วารสารวิชาการผลประโยชน์แห่งชาติ
Thai Journal of National Interest
ISSN (Online): 2730-2393

DOI:https://doi.org/10.14456/ni.2025.18

Foreign economic cooperation between Ukraine and EU countries: current trends and future forecasts

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ABSTRACT

The purpose of the article is a comprehensive analysis of the indicators of trade in goods between Ukraine and the EU, starting from 2004, identifying trends and forecasting prospects. The originality of the article lies in the combination of three research methods: extrapolation of trends – to determine the trends of export-import operations between Ukraine and the EU in 2004-2024 and obtaining point forecast values for 2025-2027; fuzzy set theory – to obtain interval forecast values of foreign economic cooperation between Ukraine and the EU for 2025 and improving the quality of forecasting; ABC analysis – to group EU countries by indicators of trade in goods with Ukraine under martial law. As a result, a polynomial trend model was built for forecasting exports of Ukrainian goods to the EU, and a power trend model for forecasting imports of European goods to Ukraine. Trapezoidal fuzzy intervals of exports of goods from Ukraine to the EU in 2025 and imports of goods from the EU to Ukraine in 2025 were obtained. When constructing trapezoidal fuzzy intervals to determine pessimistic and optimistic estimates (extreme points of the lower base and extreme points of the upper base, respectively), the author's methodology was used, according to which the optimistic interval includes approximately half of the central elements of the observed dynamic series, ordered in ascending order; they have the highest probability of verification. It was determined that under martial law, Ukraine most effectively cooperated in the field of trade in goods with seven EU countries: geographical neighbors Poland, Romania, Hungary, Slovakia (land borders), Bulgaria (sea borders), as well as the countries of the "Big Seven" – Germany, Italy. The practical significance of the study lies in the possibility of using the results of the study for planning Ukraine's foreign trade operations and choosing partner countries.

KEYWORDS: export, import, goods, trade, Ukraine, EU, forecasting, trend models, fuzzy sets, ABC analysis

Received: 02/10/2025

Revised : 21/10/2025

Accepted: 16/12/2025

1. Introduction. The Association Agreement between Ukraine and the European Union (hereinafter referred to as the EU), ratified in 2014, provides for the introduction of conditions for enhanced economic and trade relations that will lead to the gradual integration of Ukraine into the EU internal market, including through the creation of a deep and comprehensive free trade area (Association Agreement, 2014). In addition, in June 2022, Ukraine received the status of a candidate for accession to the EU. Thus, the study of export-import operations between Ukraine and the EU is relevant and interesting. In addition, the study of foreign economic cooperation between Ukraine and the EU is appropriate from the point of view of the state of war in which the country is located. After all, the russian armed invasion of Crimea and eastern Ukraine in 2014, the full-scale invasion of the territory of Ukraine in February 2022 had a negative impact not only on the social sphere, but also on the economic activity of the country: trade with the russian federation and belarus was minimized, industrial and civil infrastructure was destroyed, a number of enterprises were closed, agricultural land was contaminated, logistics chains were disrupted, workers were mobilized and emigrated, etc. All this was reflected in macroeconomic indicators (GDP, inflation, investments, unemployment), and also affected Ukraine's external cooperation with foreign partners, including the EU.

2. Literature Review. Over the past four years, scientists have published a number of works devoted not only to the current state of international trade in goods and services between Ukraine and the EU, but also to the impact of military operations in Ukraine on the economies of European countries. In particular, Ambroziak et al. (2024) assessed the competitive positions of Polish and Ukrainian food producers on the EU market and the prospects for the development of their competitive advantages. For the analysis, they used the Balassa Comparative Advantage Index (RCA) and the Trade Coverage Index (TC). The study covered the period from 2018 to 2023. In turn, Bulkowska & Bazhenova (2023) assessed the impact of the war in Ukraine on Polish trade in agri-food products. They used a statistical and descriptive method of analyzing production and trade data, as well as competitiveness indices: the Comparative Advantage Index (RCA) and the Trade Coverage Coefficient (TC). Horská et al. (2023) investigated the impact of the main factors on the dynamics of exports of regions of Ukraine in the pre-conflict and conflict periods based on data for 2003–2019. They estimated the impact of the military conflict on the development of exports using a differential dummy variable of the intersection, as well as changes in the slope coefficient.

Jacyna-Golda et al. (2024) tested an intermodal freight transportation model to optimize logistics flows in international trade between Ukraine and Poland, taking into account minimizing costs and time for transport services. Kovbatiuk et al. (2023) proposed a model for assessing Ukraine's

commodity exports to world integration associations (including the EU-27), the main component of which is the constant market share method (CMS analysis). In turn, Kudyrko et al. (2024) analyzed the volumes, dynamics and structure of exports and imports of goods and services in 2011–2021, and revealed the environmental aspects of curbing exports from Ukraine to the EU by main groups of commodity exports.

