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EVALUATION OF THE RESULTS AND ANALYSIS OF THE IMPACT OF THE DCFTA WITH THE EU ON AGRICULTURAL TRADE IN UKRAINE

Purpose. *The purpose of the article is to evaluate the impact of the EU-Ukraine Deep and Comprehensive Free Trade Area (DCFTA) on bilateral trade in agri-food products and domestic food market of Ukraine during the first five years after the entry into force of this DCFTA.*

Methodology / approach. *Analysis of the impact of DCFTA with EU on the agricultural trade is based on the cost-benefit approach. The results of the implementation of the DCFTA agreement are evaluated in terms of benefits and losses for the main stakeholders (players) in agricultural trade – Ukrainian agricultural exporters, domestic agri-food producers, consumers, and the government sector. Based on the methods of analyzing the structure of the sectoral market, a list of criteria for evaluating the results of the implementation of the Agreement was determined. A comparison method was used to evaluate the impact of the EU-Ukraine Association Agreement (hereinafter Agreement or AA) on agricultural trade and the domestic market of agri-food products of Ukraine. To study the DCFTA's impact, the five-year period (2009–2013) before its implementation was compared with the five-year period after the entry into force of the DCFTA bilaterally (2016–2020). Since Ukraine lost control over part of its territories after the start of the Agreement's implementation, relative indicators were used to assess the impact of the EU-Ukraine DCFTA on the domestic market of agri-food products. The research was conducted based on the data of the State Statistics Committee of Ukraine, UN Comtrade Trade Statistics Database, Eurostat Database.*

Results. *The analysis demonstrates the undoubted benefits of DCFTA for Ukrainian exporters of agricultural goods: (1) after the implementation of the DCFTA, there was an increase in both Ukraine's agricultural exports to the EU and imports of agricultural products from the EU to Ukraine, and the resulting positive balance in agricultural trade in 2020 was 5.5 times higher than in 2009. (2) the average growth rate of Ukraine's agricultural exports to the EU during the first 5 years of the Agreement (10.3 %) exceeded the average growth rate of agricultural imports from the EU to Ukraine (7.2 %). (3) during 2016–2020, Ukraine's exports of agricultural goods to the EU grew faster than agricultural exports to the rest of the World, which indicates the high effectiveness of bilateral liberalization of foreign trade regimes. (4) the DCFTA with the EU has not yet resulted in significantly reduce of the share of agricultural raw materials (or low value-added primary goods) in Ukraine's exports to the EU. (5) the potential for exports of Ukrainian agricultural products to the EU, including those produced by small and medium-sized agrobusinesses, has not been fully realized due to the low levels of tariff rate quotas, high level of EU import duty rates applied to quantities imported from Ukraine outside tariff quotas and long duration and high costs of the certification procedures for the export to the EU. (6) during the first 5 years of DCFTA implementation, there was no significant expansion of imports of agri-food products to the domestic market of Ukraine. This happened not so much because of the high competitiveness of domestic producers, but because of the low purchasing power of the population.*

(7) the implementation of the Agreement did not have a significant downward impact on domestic prices for agri-food products in Ukraine. (8) the lowering of the tariff protection of the domestic market did not significantly influenced the domestic production of agri-food products which remained stable, except for the production of grape wines, which decreased during 2016–2020. (9) due to the implementation of the Agreement, the EU has increased its share in the import of agri-food products to Ukraine. However, for some commodity groups there was both absolute and relative decrease in imports. This happened due to competition from other importers, as well as due to import substitution processes.

Originality / scientific novelty. The originality of the study is the specification (adaptation) of cost-benefit analysis methods to identify the DCFTA impact on the main stakeholders in agricultural trade of Ukraine with European Union – exporters, domestic producers, consumers, government sector.

Practical value / implications. The practical use of the study consists of identification of the positive and negative consequences of the DCFTA for Ukraine's agricultural trade stakeholders, as well as factors of these consequences, that allows developing practical agricultural trade policy recommendations, including periodic time-to-time review of trade provisions of the Agreement.

Key words: agricultural economics, agricultural trade, EU-Ukraine DCFTA, exporters, domestic producers, consumers.

Introduction and review of literature. The impact of the DCFTA on the agricultural trade between EU and Ukraine, Ukraine and non-EU countries, local production and consumption, price trends and benefits of local producers and consumers were analyzed in the wide range of research. However, since 2017 the agricultural and food sector in Ukraine had undergone a series of significant events that are not correlated with the DCFTA, such as trade bans with Russia, occupation of the part of the Ukrainian territory, COVID-19 pandemic, war conflicts.

Although time series data are not sufficient to use effectively tools of econometric modelling for analysis and forecasting the markets situation after the entry into force of the DCFTA, a number of researchers use combined data and model parameters obtained from the period before the DCFTA and the period during the DCFTA. Using proper data preparation procedures, the obtained results of modelling are considered valid for policy analysis purposes. One of the core approaches is establishing of the linkages between the prices and local markets of trade partners, the approach is widely used in analyzing of the European agricultural trade as it is presented by Baret and Li [1], Fackler and Goodwin [2] and Listorti [3, pp. 15–37]. From the perspective of DCFTA, Hamulzhuk et al. used the autoregressive model approach to analyze the linkages of the rapeseed market in EU and Ukraine [4]. The developed model was used to estimate the increase in trade as well as benefits for the Ukrainian producers. The authors concluded that the level of markets linkage is relatively high, and EU demand is covered with import. Given that due to planned changes in regulation in the period up to 2030 EU demand for conventional biofuel and rapeseed will consequently decrease, the DCFTA is the chance for Ukrainian producers to increase the share in the EU import and keep the volume of exports on the current level. Furthermore, Ukraine takes over the price changes from the EU market with insignificant lag and there is no evidence of the

impact in opposite direction, therefore, Ukrainian producers could benefit from DCFTA and development of exports. Kareem et al. [5] and Santeramo et al. [6; 7] presented similar approach and results.

Hamulczuk et al. [8] used a similar econometric approach of evaluating the level of linkages between EU and Ukraine markets, to analyze the perspectives of the sunflower seeds trade during the period up to 2027 and after it. The decrease of the export duty on sunflower seed exports to all the EU Member States until it reaches zero in 2027 and re-structuring of EU market of biofuels will lead to the increase of sunflower seeds export from the EU to Ukraine. However, no stable structural linkage between prices in Ukraine and EU was found by the authors, therefore any structural change, including the two mentioned above could make it impossible to develop medium and long-term analysis and forecasts. Furthermore, as it is shown in the model developed by Bouet et al. [9], the reduction of the export tax for sunflower seed in Ukraine will influence the level of production, but the impact on the level of trade will be much weaker. On the contrary, Kuts and Makarchuk [10] argue that although market of sunflower meals and pies in EU and Ukraine are not highly integrated, markets of sunflower oil are significantly integrated, and there is a possibility, that decrease in local production of sunflower oil in Ukraine will influence prices in EU more than prices in Ukraine, making Ukrainian producers and traders choose export options over local market, thus likely creating a deficit in Ukrainian market [10].

