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DEVELOPMENT OF RELATIONS BETWEEN UKRAINE AND THE EU IN CONDITIONS OF DEEP AND COMPREHENSIVE FREE TRADE AREA

The study substantiates that Ukraine has significant comparative advantages in exports of food, beverages and industrial goods. According to the correlation-regression analysis, it was confirmed that Ukraine's exports have a negative coefficient, ie export indicators decreased in the context of the DCFTA. The results of the comparative analysis (based on the gravitational model of international trade) indicate that the conclusion of the FTA leads to an increase in imports from the EU to Ukraine, but the correlation coefficient is insignificant. The main reasons for this situation are the low complementarity between Ukrainian exports and European imports, reduced competitiveness of Ukrainian goods due to inflation, reduced elasticity of Ukrainian exports to the European market and others. It is established that after the signing of the Agreement on the Deep and Comprehensive Free Trade Area between Ukraine and the EU, the European side receives greater benefits. Taking into account the European experience of successful countries, it is recommended for Ukraine to use comparative advantages in intersectoral trade and to this end to expand the range of export products, apply business climate policy and expand business activity; creating additional opportunities for European investment, etc. Relatively new is the approach of applying the gravity model based on empirical assessment of foreign trade between Ukraine and the EU, which, unlike existing ones, allows to test the mathematical approach to functional relationships between different economic factors under the FTA. Measures have been developed to intensify and increase the competitiveness of Ukrainian exports in the FTA between Ukraine and EU countries, namely: 1) to introduce a European policy on small and medium-sized businesses in order to expand entrepreneurial activity and create additional opportunities for innovation and investment; 2) consider the possibility of Ukraine joining the Single European Payments Area in order to overcome currency volatility; 3) reduce income tax to 10% for all taxpayers; 4) harmonize VAT with the EU and consider ways to deepen integration and speed up compliance with the conditions for EU membership.

Keywords: Free Trade Area, European Union, integration, economic and mathematical modeling, correlation and regression analysis, gravity model of international trade.

Introduction. The topic of deepening Ukraine's relations with the European Union has become relevant in recent decades. Deepening integration is taking place against the formation of a Deep and Comprehensive Free Trade Area (DCFTA) between Ukraine and the EU. On February 28, 2022, Ukraine officially applied for membership in the European Union. The European Parliament has recommended that Ukraine be granted EU candidate status. Therefore, the issue of determining the changes that occur after the introduction of the Free Trade Area (FTA) and prospects for integration to the EU is relevant. There is a need to apply modern tools of correlation and regression analysis to the conditions of international trade. One such tool is the gravity model of international trade. Using the gravity model will help understand the transformation of relations in the context of the DCFTA of partner countries and determine the factors influencing the volume and routing of trade flows.

Literature review. Theoretical and empirical studies of international trade were carried out based on the gravity model of J. Tinbergen [3] and studies on the free trade area by R. Mandell, A. Melchior, L. Corbin, L., M. Perry, and others. [1; 2; 4]. Such studies were further developed and served as a basis for testing hypotheses about the benefits of the FTA for participating countries.

The purpose of the article. The study aims to determine the impact of the FTA on the development of Ukraine's foreign trade relations with EU countries based on a comparative analysis of the gravity model of international trade.

Results and discussion. One of the methods used to assess the impact of macroeconomic indicators on international trade and the formation of the FTA is the gravity model of international trade, developed by Jan Tinbergen [3]. According to this model, the volume of trade between countries is directly proportional to the economic potential of the two countries and indirectly proportional to the distance between them. The main variables of the gravity model of international trade include trade between the two countries, the GDP of trading partners, and the distance between these countries. The gravity model has been widely used in empirical research since the 1960s, but it receives a new justification in modern conditions, given the additional preferences of a FTA and DCFTA. The theoretical validity and empirical application of the gravity model determine its active use in modern conditions to assess the export-import flows of international trade entities.