Levytska et al. (2024) investigated modern scientific views on the content and prospects of Ukraine's economic partnership with the EU, analyzed the main indicators of trade relations and their role for the economies of the studied countries. They used methods of theoretical generalization and comparative analysis, statistical methods of analysis. In turn, Maly et al. (2023) analyzed the relationship between ten packages of EU sanctions and foreign trade between the Czech Republic and the russian federation. Maruniak et al. (2023) carried out a spatial analysis of the features of regional differentiation of Ukraine's trade in goods with EU countries. They used such research methods as structural-spatial analysis, statistical and correlation analysis, typological analysis. The authors analyzed the dynamics of trade in goods between Ukraine and the EU in 2001–2021 and identified the main trends in interstate trade in goods.

The economic maturity of Georgia, Moldova and Ukraine in the field of integration was analyzed by Nielsen & Siljak (2025) through five key components: macroeconomic stability, functioning market economy, competitiveness, access to foreign financing and convergence with the EU. In turn, Nifatova et al. (2024) analyzed Ukraine's contribution to the total volume of imports to the EU-27 countries by categories of organic products that have the largest share in total imports from Ukraine; examined the general trends of import dependence of the European organic market on imports from Ukraine by categories with the largest contribution; conducted a clustering of the EU-27 countries based on organic market indicators; analyzed the European organic market using the example of Ukrainian imports. The main indicators of the Ukrainian economy and its foreign trade were analyzed by Radziyevska (2023). It argues that trade policy should be formulated and implemented in such a way that Ukraine's foreign economic activity is more service-oriented and based on science and technology.

Schmidt (2024) examined aid to Ukraine on a cross-national basis, using differences in the economic, political and geographical characteristics of donor countries, in particular EU and NATO members. In turn, Shnyrkov et al. (2023) proposed economic and mathematical models based on the regression-correlation method to identify the determinants of EU economic aid to Ukraine. The results of the analysis showed that the total amount of aid to Ukraine is significantly correlated with the donor country's trade relations with Ukraine, the presence of a common border with the russian federation and is inversely proportional to the size of the donor country's economy. Tokar (2024) conducted a comprehensive study of economic security in EU member states and Ukraine, identified differences and proposed targeted policy interventions based on these differences. In his study, he used a quantitative strategy that assigns numerical ratings to countries based on their indicators according to predefined

thresholds. These indicators include industrial, demographic, energy, investment and innovation, macroeconomic, food, financial, foreign trade, and social security.

Totska (2022a-d, 2023a-c, 2024a-b) published a number of works in which she analyzed financial aspects and forecasting modeling of foreign trade in agro-industrial complex products between Ukraine and Romania; forecasting the value of Ukrainian agricultural exports based on fuzzy sets; value measurement of Ukrainian exports of grain crops, fats and oils to EU countries; determining the probability of favorable trends in the export-import of tourism services of Ukraine with EU countries; value measurement of foreign trade in goods and services of Ukraine with EU countries in 2021; analysis of seasonal fluctuations in exports of agro-industrial complex products of Ukraine in the period March 2022-January 2024.

Tuliakov et al. (2023) studied the dynamics, state and structure of Ukraine's foreign trade with EU countries before the war. The authors noted that since the beginning of the war, Ukraine has seen an increase in exports of goods to the EU, as Ukrainian companies cannot directly supply goods to Asia, Africa and America due to the blockade of seaports, and they are forced to do so through EU countries. In addition, Tuliakov et al. (2024) studied the impact of Ukraine's exports and imports of goods to the EU on its national GDP from 2005 to 2023. The results of the study showed that exports, especially to countries such as the Netherlands, Romania and Bulgaria, have the greatest impact on Ukraine's GDP. They used the vector autoregression (VAR) model and the Granger causality test.

In turn, Versal et al. (2023) identified key characteristics of Ukraine's defense economy and forecasted key policy rates and exchange rates during the war. The premise of the forecast was an analysis of endogenous and exogenous factors determining the current state of Ukraine's economy, including the business expectations index in Ukraine and partner countries, the state of international trade and the balance of payments. Zalizniuk & Artamonova (2025) analyzed the structure and dynamics of Ukraine's foreign trade with European countries, focusing on the EU's demand for Ukrainian agri-food products, which are currently the leading category of Ukraine's exports to Europe. Zawojska & Siudek (2024) analyzed the consequences of russia's armed invasion of Ukraine for the EU's trade policy towards this country and for changes in mutual foreign trade in agri-food products. The study used a political economy approach (including interest group theory).

As we can see, scientists have studied the foreign economic activity of Ukraine and European countries based on various indicators and indices, applying a large number of methods and building mathematical models.

The purpose of this article, unlike the ones analyzed, is to conduct a comprehensive analysis using three methods of indicators of trade in goods between Ukraine and the EU, starting from 2004, identify trends and forecast prospects.

3. Methodology. The following methods will be used for the study:

1) the trend extrapolation method – to determine the trends of export-import operations between Ukraine and the EU in 2004–2024 and obtain point forecast values for 2025–2027;

2) fuzzy set theory – to obtain interval forecast values of foreign economic cooperation between Ukraine and the EU for 2025;

3) ABC analysis – to group EU countries by indicators of trade in goods with Ukraine under martial law (2022–2024).

