

ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ

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L. M. Lyskova, Candidate of Economic Sciences, Associate Professor**Л. М. Лиськова**, к. е. н., доцент**THE EFFECTS OF THE INCREASE IN TRADE COOPERATION BETWEEN UKRAINE AND EU IN AGRICULTURAL SECTOR: EMPIRICAL EVALUATION****НАСЛІДКИ НАРОЩЕННЯ ТОРГОВЕЛЬНОГО СПІВРОБІТНИЦТВА МІЖ УКРАЇНОЮ ТА ЄС В АГРАРНОМУ СЕКТОРІ: ЕМПІРИЧНА ОЦІНКА**

Urgency of the research. State economic growth is impossible without developing and strengthening cooperation with countries which were identified as prior during the country's integration into the European economy. Unfortunately, despite significant economic potential output Ukraine's agricultural sector is still technologically backward and therefore not sufficiently competitive in the international market.

Target setting. It is reasonable to argue the effects of trade cooperation between Ukraine and the EU in the agricultural sector in a context of increasing the competitiveness of Ukraine.

Actual scientific research and issue analysis. Certain aspects of research were expounded in the researches of T. Ostashko, Popov, A. Ermolaev S. Taubadel, O. Pavlyuchenko, I. Tyuha etc.

Uninvestigated parts of general matters defining. Despite the considerable number of scientific publications relating to the chosen subject, the effects of foreign trade of Ukraine and the EU in agriculture, based on the deeper empirical research in the long term, which is of considerable scientific interest still require thorough study.

The research objectives. The aim of the research is to analyze the possibility of main effects from increased trade cooperation between Ukraine and the EU in the agricultural sector by using empirical methods.

The statement of basic material. The article illustrates the dynamics of the volume of foreign trade between Ukraine and the EU in 2008-2015 and the main trade partners of Ukraine in the EU. The most acute problems in the development of trade relations between Ukraine and the EU in agriculture have been defined.

Conclusions. It is proved that the growth of international trade may have a positive impact on GDP and exports from the EU to third countries. Some adverse effects were defined caused by the signing the Association Agreement Ukraine and the EU.

Keywords: International trade; export; import; EU agricultural sector; empirical evaluation; regression.

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Актуальність теми дослідження. Економічне зростання держави неможливе без розвитку та зміцнення співпраці з країнами, які Україна визначила пріоритетними на етапі інтеграції країни в європейський економічний простір. Нажаль, не зважаючи на значний економічний потенціал, продукція аграрного сектору України все ще залишається не достатньо конкурентоспроможною на міжнародному ринку.

Постановка проблеми. Доцільним є аргументація ефектів від торговельного співробітництва між Україною та ЄС в аграрному секторі в контексті підвищення конкурентоспроможності України.

Аналіз останніх досліджень і публікацій. Окремі аспекти дослідження викладено у працях Т. Осташко, О. Попова, А. Ермолаєва, С. Таубадель, О. Павлюченко, І. Тюха та ін..

Виділення недосліджених частин загальної проблеми. Незважаючи на значну кількість наукових публікацій стосовно обраної тематики, все ще потребують ґрунтовного дослідження ефекти для зовнішньої торгівлі України та ЄС в аграрній сфері, розраховані на основі більш глибоких емпіричних досліджень в довгостроковому періоді, що становить значний науковий інтерес.

Постановка завдання. Метою дослідження даної статті є аналіз за допомогою емпіричних методів основних ефектів від збільшення торговельного співробітництва України та ЄС в аграрному секторі.

Викладення основного матеріалу. У статті проілюстровано динаміку обсягів зовнішньоторговельних операцій між Україною та ЄС в 2008-2015 рр. та визначено основних торговельних партнерів України серед країн ЄС. Виявлено найбільш гострі проблеми в напрямку розвитку зовнішньоторговельних відносин України та ЄС в аграрній сфері.