In modern conditions, the world is becoming more integrated. The first stage in developing relations between the two countries is the creation of a FTA. A free trade agreement is an agreement between two or more countries under which all tariffs on goods produced in member countries are reduced, and tariffs on trade with non-member countries are maintained. A. Melchior hypothesizes that the creation of the FTA is an inevitable step in international relations between countries. Thus, since 1990, the number of FTAs has grown rapidly, increasing from seventy to three hundred in 2010. According to A. Melchior, countries lose an average of 27% of their income when trade is not conducive [1]. However, L. Corbin and M. Perry emphasize that politicians have different goals, and therefore some of the concluded trade agreements, although they demonstrate the goals of economic growth, creation of new markets, and new employment opportunities, such agreements provide for the goal through humiliating and uneven agreements [2].

According to the experience of most countries, after the establishment of a FTA, there is a need to deepen international integration ties. In the postwar years, when much of Europe was still recovering after World War II, Jan. Tinbergen, a Nobel laureate in economics and a Dutch economist, argued that “integration can be called the most desirable structure of the international economy, removing artificial barriers to optimal functioning and deliberately introducing all desired tools of coordination or unification” [3]. The orientation of integration by most countries is perceived as an attempt to optimize the mechanisms of international trade and economic cooperation. J. Wiener introduced the concept of “trade creation” and “trade diversion”, showing how countries that have agreed to reduce trade barriers will benefit if the newly created trade exceeds the trade of non-FTA countries. Similar topics were considered in the works of R. Mandell on the optimal currency area [4]; P. de Grauwe on monetary integration [5], and others. The EU seeks enlargement and has broad ambitions for European integration; in particular, the preamble to the Treaty on European Union (TEU) emphasizes the “historic importance of ending the division of the European continent”, a motivation that goes beyond purely economic agreements [6]. This motivation sets a clear economic goal for member countries: “strengthening and converging their economies, as well as creating an economic and monetary union.” Further ambitions include a standard foreign and security policy, defense cooperation, free movement of people, and the creation of “area of freedom, security, and justice”.

The official opening of the negotiation process on the establishment of the FTA between Ukraine and the European Union took place on February 18, 2008. The negotiation process on the association between Ukraine and the EU continued, including the DCFTA in 2008-2015. The agreement on Ukraine's free trade area with the EU entered into force on January 1, 2016. Such an FTA between Ukraine and the EU aims to reduce and eliminate tariffs applied by the parties for goods, liberalizing access to the services market. The part of the Agreement concerning the establishment of the FTA covers the following main areas [7]:

- trade in goods, including technical barriers to trade; trade defense instruments;
- sanitary and phytosanitary measures; trade facilitation and cooperation in the customs sphere;
- administrative cooperation in the customs sphere; rules of origin of goods;
- trade relations in the energy sector; services, start-ups, and investments;
- recognition of qualifications; movement of capital and payments;

- competition policy (antitrust and state aid); intellectual property rights, including geographical indications;
- government Procurement;
- trade and sustainable development;
- transparency;
- dispute resolution.

By its Regulation № 374/2014, the European Commission has unilaterally introduced autonomous tariff preferences for goods originating in Ukraine since 2014 [8]. In particular, 82.2% of duty rates on Ukrainian agricultural products were reduced. For some products, Ukrainian exporters received an additional preference for goods for which the EU proposed to set tariff quotas. However, it should be noted that the initial terms of the DCFTA between the EU and Ukraine were asymmetric. The EU has many specific and combined import duty rates, while in Ukraine, import duty rates are mostly ad valorem. Unlike Ukraine, the EU uses a complex structure of combined duty rates and entry price systems. In addition, the Union applies export subsidies and special safeguards to agricultural products to which Ukraine is not entitled [9]. Therefore, it has a strong intensive about expanding such relations and gaining EU membership in order to establish a balance of trade and development.