Extrapolation involves the extension of past and current patterns, connections and relationships to the future, its methods are the most common methods of short-term forecasting. The trend, in turn, reflects the tendency of a phenomenon to change over time. We will build five trend models for each indicator: exponential, linear, logarithmic, polynomial, and power. Forecast indicators will be calculated based on the trend model that has the highest R^2 approximation reliability value.

In our study, the fuzzy intervals have the form of a trapezoid, where the extreme points of the lower base (pessimistic estimates) have the lowest probability of verification, and the extreme points of the upper base (optimistic estimates) have the highest probability of verification. To determine the pessimistic and optimistic estimates, a method was used, according to which the optimistic interval includes approximately half of the central elements of the dynamic series, ordered in ascending order; they have the highest probability of verification, i.e. the measure of belonging (Totska, 2022b).

According to the theory of fuzzy sets, forecast indicators of exports and imports have the highest probability of falling (measure of belonging) into the optimistic intervals. Deviations of forecast indicators from these intervals in the larger or smaller direction (pessimistic intervals) have a lower probability of being true. Forecast indicators falling outside the pessimistic intervals are unlikely.

ABC analysis is based on the so-called Pareto law (20/80, "rule of thumb"), according to which one fifth (20%) of the total number of objects usually gives about 80% of the results, and the contribution of the remaining 80% is only 20%. The essence of the Pareto principle is that in the process of achieving any goal, it is irrational to pay equal attention to objects that are decisive and objects that have a small return.

The use of ABC analysis will allow us to carry out a deeper division, compared to the Pareto principle: to divide the initial set of countries into three subsets, depending on their specific weight in the total value of the export / import indicator (A – about 80%, B – about 15%, C – about 5%).

4. Results.

4.1. Determination of trends in 2004–2024 and obtaining point forecast values for 2025–2027. At the first stage of the study, we will analyze the absolute indicators of exports and imports of goods between Ukraine and the EU for the period 2004–2024 and form forecast trend models for 2025–2027. To do this, we will construct **Table 1** and **Fig. 1–2**.

Table 1

Ukraine's foreign trade in goods with EU countries, million USD

Indicator	2004	2005	2006	2007	2008	2009	2010	2011
Exports	11,009.6	10,233.4	12,087.9	13,916.4	18,129.5	9,499.3	13,051.9	17,970.0
Imports	9,547.4	12,191.9	16,194.6	22,218.7	28,868.4	15,392.7	19,101.2	25,752.9
Indicator	2012	2013	2014	2015	2016	2017	2018	2019
Exports	17,081.3	16,758.6	17,002.9	13,015.2	13,496.3	17,533.4	20,157.0	20,750.7
Imports	26,156.4	27,046.5	21,069.1	15,330.2	17,140.8	20,799.4	23,216.5	25,012.2
Indicator	2020	2021	2022	2023	2024	2025*	2026*	2027*
Exports	18,604.9	26,793.0	27,890.7	24,715.9	24,829.8	27,934.8	29,363.8	30,853.7
Imports	23,859.7	28,954.3	26,962.4	32,641.4	35,713.3	28,469.7	28,855.5	29,229.8

*Forecast data obtained using trend models.

Note. Generated by the author based on statistical data (State Statistics Service of Ukraine, 2025).

As we can see, in the analyzed period, exports of goods from Ukraine to the EU had a wavy upward trajectory: trade peaks occurred in 2008, 2011, 2019, and 2022, declines in 2009, 2015, 2020, and 2023. The sharp decline in Ukrainian exports to the EU during the indicated periods can be explained by the consequences of the global financial crisis of 2008, the russian armed invasion of Crimea and eastern Ukraine in 2014, the spread of the coronavirus disease 2019, and the full-scale invasion of the Russian Federation into the territory of Ukraine in February 2022. Note that each subsequent peak (except 2011) and each subsequent decline is higher than the previous one. Thus, by analogy with the Dow theory of stock prices over time, the chart shows an upward (bullish) trend.