Artuc et al. [11] analyzed the overall effect of the import tariff liberalization (including those ruled by the DCFTA) for agricultural trade and social welfare. Based on the approaches presented by Melitz and Redding [12] and Fajgelbaum and Khandelwal [13], the authors used adopted welfare model of agricultural sector to indirectly estimate the effect of import tariff changes on the volume of import, consumption and welfare. Although, according to the estimation of the research the volume of trade due to the import tariff reduction will increase, there will be a positive effect from the initial inequality, and both local consumers and producers will benefit from changes in trade.

Chattellier [14] and Guyomard et al. [15] analyzed the trade in animal products between the EU and Ukraine before and after signing the DCFTA as well the effect of other EU FTA agreements. The authors observed significant facilitating in trade of core products of the animal origin only in poultry after signing the Agreement, also they mentioned the negative effect on the trade balance for Ukraine.

A number of researchers apply gravity models, CAPRI model and general equilibrium models to analyze the extent to which non-tariff instruments compensate positive effect for the EU FTA trade partners. Although DCFTA provides for partial standard harmonization, Ukraine, among other third parties suffer from the imposed non-tariff limitations and/or restrictions. Ferro [16], Fiankor et al. [17], Santeramo and Lamonaca [6], Kareem et al. [5] presented the results of the analysis of these aspects.

In 2020, the first five-year period from the entry into force of the Economic Part of the EU-Ukraine Association Agreement came to an end, which provides grounds

for its revision for the next five years and actualize the task to analyze its impact.

The purpose of the article is to analyze the impact of the Agreement on Ukraine's agricultural trade and domestic agri-food market.

Results and discussion. The timeline and the main developments of the Association Agreement with the EU and developments under DCFTA, and also main changes from the Russian side in terms of commercial bans and/or tariffs in relations with Ukraine are presented in Figure 1.

From April 23, 2014, to December 31, 2015, there were autonomous trade preferences for the export of Ukrainian goods into the EU. Since January 1, 2016, the free trade area with the EU has been operating bilaterally, and in September 2017, the Association Agreement entered into force in full. The agreement provides for the establishment of a Deep and Comprehensive Free Trade Area (DCFTA) with the EU.

The signing and start of implementation of the Agreement was accompanied by the introduction of bans on the import of agricultural goods from Ukraine by the government of the Russian Federation, the cancellation of trade preferences for goods from Ukraine in trade with Russia within the framework of the CIS FTA (the Commonwealth of Independent States, which includes a number of post-Soviet countries), the introduction of barriers to direct freight transportation through the territory of Russia for Ukrainian carriers. Figure 1 also shows the "mirror" measures of the government of Ukraine in response to restrictions and bans on the import of goods from Ukraine to Russia. The measures, introduced as a temporary instrument during 2015 and 2016, were annually extended by the governments of Russia and Ukraine until 2022, when the government of Ukraine imposed a complete ban (embargo) on the import of goods from the aggressor country.

Since the beginning of the liberalization of trade relations with the EU, enough time has passed to find out to what extent the theoretical expectations from the implementation of the Association Agreement have been confirmed by practical results. Any FTA is a set of compromise solutions that consider the interests of exporters, importers, domestic producers, consumers, and the government sector of the parties of the agreement. In general, as the experience of FTA negotiations with the EU has shown, their outcome was determined by the ratio of the impact on the negotiation process of exporters interested in maximum liberalization of trade regimes and domestic farmers not interested in strengthening the competitive position of importers. Therefore, the methodology of the study is based on evaluations of the effectiveness of the DCFTA between Ukraine and the EU in terms of compliance with the interests of exporters, importers, producers, and consumers of agri-food products, as well as the government sector of Ukraine.

The article uses the following indicators/approaches to describe and evaluate the effectiveness of the Agreement:

1) from the perspectives of Ukrainian exporters:

a) trends of agricultural exports to the EU;

b) comparing the growth rate of exports to the EU under the DCFTA with the growth rate of exports to non-EU countries;