According to the State Statistics Service of Ukraine and our calculations, the EU has been Ukraine's largest trading partner over the past five years, with a merchandise trade share of over 40% of Ukraine's total foreign trade. The number of Ukrainian companies exporting to the EU has grown rapidly, from around 11,700 in 2015 to over 14,500 in 2019. Thus, the establishment of the DCFTA aims to stimulate trade in goods and services between the EU and Ukraine by gradually reducing tariffs and bringing Ukraine's rules into line with EU rules in some industries and agricultural products. One of the most important mechanisms of the implementation of the DCFTA between Ukraine and the EU is the application of tariff regulators listed in Part IV "Trade and trade-related matters of the Agreement". At the time of application of the DCFTA, the rates of entry duty are approved by the Law of Ukraine "On the Customs Tariff of Ukraine" (Verkhovna Rada of Ukraine, 2014 [10]). Detailed information on the current rates of the increasing Customs Tariff of Ukraine at the time of application of the DCFTA (January 1, 2016) is given in Table 1.

Table 1 – Import duty (preference rates) on goods imported into the customs territory of Ukraine from January 1, 2016

Cumulative customs tariff of Ukraine									
Duty rates, %	0	0,1-5	5,1-10	10,1-15	15,1-20	20,1-25	More than 25	Spec. tariffs	Total
Number of commodity subcategories, item	3961	2915	2406	765	296	5	10	105	10463
Share of all commodity subcategories, %	37.86	27.9	23	7.3	2.8	0.05	0.1	1	100
Average rate according to tariff corridors, %	-	3.9	8.9	13.2	19.9	25	48	-	-
The maximum level of entry duty for preferential ad valorem rates: 50%									

Formed by the authors according to [11-13]

To confirm/discredit the change in foreign trade due to the conclusion of the agreement on the establishment of the DCFTA, we will conduct an empirical study using the method of correlation and regression analysis to calculate the gravitational model. The main variables of the gravitational model of Ukraine's foreign trade are trade between the two countries, the GDP of the trading partner, and the distance between the countries.

The equation proposed by J. Tinbergen (1962) [3] is as follows (form 1).

$$F_{ij} = G \frac{m_i^\alpha m_j^\beta}{d_{ij}^\delta} \varepsilon_{ij}, \quad (1)$$

where F_{ij} – is the trade turnover between countries i and j ;
 m_i and m_j represent the gross domestic product of countries i and j ;
 d_{ij} is a factor of export-related sales costs, including logistics costs;
 ε_{ij} represents all other factors that affect exports, but are not included in the equation;
 α, β, δ are the parameters of the model.

At the current stage, there are different interpretations of this model depending on the purpose of modeling. The equation of gravity is expressed in the logarithmic form to represent the growth of trade by the following formula 2.

$$\ln(F_{ij}) = \beta_0 + \beta_1 \ln(M_i) + \beta_2 \ln(M_j) - \beta_3 \ln(D_{ij}) + \varepsilon_{ij}, \quad (2)$$

The model assumes that β_1 та β_2 will be positive and β_3 will be negative. The gravitational model also affects other variables that can be added to the basic equation depending on the purpose of the simulation. The modeling methods described above allow applying a mathematical approach to functional dependencies between factors on the basis of a multifactor model.

With the help of the coefficient of elasticity of exports, it is possible to measure how the volume of exports changes when its price changes. In the event of a decline in the price of imported goods, export volumes increase, and in the case of its increase, they decrease. The formula for export elasticity is as follows (form 3):

$$E_x = \frac{\Delta X(\%)}{\Delta P(\%)} \quad (3)$$

Using the regional orientation index, it is possible to determine whether a country's exports target a particular region more than other destinations. The indicator is calculated by formula 4.

$$ROI_i = \frac{Export_{ijq}}{Export_{ij-}} \cdot \frac{Export_{ij-q}}{Export_{ij-}}, \quad (4)$$

where RCA_i is the regional orientation index of the country i ;
 $Export_{ijq}$ is the export of goods q by country i to region j ;
 $Export_{ij}$ is the total export of country i to region j ;
 $Export_{ij-q}$ is export of goods q by country i to countries outside region j ;
 $Export_{ij-}$ is the total export of country j to countries outside region j .

If the value of the index is more than 1 - it means that the country's exports tend to be relatively more focused on this region than on other countries outside the region. Conversely, if the value of the index is less than 1, the country has no advantage in favor of the region in exports of goods.

