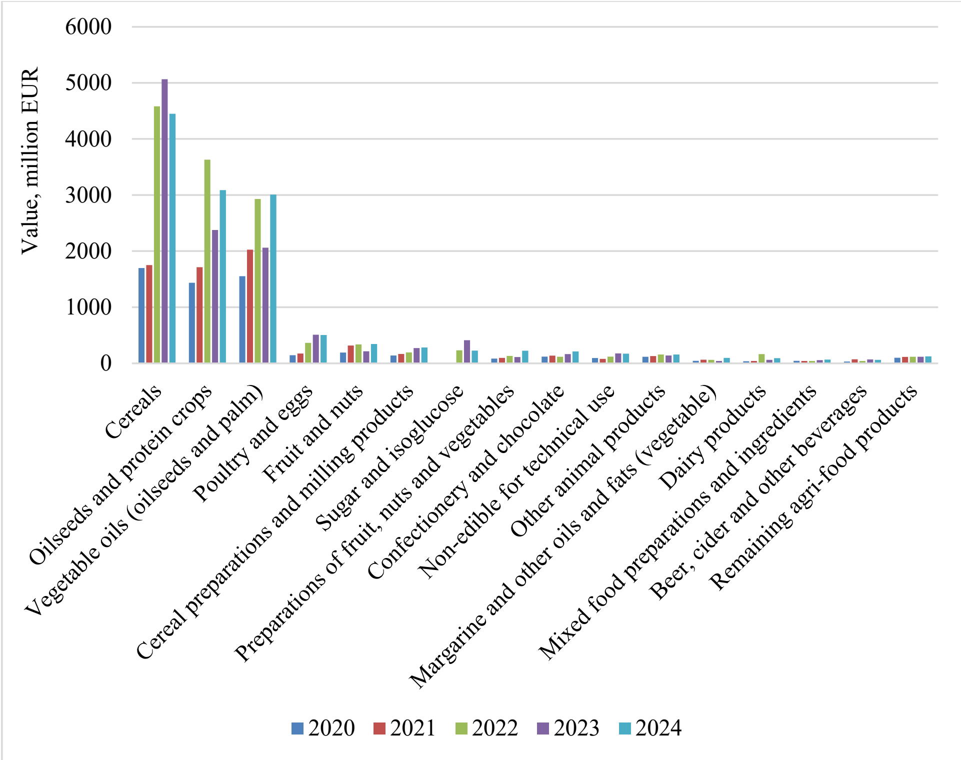

Figure 2. Top EU agri-food imports from Ukraine in 2020-2024

Source: own processing based on European Commission. Agri-food trade statistical factsheet (2025)

$$\frac{E_{EU,UA}}{E_{EU,W}} = \frac{3634\,million\ EUR}{231773\,million\ EUR} = 0.0157.$$

Then estimate Ukraine's share in global agricultural exports in 2024:

$$\frac{E_{UA,W}}{E_{W}} = \frac{22804.67\,million\ EUR}{1848600\,million\ EUR} = 0.0123.$$

$$TII_{EU,UA} = \frac{0.0157}{0.0123} = 1.2764.$$

TII shows that Ukraine's agricultural exports are more oriented towards the EU than the EU's average orientation towards the global market.

Furthermore, the Export Similarity Index (ESI) between the European Union and Ukraine for product groups in the agri-food sector in 2024 was calculated (Finger & Kreinin, 1979). The results of the study are presented in Table 5.

The results obtained indicated a moderate degree of structural overlap. The ESI indicates that approximately 28.8% of the structure of the two export baskets (i.e., the EU's agri-food exports to Ukraine and Ukraine's agri-food exports to the EU) overlap. In other words, only approximately 25-33% of the composition is structurally similar, implying that while there is some overlap in product groups exported, a significant proportion of the products differ significantly (i.e., they export different product groups).

In particular, the large share of Ukraine's exports to the EU is in "Arable crops and plant based products" (85.1 %) whereas the EU's exports to Ukraine are much more diversified across product groups (with the largest share in "Wine, beverages and food preparations" at 25.7 %, non-edible 17.9 %, etc.). This means that the overlap is largely driven by just a couple of groups and many product groups of EU exports to Ukraine have little correspondence in Ukraine's exports to the EU. The lowest overlaps are in product groups "Coffee, tea, cocoa and spices" (only 0.1 %) and "Non-edible" (only 1.5 %) meaning Ukraine exports very little of those compared to the EU exports to Ukraine.