Висновки. Доведено, що зростання міжнародної торгівлі, можливо, матиме позитивний вплив на обсяги ВВП та обсяг експорту з ЄС у треті країни. Відзначено негативні ефекти після підписання Угоди про асоціацію України з ЄС.

Ключові слова: Міжнародна торгівля; експорт; импорт; ЄС; аграрний сектор, емпірична оцінка; регресія.

Urgency of the research. In modern conditions of economic growth in most countries at the level of integration of the world economy and the level of participation in international trade there are many aspects to prospective cooperation and establishing long-term fruitful relationship. For Ukraine, which has been in a difficult economic situation in recent years, the intensification of international trade with the European Union as a strategic partner is a very important issue. In this respect, it is advisable to pay attention to the development of strategic sectors of the Ukrainian economy, among which highlights agriculture. Significant potential of Ukraine in the agricultural sector is a matter of trade relations

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with the EU, which is devoted to research. In particular, the study hypothesis about significant gains from trade for both partners, enabling separate the urgent problems of Ukraine in the field of agriculture.

Target setting. The aim is to analyze the main effects of increasing trade cooperation using empirical methods. The study is based on theoretical and empirical analysis of materials using appropriate methods.

Objectives of the study:

1. To analyze the prospects for the development of agriculture in Ukraine through review of doctrinal and empirical sources.
2. Analyze the dynamics of trade relations between Ukraine and the EU.
3. Present the results of empirical evaluation and draw appropriate conclusions.

Actual scientific researches and issues analysis. Research prospects of development of enterprises of the agricultural sector of Ukraine for the European Union market is important because it is obvious that it is necessary to further develop and expand the presence of domestic agricultural products on world markets. At present the economic situation in the agro-industrial complex (AIC) of Ukraine is complicated by a number of problems that can be solved only by deepening its integration into the global economy. In terms of a possible global agricultural crisis Ukraine could increase its presence in the global market as a manufacturer of high quality food. However, without making the corresponding transformation in the agricultural sector, the introduction of advanced technology, improving the access of farmers to credit instruments, dissemination of Ukraine's presence on the world market are not promising. Equally important is the issue of transportation and logistics reduce of the costs of transportation of perishable goods, which is of a significant scientific interest. The analysis of the publications revealed a number of areas of scientific opinion on the issue. Consider in more detail some of them.

Cramon-Taubadel notes that the Ukrainian agricultural enterprises mainly specialize in manufacturing and exporting profitable crops such as sunflower and rapeseed, without complying with scientifically based crop rotation, constant violation of farming [9]. In this regard, it is appropriate to introduce administrative and financial responsibility for the predatory exploitation of farmer land, which is the wealth of Ukraine and unable to find demand in the domestic market of agricultural products as raw materials sent to developed countries, specializing in the production of industrial products and consumer goods. Processed products enter the markets of Ukraine, replacing domestic production, thus exacerbating the problem of unemployment in the domestic labor market.

Most Ukrainian and foreign suppliers in the past two decades have developed and implemented a broad agrarian life network designed to serve large agricultural farms. In addition, local officials and resources got together to create a system of local monopolies that prevent the growth of competitive markets. Since 2000, numerous suppliers and representatives of the business environment began to open up farm shops, wholesale agricultural markets focused on small producers [5]. However, one cannot deny the existence of obstacles and constraints to the presentation of agricultural products of small and medium agricultural enterprises in international markets, including markets in the EU.

Lele emphasizes that the successful solution of problems of European integration of the agricultural sector has a promising premise due to: available rich natural resources and export potential of its human capital, extension investment attractiveness, combined with the preservation of the rural way of life based on ancient traditions of farming [4]. In this regard, scientific research and understanding of the experience of the formation of the European model of agriculture will facilitate structural reforms in agriculture and the competitiveness of agricultural products in the European and world markets.