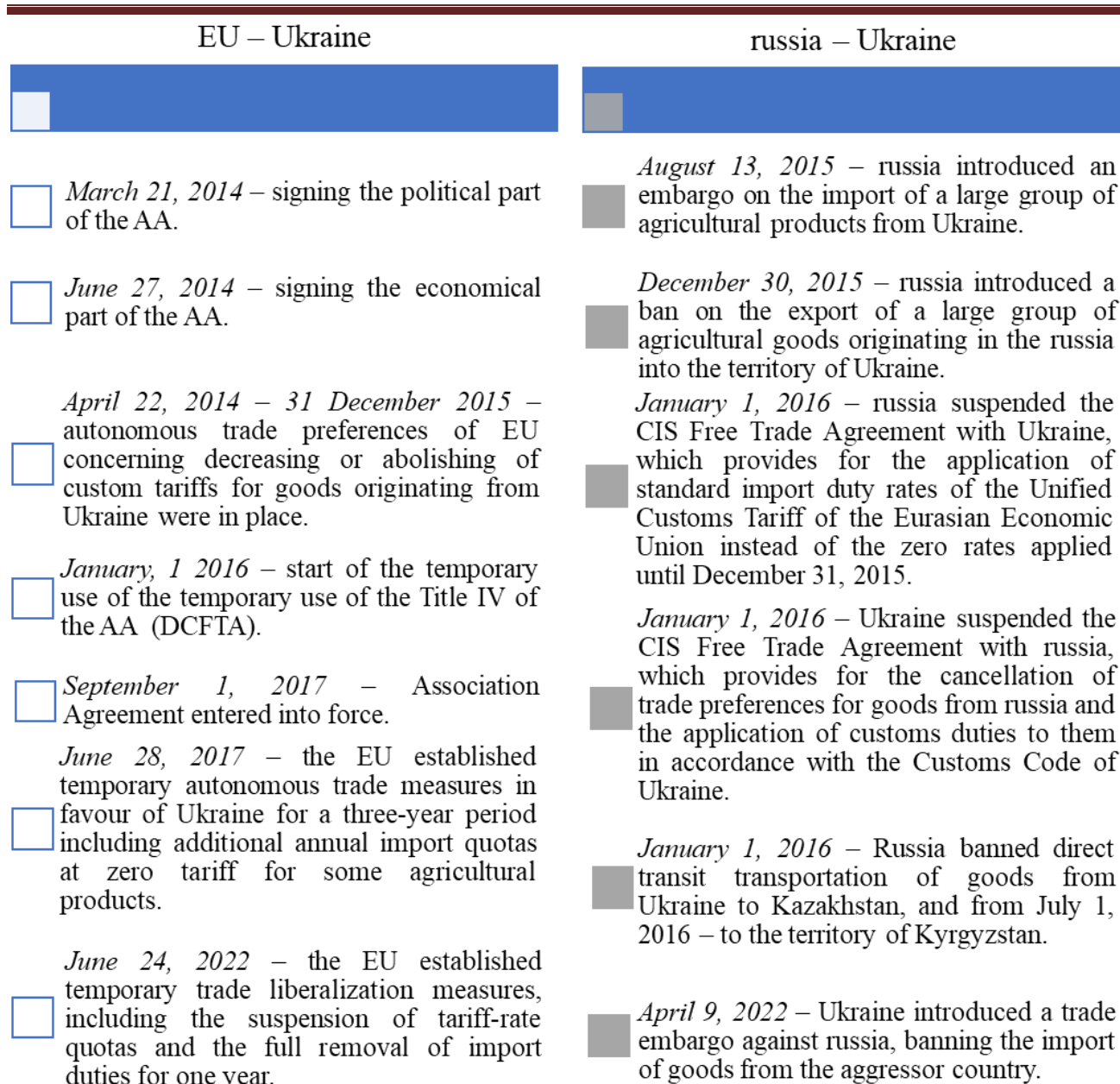


Figure 1. The main developments under EU-Ukraine DCFTA, and main changes in russia–Ukraine trade policy

Source: formed by the authors.

2) in terms of the interests of the government sector:

a) the developments of the foreign trade balance in agricultural goods with the EU and the ratio of exports to imports;

b) a change in the commodity structure of agricultural exports to the EU in the direction of reducing the share of raw materials of plant origin and increasing the share of processing industry goods and products of animal origin;

c) growth in exports of goods produced by small and medium-sized farms;

d) increasing the level of use of zero tariff rate quotas (TRQs) in the export to the EU;

e) increase in the number of enterprises certified to export their products to the EU (this indicator also characterizes the degree of implementation of EU legislation

in the field of SPS (Sanitary and Phytosanitary Measures) in agriculture in Ukraine);

3) from the perspectives of domestic agricultural producers:

a) the trends of agri-food imports from the EU to Ukraine in terms of the DCFTA;

b) the share of imports from the EU in domestic consumption of agri-food products;

4) in terms of the interests of consumers:

a) the behavior of prices for food products, in the consumption of which the share of imports from the EU is growing.

Therefore, the evaluation of the effectiveness of the EU DCFTA in terms of the interests of stakeholders of bilateral agricultural trade includes estimation of the above listed indicators and forecasting of developments (or trends) of agricultural trade and domestic agri-food market.

The study of the results of the implementation of the EU-Ukraine DCFTA for the agricultural trade development between Ukraine and the EU uses data on annual exports and imports of Chapters 01–24 of the Harmonized Commodity Description and Coding System (HS), usually referred to as agricultural products or agri-food commodities, during the period 2009–2020. Given the fact that in 2014 and 2015 there were autonomous trade preferences for the exports of Ukrainian goods to the EU, the five-year period of 2009–2013 before the implementation and the five-year period of 2016–2020 after the entry into force DCFTA bilaterally were selected as the basis for the study the of the DCFTA impact.

Evaluation of the effectiveness of the Agreement from the perspectives of Ukrainian exporters. Agricultural trade plays one of the leading roles in merchandise trade between EU and Ukraine. The share of agricultural products in total merchandise exports from Ukraine to EU has been increasing for 2009–2020 decade. In 2020 the share of agricultural products in Ukraine's export of goods to the EU has reached the level of 35.4 % compared to 22.2 % in 2009 and 30.8 % in 2016.

If we compare the indicators of trade in 2009 and 2020, Ukraine increased the export of agricultural goods to the EU in 2.7 times during this period, while agricultural imports from the EU to Ukraine increased by 83.0 %. The positive balance of foreign trade in agricultural goods with EU increased 5.5 times during this period. The average ratio of annual exports to imports increased from 1.3 times in the period of 2009–2013 to 2.45 times in the period of 2016–2020 (Figure 2). These indicators present the high effectiveness of the DCFTA with the EU for both Ukrainian exporters and importers of agri-food products. The average growth rate of agri-food exports over the 5 years of the Agreement was 10.3 %, and the average growth rate of agricultural imports was 7.2 %. In 2020, when severe restrictions on economic activity were imposed in response to the COVID-19 pandemic, annual imports of agri-food products from the EU increased by 16.6 %, while exports fell by 10.7 %. Nevertheless, the ratio of agricultural exports to imports in 2020 was 1.98, thus exceeding the corresponding indicators during the period 2009–2013.

Comparison of the growth rate of exports to the EU under the DCFTA with the growth rate of exports to non-EU countries, could be one of the parameters for

evaluating its effectiveness, as the purpose of the DCFTA is to increase trade between the parties due to the liberalization of trade regimes and harmonization of the regulatory environment.