The modest overlap indicates that, at least in terms of structure, the potential for direct competition between EU agri-food exports to Ukraine and Ukraine agrifood exports to the EU is limited. It is evident that the baskets being exported differ from those previously observed. However, the considerable overlap in arable crops indicates the presence of some degree of competition. Consequently, trade strategies may concentrate on complementary niches as opposed to direct competition. Conversely, the ESI does not provide insights into market size or market share; it exclusively quantifies structural similarity.

The results of the calculation of agri-food trade integration indicators for the EU-Ukraine and Ukraine-EU contexts in 2024 are presented in Table 6.

Table 4
Indicators for assessment agricultural trade integration and export similarity between the EU and Ukraine

Indicator	Formula	Interpretation
Trade Intensity Index (TII)	For Ukraine-EU agri-food trade: $TII_{UA,EU} = \frac{\frac{E_{UA,EU}}{E_{UA,W}}}{\frac{E_{EU,W}}{E_W}}$ where $E_{UA,EU}$ – Ukraine's agricultural exports to EU, $E_{UA,W}$ – Ukraine's total agricultural exports to world, $E_{EU,W}$ – EU's total agricultural exports to world, E_W – world's total agricultural exports. For EU-Ukraine agri-food trade: $TII_{EU,UA} = \frac{\frac{E_{EU,UA}}{E_{EU,W}}}{\frac{E_{UA,W}}{E_W}}$ where $E_{UA,EU}$ – EU's agricultural exports to Ukraine, $E_{EU,W}$ – EU's total agricultural exports to world, $E_{UA,W}$ – Ukraine's total agricultural exports to world, E_W – world's total agricultural exports.	Higher TII values reflect Ukraine's strong orientation toward the EU market in specific agricultural sectors, while lower values indicate limited trade integration or diversification toward other markets.
Export Similarity Index (ESI)	$ESI_{UA,EU} = \sum_{k=1}^{n} \min\left(s_{UA,k}, s_{EU,k}\right),$ where $s_{UA,k}$ – share of product *k* in Ukraine's total exports; $s_{EU,k}$ – share of product *k* in EU's total exports.	Analyse how similar the EU's and Ukraine's export structures are. ESI ranges between 0 (completely different export structures) and 1 (identical).
Grubel-Lloyd Index (GLI)	$GLI = 1 - \frac{\lvert X_i - M_i \rvert}{X_i + M_i}$ where X_i – value of exports of product *i*, M_i – value of imports of product *i*.	A higher GLI value (closer to 1) signifies that Ukraine and the EU engage in a substantial two-way exchange of similar agricultural products. A lower GLI value (closer to 0) indicates that trade between Ukraine and the EU remains inter-industry.
Weighted GLI (aggregate)	$GLI_w = 1 - \frac{\sum_i \lvert X_i - M_i \rvert}{\sum_i (X_i + M_i)}$ where X_i – value of exports of product *i*, M_i – value of imports of product *i*, $\sum_i$ – sum over all agricultural products considered.	Overall two-way trade intensity, weighted by trade value. The Weighted GLI ranges from 0 to 1.
Cosine Similarity (CS)	$CS_{UA,EU} = \frac{\sum_{i=1}^{n} E_{UA} \times E_{EU}}{\sqrt{\sum_{i=1}^{n} E_{UA}^2} \times \sqrt{\sum_{i=1}^{n} E_{EU}^2}}$ where E_{UA} – value of Ukraine's exports of agricultural product *i*, E_{EU} – value of the EU's exports of the same agricultural product *i*, *n* – total number of agricultural products.	Measures export structure similarity (composition correlation). 1 means identical (very similar) agricultural export structures (Ukraine and the EU export similar products in similar proportions); 0 means completely different.
Herfindahl-Hirschman Index (HHI)	$HHI = \sum_{i=1}^{n} s_i^2$ where s_i – share of product *i* in total agricultural exports.	Measures market concentration of EU imports (exports) from (to) Ukraine. Higher value means more concentrated.
Export Diversification Index (EDI)	$EDI = 1 - \sum_{i=1}^{n} s_i^2$	Higher value means more diversified export basket.

Source: own processing based on Finger & Kreinin, 1979; Trade Indicators (2025)

With a cosine similarity of 0.364, there is partial convergence, indicating some structural alignment in arable crops, but significant overall divergence because the EU's exports are more diversified than Ukraine's, which remain concentrated in crops.