Today agriculture Ukraine has a lot of problems, among which are those related to very critical. At present, should be resolved following range of problems:

- lack of financial support from the state (subsidies and support programs);
- deficient infrastructure, which increases the cost of production, significant cost during transportation or storage;
- corruption and too complicated mechanism of customs procedures;
- VAT refunds for exporters;

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- failure to conform to existing European standards.

There may also be problems with modernization, refurbishment production facilities.

Scientists identify the following issues: Ukrainian enterprises exporting agricultural products, do not use the full potential of the Global System of Preferences (GSP), which was signed by Ukraine and the EU in 1993. The reasons for low usage preferences are: poor knowledge of Ukrainian exporters of opportunities of GSP; preferential complexity of the EU; extensiveness localization system for determining the origin of goods; relatively small size commercial advantages for certain types of agri-food products. Ukraine and the EU are interested in deepening trade and economic relations and free trade. This explains the interest of the EU growth prospects own influence in the region and access to new markets. This view is shared by the AS and AL Taubadel Popov [6; 10].

The statement of basic materials. Agriculture of Ukraine is probably one of the most important industries in the economy of Ukraine. It provides 9,2 % of gross value added; it used fixed assets worth more than 100 billion UAH, companies use 20,6 million hectares of agricultural land, State Statistics Service of Ukraine, (2015). Farms produce 223,2 billion of the gross agricultural product, including 149,2 billion crop production and 74 billion of animal products [8].

Agricultural activity is carried out almost throughout the country. At the beginning of 2015 in rural areas lived nearly a third of the total population (31,4 %). The industry employs 3,49 million people from among the rural population. In 2008 and 2011 the highest in the history of Ukraine grain harvests – respectively 53,3 and 56,7 million tons against 51 million tons in 1990 were received [8].

Since 2001, agricultural production in agricultural enterprises possibly are profitable, profitability in 2013 was 19,3 %, and in 2014 was 16,2 %, which is relatively high in recent years. The level of profitability is almost always profitable crop (except crisis 2008) in 2015 was 22,3 %, and livestock – 14,3 % [8].

Due to State Statistics Service of Ukraine domestic production provided by internal demand in grain, sugar, butter, potatoes, vegetables, increased consumption per capita milk and meat [8].

Trade relations between Ukraine and the EU apparently came out to a new level after the signing of an association agreement between Ukraine and the EU (was signed 27 June 2014). For Ukraine, European integration is possibly a way to modernize the economy, attract foreign investment and new technologies, and increase the competitiveness of domestic producers, the possibility of entering the single EU internal market. In the political aspect European integration could determine the modernization of the legal framework of the Ukrainian state, the democratization of its political and institutional system. Cooperation with the EU, facilitating approximation of social conditions of Ukraine to the highest European standards, will improve the standard of living and welfare.

It seems to be that an essential element of the Association Agreement between Ukraine and the EU bases on a profound and comprehensive free trade area (FTA). It provides substantial trade liberalization (elimination of tariffs or quotas) between the parties, the harmonization of legislation and the legal and regulatory framework. According to analytics, Ukrainian agricultural sector could receive the biggest advantages of importable from reduced duties: 330 million Euros for agricultural production and 53 million Euros to processed agricultural products of agricultural commodities. New access to the EU market and the introduction of higher standards of production could encourage investment, possible stimulate the modernization of agriculture and improve working conditions. Briefly, analyze the dynamics of foreign trade turnover to understand the first effects for both members of the Association Agreement [5].

Analyzing data in Fig. 1 we can assume that there are the following trends: an increase in imports in 2009-2013, while in 2014-2015 there was a significant reduction (in 2014 imports from the EU countries decreased by 22,1 % and in 2015 – 27,2 %). As for export, a clear tendentiousness is not observed. In particular, in 2011-2014 Ukrainian exports to the EU fluctuated within 17 billion dollars. Despite the signing of the Association Agreement in 2014 volume of exports decreased by 23,5 % compared to the previous year [8].

