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IMPACT OF WAR AND GEOPOLITICAL FACTORS ON FOREIGN TRADE

ABSTRACT

In the context of the current geopolitical transformations caused by the war in Ukraine, world trade is undergoing significant changes that emphasize the need to analyze the new geoeconomic reality. The war in Ukraine has become a catalyst for the restructuring of global trade chains, intensifying de-globalization processes that are shaping a sustainable preference for political loyalty over economic efficiency. The purpose of the article is to analyze the impact of the war in Ukraine and geopolitical factors on the dynamics of world foreign trade in 2016-2024, with a focus on structural changes in Ukraine's trade flows. The study applies an econometric panel regression model to estimate trade turnover, exports, imports, and their percentage changes, taking into account commodity prices, macroeconomic conditions, exchange rate, and time effects. The econometric model found that the war-induced rise in commodity prices significantly increased the turnover of commodity groups, particularly mineral products. Hryvnia devaluation stimulated exports, while global GDP growth had a weaker effect. Fuel and energy products showed low growth due to import restrictions. The model confirmed a high explanatory power ($R^2 > 0.8$) for trade turnover and emphasized the vulnerability of trade to geopolitical shocks that could hinder the recovery in 2024. Further research should focus on analyzing the long-term effects of the war and sanctions, including detailed data on logistical constraints and sanctions pressure, and assessing the impact of trade agreements with the EU on Ukrainian exports. Expanding the model to analyze trade in services and regional blocs will help develop strategies for adapting to the new geopolitical reality.

Keywords: war in Ukraine, geopolitics, international trade, de-globalization, exports and imports, economic security

JEL Classification: F10, F14, O24

INTRODUCTION

In today's environment of geopolitical instability and growing conflict between Western countries and their political and economic opponents, the world's foreign trade system is undergoing profound structural changes that are gradually transforming the configuration of global economic relations. The unfolding of a full-scale war in Ukraine, which was the result of Russian aggression, is not only a regional security challenge but also a key trigger for rethinking the principles of global economic interaction, affecting sanctions policy, investment flows, logistics routes, and the architecture of multilateral cooperation (Paryan & Hashfi, 2023). Increased sanctions pressure from Western countries, tighter restrictions on technological exchange, and growing barriers to international trade contribute to the intensification of economic polarization and the emergence of alternative centers of power that increasingly oppose Western models of global order regulation. At the same time, the war in Ukraine is a catalyst for the institutionalization and activation of the collective "Global South" or the so-called "non-West", which includes states that do not support the replacement of international law with the concept of a "rules-based order" promoted by the United States and its allies (Blenkinsop, 2024).

The study is especially relevant in the context of the current wave of de-globalization, which is increasingly manifested in the reduction of the role of Western institutions, reorientation of trade flows, and the growing role of regional integration initiatives. Today, the international economic system is facing processes that are both a response to

foreign policy crises and the result of long-term dynamics of the global economy, where traditional centers of power are gradually losing influence and large economies that are not part of the transatlantic space are coming to the fore.

LITERATURE REVIEW

The multidimensional and contradictory impact of foreign trade liberalization on the development of national economies is reflected in the works of well-known economists and practitioners (in particular, Mazaraki & Melnyk, 2025; Qiu, Xia & Yetman, 2025; Yu & Wang, 2023), who in their works emphasized both the potential of open trade regimes to stimulate economic growth and the threats associated with uneven distribution of benefits and vulnerability to global shocks. These studies have laid the foundation for the formation of an understanding of the ambivalent nature of globalization, within which trade liberalization can act both as a source of economic consolidation and as a factor in exacerbating structural imbalances. In the context of Ukraine, the theoretical and practical aspects of foreign trade, its integration into global economic processes, and the consequences for the domestic market are the subject of systematic research by scholars, among which it is worth noting the works of Pichkurova (2024) and Singh et al. (2022). Their works focus on assessing export potential, barriers to access to international markets, and the impact of the global environment on the dynamics of Ukrainian foreign trade.

Studies by international organizations, as well as the use of official statistics, from the United Nations Conference on Trade and Development, 2024; World Bank, 2024; World Trade Organization, 2024, provide an empirical basis for analyzing changes in foreign trade under martial law. The authors of Shamborovskyi (2024) and Zhyla (2023) pay special attention to the impact of the war on export and import indicators, transformation of the commodity structure, and change of priorities in trade directions.

At the same time, a critical analysis of the literature reveals a significant gap in the study of the impact of geopolitical factors, in particular a full-scale war in Ukraine, on the long-term dynamics of foreign trade relations. The issues of adaptation to the destroyed logistics, new challenges of international competition, and assessment of the structural shift towards allied trade blocs remain insufficiently studied. In this regard, there is a growing need for a comprehensive study of strategies for restoring and rebuilding Ukraine's foreign trade potential in the new geoeconomic reality.

AIMS AND OBJECTIVES

The purpose of the article is to conduct an empirical analysis of the impact of the full-scale war in Ukraine and current geopolitical factors on the dynamics, structure, and strategic vectors of world foreign trade, with a special emphasis on the transformation of Ukraine's international trade relations.

METHODS

The econometric approach used in this study is based on panel fixed effects regression. The method was deliberately chosen because of its ability to capture the subtleties of interactions between different commodity groups and time changes, providing a perspective for understanding the changing trade landscape. Based on a structured data set covering a variety of trade indicators from total trade to exports, imports, and their relative changes, the study provides a comprehensive framework for examining patterns across sectors, from agricultural products to manufactured goods. At the core is the modeling of trade volumes as a function of key economic and geopolitical factors, including commodity price fluctuations, global economic growth trends, exchange rates, and time shifts. An additional analysis looks at percentage changes in trade volume, taking into account baseline trade levels to account for economies of scale.