With the help of the Revealed Comparative Advantage Index (RCA) it is possible to determine in which goods the country has comparative advantages. The RCA is calculated by formulas 5 and 6:

$$RCA_i = \frac{Export_{iq}}{Export_i} \cdot \frac{Export_{wq}}{Export_w}, \quad (5)$$

where RCA_i is the RCA of country i ;
 $Export_{iq}$ is the export of goods q by country i ;
 $Export_i$ is the total export of goods of country i ;
 $Export_{wq}$ is the world exports of goods q ;
 $Export_w$ is the total world exports.

$$RCA_{ij} = \frac{Export_{iq}}{Export_i} \cdot \frac{Export_{jq}}{Export_j}, \quad (6)$$

where RCA_{ij} – is the RCA of country i and j ;
 $Export_{iq}$ is the export of goods q by country i ;
 $Export_i$ is the total export of goods of country i ;

$Export_{jq}$ is the export of goods q by country j ;
 $Export_j$ is the total export of goods of country j .

The Complementarity Index (TCI) shows how many countries (or country / region, regions) are "natural trading partners" in the sense that when one country exports, it coincides with what another country imports, i.e. how much one country's demand in international trade coincides with the proposal of another. The complementarity index of trade is calculated by formula 7:

$$TCI_{ij} = 1 - \left\{ \frac{\sum_{q=1}^n \left| \frac{(Import_{iq})}{(Import_i)} - \frac{(Export_{jq})}{(Export_j)} \right|}{2} \right\}, \quad (7)$$

where TCA_{ij} is the complementary index between countries i and j ;

$Import_{iq}$ is the import of goods q by country i ;

$Import_i$ is the total import of country i ;

$Export_{iq}$ is the export of goods q by country j ;

$Export_i$ is the total export by country j .

This index takes values from 0 (no complementarity) to 1 (full complementarity). A high degree of complementarity is considered an indicator of more favorable prospects for the success of trade agreements.

With the help of a dummy variable, we can analyze the impact of the foreign trade policies of the DCFTA. Statistics on foreign trade development indicators were taken from the World Bank Report for 28 (including the United Kingdom) EU countries for the period 1999-2020 [19].

The results of the study based on statistical data (Tables 2,3) are presented in formula 8:

$$\ln TRADE_{ij} = 4.44 + 0.41 \ln GDP_i + 0.87 \ln GDP_j - 2.41 \ln Dist_{ij} - 0.04 DCFTA, \quad (8)$$

(0.006**) (0.000***) (0.000***) (0.000***) (0.612)

where $\ln Trade_{ij}$ is the natural logarithm of the annual turnover (export + import) of Ukraine and its trading partner;

$\ln GDP_i$ is the natural logarithm of Ukraine's gross domestic product at current prices;

$\ln GDP_j$ is the natural logarithm of the gross domestic product of the trading partner at current prices;

$\ln Dist_{ij}$ is the natural logarithm of the distance between Kyiv and the capital of a trading partner in km;

$DCFTA$ is a dummy variable that takes the value "0" in years when there is no deep and comprehensive free trade area between Ukraine and the EU, and "1" is an agreement in force.

Based on the indicators obtained, the following conclusions can be drawn: the conclusion of an agreement on air traffic control between Ukraine and the EU is not a significant factor influencing trade between them.

The reliability of the data obtained is evidenced by the coefficient of determination equal to 0.783, that is, the variation of the dependent variable by 78.3% depends on the variation of the independent variables. The dummy variable coefficient (DCFTA) is negative and not statistically significant. Therefore, we cannot reject the null hypothesis ($p > 0.05$) that the DCFTA agreement had no effect on foreign trade.

Further, according to the logic of our study, we will try to build a correlation-regression model of the effect of the DCFTA on exports and imports separately. Our assumptions are that the agreement did not lead to an increase in exports due to inflationary changes in the economy of Ukraine (the calculation is given in Forms 9, 10).

$$\ln Export_{ij} = 2.90 + 0.43 \ln GDP_i + 1.09 \ln GDP_j - 3.17 \ln Dist_{ij} - 0.09 DCFTA, \quad (9)$$

(0.000***) (0.000***) (0.000***) (0.000***) (0.272*)

$$\ln Import_{ij} = 4.09 + 0.39 \ln GDP_i + 0.78 \ln GDP_j - 2.14 \ln Dist_{ij} + 0.15 DCFTA, \quad (10)$$

(0.000***) (0.000***) (0.000***) (0.000***) (0.202*)

where $\ln Export_{ij}$ is the natural logarithm of Ukraine's exports to the EU;
 $\ln Import_{ij}$ is the natural logarithm of imports from the EU to Ukraine.