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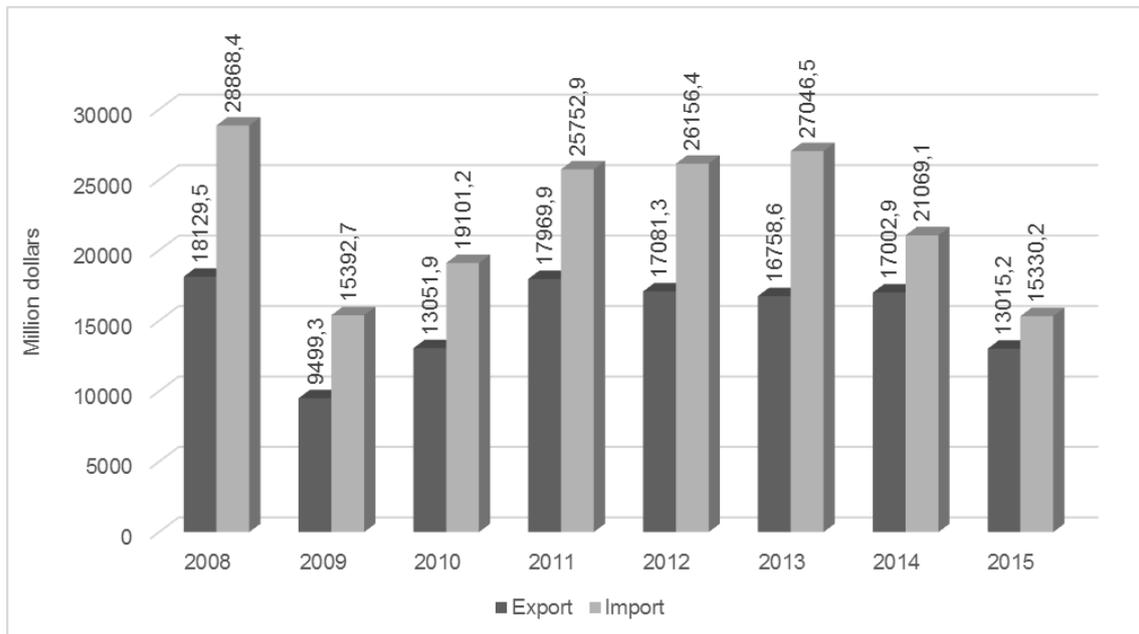


Fig. 1. The dynamics of international trade in Ukraine with the EU

Source: built according to the database of State Statistics Service of Ukraine [8]

Most production Ukraine exports to: Italy, Poland, Germany, Spain, the Netherlands, Romania, Czech Republic, France and Slovakia (Fig. 2).