RESULTS

The new geopolitical reality and its impact on global trade

The academic community has long been analyzing trends in the shift of industrial, financial, and intellectual activity from traditional Western economies to new players, primarily China and Southeast Asia. The global financial crisis of 2008-2009 exposed the vulnerability of the Western financial architecture and, at the same time, stimulated a growing discourse on the shift in the centers of economic power in the world, focusing on the growing influence of new economies and the

gradual reformatting of the geo-economic space. Later, these changes only deepened under the influence of new challenges, such as the COVID-19 pandemic, technological and trade wars between the United States and China, climate threats, and military conflicts, among which the war in Ukraine has become the most powerful trigger for the restructuring of global trade.

Even though international experts had noted the growth of de-globalization processes even before the Russian-Ukrainian war, exacerbated by the COVID-19 pandemic and trade conflicts between the United States and China, it was the war in Ukraine that became the point of no return, after which geopolitical considerations finally dominated the logic of free trade, economic integration, and technological cooperation. The governments of leading countries have increasingly resorted to friendshoring and allyshoring strategies, which involve the relocation of production facilities or the establishment of new cooperative ties exclusively with "friendly" countries that share similar political values or are part of geopolitical alliances.

Under the current conditions, when the degree of distrust between the world's major geo-economic blocs has reached a record level, geographic proximity is giving way to political loyalty, and economic benefits are already becoming a criterion for strategic security. The tendency to reorient trade and production chains based on political compatibility became apparent during the US-China trade war, but it was the war in Ukraine that largely consolidated the West around the idea of countering the aggressor through the tools of economic pressure, sanctions, and restructuring of trade priorities.

According to IMF analytical estimates, since 2010, the importance of geopolitical proximity for the location of foreign direct investment flows has far outweighed geographic proximity, and this pattern has become even more pronounced since the outbreak of a full-scale war. Governments of developed countries are not only calling for the return of production to their territory or to allies, but are also taking measures to limit the export of strategic technologies to competing countries, which threatens to fragment the single global market into opposing political zones of influence.

However, even with the active formation of economic blocs, it is not possible to completely isolate the global economy because of the deep interdependence between the world's major economies. For example, the OECD's interstate input-output tables show that the hidden ties between the United States and China in the supply of goods and technologies are much deeper than superficial statistical indicators indicate, making it difficult to divide the world into two opposing economic systems without serious global losses.

An analysis of the dynamics of global foreign trade in 2016-2024 shows that significant fluctuations in the volume of international exchange of goods and services occur not only during periods of deep economic crises, such as the 2020 pandemic, but also under the influence of political instability and pre-crisis conditions, in particular in 2016, 2019, and 2023, which indicates an increase in the sensitivity of global trade to geopolitical factors and force majeure events. This trend was especially pronounced in the context of the full-scale war in Ukraine, which dramatically changed the rules of global trade chains, questioning the sustainable logic of globalization and forcing governments and businesses to adapt to the new security and economic reality (International Trade Centre, 2025). Despite the presence of recessionary trends in certain years, the global economy has shown steady growth in absolute terms over the past decade: according to estimates, the global gross domestic product has increased from USD 76.6 trillion in 2016 to a projected USD 115.6 trillion in 2025. In 2016, the global gross domestic product is projected to reach USD 76.6 trillion to USD 115.5 trillion in 2025. This is an increase of one and a half times in 2025. However, in the period after the pandemic, in particular in 2022-2024, despite the positive dynamics (in the range of 3.2-3.6%), the growth rate remains lower than the average of the previous two decades (2000-2019), when annual global GDP growth averaged 3.7%. The only exception was 2021, which was a year of rapid recovery from the pandemic shock, with global GDP growth of 6.6% (Figure 1).

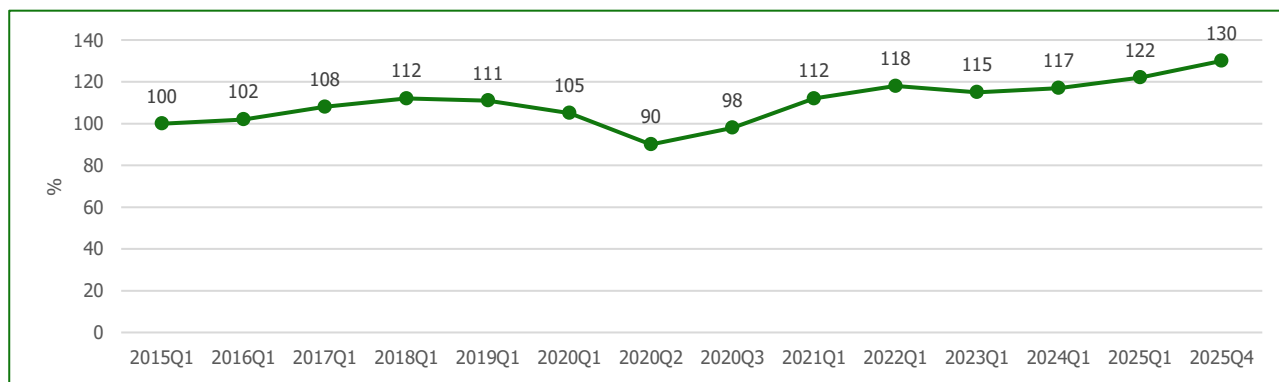


Figure 1. Dynamics of the World Merchandise Trade Index by Quarters in the Period from 2015 to 2025. (Source: World Trade Organization, 2024a)

In terms of international trade, there has been a noticeable expansion of its scale in nominal terms over the same period: global exports of goods and services increased from USD 20.8 trillion in 2016 to an estimated USD 1.5 trillion in 2017. In 2016, the volume of global exports of goods and services increased from USD 20.8 trillion to a projected USD 33.5 trillion in 2015. This is a more than 1.6-fold increase in 2025. This increase occurred despite numerous geo-economic shocks, from the US-China trade war to the disruption of supply chains caused by the fighting in Ukraine.