According to the data of the conducted study of correlation and regression analysis, it was confirmed that exports have a negative coefficient, that is, export indicators decreased under the conditions of the DCFTA. One of the reasons for this trend is the increase in inflation since 2015. In general, inflation leads to the fact that at some point domestic goods become uncompetitive due to the possibility of providing alternative imports in the partner country. Exports of goods and services will grow only if the demand for domestic exports in foreign countries is inelastic.

Therefore, it is advisable to analyze the elasticity of Ukraine's exports to the European market using formula 3, according to World Bank data on exports for 2000-2020 for 28 EU countries (Fig. 1). Export elasticities illustrate the resilience of exporters in the face of a sudden deterioration in their position.

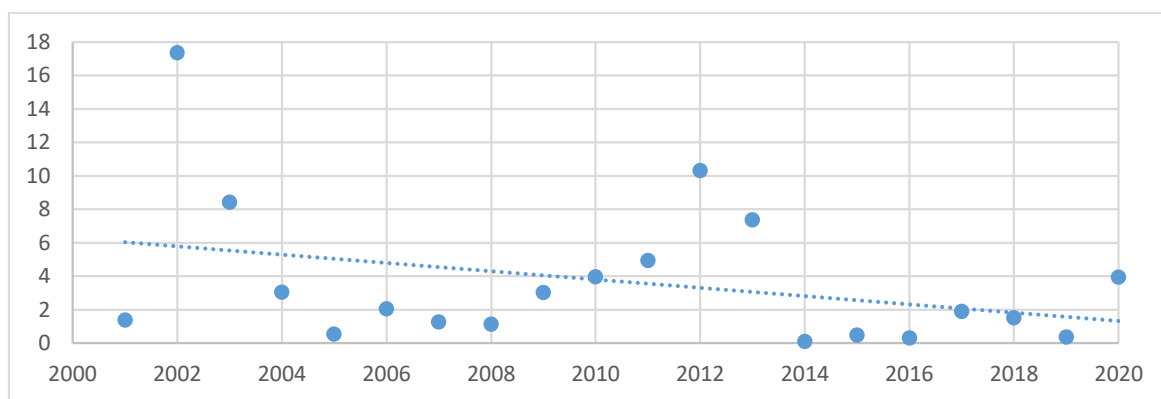


Figure 1 – Elasticity of Ukraine's exports to the European market

Formed by the authors on the basis of the form 3, according to the World Bank [14]

According to Figure 1, the elasticity of Ukraine's exports to the European market has been declining over the years. In 2015, even with a rather low elasticity (0.47%) due to high inflation (48%), Ukraine's exports decreased by 22%, so the DCFTA had no effect on Ukraine's exports during 2015-2016. During 2017-2020, with inflation of 10-14%, export elasticity began to increase. High elasticity between countries today is common due to the fact that there is increased competition between countries for foreign markets. As a result of inflation and other factors, Ukrainian goods have lost their competitiveness in the European market.

Sometimes loss of competitiveness in a particular foreign market leads a country to seek alternative export opportunities as production capacity grows and barriers resulting from loss of competitiveness prevent goods from freely entering the foreign market. In this case, it is advisable to analyze the use of alternative exports to Ukraine. As a rule, a regional orientation index is used, showing whose exports of a country's goods are more focused on a certain region than on other destinations [15] (Table 2).

According to Table 2, the index of regional orientation acquired a value greater than one after the application of the DCFTA by indicators of industrial supply and fuels and lubricants. That is, the conclusion of the DCFTA agreement led to the fact that Ukraine changed its priorities for exports above these categories in favor of the EU.