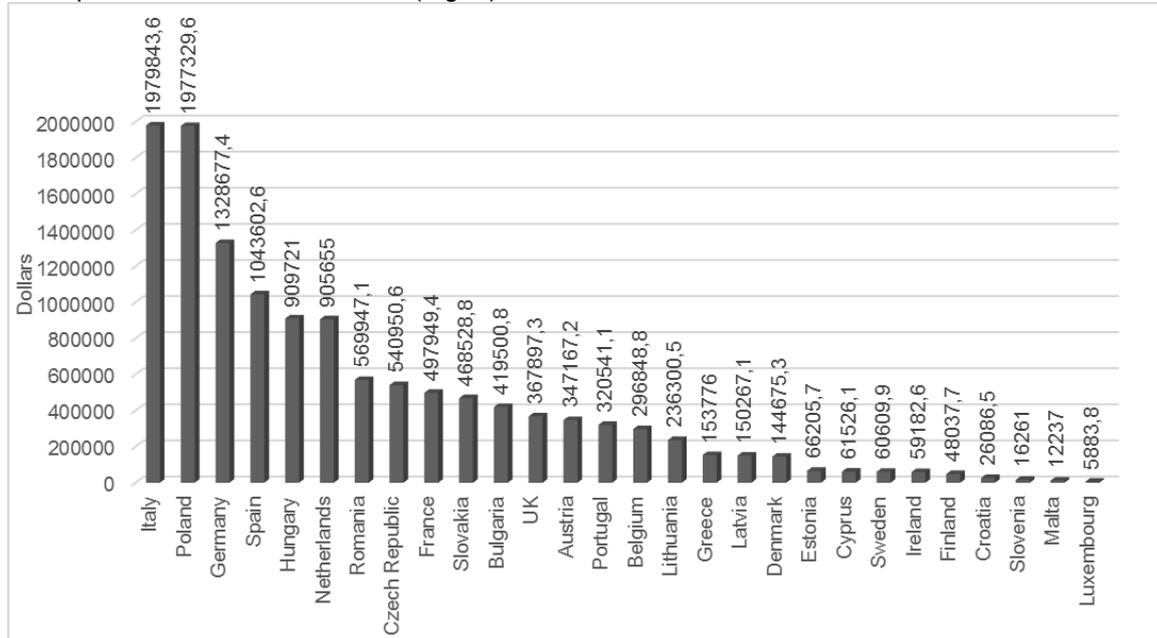


Fig. 2. Geographic structure of exports to the EU in 2015

Source: built according to the data base of State Statistics Service of Ukraine [8]

Instead, most products Ukraine imports from Germany, Poland, Hungary, Italy, France, Great Britain, Lithuania, the Czech Republic and the Netherlands (Fig. 3).

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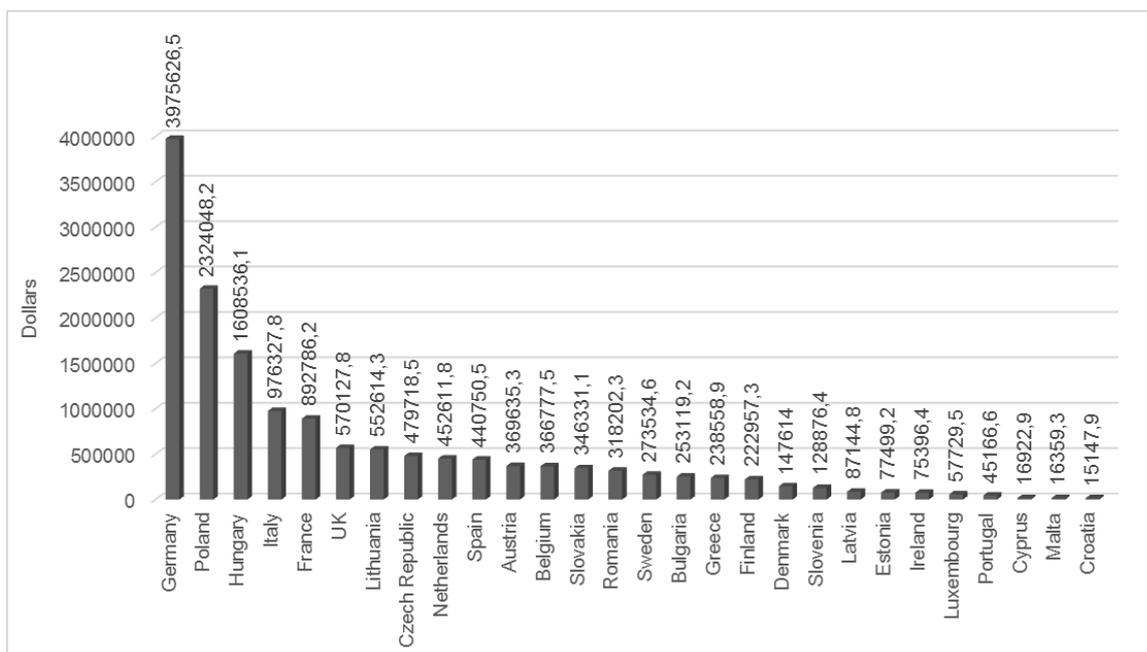