Table 1. Dynamics of Gross Domestic Product and International Trade, 2016-2025 (USD trillion, %). (Source: World Trade Organization, 2024b)

Indicator	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
GDP										
World, USD trillion	76.598	81.479	86.497	87.772	85.519	97.403	101.409	105.685	110.065	115.494
World, growth, %	3.3	3.8	3.6	2.9	-2.7	6.6	3.6	3.3	3.2	3.3
Developed countries	1.8	2.6	2.3	1.9	-4.0	6.0	2.9	1.7	1.8	1.8
Transition and developing countries	4.4	4.8	4.7	3.7	-1.8	7.0	4.0	4.4	4.2	4.2
International trade, exports										
Goods and services, USD trillion	20.838	23.012	25.209	24.819	22.413	28.119	31.552	30.963	32.263	33.542
Growth, %	-1.8	10.4	9.5	-1.5	-9.7	25.5	12.2	-1.9	4.2	3.9
Commodities, USD trillion	15.748	17.477	19.132	18.564	17.192	21.846	24.287	23.133	23.922	24.810
Growth, %	-2.8	10.9	9.5	-2.9	-7.4	27.1	11.2	-4.8	3.4	3.7
Share of goods in world trade, %.	75.6	75.9	75.9	74.8	76.7	77.7	76.9	74.7	74.1	74.0

After the unfavorable situation in 2023, when the impact of war, energy shocks, and monetary tightening in developed countries led to a slowdown in trade activity, IMF experts predict a recovery in foreign trade in 2024 with a growth rate of 4.2%, and in 2025 by 3.9%. This dynamic is due to the partial stabilization of global prices for raw materials and energy resources, business adaptation to new geopolitical realities, and the expansion of trade cooperation within regional blocs formed on the basis of political identity or strategic trust (Metelenko et al., 2019).

In the same context, the nominal growth of international merchandise exports is expected to increase by 1.57 times over the decade, reaching 3.4% in 2024 and 3.7% in 2025, which is a sign of the gradual stabilization of the global economy in the new geopolitical reality. It also indicates the formation of a new model of global trade, which is increasingly based on political considerations, security guarantees, and strategic autonomy, rather than just economic efficiency or logistical feasibility (World Trade Organization, 2024b).

Although the growth of commodity exports in many countries is largely driven by increased external demand, prices for food, energy, and other key commodities may be subject to significant fluctuations caused by geopolitical turmoil, in particular the war in Ukraine, which began in 2022 and has significantly affected global trade flows. According to experts, uncertainty in trade policy has increased significantly due to rising tensions between countries and the formation of conventional geopolitical blocs that unite states with similar political views, which, in particular, has led to a 4% slowdown in trade between these blocs compared to trade within such associations. This trend, as illustrated in Figure 2, emphasizes the vulnerability of global trade to external shocks, as despite significant economic challenges, merchandise trade volumes have remained relatively stable over the past four years, demonstrating impressive resilience.

However, data analysis shows that the volume of trade in goods in 2023 either significantly exceeded pre-pandemic levels or declined only slightly in the fourth quarter compared to the first quarter of 2022 (by 0.6%), indicating uneven recovery dynamics. As a result, the unfavorable trade environment in 2023, which was influenced by the war in Ukraine and other geopolitical factors, is expected to have long-term consequences, holding back the development of merchandise trade in 2024 and 2025, requiring additional efforts to stabilize global markets.

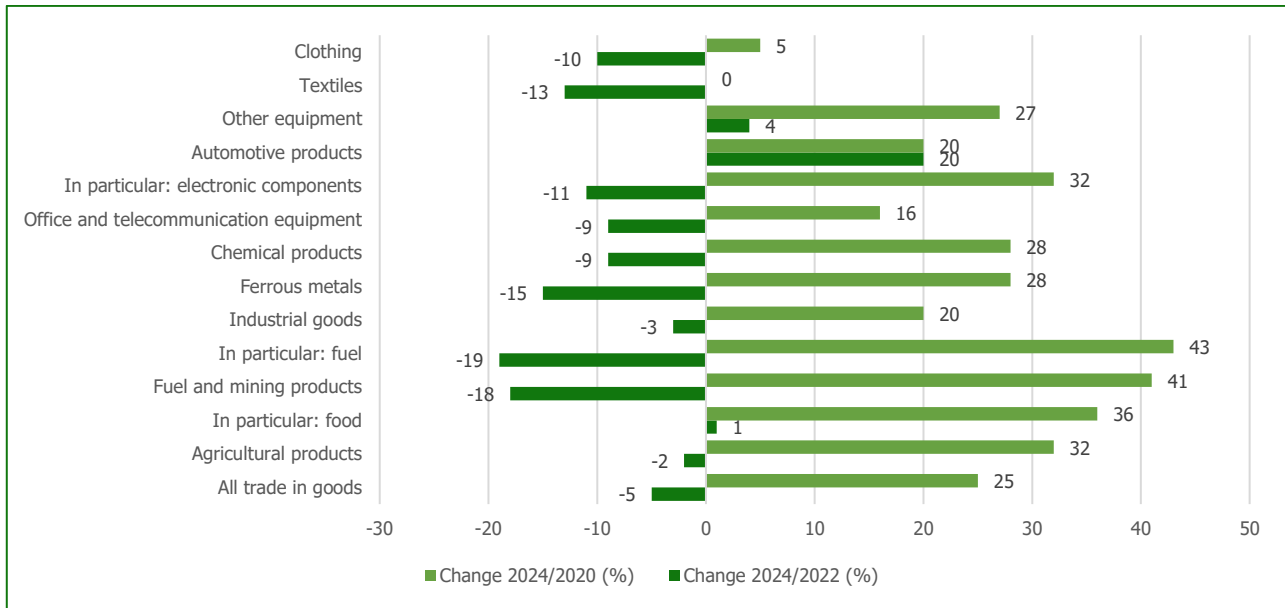


Figure 2. Annual changes in world merchandise trade in 2024/2022 and 2024/2020 for selected product groups, %. (Source: Economist Impact, 2025)

At the end of 2024, the overall dynamics of the global economy and international trade demonstrates a strong dependence on a number of political and macroeconomic factors, among which the leading place is occupied by the impact of the full-scale war in Ukraine, which has been going on for three years, as well as the growing geopolitical confrontation between the world's leading centers of power. The combination of sanctions pressure on Russia from Western countries, which remains in a tough format, together with the increase in key interest rates by major central banks in order to curb persistent inflation, creates significant pressure on global economic activity (Table 2) (World Bank, 2024).