Comparative data about trade patterns in the EU–Ukraine agri-food sector are summarised in Table 7.

A comparative analysis of agricultural development and export structures in the European Union and Ukraine was conducted, which demonstrated

Table 5

ESI between the European Union and Ukraine for product groups of the agri-food sector in 2024

Product group	EU export, million EUR	EU share, %	UA export, million EUR	UA share, %	Min. share, %
Animal products	543	14.9	756	5.8	5.8
Arable crops and plant based products	507	13.9	11145	85.1	13.9
Fruit, vegetables and olive oil	516	14.2	602	4.6	4.6
Wine, beverages and food preparations	934	25.7	369	2.8	2.8
Coffee, tea, cocoa and spices	481	13.2	17	0.1	0.1
Non-edible	652	17.9	203	1.5	1.5
Sum of minimum					28.8

Source: own processing

Table 6

Results of calculation of agri-food trade integration indicators for EU-Ukraine and Ukraine-EU in 2024

Indicator	EU	UA	Interpretation
Weighted GLI	0.257		The EU and Ukraine mostly exchange different agri-food products, not similar varieties.
CS	0.364		Low structural similarity of export shares between the two exporters. The EU exports to Ukraine differ from imports from Ukraine.
HHI	0.1778	0.7307	Ukraine's export structure is highly concentrated; the EU's is more diversified.
EDI	0.8222	0.2696	EU exports to Ukraine are quite diverse, whereas Ukrainian exports to the EU are not.

Source: own processing based on Trade Competitiveness Map (2025); European Commission. European Union Trade in goods with Ukraine (2025); European Commission. Agri-food trade statistical factsheet. European Union - Extra EU27 (2025); European Commission. Agri-food trade statistical factsheet. European Union – Ukraine (2025); State Statistics Service of Ukraine (2025); OEC (2025); Infographic report Agribusiness of Ukraine, 2023/24

Table 7

Trade patterns in the EU-Ukraine agri-food sector

Item	Structural similarities and differences
Similarities between the EU and Ukraine	1. Both are major producers of agricultural commodities in Europe (significant role in regional food supply). 2. Both rely on mechanised commercial farming for their major export crops (large commercial farms produce the bulk of traded cereals, oilseeds). 3. Both face pressures to green agriculture (environmental targets, sustainable practices) and need investments to balance productivity with sustainability.
Differences the EU compared to Ukraine	1. Product mix, because EU exports relatively more processed, high-value agri-food; Ukraine exports mainly bulk raw commodities. 2. Policy environment, because EU operates under the CAP with significant direct payments, environmental conditionality, and market management; Ukraine's policy framework is evolving and shaped by recovery and DCFTA alignment. 3. Market diversification, namely EU's export destinations are more diversified; Ukraine is heavily oriented to the EU market for grains, oilseeds.
Differences Ukraine compared to the EU	1. Value addition, because Ukraine captures less value per unit (exports raw commodities) and has lower levels of processed exports, which is a challenge for industrial policy and job creation. 2. Vulnerability to shocks, because war impacts, infrastructure damage and logistic constraints make Ukraine's agriculture more vulnerable to large shocks. 3. Integration readiness, because Ukraine is aligning with EU standards but still needs improvements and investments.

Source: own processing

moderate similarities but substantial differences. Both maintain organised agricultural sectors, engage in global trade, and adopt environmental and regulatory frameworks. However, a divergence emerges in terms of production scale, technological advancement, export composition, and value-chain integration. Ukraine's agricultural sector is characterised by a significant reliance on raw commodities, predominantly cereals, oilseeds and protein crops, and vegetable oils. The processing industry in Ukraine is underdeveloped and mechanisation is only moderate. In contrast, the EU operates a diversified, high-value, technologically advanced system with strong vertical integration and a focus on processed and animal-based products. These structural differences indicate complementarity rather than competition. The hypothesis that deeper trade co-operation, supply chain integration, and regulatory alignment could strengthen mutual benefits and foster a more resilient and competitive European agri-food market is one that merits further investigation.