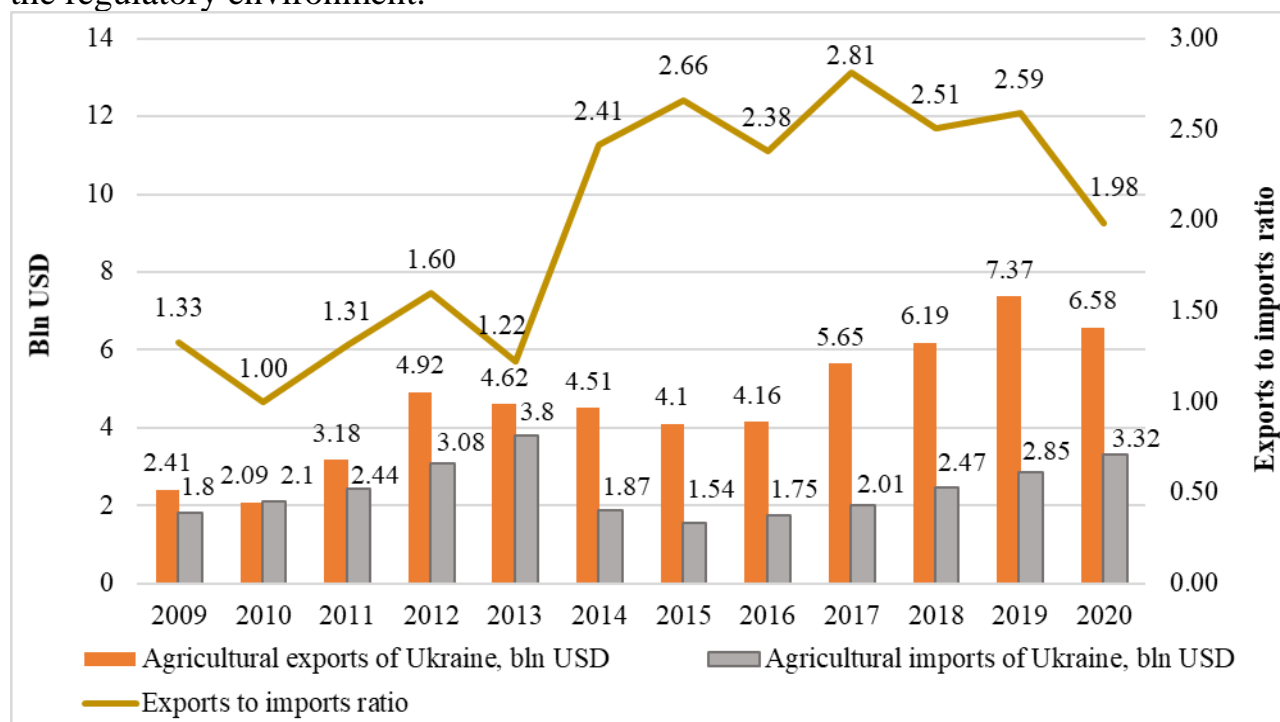


Figure 2. Agricultural trade between Ukraine and EU in 2009–2020, bln USD

Source: calculated by the authors based on the UN Comtrade Database [18].

During 2016–2019, exports of Ukrainian agricultural goods to the EU grew steadily, and the average annual growth rate was 13.6 % (Figure 3).

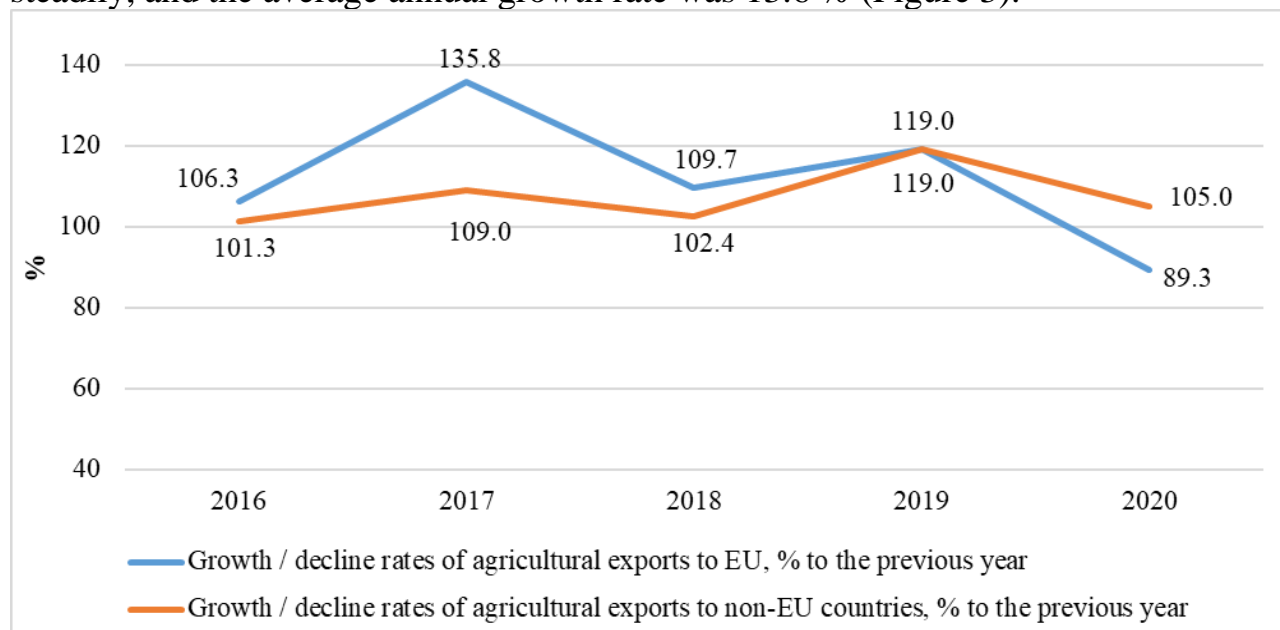


Figure 3. Growth/decline rates of Ukraine's agricultural exports into EU and the Ukraine's agricultural exports to non-EU countries in 2016–2020 (as a percentage of the corresponding indicator of the previous year)

Source: calculated by the authors based on the UN Comtrade Database [18].

However, in 2020, due to economic restrictions imposed in response to the COVID-19 pandemic, Ukrainian agricultural exports to the EU decreased by 10.7 %. The decline was caused by a decrease in demand, complications in supply logistics due to quarantine restrictions and a drought in Ukraine. This decrease was compensated by an expansion of Ukrainian exports to Asian countries' markets, mainly to the Chinese market. Ukraine's agricultural exports to non-EU countries increased by 5.8 % in 2020.

During 2016–2020 Ukrainian exports of agricultural goods to the EU grew faster than agricultural exports to non-EU countries. Exports of agricultural goods to the EU in 2020 exceeded the corresponding figure in 2016 by 58.3 %. On the contrary, Ukraine's agricultural exports to non-EU countries in 2020 were 40.5 % higher than in 2016.

The Table 1 provides the detailed comparison of the growth rate of exports to the EU under the DCFTA with the growth rate of exports to non-EU countries as well as share in agricultural exports for HS Chapters 01–24.

The average annual growth/decrease rates of agricultural exports from Ukraine to the EU are compared with the average annual growth/decrease rates of exports from Ukraine to non-EU countries for HS Chapters 01–24 in the period 2016–2020. For most agricultural products, the average annual growth rate of exports to the EU exceeds the average annual growth rate of exports to non-EU countries. However, for ten HS chapters of agricultural products, exports outside the EU are developing at a faster pace. The list of such HS chapters includes product groups with an extremely small share (below 1 %) in agricultural exports of Ukraine to the EU (HS 01, HS 03, HS 06, HS 09, HS 11, HS 16). However, this list also includes goods that are important for agricultural exports of Ukraine. These are cereals (HS 10), fruits and nuts (HS 08), preparations of vegetables, fruit, nuts (HS 20), and food industries, residues and wastes (HS 23). The reasons for the comparatively lower rates of growth of grain exports to the EU compared to the growth rates of exports to non-EU countries are the dynamic growth of grain exports from Ukraine to Asian and African countries, as well as the EU tariff quotas for the import of wheat, corn, barley and oats from Ukraine. EU tariff quotas are also defined in Chapter HS 20 for prepared or preserved sweetcorn, prepared or preserved tomatoes, grape and apple juice, as well as in Chapter HS 23 for bran, sharps and other residues. In general, the average annual growth rate of exports of agricultural goods from Ukraine to the EU during 2016–2020 was 9.0 %, and the corresponding indicator of the growth rate of exports to non-EU countries was slightly lower and equal to 8.8 % during this period. This comparison supports the conclusion that growth of Ukraine's agricultural exports to the EU in terms of DCFTA with the EU is more rapid than exports to non-EU countries. The exceptions include mainly the product groups within which tariff quotas for imports from Ukraine to the EU are defined.