These results, together with the results of the correlation-regression analysis, indicate that although Ukrainian goods have lost their competitiveness as a result of inflation, Ukraine was able to redirect part of its exports from the CIS market to the EU.

Table 2 – Index of regional orientation for Ukrainian exports to the EU according to the Broad Economic Categories classification

Goods	Year	2014	2016	2020
	Food and beverages		0.54	0.49
Industrial supplies nes		1.19	1.30	1.04
Fuels and lubricants		5.84	x	x
Capital goods (except transport equipment), and parts and accessories thereof		0.50	0.69	1.02
Transport equipment, and parts and accessories thereof		0.67	1.10	1.35
Consumption goods nes		0.96	1.43	2.01
Goods nes		x	0.68	1.11

Formed by the authors on the basis of the form 4, according to [15,16]

The presence of a low impact of the DCFTA on Ukraine's exports to the EU requires an analysis of the trade opportunities of both partners in order to determine comparative advantages. The classical theory of international trade states that some of the benefits of trade come from specialization in a country's sector of comparative advantage. The Revealed Comparative Advantage Index (RCA) shows in which goods a country has a comparative advantage [17]. This index will help us identify the main comparative advantages of Ukrainian exports over European ones in order to further analyze the impact of the DCFTA (Table 3).

Table 3 – Revealed Comparative Advantage Index for Ukraine and the EU according to the Broad Economic Categories classification

Goods	Year	2016		2020	
		Ukraine	EU	Ukraine	EU
Food and beverages		4.19	0.83	4.04	1.03
Industrial supplies nes		1.89	0.95	1.61	0.89
Fuels and lubricants		0.13	0.41	0.15	0.41
Capital goods (except transport equipment), and parts and accessories thereof		0.22	0.99	0.22	1.05
Transport equipment, and parts and accessories thereof		0.44	1.52	0.46	1.46
Consumption goods nes		0.45	1.10	0.46	1.24
Goods nes		0.12	0.97	0.10	0.74

Formed by the authors on the basis of the form 5, according to [16]

According to Table 3, Ukraine has significant comparative advantages in food and beverage exports and industrial supplies exports. Next, it is logical to analyze trade advantages between Ukraine and the EU. Therefore, it is prudent to calculate the comparative advantages of Ukraine in relation to the EU based on the calculation of the RCA index. Consider the change in trade for 2014-2020: the period to the HCTS Agreement (2014), in the first year of the agreement (2016) and the current period (2020), table. 4.

The conclusion of the DCFTA agreement led to a change in the terms of trade between Ukraine and the EU, which is reflected in the index of revealed comparative advantages, but for groups of goods where the index is much higher than 1, the probability of losing the advantage when conditions change is small.

According to Table 6, the RCA of the food and beverage category increased in the first year of the agreement, but decreased over the years. To a large extent, it is those goods in which Ukraine has an advantage that form the basis of our exports.

Table 4 – Revealed Comparative advantages of Ukraine over the EU according to the Broad Economic Categories classification

Goods \ Year	2014	2016	2020
Food and beverages	3.84	5.05	3.90
Industrial supplies nes	2.18	1.99	1.82
Fuels and lubricants	0.64	0.32	0.38
Capital goods (except transport equipment), and parts and accessories thereof	0.26	0.23	0.21
Transport equipment, and parts and accessories thereof	0.37	0.29	0.31
Consumption goods nes	0.42	0.41	0.37
Goods nes	0.05	0.12	0.13

Formed by the authors on the basis of the form 6, according to [16]

Sometimes one of the reasons for the low effect of trade agreements is the insufficiently high complementarity of trade between countries. The Complementarity Index (TCI) shows the extent to which countries (or country and region, regions) are "natural trading partners" in the sense that what one country exports coincides with what another country imports, i.e. how much one country's demand is international trade coincides with the proposal of another (table 5) [18]. It is likely that the low complementarity between Ukrainian exports and European imports hinders the increase in export flows from Ukraine.