5. Discussions

The hypothesis that deeper trade co-operation, supply chain integration, and regulatory alignment could strengthen mutual benefits and foster a more resilient and competitive European agri-food market is one that merits further investigation. In a manner consistent with the conclusions of the European Commission (2025), the present study, based on calculated indicators, confirms that Ukraine's exports are dominated by raw and plant-based commodities, whilst those of the EU are more diversified and value-added, thus suggesting a complementary rather than competitive integration. However, in contrast to the findings of Caetano & Galego (2006), who identified gradual increases in intra-industry trade for Central and Eastern European partners, the analysis reveals that the exchange of agri-food products between the EU and Ukraine continues to exhibit a predominantly inter-industry pattern, characterised by limited product overlap. There are still open questions regarding how post-war reconstruction, investment in processing capacity, and adaptation to EU Green Deal standards will affect future structural convergence and whether Ukraine can move towards a more diversified and innovation-driven agricultural trade profile.

6. Conclusions and Recommendations

An analysis of agricultural trade integration between Ukraine and the European Union reveals an asymmetric yet gradually intensifying relationship. The findings of the Trade Intensity Index demonstrate that Ukraine remains a substantial agri-food partner for the EU, while the EU continues to be Ukraine's predominant trading counterpart. However, Ukraine's agricultural exports exhibit a greater degree of orientation towards the EU than the EU's average orientation towards the global market. This high level of trade intensity is indicative of the geographical proximity, preferential access granted by the DCFTA, and complementary resource endowments of both partners.

However, an analysis of the structure of bilateral agri-food trade demonstrates limited structural convergence. The Export Similarity Index and Cosine Similarity both indicate that the EU and Ukraine still specialise in distinct agri-food segments. Ukraine's exports are heavily concentrated in arable crops and plant-based commodities, as evidenced by the Herfindahl-Hirschman Index and Export Diversification Index. In contrast, the EU's export structure is more diversified, dominated by processed and high-value food products such as beverages, animal products, and non-edible goods. The Grubel-Lloyd Index and its weighted aggregate value demonstrate that bilateral trade is predominantly inter-industry in nature. A mere fraction of the aggregate agri-food exchange can be designated as intra-industry trade, predominantly in the domains of fruits, vegetables, and beverages. This phenomenon can be interpreted as indicative of a complementary relationship between the EU and Ukraine, as opposed to a competitive one. The dynamics of trade in this context are driven by disparities in production structures and comparative advantage, as opposed to product differentiation within the same industry.

The findings under consideration highlight both the progress and structural limitations of EU-Ukraine agricultural trade integration. While trade intensity has increased substantially since the implementation of the DCFTA, the composition of trade remains asymmetric. Ukraine's economic focus remains predominantly on the production of raw and semi-processed commodities, while the EU's export portfolio is characterised by a significant emphasis on processed and high-value food products. This pattern indicates a necessity for policies that promote structural upgrading and diversification within Ukraine's agri-food sector.

Firstly, it is imperative that the enhancement of value-added production becomes a primary priority. The hypothesis is that targeted investment in food processing, logistics infrastructure, and certification systems would enable Ukrainian producers to meet EU quality and safety standards, thus moving up the value chain. This could stimulate a gradual shift from inter-industry to intra-industry trade, increasing integration depth.

Secondly, it is imperative to emphasise the significance of trade facilitation and regulatory harmonisation. Maintaining alignment with EU sanitary, phytosanitary, and environmental standards as outlined in the Association Agreement is expected to result in a reduction of non-tariff barriers and transaction costs.

Thirdly, policies that encourage innovation and sustainability can foster long-term competitiveness. The encouragement of research, digitalisation, and the adoption of green technologies in agriculture will not only increase productivity but also align Ukraine's agricultural system with the EU's Green Deal objectives. The integration of sustainability standards has the potential to create new export opportunities and enhance resilience against climate and market shocks.

Finally, it is recommended that regional and institutional co-operation be strengthened. The establishment of collaborative programmes in the domains of agricultural research, technical assistance and rural development would facilitate

Ukraine's integration into the agri-food value chains of the European Union. Such measures would foster greater convergence of production structures, promote diversification, and transform bilateral trade from a predominantly commodity-based exchange into a balanced, innovation-driven partnership.

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Conflict of interests

The authors declare no conflict of interest.

Author Contributions

The contribution of the authors to different parts of the article is equal.