Table 1

**Ukraine's agricultural exports to the EU and to non-EU countries in 2016–2020
by HS Chapters 01–24**

HS Chapter	Ukraine's exports to the EU, 2016–2020, annual averages			Ukraine's exports to non-EU countries, 2016–2020, annual averages		
	Mln USD	Change rates, %	Share in total agri- cultural exports to EU, %	Mln USD	Change rates, %	Share in total agri- cultural exports to non-EU countries, %
01 Live animals	1.34	+17.6	0.02	51.15	+18.0	0.35
02 Meat and edible meat offal	169.77	+12.7	2.31	492.29	+11.8	3.33
03 Fish and crustaceans	22.93	+28.2	0.31	8.52	+76.5	0.06
04 Dairy produce; birds' eggs	120.45	+4.2	1.64	394.33	+2.1	2.67
05 Products of animal origin	9.89	+1.3	0.13	7.01	-20.1	0.05
06 Trees and other plants	1.87	+22.4	0.03	3.47	+36.5	0.02
07 Vegetables and certain roots	67.16	+16.2	0.91	147.64	+8.4	1.00
08 Fruit and nuts	203.40	+10.1	2.77	41.67	+14.0	0.28
09 Coffee, tea	3.54	+8.7	0.05	11.88	+11.9	0.08
10 Cereals	2615.42	+9.9	35.61	6369.54	+12.9	43.12
11 Products of the milling industry	21.14	+7.6	0.29	173.92	+7.5	1.18
12 Oil seeds	1336.66	+7.2	18.20	949.54	-6.8	6.43
13 Lac; gums	0.45	+18.5	0.01	0.44	+16.3	0.00
14 Vegetable plaiting materials	56.35	+4.8	0.77	1.35	+7.8	0.00
15 Animal or vegetable fats and oils	1618.98	+12.2	22.04	3753.90	+9.5	25.42
16 Meat, fish products	4.16	+13.6	0.06	17.77	+18.9	0.12
17 Sugars and sugar confectionery	66.70	+16.4	0.91	295.48	+15.3	2.00
18 Cocoa and cocoa preparations	54.33	+1.9	0.74	174.33	-4.6	1.18
19 Preparations of cereals, flour, starch or milk	94.08	+5.2	1.28	231.47	-0.2	1.57
20 Preparations of vegetables, fruit	108.55	+0.2	1.48	98.99	+1.7	0.67
21 Miscellaneous edible preparations	51.53	+7.1	0.70	103.05	+2.6	0.70
22 Beverages, spirits and vinegar	46.94	+4.9	0.64	197.15	+0.6	1.33
23 Food industries, residues	668.92	+9.9	9.11	794.64	+21.0	5.38
24 Tobacco and manufactured tobacco substitutes	0.65	+5.0	0.01	460.55	+5.0	3.12
01–24 Agricultural products	7345.23	+9.0	100.00	14770.37	+8.8	100.00

Source: calculated by the authors based on the UN Comtrade Database [18].

Evaluation of the effectiveness of the Agreement in terms of the interests of the government sector. Before the implementation of the DCFTA Ukrainian agricultural exports to the EU were mainly raw materials, therefore, changes in the commodity pattern of agricultural exports to the EU in the direction of increasing the share of exports with higher value added is one of the strategic aims of Ukrainian government.

During the period 2009–2020, the list of the top four agricultural exports of Ukraine remained stable. These are cereals (HS 10), vegetable oils (mainly sunflower seed oil HS 1512; rapeseed oil HS 1514; soybean oil HS 1507, which amount 98–99 % of the HS 15 exports of Ukraine to the EU) and residues and wastes from the food industry (HS 23). In the period 2009–2013, the share of the top four agricultural export HS chapters averaged 90.0 %, and during 2016–2020 it decreased to 84.8 %, which indicates the beginning of trade diversification under the DCFTA (Figure 4).