Table 2. Dynamics of international trade, commodity prices, and consumer prices in the period 2021-2024. (Source: United Nations Conference on Trade and Development, 2024)

Indicator	2021	2022	2023	2024	Correction (October 2022 WEO) 2023	Correction (October 2022 WEO) 2024
International trade (goods and services)	10.4	5.4	2.4	3.4	-0.1	-0.3
Countries with developed economies	9.4	6.6	2.3	2.7	0.0	-0.4
Transition and developing countries	12.1	3.4	2.6	4.6	-0.3	0.0
Prices for raw materials						
Oil	65.8	39.8	-16.2	-7.1	-3.3	-0.9
Non-energy sector	26.4	7.0	-6.3	-0.4	-0.1	0.3
Global consumer prices	4.7	8.8	6.6	4.3	0.1	0.2
Countries with developed economies	3.1	7.3	4.6	2.6	0.2	0.2
Transition and developing countries	5.9	9.9	8.1	5.5	0.0	0.2

While China's economy showed a slowdown in growth in 2022, primarily due to severe anti-pandemic restrictions, in late 2023 and early 2024, there was a gradual shift away from this policy, which paved the way for a faster-than-expected recovery in production and foreign economic activity in China. At the same time, according to updated estimates by international institutions, including the International Monetary Fund, the overall global inflation rate, which reached 8.8% in 2022, shows a stable downward trend to 6.6% in 2023 and approximately 4.3% in 2024. However, even with this positive trend, inflationary pressures remain higher than in the pre-crisis period of 2017-2019, when the average global inflation rate was approximately 3.5% (World Bank, 2024).

In recent years, inflation rates have been particularly high in transition and developing countries, where inflation is projected to reach 8.1% in 2023 and 5.5% in 2024. At the same time, more moderate rates are expected in advanced

economies: 5.7% in the euro area in 2023 and 3.3% in 2024, 4.0% and 2.2% in the United States, respectively, and 2.8% and 2.0% in Japan (Zhuang, 2024).

As for international trade, its dynamics in 2023-2024, according to IMF estimates, are associated with the traditional correlation with global production. After a 5.4% growth in trade in 2022, 2023 was marked by a slowdown to 2.4%, while in 2024, growth is expected to resume to 3.4%, indicating that the world economy is gradually adapting to the new conditions of global turbulence. These forecasts are based on expectations of changes in the price dynamics of energy and non-energy commodities with a general downward trend in prices. In particular, oil prices are expected to decline by 16.1% in 2023 and by another 7.1% in 2024. Non-energy resources are projected to fall by 6.3% in 2023 and by 0.4% in 2024. This scenario is accompanied by a policy of tightening monetary conditions, which has been systematically implemented by the world's leading central banks since October 2022, aimed at stabilizing the monetary environment (Centre for the Promotion of Imports from Developing Countries, 2025).

In 2024, amid the ongoing war in Ukraine and related geopolitical challenges, global trade in commercial services showed steady growth, which, in contrast to the unstable dynamics of trade in goods, reached an 8% increase in 2023 and amounted to USD 7.54 trillion. This was largely driven by a recovery in demand for international travel, transportation, and other commercial services following the COVID-19 pandemic, although regional disparities remained pronounced. In particular, the transport sector, which accounted for almost a quarter of the global services market in 2022, suffered significant losses in Asia, where exports of transport services declined by 25%, with a particularly sharp 40% decline in China due to prolonged restrictions, while Europe, where the war in Ukraine disrupted logistics chains, also recorded an 8% decline, reflecting the sector's vulnerability to geopolitical shocks (Figure 3).

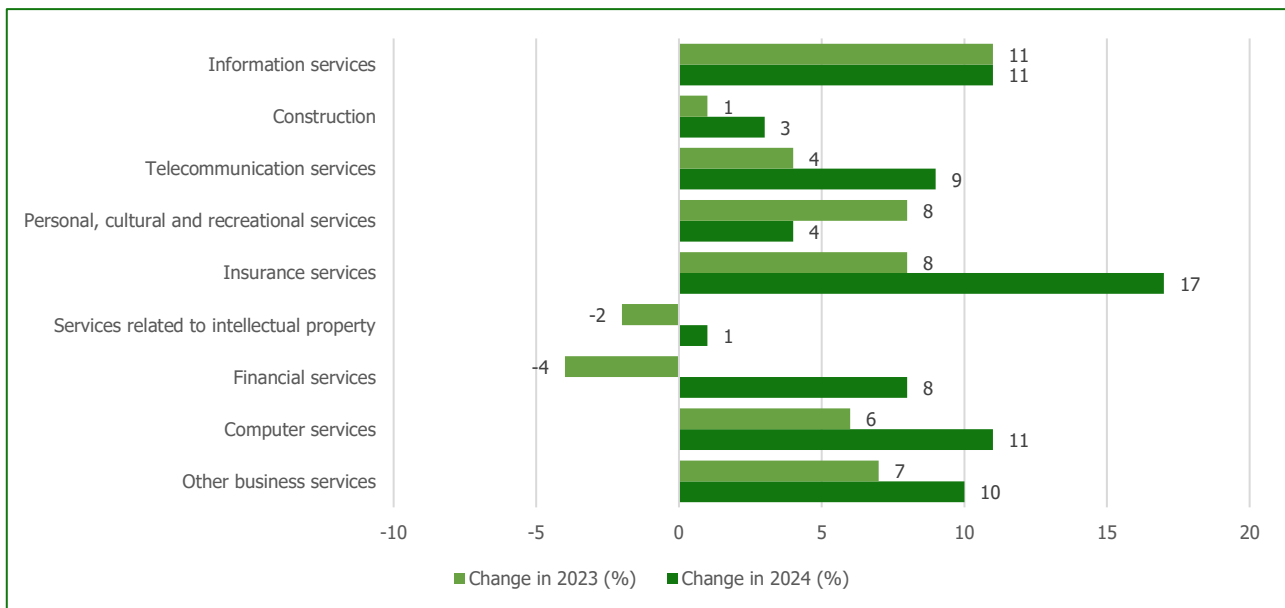


Figure 3. Annual growth of world exports of the main subsectors of commercial services in 2023 and 2024 in %. (Source: United Nations Conference on Trade and Development, 2024)