Fig. 3. Geographic structure of imports from the EU in 2015

Source: built according to the data base State Statistics Service of Ukraine [8]

According to State Statistics Service of Ukraine, in January-June 2016 it appears an increase Ukrainian exports to the EU of certain categories of goods:

- Milk and milk products, eggs, poultry; natural honey – by 56,1 %;
- Products of the milling industry – by 63,6 %;
- Fats and oils of animal or vegetable origin – to 200,7 %;
- Meat, fish – by 193,9 %;
- Mass of wood – by 62,8 %;
- Paper and paperboard – by 60,1 %;
- Printed production – by 169,9 %;
- Umbrellas – by 195,1 %;
- Ceramic products – 50,2 %;
- Furniture – by 55,8 %;
- Various products – by 102,0 %.

Ukraine produces much more agricultural than it is required for domestic consumption. Ukraine holds leading positions in the markets of agricultural products, ores and metals, that is, the so-called stock goods. So, in structure of export dominate agricultural commodities such as grains and vegetable oils. Instead, there is a very small proportion of products with high added value [7]. Today Ukraine does not use the full quota granted by the EU to export pork, beef, lamb and dairy products.

The dynamics of foreign trade of Ukraine and the EU in 2014-2016, despite the signing of the Association Agreement, showed a downward trend. The majority of Ukrainian exports are commodities. In particular, this trend applies to agricultural products, where the main export items seem to be grains and oilseeds.

Any economic process, especially if it can fully be expressed or determined through quantitative characteristics, is often subjected to mathematical modeling, i.e. its expression through regression equation. Thus, regression refers to a random variable dependent on another random variable. This process of constructing mathematical relationships between factor and dependent variable feature allows us not only to identify the existing close relationship between these parameters (that is solved using correlation analysis), but also to predict one (dependent) variable (y) from another (others) vari-

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able (x). Therefore, regression analysis allows making conclusions on the development of the economic process based on and supported by specific mathematical calculations. It is planned to present the potential benefits for the European Union from increasing volumes of trade with Ukraine using regression analysis. Empirical research methods, including using macroeconomic modeling program Eviews (version 7.0) were used in studies of IMF, World Bank, European Bank analysts, experts in international trade and economics [3]. So, these methods could be used in this research paper.

The choice of exact program was made because it is a special statistical package, which is mainly used for general statistical analysis and econometric analysis and very popular among well-known economists and analysts around the world [1]. For the analysis the next series were selected, as the best reflect the purpose of the research, namely determining the benefits of deepening trade with Ukraine for the European Union:

- TRADE – the volume of bilateral trade between Ukraine and EU.
- INVEST – amount of direct investments in EU.
- EXPORT – exports of products in EU.
- GDP – gross national product volume of EU.
- INF – inflation rate in EU.
- PROD – index of industrial production in EU.
- UNE – unemployment rate in EU.

We hypothesized that the increase in trade between Ukraine and the EU would have a positive impact on the socio-economic situation in Europe. So, the dependent variables – *INVEST*, *EXPORT*, *GDP*, *INF*, *PROD*, *UNE*. Independent variable – *TRADE*.

Statistical sampling – January 2008-October 2016. The monthly data was selected for the study, which was collected from official statistical databases such as Eurostat, the State Statistics Committee of Ukraine and the International Monetary Fund [2; 8].

Most economic time series have the seasonal component. For the series, the seasonal smoothing was performed to devoid of seasonality (using X12 method). The advanced Dickey-Fuller test (option Augmented Dickey-Fuller) and Phillips-Perron test (option Phillips-Perron) was used to check the data on stationary. In tables 1, 2 the results of statistical tests PP and ADP are given, which show that the selected data do not change their characteristics over time so that they can be used for further analysis [1].