References:

Belkin, I., Trapaidze, S., Bondarenko, V., Omelianenko, O., & Cherniavskyi, I. (2025). Sustainable Marketing of Ukrainian Agricultural Enterprises to Enter Global Grain Markets. *European Journal of Sustainable Development, 14*(2), 490–490. DOI: https://doi.org/10.14207/ejsd.2025.v14n2p490

Bogonos, M., & Chmil, A. (2023). Development of agricultural trade between Ukraine and EU. *German-Ukrainian Agricultural Policy Dialogue (APD), 71*. Available at: https://www.apd-ukraine.de/fileadmin/user_upload/Agrarpolitische_Berichte/APD_Bogonos_ENG.pdf

Caetano, J. M. M., & Galego, A. (2006). In search for determinants of intra-industry trade within an enlarged Europe. Available at: https://asecu.gr/old_files/Seeje/issue09/caetano.pdf

Countryman, A. M., Litvinov, V., Kolodiazhnyi, I., Bogonos, M., & Nivievskyi, O. (2025). Global economic effects of war-induced agricultural export declines from Ukraine. *Applied Economic Perspectives and Policy, 47*(2), 624–665. DOI: https://doi.org/10.1002/aepp.13468

Dankevych, V., Dankevych, Y., & Pyvovar, P. (2018). Clustering of the international agricultural trade between Ukraine and the EU. *Management Theory and Studies for Rural Business and Infrastructure Development, 40*(3), 307–319. DOI: https://doi.org/10.15544/mts.2018.29

European Commission. Agri-food trade statistical factsheet. European Union – Extra EU27. Available at: https://agriculture.ec.europa.eu/system/files/2023-05/agrifood-extra-eu27_en.pdf

European Commission. Agri-food trade statistical factsheet. European Union – Ukraine. Available at: https://agriculture.ec.europa.eu/system/files/2023-05/agrifood-ukraine_en_0.pdf

European Commission. European Union Trade in goods with Ukraine. Available at: https://webgate.ec.europa.eu/isdb_results/factsheets/country/details_ukraine_en.pdf

Eurostat. Extra-EU trade in agricultural goods. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Extra-EU_trade_in_agricultural_goods

Fediv, R., & Fediv, I. (2020). Directions of development and implementation of the Ukrainian export potential. *Scientific papers-series management economic engineering in agriculture and rural development, 4*(20), 195–202.

Finger, J. M., & Kreinin, M. E. (1979). A measure of "export similarity" and its possible uses. *The Economic Journal, 89*(356), 905–912. DOI: https://doi.org/10.2307/2231506

Gagalyuk, T., Ostapchuk, I., Lapa, V., & Balmann, A. (2022). Why did Ukraine become a key player on the world agri-food markets? An enterprise-level perspective. *German Journal of Agricultural Economics, 71*(3). DOI: https://doi.org/10.30430/gjae.2022.0302

Galunets, N. (2019). Place of the Ukrainian agricultural exports on the world food market. *Agricultural and Resource Economics: International Scientific E-Journal, 5*(4), 79–94. DOI: https://doi.org/10.51599/are.2019.05.04.05

Horská, E., Moroz, S., & Palkovič, J. (2023). Determinants of export activities in Ukrainian regions in the pre-conflict and the first-stage conflict periods. *Entrepreneurial Business and Economics Review, 11*(1), 181–198.

Infographic report Agribusiness of Ukraine 2023/24. Available at: https://agribusinessinukraine.com/the-infographics-report-ukrainian-agribusiness-2024-eng/

Karasova, N. (2016). Comparative advantages in international trade of Ukrainian agriculture. *Management Theory & Studies for Rural Business & Infrastructure Development, 38*(3). DOI: https://doi.org/10.15544/mts.2016.18

Kravchenko, I. (2014). Management of the export potential of the Ukrainian enterprises in the context of entrance to the European market. *Central European Journal of Management, 1*(2), 19–39. DOI: https://doi.org/10.5817/CEJM2014-2-2

Kryukova, I. O., Kalyna, T. Y., Panteleiev, V. P., & Minakova, S. M. (2018). The export potential of the agrarian sector of Ukraine in a competitive environment. *Financial and credit activity problems of theory and practice,* 3(26), 196–207. DOI: https://doi.org/10.18371/fcaptp.v3i26.144833

Lupenko, Y. O., Gutorov, A. O., & Gutorov, O. I. (2018). Investment ensuring for development of integration relations in the agricultural sector of Ukrainian economy. *Financial and credit activity problems of theory and practice, 4*(27), 381–389. DOI: https://doi.org/10.18371/fcaptp.v4i27.154221