During 2024, the decline in inflation rates had a positive impact on the tourism industry, allowing Europe and the Middle East to not only reach but exceed pre-pandemic levels of exports and imports of travel services, while Africa showed a full recovery in travel exports, with an increase of 5% compared to 2019, although in Asia, particularly in China, the tourism sector remained subdued, with exports and imports 17% and 13% below pre-pandemic levels due to the slow recovery of outbound tourism, due to previous air travel restrictions and administrative barriers. Positive dynamics in China began to emerge only at the end of 2023, when the introduction of a visa-free regime for certain countries and the revival of tourist activity during the autumn holidays of 2024 contributed to a significant increase in the number of tourists in the first months of the year, which, however, could not fully offset the negative impact of geopolitical instability caused by the war in Ukraine, which continued to pose risks to the sustainable development of global trade in services in 2024 (Seong, et al., 2024).

Ukraine and its foreign trade during martial law.

According to the results of 2024, Ukraine's foreign trade in goods demonstrates positive dynamics, which is manifested in an increase in the value of trade turnover by 13% to USD 112.3 billion. This is reflected in an increase in the physical volume of turnover by 26 %, amounting to almost 160 million tons, which, in turn, exceeds the growth rate of global trade by more than ten times, although the current level remains below the pre-crisis figure of 2021, when there was no full-scale aggression of the Russian Federation against Ukraine (Shnyrkov, Filipenko & Polishchuk, 2025).

Table 3. Trade turnover, exports, imports, and balance by major commodity groups of Ukraine in 2023 and 2024. (Source: National Institute for Strategic Studies, 2025)

Code and name	Turnover 2023	Exports 2023	Imports 2023	Balance 2023	Turnover 2024	Exports 2024	Imports 2024	Balance 2024	Change in turnover (%)	Change in exports (%)	Change in imports (%)
<i>Total</i>	99414	35958	63456	-27497	112267	41589	70679	-29090	13	16	11
1-24 Food and agricultural products	28796	21845	6941	14905	32427	24607	7639	16968	12	13	10
25-26 Mineral products	2233	1963	270	1693	3423	3159	264	2895	53	61	-2
27 Fuel and energy products	10729	391	10338	-9947	9099	201	8898	-8696	-15	-49	-14
28-40 Chemical products industry, rubber	12184	1145	11039	-9894	12948	1204	11744	-10541	6	5	6
41-43 Leather, fur, and products made of them	336	78	258	-180	352	200	352	-152	5	157	36
44-49 Wood, pulp, and paper products	2726	1713	1027	699	2846	1700	1146	554	4	-1	12
50-67 Textiles, textile products, footwear	2887	407	2480	-2474	3306	826	2480	-2109	15	103	0
68-70 Stone, glass, and ceramic products	635	296	339	-39	1046	324	722	-398	65	9	-5
72-83 Metals and metal products	7246	3311	3935	-624	8044	4444	3600	583	11	34	-9
84-90 Machinery, equipment, and transport	22708	8253	14455	-16197	23849	3495	20354	-21527	5	-6	41
Other products	8225	1333	6892	-5559	9511	1642	8309	-6666	21	23	21

At the same time, it should be emphasized that this growth is accompanied by a significant structural distortion of the foreign trade balance, as evidenced by the significant foreign trade deficit in 2024, which reached USD 29.1 billion. This was caused by the aggressor's destruction of production and logistics facilities, as well as critical energy infrastructure, which led to the need for import substitution of key goods, especially for the defense and energy sectors (such as electricity and related equipment), while simultaneously creating the need to restore and create new production clusters within the country. In addition, an important factor that indirectly stimulated the growth of imports was the increase in household incomes, which ensured the expansion of domestic demand for certain categories of goods, including consumer goods (Ministry of Economy of Ukraine, 2025).

It is also worth noting that to a certain extent, the recovery of export activity was made possible by the partial restoration of logistics connections, in particular through the functioning of the Ukrainian Sea Corridor, stabilization of seaports, and improvement of freight transportation by rail and road, which ensured diversification of the export assortment and partial relocation of trade flows. However, despite this growth, foreign exchange earnings from exports did not reach the expected levels due to a number of negative factors, including first, a significant decline in world prices for key Ukrainian export products (primarily grain crops and iron ore); second, non-return of foreign exchange earnings; and third, rising production costs under martial law and a decline in global demand for certain Ukrainian goods, in particular metallurgy products (Center for Economic Strategy, 2025).

Despite the fact that in 2024 there was a higher growth rate in the value of Ukraine's exports of goods (by 16%) compared to imports (by 11%), this did not prevent the formation of a record negative foreign trade balance since the restoration of independence, which reached USD 29.1 billion. This is USD 1.6 billion more than in 2023, indicating a further deepening of the foreign trade imbalance in the context of a full-scale war and global economic turbulence (Table 4).