Table 1

ADF test the residual for stationarity indicators

Indicators	Logarithm of the levels			The first differences		
	1	2	3	1	2	3
<i>INVEST</i>	-0,752	-0,587	-0,358	-3,870*	-3,264**	-2,576
<i>EXPORT</i>	-2,314	-1,640	-1,522	-4,139*	-3,654**	-2,110
<i>GDP</i>	-1,232	-0,754	-1,082	-8,580*	-10,754*	-1,472
<i>IMPORT</i>	-2,027	-1,322	-0,403	-8,657*	-9,819*	-2,726***
<i>INF</i>	-0,616	-0,526	-0,627	-3,817*	-2,740***	-1,880
<i>PROD</i>	-1,190	-1,006	-0,129	-4,300*	-4,038*	-2,419
<i>UNE</i>	-2,939***	-1,399	-1,089	-6,721*	-4,399*	-2,326

Note: * – hypothesis can be rejected at the level of statistical significance of 1 %, ** – 5 % *** – 10 %

Table 2

PP test the residual for stationarity indicators

Indicators	Logarithm of the levels			The first differences		
	1	2	3	1	2	3
<i>INVEST</i>	-0,876	-0,834	-0,787	-5,422*	-5,453*	-5,514*
<i>EXPORT</i>	-2,103	-2,075	-1,989	-4,015*	-3,937*	-3,855*
<i>GDP</i>	-0,745	-0,525	-0,337	-5,833*	-6,685*	-9,464*
<i>IMPORT</i>	-2,330	-2,039	-2,056	-6,238	-7,360*	-8,976*
<i>INF</i>	0,707	0,711	0,866	-8,083*	-8,047*	-8,005*
<i>PROD</i>	-1,266	-1,326	-1,363	-6,187*	-6,389*	-6,547*
<i>UNE</i>	-2,842***	-2,684***	-2,648***	-5,381*	-5,765*	-6,374*

Note: * – hypothesis can be rejected at the level of statistical significance of 1 %, ** – 5 % *** – 10 %

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The next stage of the research is to determine the causal connections between independent and dependent variables using a statistical test Granger (Granger causality test). The results of the test are given in Table 3. According to the results of the test:

- Mutual causality was found between the amount of investments and the volume of bilateral trade with a lag of one-quarter (statistical significance is 1 and 5 %).
- Also a relationship between the volume of trade and exports was found with a lag of two quarters (the statistical significance – 5 %) and with a lag of four quarters (10 % of statistical significance).
- There is a clear relationship between the volume of trade and GDP with a lag of 2,3,4 quarters and statistical significance of 1 %.
- True hypothesis about the impact of the trade on inflation rate (all lags with the statistical significance of 1 and 5 %).
- In 1 and two lags, there is a trend impact of trade volumes on the index of industrial production (statistical significance 1 and 10 % respectively).
- Also was found a relationship between the volume of trade and unemployment rate.

Table 3

Hypothesis	Results of the Granger test			
	Lags			
	1	2	3	4
<i>INVEST</i> does not affect <i>TRADE</i>	(10,8335*)	–	–	–
<i>TRADE</i> does not affect <i>INVEST</i>	(5,0537**)	(2,7152***)	–	–
<i>TRADE</i> does not affect <i>EXPORT</i>	–	(3,8436**)	–	(2,4237***)
<i>TRADE</i> does not affect <i>GDP</i>	–	(14,5041*)	(7,7479*)	(7,6991*)
<i>INF</i> does not affect <i>TRADE</i>	(7,1860**)	–	–	–
<i>TRADE</i> does not affect <i>INF</i>	(5,2330**)	(3,9111*)	(5,0326**)	(3,1189**)
<i>TRADE</i> does not affect <i>PROD</i>	(8,1691*)	(3,1503***)	–	–
<i>UNE</i> does not affect <i>TRADE</i>	(12,3352*)	(2,5715***)	–	–
<i>TRADE</i> does not affect <i>UNE</i>	–	–	–	(2,6956***)

Note: * – hypothesis can be rejected at the level of statistical significance of 1 %, ** – 5 % *** – 10 %