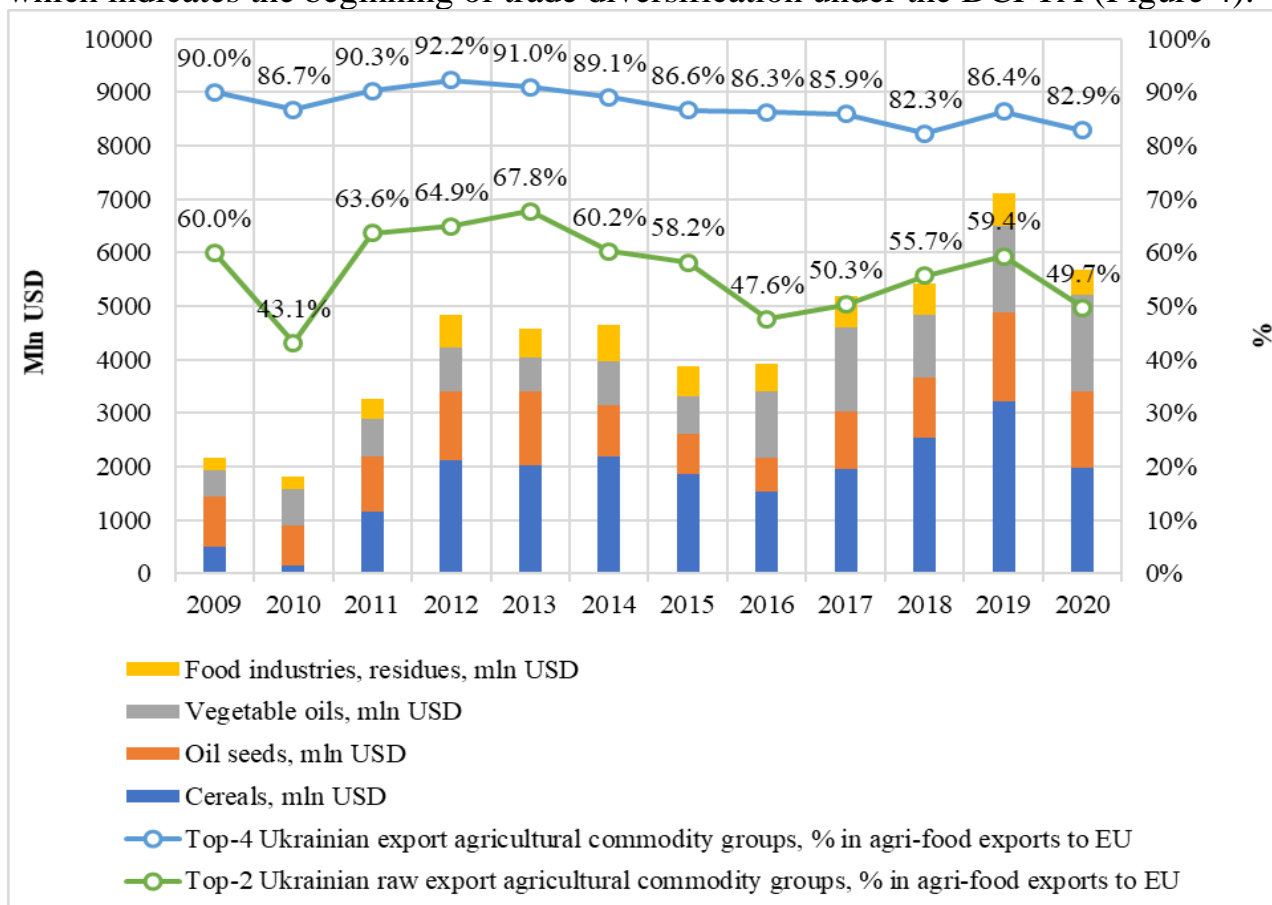


Figure 4. Top four Ukrainian export agricultural commodity groups to the EU: value (mln USD) and share in total agri-food exports

Source: calculated by the authors based on the UN Comtrade Database [18].

Average share of the top two raw export commodities – grain and oilseeds – in agricultural exports to the EU decreased slightly from 59.9 % in the period 2009–2013 to 52.6 % in the period 2013–2020. That is, the FTA with the EU has not yet led to a significant diversification of Ukrainian agriculture export to the EU as well as to significant reduction in the share of agricultural raw materials (or raw materials with low value added) in Ukrainian exports to the EU. Nevertheless, positive changes in the structure of agricultural exports to the EU have been slowly occurring since 2014.

Obviously, Ukraine is interested in exporting products of animal origin and processing industry with higher value added, as well as products produced by small and medium-sized farms. The data presented in Table 1 show a slight increase in the share of meat and meat products, dairy products, preparations of cereals, preparations of vegetables, fruit and nuts in Ukraine's agricultural exports to the EU. Alongside

mentioned above average annual rates of growth of the export of meat and meat products, fruits and nuts, preparations of cereals during 2016–2020 were higher than average annual growth rates of the export of argi-food goods from Ukraine to the EU in total.

These data allow us to conclude that the share of exports of goods with higher value added has not changed significantly during 2016–2020 and remains relatively low (except for vegetable oils).

Furthermore, the effectiveness of the Agreement is also estimated by the growth of exports of goods produced by small and medium-sized enterprises in Ukraine. During the five-year period of the DCFTA 2016–2020, exports to the EU of fruits and nuts (HS 08) increased 1.9 times – from 114.7 thsd tons in 2016 to 218.6 thsd tons in 2020. Dynamic growth of the blueberry market during 2016–2010 under the impact of the demand from the EU is an example of a success story. More than 50 % of blueberries produced in Ukraine are exported [19], and the share of EU in export of blueberries from Ukraine in 2020 was 56 %.

The level of use of EU tariff quotas by Ukrainian exporters of processed food products and by small and medium-sized farms is one of the indicators for evaluating the effectiveness of the DCFTA (Table 2).

Rapid growth of exports of natural honey (HS 0409) from Ukraine to the EU during the first 5 years of implementation of the Agreement is another successful case. If in 2009–2013 only 7.5 thsd tons of honey were exported from Ukraine to the EU on average per year, in 2020 – 54.8 thsd tons. The DCFTA has a tariff quota with zero import tariff into the EU of 5 thsd tons per year with a gradual increase up to 6 thsd tons in a period of 5 years, and the rate of import tariff above the quota equals 17.3 %. Also, in autumn 2017, an additional duty-free quota for honey in the amount of 2.5 thsd tons per year for a period of 3 years was introduced within the framework of temporary additional EU trade preferences for Ukraine. Ukrainian exporters of honey, most of which are small and medium-sized businesses, after the use of duty-free tariff quotas, also export honey in excess of the quota.

During 2016–2020, 83.5 % of the honey export volume in the EU on average was exported above TRQs. The EU is the main destination for the export of domestic honey, the average annual share of the EU in the export of honey from Ukraine was 73.1 % during 2016–2020. Also, an average of 59.8 % of export volumes of grape and apple juice were exported to the EU over TRQs in 2016–2020 and 66.9 % of the export volume of processed tomatoes annually. During the 5-year period of DCFTA implementation, the EU became the main importer of Ukrainian processed tomatoes. If during 2009–2013, only 7.5 % of the total export of processed goods from Ukraine was exported annually to the EU, in 2016–2020 this share reached 75.9 %.

Small volumes of tariff quotas and the fact that the cost of obtaining export licenses exceeds the benefits received caused the low interest of Ukrainian producers in exporting to EU. This is especially true for the export of livestock products – meat and dairy products, where the procedures for obtaining export permits take several years, and annual tariff quotas are small compared to the corresponding costs.

Table 2

The use of tariff rate quotas (TRQs) in export of the food from Ukraine to the EU

Product	Average 2009–2013	2016	2017	2018	2019	2020
<i>Honey (HS 0409)</i>						
TRQs, thsd tons	-	5.0	5.2	5.4	5.6	5.8
Temporary TRQs, thsd tons	-	-	2.5	2.5	2.5	2.5
Export to the EU, thsd tons:	7.5	36.7	47.1	41.0	45.0	54.8
-use of TRQs, %	-	-	100.0	100.0	100.0	100.0
-use of temporary TRQs, %	-	-	100.0	100.0	100.0	100.0
-export above quotas, thsd tons	-	31.7	39.4	33.1	36.9	46.5
Share of the EU in the total export, %	63.4	64.4	69.4.0	83.0	80.8	67.7
<i>Grape and Apple juice (HS 200961, 200969, 200971, 200979)</i>						
TRQs, thsd tons	-	10.0	12.0	14.0	16.0	18.0
Temporary TRQs, thsd tons	-	-	0.5	0.5	0.5	0.5
Export to the EU, thsd tons:	33.9	46.0	40.4	39.3	44.5	24.9
-use of TRQs, %	-	100.0	100.0	100.0	100.0	100.0
-use of temporary TRQs, %	-	-	100.0	100.0	100.0	100.0
-export above quotas, thsd tons	-	36.0	27.9	24.8	28.0	6.4
Share of the EU in the total export, %	48.3	76.8	63.2	57.0	42.8	46.6
<i>Processed tomatoes (HS 200210, 200290)</i>						
TRQs, thsd tons	-	10.0	10.0	10.0	10.0	10.0
Temporary TRQs, thsd tons	-	-	3.0	3.0	3.0	3.0
Export to the EU, thsd tons:	1.5	33.5	33.7	40.1	39.9	40.8
-use of TRQs, %	-	100.0	100.0	100.0	100.0	100.0
-use of temporary TRQs, %	-	-	100.0	100.0	100.0	100.0
-export above quotas, thsd tons	-	23.5	20.7	27.1	26.9	27.8
Share of the EU in the total export, %	7.5	79.1	79.1	74.7	73.9	72.8
<i>Poultry meat and poultry meat preparations (HS 020712, 020713, 020714, 020724, 020725, 020726, 020727, 160231, 160232, 160239)</i>						
TRQs, thsd tons	-	16.0	16.8	17.6	18.4	70.0
Export to the EU, thsd tons:	0.0	35.3	61.5	105.6	110.5	80.9
-use of TRQs, %	-	100.0	100.0	100.0	100.0	100.0
-export above quotas, thsd tons	-	19.3	44.7	88.0	92.1	10.9
Share of the EU in the total export, %	0.1	14.6	22.6	32.1	26.7	18.7
<i>Butter and dairy spreads (HS 040510, 040520, 040590)</i>						
TRQs, thsd tons	-	1.5	1.8	2.1	2.4	2.7
Export to the EU, thsd tons:	0.0	0.7	2.5	4.1	2.4	0.0
-use of TRQs, %	-	46.0	100.0	100.0	100.0	0.0
-export above quotas, thsd tons	-	0.0	0.7	2.0	0.0	0.0
Share of the EU in the total export, %	0.0	5.7	8.4	13.8	7.9	0.0