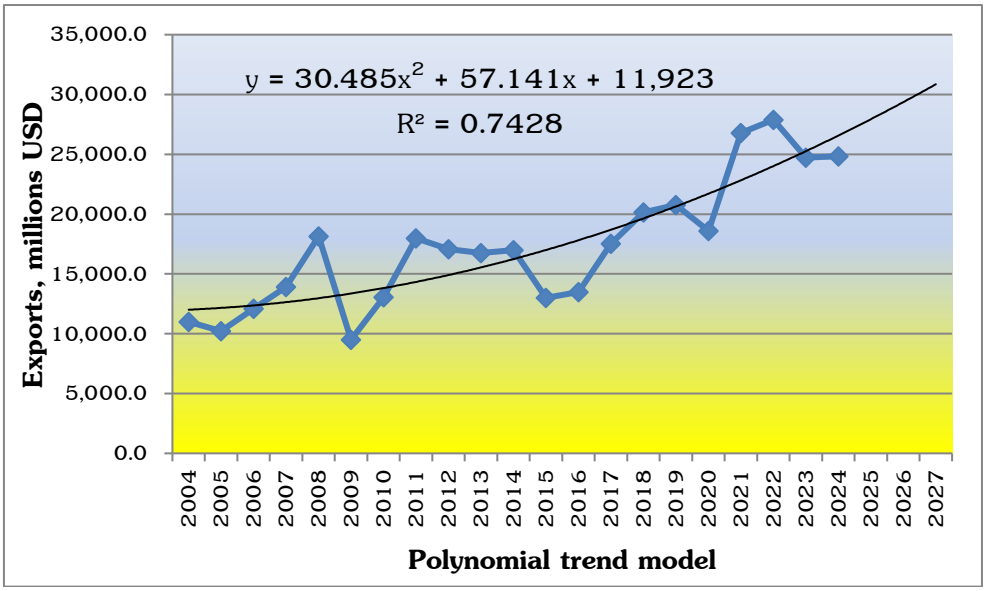

Figure 1. *Dynamics of exports of goods from Ukraine to the EU, million USD*

Note. Compiled by the author based on **Table 1**.

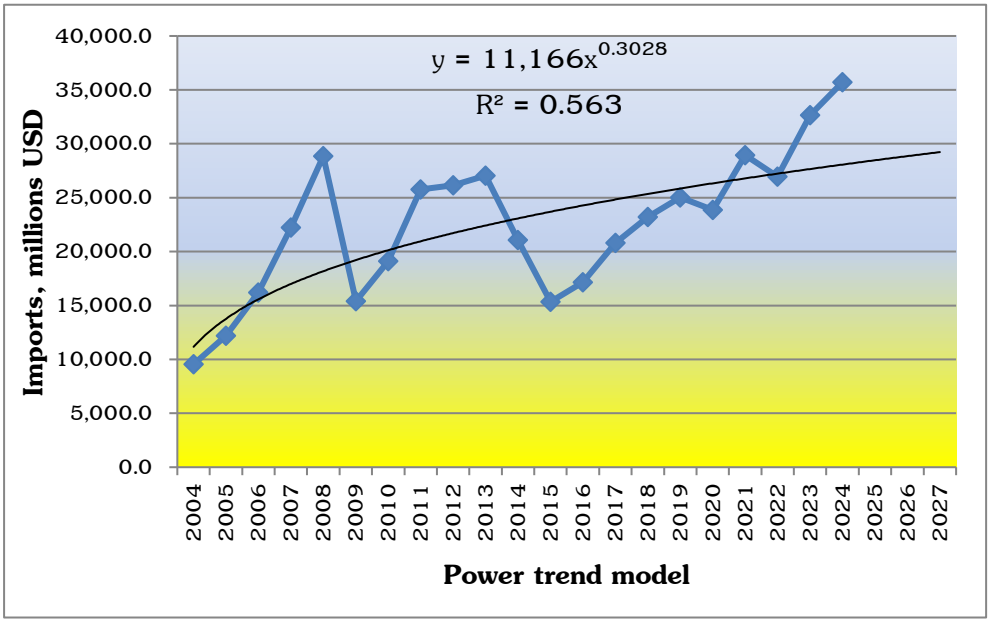

Figure 2. *Dynamics of imports of goods from the EU to Ukraine, million USD*

Note. Compiled by the author based on **Table 1**.

Imports of goods from the EU to Ukraine generally also tend to increase, in particular, the peaks of import supplies of goods fell on 2008, 2013, 2021, 2024. The sharpest drop in imports of European goods was observed in 2009 and 2015, which can also be considered a consequence of the global financial crisis and the Russian invasion of Ukraine. In our opinion, there is also an upward (bullish) trend here, although not as pronounced as in the previous **Figure 1**.

To obtain point forecast indicators of export-import activity between Ukraine and the EU, we will use the trend extrapolation method.

So, using Microsoft Excel, we will build five trend models:

exponential ($y = a_1 e^{a_0 x}$);

linear ($y = a_1 x + a_0$);

logarithmic ($y = a_1 \ln(x) + a_0$);

polynomial ($y = a_2 x^2 + a_1 x + a_0$);

power ($y = a_1 x^{a_0}$), where a_0, a_1, a_2 are constants, x is time.

However, we will choose only one of them that has the highest value of the R^2 approximation reliability. In our case, for the export of goods from Ukraine to the EU, we will obtain the following trend equations:

$y_1 = 10{,}446e^{0.042x}$ $(R_1^2 = 0.699)$ – exponential trend model;

$y_2 = 727.81x + 9{,}352.6$ $(R_2^2 = 0.7067)$ – linear trend model;

$y_3 = 4{,}865.9 \ln(x) + 6{,}843.4$ $(R_3^2 = 0.5485)$ – logarithmic trend model;

$y_4 = 30.485x^2 + 57.141x + 11{,}923$ $(R_4^2 = 0.7428)$ – polynomial trend model;

$y_5 = 8{,}815.7x^{0.2924}$ $(R_5^2 = 0.5879)$ – power trend model.