Thus, the connectivity between selected indicators was found, data is stationary and can be used to build regression models using the least squares method and this formula:

$$Y = a_0 + ba_1 + ca_2 + da_3 + ea_4 \quad (1)$$

where, a_0, a_1, a_2, a_3, a_4 – regression coefficients;
 b, c, d, e – independent variables;
 Y – dependent variable

The first regression model (equation 2) describes the impact of bilateral trade to GDP volume. Characteristics of the model indicate its adequacy, and therefore the results, are significant. In particular, the Durbin-Watson index is statistically acceptable ($DW=1,81$), and adjusted coefficient of determination indicating that independent variables explain dependent variables on 93 %. So, it is possible, that the growth of trade with Ukraine on 1 %, EU GDP could increase by 0,045 %. This result is statistically significant at the 1 % level.

The next regression model (equation 3) describes the impact of bilateral trade on indices of industrial production. The characteristics of the model indicate the reliability of the results ($DW= 1,72$, $AR^2=0,93$). So, it can be assumed, that the growth of international trade with Ukraine, the index of industrial production in the EU could be reduced by 0,038 %. This result is statistically significant at 10 %.

The third regression model (equation 4) describes the impact of bilateral trade in exports. The main features of the model indicate the reliability of the results. Thus, we can assume that the growth of trade with Ukraine, exports from the EU to third countries may increase by 0,231 %. This result is statistically significant at the 1 % level.

Equation 5 demonstrates the regression model on the impact of bilateral trade on investments. Pa-

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rameters of the model indicate that obtained results, possibly, can be taken into account. Thus, it could be assumed, that the growth in international trade with Ukraine on 1 %, may reduce the volume of investments in the EU on 0,234 %. This result is statistically significant at the level 1 %.

The latest regression model demonstrates the impact of bilateral trade on the unemployment rate. Parameters of the model indicate its authenticity. Thus, it seems to be, that the growth in international trade with Ukraine on 1 %, could increase the unemployment rate in the EU on 0,77 %. This result is statistically significant at the level 5 %.

So, the increase of international trade between Ukraine and the European Union could have a positive impact on the socio-economic situation in the EU. The econometric studies conducted have shown that the increase of international trade, perhaps, will have a positive impact on the GDP volumes, and the volume of exports from the EU to third countries. Some negative effect was indicated by the increase in unemployment rate, which could be explained by the creation of Ukrainian products competitiveness on the EU internal market, and therefore it can cause a decrease in domestic production and a slight reduction in staff. Another negative consequence is the reduction of investments that are coming into the EU.

Conclusions. EU might be a strategic trade partner for Ukraine, especially, regarding the signing of the Association Agreement and Ukraine's aspiration to integrate into the European Union. The analysis of the dynamics and scope of foreign trade of Ukraine with the EU in agricultural products showed that in 2014-2016 the volume of commerce significantly declined. This may be related with the deterioration of the overall economic situation in Ukraine, reduction of business activity of agricultural enterprises, impaired quality of products and so on. Ukrainian exports mainly based on grains and vegetable oils, only partly coincides with the structure of world commodity demand. In the structure of exports there are no products with high added value. Most production Ukraine exports to Italy, Poland, Germany, Spain, the Netherlands, Romania, Czech Republic, France and Slovakia. Despite the quotas received by Ukraine from the writings of the Association Agreement with the EU, Ukraine free trade results in EU markets are quite ambiguous. Enterprises just exhaust the quota for corn, but other products cannot fill, and for some positions, exports even never began. Partly because of insufficient production, but mainly – due to low product quality and yield complex manufacturers on the European market. Econometric analysis with the help of special statistical package Econometric Views (version 7.0) showed that the increase of international trade between Ukraine and the European Union could have a positive impact on the socio-economic situation in the EU. In particular, the growth of international trade, perhaps, will have a positive influence on the GDP volumes, and the volume of exports from the EU to third countries.

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