Note. Calculations were made on the basis of 8-digit HS codes in accordance with the Appendix to Annex I-A of the Association Agreement between the EU and Ukraine.

Source: calculated by the authors based on European Commission Access2Markets [20]; Foreign trade of certain types of goods by countries of the world [21].

These small volumes of tariff quotas are taken up by the licensed producers very fast, and exports over tariff quotas on animal products is close to impossible as level

of import duties of out-quotas is de facto prohibitive. For example, the duty rate for butter of out quota quantity is 189.6–231.3 EUR/100 kg and the cost of 1 kg of butter in FOB prices for exports from Ukraine in 2021 amounted to 4.1 EUR. However, because of poultry producers' strategy of entering the EU markets while avoiding the tariff quotas, in March 2019 the European Commission reached an agreement with Ukraine to amend the EU-Ukraine Association Agreement to limit uncontrolled imports of chicken into the EU. Amendments to the Agreement entered into force on January 1, 2020. Ukraine has committed to process boneless chicken breasts for export to the EU, and the tariff quota for imports from Ukraine into the EU of poultry meat with a zero-import tariff rate has been increased from 20,000 to 70,000 tons.

In 2019 agri-food products were exported under 32 out of 38 agricultural TRQs in total. A number of 12 tariff quotas were used completely, while under 9 of them export was conducted in excess of quotas. Quotas for beef, pork (main and additional quotas), mutton, butter and dairy spreads, mushrooms (additional quota) were not used at all during 2016–2020.

The number of Ukrainian companies that have received permits to export products to the EU is an important indicator of the effectiveness of the Agreement for domestic producers and in terms of national interests in general. This indicator also is an indirect estimate of the effectiveness of the harmonization of Ukrainian legislation with EU legislation on SPS. As of January 28, 2022, 63 Ukrainians food processing enterprises, including small and medium-sized enterprises, received a permit to export their products to the EU [22]. Five Ukrainian companies received permits to export eggs and egg products [23], four companies – to export poultry meat [24], four companies – to export meat products, mainly chicken products [25], 29 companies – to export dairy products (mostly they obtained animal health certificates, and 2 companies certified the production of ice-cream) [26].

On June 24, 2022, the European Commission established temporary trade liberalization measures with regard to certain Ukrainian products, including the suspension of tariff-rate quotas and the full removal of import duties. Through these measures, the EU will be able to significantly support the economy of Ukraine, which has been suffered from Russian aggression. These measures will be in effect until 5 June 2023.

Evaluation of the effectiveness of the Agreement from the perspectives of domestic agricultural producers. The main impact of the Association Agreement on the domestic market of agri-food products of Ukraine is correlated with two main factors: trade liberalization and harmonization of legislation. Therefore, both positive and negative implications can be expected from the implementation of the Association Agreement for the domestic market.

The expected positive implications include the increase in competition in the domestic market, lower prices, and improved product quality. These positive effects can theoretically benefit primarily consumers and local producers. Consumers will receive quality goods at a low price, and local producers will gain access to modern technology and cheaper production resources.

The negative consequences of the implementation of the Association Agreement could be related to the increase in imports. European producers are more competitive than domestic ones, so by benefiting from the abolition of customs barriers, they can compete with domestic producers. Furthermore, a significant part of grocery supermarkets of Ukraine belongs to European multinational corporations, which have established relations with European manufacturers. Ukraine already had a negative experience when domestic food industry enterprises stopped or reduced their production due to large volumes of imports.

In order to assess the impact of the Association Agreement on the domestic market of agri-food products, the degree of compliance with expectations regarding the increase in imports of European goods into the domestic market of Ukraine was estimated.

To do this, the authors compared the growth of imports of agro-food products before and after the implementation of the Association Agreement. Sections 1–4 of the HS were compared: 1) live animals, products of animal origin; 2) products of plant origin; 3) fats and oils of animal or vegetable origin; 4) processed food products. In addition, all HS chapters and four-digit commodity groups were compared. In general, during the first five years of the establishing of the DCFTA, no expansion of imports of agri-food products from the EU was recorded (Table 3).

Table 3

Ukraine's import of agri-food goods by HS sections

HS Sections	2009–2013*, USD/capita	2016–2020, USD/capita	Change rates, %
Total	143	120	-16,1
from EU	54	58	+7,4
share of EU, %	38	48	+10.0**
I. Live animals and animal products	31	22	-29,0
from EU	12	10	-16,7
share of EU, %	37	47	+10.0**
II. Products of plant origin	42	38	-9,5
from EU	15	12	-20,0
share of EU, %	36	32	-4.0**
III. Fats and oils of animal and plant origin	9	6	-33,3
from EU	2	1	-50,0
share of EU, %	26	24	-2.0**
IV. Processed products	60	55	-8,3
from EU	25	34	+36,0
share of EU, %	42	62	+20.0**

Notes. *Although in the period from April 23, 2014, to December 31, 2015, there were autonomous trade preferences for the export of Ukrainian goods into the EU, the period 2014–2015 is not used for the comparison due to the deep economic crisis in Ukraine, not related to the impact of the DCFTA. Average indicator per capita was used for calculation, since during 2016–2020 Ukraine lost control over a part of its territory.

**Percentage points.

Source: calculated by the authors based on Statistical Yearly Outlook of Ukraine, statistical review “Cooperation between Ukraine and EU” [27], statistical review “Foreign Trade of Ukraine” [28], UN Comtrade Database [18].