As we can see, the polynomial trend model has the highest value of the R^2 approximation reliability. The forecast indicators of goods exports calculated on its basis are given in the penultimate row of **Table 1**. They indicate a significant increase in exports of Ukrainian goods to the EU in 2025–2027 and reaching the value of 30,853.7 million USD in 2027.

For imports of goods from the EU to Ukraine, we obtained the following trend equations:

$y_6 = 14{,}400e^{0.0364x}$ $(R_6^2 = 0.4676)$ – exponential trend model;

$y_7 = 738.82x + 14{,}405$ $(R_7^2 = 0.4702)$ – linear trend model;

$y_8 = 5{,}680.1\ln(x) + 10{,}258$ $(R_8^2 = 0.4826)$ – logarithmic trend model;

$y_9 = 13.261x^2 + 447.08x + 15{,}523$ $(R_9^2 = 0.4746)$ – polynomial trend model;

$y_{10} = 11{,}166x^{0.3028}$ $(R_{10}^2 = 0.563)$ – power trend model.

Among these models, the power model has the highest R^2 approximation reliability value. The forecast indicators of imports of goods calculated on its basis are given in the last row of **Table 1**. They indicate a decrease in imports of European goods to Ukraine in 2025, followed by a gradual increase in 2026–2027 and reaching a value of 29,229.8 million USD in 2027.

4.2. Obtaining interval forecast values for 2025. At the second stage of the study, we will forecast the export / import indicators of goods between Ukraine and the EU based on the theory of fuzzy sets. The forecasting results are shown in **Fig. 3–4**.

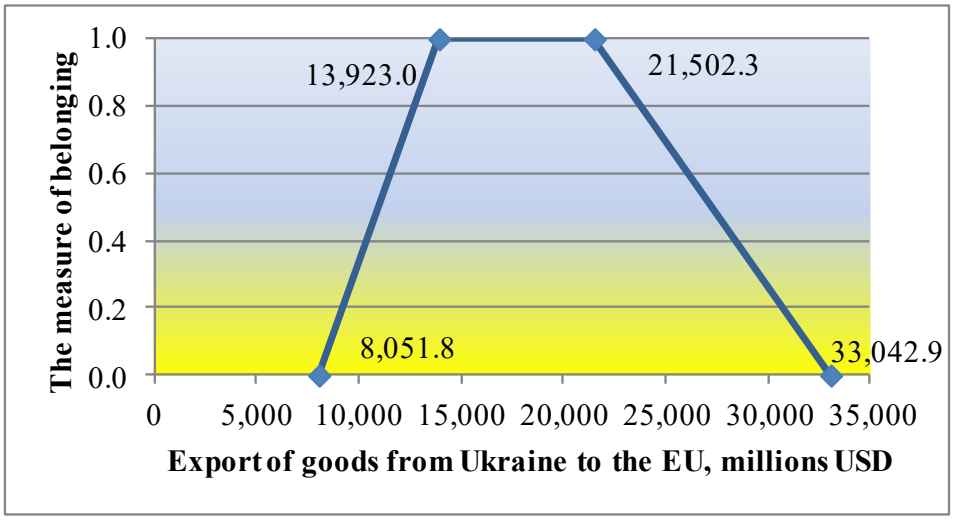

Figure 3. *Trapezoidal fuzzy interval of exports of goods from Ukraine to the EU, million USD*

Note. Generated by the author based on **Table 1**.

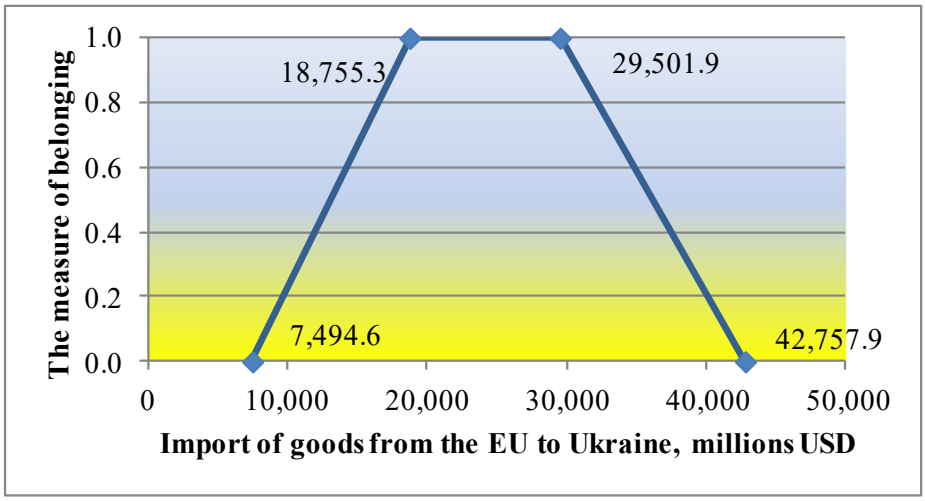

Figure 4. *Trapezoidal fuzzy interval of imports of goods from the EU to Ukraine, million USD*

Note. Generated by the author based on **Table 1**.