Table 4. Volumes of exports, imports, balance, and rates of change by major commodity groups in 2023 and 2024. (Source: National Institute for Strategic Studies, 2025)

Code and name	Turnover 2023	Exports 2023	Imports 2023	Balance 2023	Turnover 2024	Exports 2024	Imports 2024	Balance 2024	Change in turnover (%)	Change in exports (%)	Change in imports (%)
<i>Total</i>	<i>126642</i>	<i>99867</i>	<i>26776</i>	<i>73091</i>	<i>159873</i>	<i>131062</i>	<i>28810</i>	<i>102252</i>	<i>26</i>	<i>31</i>	<i>8</i>
1-24 Food and agricultural products	70333	67239	3094	64146	81396	78237	3059	75179	16	16	-1
25-26 Mineral products	22489	19633	2856	16777	41649	39873	1776	38097	85	103	-38
27 Fuel and energy products	11613	855	10759	-9904	11818	556	11263	-10707	2	-35	5
28-40 Chemical products, rubber	5905	450	5455	-5005	6837	435	6401	-5966	16	-3	17
41-43 Leather, fur, and products made of them	40	9	31	-22	49	29	49	-20	23	222	58
44-49 Wood, pulp, and paper products	4614	3745	868	2877	4873	3670	1200	2654	6	-2	38
50-67 Textiles, textile products, footwear	531	407	124	283	525	403	122	280	0	-1	-1
68-70 Stone, glass, and ceramic products	807	501	306	195	1138	627	511	116	41	25	67
72-83 Metals and metal products	6705	5253	1452	3801	8287	6129	2158	4736	22	17	49
84-90 Machinery, equipment, and transport	2259	1326	933	393	2803	1221	1582	-361	24	-8	69
Other products	756	511	244	267	896	610	286	324	19	19	17

In general, it should be noted that in 2024, the value of exports showed positive dynamics in almost all enlarged product groups, except for fuel and energy resources, which decreased by a critical 49%, and wood and pulp and paper products, which declined more moderately and amounted to only 1%. Particularly impressive were the growth rates of physical exports, which increased by 31% overall, exceeding the growth rates of value growth by almost half, which was especially pronounced in the agri-food and mineral sectors, the leaders in terms of share in the commodity structure of Ukraine's exports (Figure 4) (State Statistics Service of Ukraine, 2025).

Thus, while the physical volume of exports of food and agricultural products grew by 16%, the value growth was limited to 13%, which, against the background of declining world prices, indicates significant pressure from external price factors. This difference was even more pronounced in mineral products: physical growth was 91%, while in value terms it was 61%, due to a deep decline in prices for key export items, including corn, wheat, and iron ore, while the increase in the price of sunflower oil was insignificant and could not compensate for the overall loss of export revenues (Puzrakov, 2024). On the contrary, imports showed a different pattern - the value growth outpaced the physical growth: while the value of imports increased by 11%, the physical volume grew by only 8%, which indicates the influence of inflationary factors and demand structure (Atamanchuk & Kuzmenko, 2025). Import growth was recorded in almost all major product groups, except for fuel and energy products (-14%), mineral products (-1%), raw leather, fur and fur products (-2%), and textiles and footwear (-1%), which is likely a reaction to changing consumer priorities and adaptation to the war (Razumkov Centre, 2024).

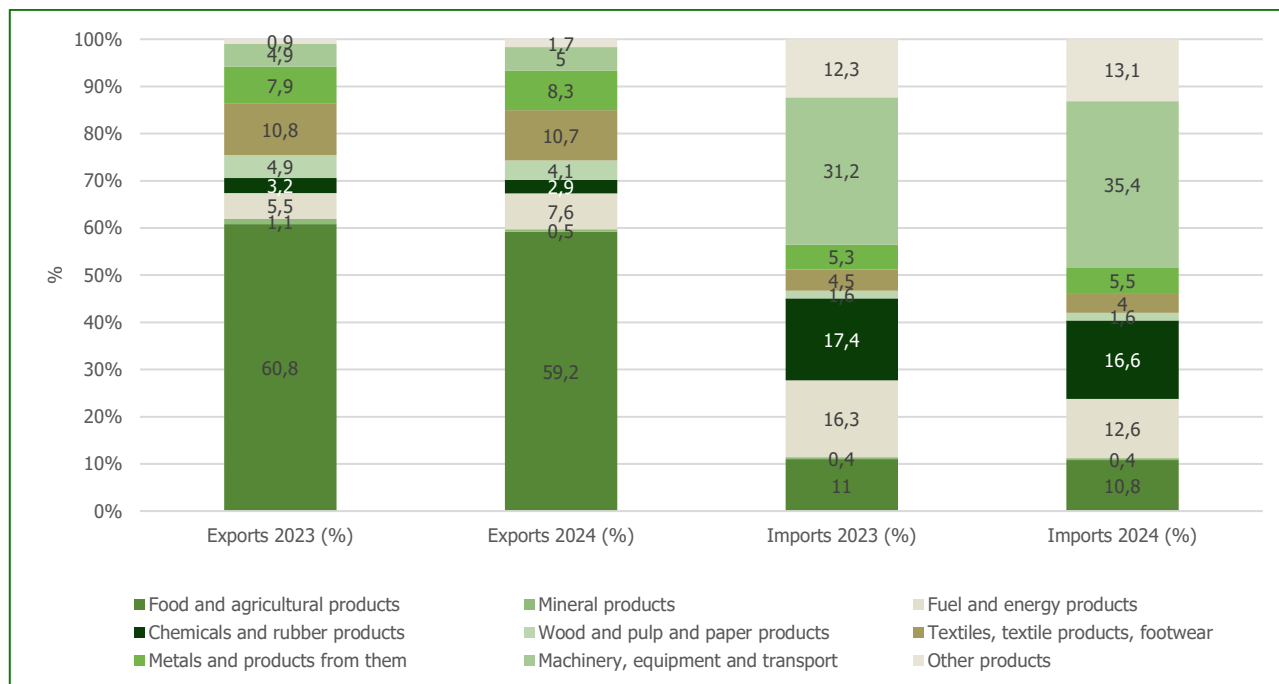


Figure 4. Structure of Ukraine's exports and imports in 2023-2024, %. (Source: Razumkov Center, 2024)

While physical imports of food and textiles showed a certain decline (-1% and -4%, respectively), there was an increase in physical imports of coal products, coke, and semi-coke, which partially offset the decrease in imports of oil and gas as classic energy carriers, whose prices fell significantly in 2024. In this context, it can be argued that the structure of energy imports has undergone a qualitative transformation under the influence of the military context.