Table 5 – The Complementarity Index between Ukraine and the EU

Category \ Year	2014	2016	2020
Ukraine's exports/EU's imports	0.50	0.51	0.52
EU's exports/Ukraine's imports	0.70	0.78	0.87

Formed by the authors on the basis of the form 7, according to [16]

Based on the calculated data in table 5, it can be stated that Ukrainian exports were 51% complementary with European imports at the time of application of the DCFTA agreement (2016) (index value 0.51), in the same period European exports coincided with Ukrainian imports by 78% (index value 0.78), which means that imports from the EU satisfy Ukraine's needs for imported goods more than imports from Ukraine to the EU states. This trend, which persists throughout the entire period of application of the DCFTA, prevents an increase in export flows from Ukraine to the EU. This may indicate that the signing of the DCTA Agreement between Ukraine and the EU provides great benefits for the European side.

The results of the correlation-regression analysis indicate that the conclusion of the DCFTA agreement led to an increase in imports from the EU to Ukraine, but the correlation coefficient is insignificant. Many scientists argue that the increase in imports has a positive effect on the welfare of consumers [9; 19]. Imported products tend to have lower prices than locally produced products for a variety of reasons, including lower labor costs and better technology in the exporting country. While underpricing may result in wage losses for individuals working for a national producer, lower prices may be beneficial for households if a cheaper product is in their consumer basket. In some developing countries, this consumption gain is, on average, larger than the wage effect. Thus, the welfare of the countries participating in the FTA is growing, which leads to greater purchasing power.

We recommend to use the experience of the successful countries of Central and Eastern Europe to enhance trade and improve the competitiveness and welfare of the population in Ukraine. It is therefore necessary:

firstly, to harmonize VAT with the EU and consider the possibility of joining the EU Customs Union on the same principles as Turkey (the issue is especially relevant after the signing of the FTA Agreement between Ukraine and Turkey, 2021) and deepening integration through EU membership;

secondly, reduce the income tax to 10% for all taxpayers (this will create opportunities to reduce inflation, lower prices and increase welfare);

thirdly, consider joining the Single European Payments Area in order to overcome currency volatility;

fourthly, to introduce a European policy towards small and medium-sized businesses in order to expand entrepreneurial activity and create additional opportunities for innovation and investment (for exporting innovative, exclusive goods to the European market and by increasing the interest of Europeans in Ukrainian products);

fifth, to expand the range of export products, to take advantage of intersectoral trade;

sixth, to intensify online consulting of business associations, which will promote a better understanding of business relevant practices and trends in the EU market, and thus create a basis for better protection of the interests of Ukrainian producers in the EU;

seventh, to use conventional mechanisms of legal regulation of foreign trade in goods and services to promote and protect the national interests of the state.

Conclusions. The formation of an FTA affects the development of foreign trade relations of countries, evidence of this is the study conducted on the basis of a comparative analysis of the gravitational model of foreign trade. Comparison of indicators of trade between countries during the analysis using the gravity model of development showed a low effect of trade agreements and insufficiently high complementarity of trade between countries. In order to increase the effectiveness of agreements and competitiveness in the current conditions of the FTA between Ukraine and the EU countries, it is recommended that the national economy apply the following measures: to introduce a European policy on small and medium-sized businesses in order to expand entrepreneurial activity and create additional opportunities for innovation and investment; consider the possibility of Ukraine joining the Single European Payments Area in order to overcome currency volatility; reduce income tax to 10% for all taxpayers; harmonize VAT with the EU and consider ways to deepen integration into the Customs Union and ensure the acceleration of conditions for EU membership.

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РОЗВИТОК ВІДНОСИН МІЖ УКРАЇНОЮ ТА ЄС ЗА УМОВ ПОГЛИБЛЕНОЇ ТА ВСЕОХОПЛЮЮЧОЇ ЗОНИ ВІЛЬНОЇ ТОРГІВЛІ

Проблема. Поглиблення відносин України з Європейським Союзом відбувається на тлі формування глибокої та всеохоплюючої зони вільної торгівлі. Дослідження базується на гіпотезі про те, що відстань між країнами (метод розрахунку на основі гравітаційної моделі) впливає на розвиток зовнішньоторговельних відносин, але не суперечить поглибленню взаємної торгівлі між країнами та залежить від багатьох факторів, у тому числі – інституційних.