In **Fig. 3** and **4**, the upper base of the trapezoid is the optimistic interval; the sides of the trapezoid are the pessimistic interval.

That is, in 2025, the most likely value of exports of goods from Ukraine to the EU is within the range of 13,923.0–21,502.3 million USD, less likely – in the ranges of 8,051.8–13,923.0 million USD and 21,502.3–33,042.9 million USD.

In turn, for imports of goods from the EU to Ukraine, the most likely forecast value is within the range of 18,755.3–29,501.9 million USD, less likely – in the ranges of 7,494.6–18,755.3 million USD and 29,501.9–42,757.9 million USD.

4.3. Grouping of EU countries by indicators of trade in goods with Ukraine under martial law (2022–2024). In the third stage of the study, we will group EU countries by indicators of trade in goods with Ukraine using ABC analysis.

Table 2 shows the distribution of 27 EU countries by the indicator of exports of goods from Ukraine for 2022–2024. The table calculates the share and accumulated share of each state in the total volume of exports of Ukrainian goods to the EU. It also determines the group into which EU countries fall according to the results of the ABC analysis. Note that the countries are arranged in descending order of the indicator of exports of goods.

Table 2

Geographical structure of foreign trade in goods of Ukraine with EU countries (exports), million USD

Country	2022	2023	2024	In general, for the years 2022–2024	Share in the total volume of exports, %	Accumulated share in the total volume of exports, %	Group ABC
Poland	6,653.0	5,072.1	4,708.9	16,434.0	21.22	21.22	A
Romania	3,855.8	3,863.0	1,760.8	9,479.7	12.24	33.46	A
Germany	2,264.7	2,411.4	2,840.8	7,516.8	9.71	43.17	A
Spain	1,572.3	2,010.4	2,863.5	6,446.1	8.32	51.50	A
Italy	1,647.3	1,562.5	1,935.7	5,145.5	6.64	58.14	A
Netherlands	1,540.8	1,527.3	1,990.4	5,058.4	6.53	64.67	A
Hungary	2,270.9	1,382.5	1,152.1	4,805.5	6.21	70.88	A
Slovakia	1,506.8	1,102.9	942.6	3,552.3	4.59	75.47	A
Bulgaria	1,426.1	908.0	1,133.6	3,467.7	4.48	79.94	A
Czechia	1,252.0	1,034.9	919.8	3,206.7	4.14	84.09	B
Austria	822.1	635.0	626.9	2,084.0	2.69	86.78	B
Lithuania	662.1	652.8	594.7	1,909.6	2.47	89.24	B
France	586.0	541.3	737.8	1,865.1	2.41	91.65	B
Belgium	466.7	377.9	854.4	1,699.0	2.19	93.85	B
Latvia	297.0	336.0	303.9	936.9	1.21	95.06	C
Greece	184.1	258.3	409.2	851.6	1.10	96.15	C
Denmark	231.3	240.8	211.6	683.7	0.88	97.04	C
Portugal	135.7	225.6	235.9	597.2	0.77	97.81	C
Cyprus	54.8	107.9	139.8	302.5	0.39	98.20	C
Estonia	125.4	97.3	75.5	298.3	0.39	98.58	C
Sweden	78.0	81.9	95.5	255.5	0.33	98.91	C
Croatia	73.5	87.4	65.1	226.0	0.29	99.21	C
Slovenia	59.0	65.0	64.0	187.9	0.24	99.45	C
Finland	61.7	45.1	46.1	152.8	0.20	99.65	C
Malta	9.7	70.1	55.2	135.1	0.17	99.82	C
Ireland	44.9	14.9	61.2	121.0	0.16	99.98	C
Luxembourg	9.2	3.4	5.1	17.7	0.02	100.00	C

Country	2022	2023	2024	In general, for the years 2022–2024	Share in the total volume of exports, %	Accumulated share in the total volume of exports, %	Group ABC
EU 27	27,890.7	24,715.9	24,829.8	77,436.4	100.00		

Note. Compiled by the author based on statistical data (State Statistics Service of Ukraine, 2025).

Thus, Group A included nine EU countries: Poland, Romania, Germany, Spain, Italy, the Netherlands, Hungary, Slovakia, Bulgaria. During 2022–2024, Ukrainian goods were exported to each of them in the amount of USD 3.47 billion to USD 16.43 billion. The share of these countries in the total amount of Ukrainian exports of goods to the EU ranged from 4.48 to 21.22%.

Group B united five EU countries: Czechia, Austria, Lithuania, France, Belgium. The volume of purchases of Ukrainian goods by them ranged from USD 1.70 billion to USD 3.21 billion. Their contribution to the total amount of exports of Ukrainian goods to the EU ranged from 2.19 to 4.14%.

Group C included 13 EU countries: Latvia, Greece, Denmark, Portugal, Cyprus, Estonia, Sweden, Croatia, Slovenia, Finland, Malta, Ireland, Luxembourg. To each of them, exports of goods from Ukraine were less than USD 940 million. Their share in the total amount of exports of Ukrainian goods to the EU ranged from 0.02 to 1.21%.