Melnyk, T., Tunitska, Y., & Liubyma, A. (2021). Export potential of Ukrainian agro-industrial complex: factors of formation and evaluation. *Baltic Journal of Economic Studies,* 7(5), 130–143. DOI: https://doi.org/10.30525/2256-0742/2021-7-5-130-143

Moroz, S., Nagyova, L., Bilan, Y., Horska, E., & Polakova, Z. (2017). The current state and prospects of trade relations between Ukraine and the European Union: the Visegrad vector. *Economic annals-XXI,* 163, 14–21. DOI: https://doi.org/10.21003/ea.V163-03

Nagyova, L., Horáková, M., Moroz, S., Horská, E., & Poláková, Z. (2018). The analysis of export trade between Ukraine and Visegrad countries. *E+M Ekonomie a Management*. DOI: https://doi.org/10.15240/tul/001/2018-2-008

Nivievskyi, O., & Bogonos, M. (2024). Impact Assessment of Agri-Food Trade Between Ukraine and the EU. *APD/APB/07/2024 Policy Study*. DOI: http://dx.doi.org/10.2139/ssrn.5129578

OEC. Animal Products. Available at: https://oec.world/en/profile/hs/animal-products

OEC. Ukraine. Retrieved from https://oec.world/en/profile/country/ukr

OEC. Vegetable Products in Ukraine. Available at: https://oec.world/en/profile/bilateral-product/vegetable-products/reporter/ukr

OEC. World Animal Products. Available at: https://oec.world/en/profile/hs/animal-products

Ostashko, T., Kobuta, I., Olefir, V., & Lienivova, H. (2022). Evaluation of the results and analysis of the impact of the DCFTA with the EU on agricultural trade in Ukraine. *Agricultural and Resource Economics: International Scientific E-Journal,* 8(4), 86–108. DOI: https://doi.org/10.51599/are.2022.08.04.04

Sardak, S., Radziyevska, S., & Us, I. (2019). Exports of Ukraine as a global challenge for its future, In *SHS Web of Conferences,* 65, 09003. DOI: https://doi.org/10.1051/shsconf/20196509003

Shubravska, O., & 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. DOI: https://doi.org/10.36956/rwae.v3i4.693

Shubravska, O., Prokopenko, K., Krupin, V., & Wojciechowska, A. (2024). Challenges and opportunities for the development of Ukrainian agriculture in the context of EU enlargement. *Studies in Agricultural Economics,* 126(2), 1–9. DOI: https://doi.org/10.7896/j.2833

State Statistics Service of Ukraine. Structure of foreign trade. Available at: https://www.ukrstat.gov.ua/

Spiliopoulos, O. (2014). The EU-Ukraine association agreement as a framework of integration between the two parties. *Procedia Economics and Finance*, *9*, 256–263. DOI: https://doi.org/10.1016/S2212-5671(14)00027-6

Szajner, P., Szczepaniak, I., & Łopaciuk, W. (2024). An assessment of the production potential and food self-sufficiency of Ukraine against the background of the European Union and Poland. *Sustainability, 16*(17), 7735. DOI: https://doi.org/10.3390/su16177735

Totska, O. L. (2022). The value dimension of Ukrainian exports of grain crops, fats and oils to European Union countries. *Scientific Papers Series «Management, Economic Engineering in Agriculture and Rural Development, 22*(3), 767–770.

Trade Competitiveness Map. Available at: https://tradecompetitivenessmap.intracen.org/TP_EP_CI.aspx?RP=804&Yr=2023

Trade Indicators. Available at: https://wits.worldbank.org/wits/wits/witshelp/Content/Utilities/e1.trade_indicators.htm

Van der Loo, G. (2016). *The EU-Ukraine Association Agreement and Deep and Comprehensive Free Trade Area: a new legal instrument for EU integration without membership* (Vol. 10). Brill.

Verzun, A., Voinycha, L., Fedyk, O., Shulha, O., Lipych, L., Shmatkovska, T., & Herylo, V. (2023). Export potential of agricultural-industrial complex of Ukraine: logistics and development prospects. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, *23*(4).

Urba, S., Senyshyn, O., Zamroz, M., & Shparyk, Y. (2023). Assessment of export capacity of agricultural sector in the context of international competitiveness. *Management Theory and Studies for Rural Business and Infrastructure Development, 45*(1), 67–78. DOI: https://doi.org/10.15544/mts.2023.08

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