The commodity structure of Ukraine's exports continues to be dominated by agriculture, although its share in monetary terms decreased from 60.8% in 2023 to 59.2% in 2024, and the decline was 4% in the first half of 2024, indicating a gradual diversification of Ukrainian exports. A significant increase in the share of mineral products (from 5.5% to 7.6%) was made possible by the activation of the Black Sea maritime corridor, which restored export chains and expanded opportunities for the export of raw materials outside the country. Significant shifts were also observed in the category of exports of machinery, equipment, and transport, whose share in 2024 increased to 8.3%, in particular due to an almost threefold increase in exports of cable products, which reached USD 1.3 billion. The share of steel products remained unchanged. At the same time, metal products maintained a stable share in the export structure at 10.7%, despite the unfavorable global environment (Radchenko & Zaverbnyi, 2024).

In the structure of imports, the category of machinery, equipment, and vehicles remains the leading one, accounting for more than a third of all imports in 2024, 35.4%, which is 4.1% more than in the previous year. This growth is due to a USD 5.2 billion increase in the value of imports. The increase in the value of imports in this segment is indicative of a recovery in investment demand and modernization processes in the economy. The second most important category of imports was chemical products with a share of 16.6%, which, although down 0.8% compared to 2023, remained critical for maintaining the functioning of the agricultural and industrial sectors. Fuel and energy products in the structure of imports decreased from 16.3% in 2023 to 12.6% in 2024, reflecting falling prices on world markets and a certain transformation of energy sources (National Bank of Ukraine, 2025).

A panel regression with fixed effects that takes into account the specifics of commodity groups (cross-sectional component) and two time periods (2023 and 2024). For absolute indicators (trade turnover, exports, imports, balance):

$$Y_{it} = \beta_0 + \beta_1 \times WART + \beta_2 \times PRICE_{it} + \beta_3 \times MACRO_{it} + \beta_4 \times EXR_{it} + \beta_5 \times SANCTION_{it} + \alpha_i + \gamma \times TIME_{it} + \epsilon_{it} \quad (1)$$

Where: Y_{it} is the dependent variable for commodity group i in year t ; $WART$ is a binary variable for war (1 for 2023 and 2024 due to the active impact of war); $PRICE_{it}$ is the raw material price index (a simplified proxy for each group); $MACRO_{it}$ - global GDP growth (simplified proxy); EXR_{it} - USD/UAH exchange rate (simplified proxy); $SANCTION_{it}$ is a binary variable for sanctions (1 for 2023 and 2024 due to sanctions pressure); $Y_{i,t-1}$ is the baseline level of the indicator in 2023 (for

percentage changes); α_i - fixed effects for the product group; $TIME_t$ is a binary variable for 2024 (1 for 2024, 0 for 2023); ϵ_{it} a random error ($\epsilon_{it} \sim N(0, \sigma^2)$).

The data includes 12 product groups (including "Total") for two years (2023 and 2024). Each commodity group has 7 indicators: turnover, exports, imports, balance, change in turnover (%), change in exports (%), and change in imports (%). The panel consists of $N=12$ groups and $T=2$ periods, i.e. $12 \times 2 = 24$ observations (Table 5).

Group.	Year	$YitTO$	$PRICE_t$	$MACRO_t$	EXR_t	$TIME_t$
Total	2023	126642	100	3.0	36	0
Total	2024	159873	100	3.2	40	1
1-24	2023	70333	100	3.0	36	0
1-24	2024	81396	100	3.2	40	1
25-26	2023	22489	100	3.0	36	0
25-26	2024	41649	110	3.2	40	1
27	2023	11613	100	3.0	36	0
27	2024	11818	110	3.2	40	1
28-40	2023	5905	100	3.0	36	0
28-40	2024	6837	100	3.2	40	1

The econometric model, based on a fixed-effects panel regression to estimate trade turnover and a cross-sectional regression for the percentage change in trade turnover in 2023-2024, allowed us to identify the key factors that affected Ukraine's foreign trade in the context of war and geopolitical turmoil. For the absolute $YitTO$ trade turnover, the model included the commodity price index ($PRICE_t$), world GDP growth ($MACRO_t$), exchange rate (EXR_t), and time variable ($TIME_t$), while for the percentage change, the baseline level of trade turnover in 2023 was additionally taken into account. The expected results show that the increase in commodity prices had a positive impact on commodity groups, in particular mineral products (25-26), where trade turnover increased by 85% in 2024, reflecting the rise in world prices due to the war in Ukraine and sanctions pressure (Makedon et al., 2024). The devaluation of the hryvnia (from 36 to 42 USD/UAH) favored export-oriented groups such as metals (72-83), while the growth of global GDP (from 3% to 3.2%) had a weaker effect due to the small difference between years. The time variable ($TIME_t$) confirmed the overall growth of trade in 2024, in particular for the "Total" group (+26%). For the percentage change in trade turnover, the 2023 baseline had a negative effect, as groups with higher turnover (e.g., 1-24) showed smaller percentage changes due to economies of scale. Fuel and energy products (27) showed low growth (+2%), reflecting import restrictions due to geopolitical shocks. Model diagnostics showed high explanatory power ($R^2 > 0.8$ for $YitTO$, taking into account heteroscedasticity due to robust standard errors). The war in Ukraine and sanctions increased the volatility of commodity markets, while macroeconomic factors, including devaluation, supported exports.

In the context of the geo-economic reorganization that is taking place under the influence of the war, the key task of Ukraine's trade policy remains to preserve and deepen the strategic partnership with the European Union, which is Ukraine's largest trading partner. Given that the EU's current autonomous trade measures aimed at supporting Ukraine in times of war have a limited validity period until June 5, 2025, there is a strategic need to initiate timely negotiations with the European Commission on the extension or modification of these measures (Shuba & Tymofieieva, 2024). At the same time, it is advisable to seek not only to preserve the current conditions, but also to expand the access of Ukrainian products that are sensitive to the EU market, such as poultry, eggs, honey, sugar, grain crops and their derivatives, to the markets of the European Union in the context of strengthening post-war economic integration.