Table 3 shows a similar distribution of 27 EU countries by the indicator of imports of goods to Ukraine for 2022–2024.Here, group A united ten EU countries: Poland, Germany, Bulgaria, Italy, Czechia, Romania, Slovakia, France, Greece, Hungary. During 2022–2024, goods worth from USD 4.03 billion to USD 19.07 billion were imported from these countries. The share of these countries in the total amount of imports of goods from the EU ranged from 4.23 to 20.01%.

Table 3

Geographical structure of foreign trade in goods of Ukraine with EU countries (imports), million USD

Country	2022	2023	2024	In general, for the years 2022–2024	Share in the total volume of imports, %	Accumulated share in the total volume of imports, %	Group ABC
Poland	5,491.4	6,589.8	6,990.1	19,071.2	20.01	20.01	A

Country	2022	2023	2024	In general, for the years 2022-2024	Share in the total volume of imports, %	Accumulated share in the total volume of imports, %	Group ABC
Germany	4,563.0	5,076.8	5,386.2	15,026.0	15.76	35.77	A
Bulgaria	2,082.7	2,219.2	2,360.1	6,662.0	6.99	42.76	A
Italy	1,801.4	2,280.2	2,576.2	6,657.8	6.98	49.75	A
Czechia	1,464.8	1,790.9	2,476.5	5,732.2	6.01	55.76	A
Romania	1,503.2	1,655.1	1,710.8	4,869.2	5.11	60.87	A
Slovakia	988.7	1,677.5	2,001.1	4,667.3	4.90	65.77	A
France	1,232.7	1,760.9	1,621.0	4,614.7	4.84	70.61	A
Greece	756.1	1,374.1	2,067.1	4,197.3	4.40	75.01	A
Hungary	1,022.3	1,387.2	1,620.6	4,030.1	4.23	79.24	A
Lithuania	1,323.1	1,306.0	1,194.4	3,823.5	4.01	83.25	B
Netherlands	1,091.3	1,037.1	916.7	3,045.1	3.19	86.44	B
Spain	702.4	887.6	853.6	2,443.6	2.56	89.01	B
Sweden	514.8	794.6	994.7	2,304.1	2.42	91.43	B
Belgium	539.9	663.4	674.2	1,877.5	1.97	93.40	B
Austria	515.3	537.8	625.0	1,678.2	1.76	95.16	C
Finland	239.2	283.9	241.0	764.2	0.80	95.96	C
Denmark	240.3	250.8	273.0	764.1	0.80	96.76	C
Slovenia	248.1	242.0	265.0	755.1	0.79	97.55	C
Latvia	235.9	280.0	197.0	713.0	0.75	98.30	C
Ireland	147.2	196.0	245.8	588.9	0.62	98.92	C
Estonia	95.7	128.3	122.1	346.2	0.36	99.28	C
Croatia	67.9	82.5	112.6	262.9	0.28	99.56	C
Portugal	60.8	70.2	81.3	212.4	0.22	99.78	C
Cyprus	14.6	47.8	80.6	143.1	0.15	99.93	C
Luxembourg	11.0	13.5	14.7	39.2	0.04	99.97	C
Malta	8.1	7.9	11.4	27.4	0.03	100.00	C
EU 27	26,962.4	32,641.4	35,713.3	95,317.1	100.00		

Note[1]. In some cases, the sum of the components may not equal the total due to rounding of data.

Note[2]. Compiled by the author based on statistical data (State Statistics Service of Ukraine, 2025).

Group B united five EU countries: Lithuania, the Netherlands, Spain, Sweden, Belgium. The volume of purchases of their goods by Ukraine ranged from USD 1.88 billion to USD 3.82 billion. Their contribution to the total amount of imports of goods from the EU ranged from 1.97 to 4.01%.

Group C included 12 EU countries: Austria, Finland, Denmark, Slovenia, Latvia, Ireland, Estonia, Croatia, Portugal, Cyprus, Luxembourg, Malta. From these countries, imports of goods to Ukraine were less than USD 1.70 billion. Their share in the total amount of imports of goods from the EU ranged from 0.03 to 1.76%.

According to the results of the ABC analysis of EU countries by the value of export-import operations with Ukraine, in both cases, the following seven EU countries were included in Group A: Poland, Romania, Germany, Italy, Hungary, Slovakia, Bulgaria. That is, under martial law, Ukraine's largest trading partners in terms of export-import of goods are neighboring countries with which Ukraine has land or sea borders – Poland, Romania, Hungary, Slovakia, Bulgaria, as well as the countries of the "Big Seven" (G7) – Germany, Italy.