Мета. Дослідження спрямоване на визначення впливу зони вільної торгівлі (ЗВТ) на розвиток зовнішньоторговельних відносин України з країнами ЄС на основі порівняльного аналізу гравітаційної моделі міжнародної торгівлі.

Методологія. У ході дослідження були використані такі методи: порівняльного аналізу (при порівнянні показників торгівлі між країнами); систематизації, групування (при аналізі гравітаційної моделі міжнародної торгівлі); кореляційно-регресійного аналізу (при розрахунку гравітаційної моделі). Для розрахунку наслідків ЗВТ було здійснено кореляційно-регресійний аналіз (на основі гравітаційної моделі) показників розвитку зовнішньої торгівлі 28 країн ЄС (включаючи Великобританію) за період 1999-2020 рр.

Результати. У дослідженні обґрунтовано, що Україна має значні порівняльні переваги в експорті продуктів харчування, напоїв та промислових товарів. За даними проведеного кореляційно-регресійного аналізу підтверджено, що експорт України має негативний коефіцієнт, тобто показники експорту знизилися в умовах ПВЗВТ. Результати проведеного компаративного аналізу (на основі гравітаційної моделі міжнародної торгівлі) свідчать про те, що укладання угоди про ЗВТ призводить до підвищення імпорту з ЄС до України, але коефіцієнт кореляції незначний. Основними причинами такої ситуації є наявність низької компліментарності між українським експортом та європейським імпортом, зниження конкурентоспроможності на українські товари внаслідок інфляції, зниження еластичності українського експорту на європейський ринок та інші. Встановлено, що після підписання угоди про Поглиблену та всеохоплюючу зону вільної торгівлі між Україною та ЄС, європейська сторона отримує більші переваги. Враховуючи європейський досвід успішних країн рекомендовано для України

використовувати порівняльні переваги у міжгалузевій торгівлі і з цією метою розширити асортиментний ряд експортної продукції, застосовувати політику ділового клімату та розширення ділової активності; створення додаткових можливостей для європейських інвестицій тощо.

Наукова новизна. Відносно новим є підхід застосування гравітаційної моделі на основі емпіричної оцінки зовнішньої торгівлі між Україною та країнами ЄС, що на відміну від існуючих, дає можливість апробувати математичний підхід до функціональних залежностей між різними економічними факторами в умовах дії угоди про ЗВТ. Розроблено заходи активізації та підвищення конкурентоспроможності українського експорту в умовах ЗВТ між Україною та країнами ЄС, а саме: 1) запровадити європейську політику щодо малого та середнього бізнесу з метою розширення підприємницької діяльності та створення додаткових можливостей для інновацій та інвестицій; 2) розглянути можливість приєднання України до Єдиної європейської платіжної зони з метою подолання волатильності валюти; 3) зменшити податок на прибуток до 10% для всіх платників податків; 4) гармонізувати ПДВ з ЄС та розглянути шляхи поглиблення інтеграції та прискорення відповідності умов для членства в ЄС та ін.

Висновки. Порівняння показників товарообігу між країнами ЄС під час аналізу з використанням гравітаційної моделі розвитку показало низьку дію торговельних угод та недостатньо високу взаємодоповнюваність торгівлі між країнами. З метою підвищення ефективності угод між Україною та країнами ЄС окреслено пріоритетні задачі: розширити асортиментний ряд експортної продукції, використати переваги міжгалузевої торгівлі, активізувати онлайн консалтинг бізнес-асоціацій, що сприятиме кращому розумінню бізнесом відповідних практик і трендів на ринку ЄС, а отже створюватиме підґрунтя для кращого захисту інтересів українських виробників в ЄС; використовувати конвенційні механізми правового регулювання зовнішньої торгівлі товарами і послугами для просування і захисту національних інтересів держави та інші.

Ключові слова: зона вільної торгівлі (ЗВТ), Європейський Союз (ЄС), інтеграція, економіко-математичне моделювання, кореляційно-регресійний аналіз, гравітаційна модель зовнішньої торгівлі.

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