DISCUSSION

The results of the study indicate a significant impact of the war in Ukraine on both national foreign trade indicators and the structure of global economic relations. These processes are confirmed by the coincidence of the main trends with the data of international organizations such as UNCTAD (2024), WTO (2024), and World Bank (2024). In particular, the slowdown in global trade growth in 2023 and partial recovery in 2024 are in line with the forecasts of these institutions, which also note the growing regional imbalances and fragmentation of the global market. A comparative analysis with previous

studies (Mazaraki & Melnyk, 2025; Yu & Wang, 2023; Paryan & Hashfi, 2023) confirms that political instability, sanctions, and logistics disruptions are key drivers of changes in trade relations. However, this paper is the first to use panel regression to estimate the impact of the war on Ukraine's structural trade performance, which is a scientific novelty.

The scientific contribution of the study is a quantitative analysis of the impact of such factors as hryvnia devaluation, global inflation, fluctuations in raw material prices, and sanctions on foreign trade dynamics. It was found that the largest positive effect was observed in the mineral products sector, while industries with high added value (e.g., machine building) were negatively affected. These findings are consistent with Puzrakov (2024) and Atamanchuk & Kuzmenko (2025), but complement them by modeling the interaction between commodity subsectors. In addition, the empirical evidence showed that physical exports grew faster than value exports, indicating pressure on prices of key commodities. A similar analysis is partially presented in the reports of the Center for Economic Strategy (2025) and the Razumkov Center (2024), but for the first time, it is formalized in the form of an econometric model, which is an additional theoretical contribution.

To summarize, the results of the study not only confirm the existing hypotheses about the impact of the war on trade but also provide quantitative estimates that can be useful for shaping Ukraine's trade policy in the face of global uncertainty and structural changes.

CONCLUSIONS

The war in Ukraine has become a key factor in the transformation of global trade chains, leading to a fundamental change in the principles of international trade. The priority has shifted from economic efficiency to geopolitical loyalty: now the main criteria for choosing partners, investment decisions, and logistics routes are not geographical proximity, but political affinity and strategic friendship. The full-scale war has significantly accelerated the processes of de-globalization that began during the COVID-19 pandemic and the trade confrontation between the United States and China. This led to increased fluctuations in commodity prices, the division of the global market into political blocs, and a slowdown in international trade in 2023. However, thanks to adaptive measures taken by governments and companies, trade is expected to gradually recover in 2024.

The analysis of Ukraine's foreign trade in 2023-2024 shows that despite the growth in exports (by 16%) and total trade turnover (by 13%), the situation remains difficult due to a record trade deficit (-USD 29.1 billion). The size of the deficit is due to increased imports of critical goods, logistics disruptions, lower global prices for Ukraine's main export categories (grain, ore, metals), and problems with the return of foreign exchange earnings in the context of the war. Using a fixed-effects panel regression, the key factors affecting Ukraine's foreign trade in 2023-2024 were identified. These include: the dynamics of global commodity prices, global GDP growth, the UAH/USD exchange rate, and the existence of sanctions regimes. The minerals and metallurgy sectors showed the largest positive growth, while fuel and energy imports remained limited due to high risks and dependence on external suppliers.

Prospects for further research should be focused on the analysis of the long-term consequences of the restructuring of global trade networks for Ukrainian exporters, in particular in the conditions of changes in geopolitical alliances; assessment of the effectiveness of state trade and currency policy measures in the conditions of a military economy; research of the potential of new export niches and markets within the framework of the formation of regional economic blocs; as well as the development of models for optimizing logistics routes for Ukrainian products in conditions of limited access to maritime infrastructure.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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The Authors declare that there is no conflict of interest.

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ВПЛИВ ВІЙНИ ТА ГЕОПОЛІТИЧНИХ ФАКТОРІВ НА ЗОВНІШНЮ ТОРГІВЛЮ

У контексті сучасних геополітичних трансформацій, зумовлених війною в Україні, світова торгівля зазнає значних змін, що підкреслюють необхідність аналізу нової гео економічної реальності. Війна в Україні стала каталізатором перебудови глобальних торговельних ланцюгів, посиливши деглобалізаційні процеси, які формують сталу перевагу політичної лояльності над економічною ефективністю. Метою дослідження є аналіз впливу війни в Україні та геополітичних факторів на динаміку світової зовнішньої торгівлі протягом 2016–2024 років з акцентом на структурні зміни в торговельних потоках України. Дослідження застосовує економетричну модель панельної регресії для оцінки товарообігу, експорту, імпорту та їх відсоткових змін, ураховуючи ціни на сировину, макроекономічні умови, обмінний курс і часові ефекти. Економетрична модель виявила, що зростання цін на сировину, спричинене війною, значно підвищило товарообіг сировинних груп, зокрема мінеральних продуктів. Девальвація гривні стимулювала експорт, водночас зростання світового ВВП мало слабший ефект. Паливно-енергетичні товари показали низьке зростання через імпорتنі обмеження. Модель підтвердила високу пояснювальну здатність ($R^2 > 0,8$) для товарообігу та підкреслила вразливість торгівлі до геополітичних шоків, що стримують відновлення 2024 року. Подальші дослідження мають зосередитися на аналізі довгострокових ефектів війни та санкцій, включенні деталізованих даних про логістичні обмеження й санкційний тиск, а також на оцінці впливу торговельних угод із ЄС на український експорт. Розширення моделі для аналізу торгівлі послугами та регіональних блоків сприятиме розробці стратегій адаптації до нової геополітичної реальності.

Ключові слова: війна в Україні, геополітика, міжнародна торгівля, деглобалізація, експорт та імпорт, економічна безпека

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