5. Discussion. The Ministry of Economy, Environment and Agriculture of Ukraine (August 2025) identified the stimulating and restraining factors of Ukraine's export-import operations:

1) key factors stimulating exports: continuation of the Ukrainian Sea Corridor and use of alternative logistics routes; introduction of a mechanism for insuring ships against military risks; relocation of export-oriented enterprises; activation of the work of the Export Credit Agency; extension of: "transport" visa-free travel with EU countries until Dec. 31, 2025; preferential EU regime for imports of Ukrainian steel and iron after Jun. 6, 2025;

2) main restraining factors for exports: continuation of hostilities on the territory of Ukraine; loss of industrial enterprises due to destruction, damage and temporary occupation by the Russian Federation; increased attacks on Ukraine's transport infrastructure; complication and increase in the cost of export logistics; termination of the "goods" visa-free regime with EU countries and continuation of restrictions by some EU countries on the import of Ukrainian agricultural products; decrease in agricultural exports; unfavorable price conditions for the main Ukrainian export goods; changes in customs regulations and domestic policies of individual countries;

3) key incentives for import growth: growing needs for the import of critically important goods (military and defense products, mechanical engineering, pharmaceutical segment, food, etc.), international support for Ukraine through the provision of humanitarian aid and equipment for infrastructure reconstruction, reorientation of imports to products of high and medium technological levels;

4) main constraining factors for imports: continuation of hostilities on the territory of Ukraine, existing logistical restrictions and high logistics costs; decrease in purchasing power and forced migration of the population abroad; limited financial resources for the purchase of imported high-tech products.

Of course, this list can be supplemented with other elements. In general, we see that, despite the martial law, the Ukrainian economy is adapting to new challenges and threats, domestic enterprises are adapting to modern realities. To deepen the research, it is desirable to conduct a structural analysis of Ukraine's export-import operations with each EU country.

6. Conclusions. During 2004–2024, Ukraine demonstrated an increase in foreign economic cooperation with the EU. However, the growth of trade was not smooth and uniform. In particular, the peaks of exports of goods fell on 2008, 2011, 2019 and 2022, declines – on 2009, 2015, 2020, 2023; peaks of import supplies of goods fell on 2008, 2013, 2021, 2024, declines – on 2009 and 2015.

Reasons for the decline in exports / imports in the specified periods: the global financial crisis of 2008, the russian armed invasion of Crimea and eastern Ukraine in 2014, the spread of the coronavirus disease in 2019, the full-scale invasion of the Russian Federation into the territory of Ukraine in February 2022.

Consequences: reorientation to online trade, search for new product sales markets, state support for export activities.

The polynomial trend model of the form $y=30.485x^2+57.141x+11,923$ ($R^2=0.7428$) indicates a significant increase in exports of Ukrainian goods to the EU in 2025–2027 and reaching a value of USD 30,853.7 million in 2027. In turn, the power-law trend model of the form $y=11,166x^{0.3028}$ ($R^2=0.563$) predicts a decrease in imports of European goods to Ukraine in 2025, followed by a gradual increase in 2026–2027 and reaching a value of USD 29,229.8 million in 2027. However, it is worth noting that the values of the R^2 approximation reliability are not sufficiently large due to frequent changes in the direction of movement of the dynamics indicators.

To improve the quality of point forecasts, trapezoidal fuzzy intervals of exports of goods from Ukraine to the EU and imports of goods from the EU to Ukraine were constructed, which predict in 2025 the most probable value of exports within the range of USD 13,923.0–21,502.3 million, and imports within the range of USD 18,755.3–29,501.9 million.

Under martial law (2022–2024), the largest trading partners of Ukraine with the EU in terms of export-import of goods, according to the results of ABC analysis, were neighboring countries and the countries of the "Big Seven" (G7): Poland (exports – USD 16.43 billion, imports – USD 19.07 billion), Romania (exports – USD 9.48 billion, imports – USD 4.87 billion), Germany (exports – USD 7.52 billion, imports – USD 15.03 billion), Italy (exports – USD 5.15 billion, imports – USD 6.66 billion), Hungary (exports – USD 4.81 billion, imports – USD 4.03 billion), Slovakia (exports – USD 3.55 billion, imports – USD 4.67 billion), Bulgaria (exports – USD 3.47 billion, imports – USD 6.66 billion).

We see further research directions in the implementation of the following tasks:

1) analyze the dynamics of trade in goods between Ukraine and each EU country for 2004–2025;

2) conduct a comparative analysis of the structure of exports and imports of goods between Ukraine and EU countries in 2021 and 2025;

3) conduct trend forecasting modeling of the dynamics of export-import operations between Ukraine and each EU country for 2026-2028;

4) forecast indicators of exports and imports of goods between Ukraine and 27 EU countries using trapezoidal fuzzy sets;

5) build a probabilistic-automatic model for simulation modeling of foreign trade in goods of Ukraine with EU countries;

6) to plan a project for publishing a scientific monograph on foreign trade in goods of Ukraine with 27 EU countries using Microsoft Office Project;

7) to build a probabilistic-automatic model for simulation modeling of foreign trade in agricultural products of Ukraine with EU countries.

The practical significance of the study lies in the possibility of using the results of the study for planning Ukraine's foreign trade operations and selecting partner countries.

7. Funding. Research funded by the French Research Center in Humanities and Social Sciences. CEFRES, UAR 3138 CNRS-MEAE: CEFRES Non-Residential Scholarships for Ukrainian Researchers in Humanities and Social Sciences, project "Foreign economic cooperation of Ukraine and EU countries: modern trends".

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