Imports decreased both in general and in sections 1–4 of the HS. In general, imports of agri-food products decreased by 16 %, in the group of animal products – by 29 %, in the group of vegetable products – by 10 %, fats and oils – by 33 %, processed products – by 8 %. Imports from the EU increased by 7 %, but only due to the group of processed food products, the import of which increased by 36 %. For the other three HS sections, Ukraine’s imports from the EU also decreased during 2016–2020 as compared to 2009–2013.

Expansion of imports was recorded only for few commodity groups – seven chapters out of 24: HS 24 – tobacco and manufactured tobacco substitutes; HS 22 – beverages, spirits and vinegar; HS 12 – oil seeds; HS 19 – preparations of cereals; HS 07 – edible vegetables; HS 11 – products of the milling industry; HS 05 – other products of animal origin (Table 4).

Table 4

Import of agri-food goods into Ukraine by HS chapters

HS Chapters	2009–2013*, USD/capita	2016–2020 USD/capita	Change rates, %
24 – tobacco and manufactured tobacco substitutes	10330	10908	+5.6
from EU	1911	4884	+155.6
share of EU, %	19	45	+26.0**
22 – beverages, spirits and vinegar	8636	10727	+24.2
from EU	4166	6908	+65.8
share of EU, %	48	64	+16.0**
12 – oil seeds	5896	8799	+49.2
from EU	2546	3060	+20.2
share of EU, %	43	35	-8.0**
19 – preparations of cereals, flour, starch or milk	3377	3786	+12.1
from EU	1869	3204	+71.4
share of EU, %	55	85	+30.0**
07 – vegetables and certain roots	2938	3487	+18.7
from EU	1109	1094	-1.4
share of EU, %	38	31	-7.0**
11 – products of the milling industry	662	750	+13.3
from EU	217	244	+12.4
share of EU, %	33	32	-1.0**
05 – products of animal origin	338	508	+50.3
from EU	127	116	-8.7
share of EU, %	38	23	-15.0**

Notes. *For a correct comparison, the 5-year average import figures have been adjusted for thousands of people in the current population. Average indicator per thousand population were used for calculation, since during 2016–2020 Ukraine lost control over a part of its territory.

**Percentage points.

Source: calculated by the authors based on Statistical Yearly Outlook of Ukraine, statistical review “Cooperation between Ukraine and EU” [27], statistical review “Foreign Trade of Ukraine” [28], UN Comtrade Database [18].

The largest expansion of imports in value terms was recorded for HS chapter 12

– oil seeds. In 2021 this group was not the largest in terms of imports of agri-food products to Ukraine, but it showed the largest increase in imports since the implementation of the Association Agreement. This is primarily due to the rapid growth of vegetable oil production in Ukraine, which is mainly exported. Comparison of two 5-year periods shows that during 2009–2013 vegetable oil production increased by 23 %, and during 2016–2020 – by 38 %.

Not all HS chapters experienced the increase of import caused by the beginning of the implementation of the Association Agreement. In two HS chapters (HS 07 – vegetables, HS 05 – other products of animal origin), Ukraine's imports originated from the EU decreased, while in two other HS chapters (HS 12 – oil seeds, HS 11 – products of the milling industry) the growth of imports from the EU was relatively small and lagged behind in the growth of imports from other countries. As a result, the share of EU countries in import of oilseeds decreased from 43 to 35 %, and in import of flour and cereals – from 33 to 32 %. Only in three HS chapters (HS 24 – tobacco and manufactured tobacco substitutes; HS 22 – beverages, spirits and vinegar; HS 19 – preparations of cereals) the expansion of import was caused mainly by imports from the EU.

HS 24 – tobacco and manufactured tobacco substitutes together with HS 08 – edible fruit and nuts and HS 03 – fish and crustaceans constitute the list of three commodity groups of agri-food products with the highest volume of imports. At the same time, the large share of the HS 24 belongs to tobacco raw materials, which are supplied to domestic tobacco factories, while the products of HS 08 and HS 03 are focused mostly on end users and basically supplied to retail and restaurant chains.

Since the beginning of the implementation of the Association Agreement, the Ukraine's domestic tobacco industry has undergone significant structural changes that were primarily related to the harmonization of national legislation with EU regulations, which provide for a significant increase in excise taxation of tobacco products. As a result, a reduction in the legal production and import of tobacco products, an increase in illicit trafficking and the spread of innovative nicotine supply products have been observed in the domestic market. Large volumes of imports of tobacco-containing products don't cause threat to domestic producers, as they are not currently produced locally in Ukraine.

Both before and after the implementation of the Association Agreement, a large share the Ukraine's import of agri-food products from the EU was and remained occupied by the products of the HS chapter 22 – beverages, spirits and vinegar. During 2018–2020, this commodity group was the absolute leader by volume of import by Ukraine of HS chapters. The share of the EU in Ukrainian import of the HS chapter 22 beverages, spirits and vinegar during 2016–2020 was equal to 66 % in average, while before the implementation, during 2009–2013 it was at the level of 48% in average. European producers have increased their share in imports mainly by replacing imports from the CIS countries after receiving preferential terms. Imports of three HS headings of HS chapter 22: 2203 – beer, 2204 – wine, 2206 – other fermented beverages grew particularly fast. Imports of beer and wine increased

2.5 times, and volume of import of the other fermented beverages (for example, cider, perry, mead) multiplied by 11 times. It should be noted that even before the implementation, imports of HS chapter 22 products from the EU to Ukraine grew at an accelerated pace.

After the beginning of the implementation of the Association Agreement, import from the EU into Ukraine of the products of the HS chapter 19 – preparations of cereals increased significantly. This tendency was primarily observed in import of flour confectionery, prepared food products from flour, as well as from cereals, starch and malt extracts, pasta, ravioli, flakes. Increase in imports of these products was facilitated by a significant reduction in tariff protection by Ukraine immediately after the beginning of the DCFTA implementation. This was the main factor in the overall growth of imports of HS chapter 19 by 12 % and an increase in the share of EU countries in imports of this HS chapter from 55 to 85 %.

In addition to HS chapters, the number of HS headings was also analyzed. This was primarily done for headings for which the EU has the largest volume of export: meat and edible offal; milk and dairy products; cereals. The expansion of imports, which was caused by imports from the EU was found in the following HS headings of the HS chapter 04: 0401 – non-concentrated milk and cream; 0406 – cheese and curd. The total import of non-concentrated milk and cream increased by 8 % (including from the EU – by 76 %), cheese – by 40 % (including from the EU – by 2.2 times).

The share of imports in domestic consumption is considered the most comprehensive parameter that measures the expansion of import. This indicator takes into account both the developments of imports, production and exports. Table 3 shows the trends of the share of imports in domestic consumption for certain food products, for which the largest increase in imports into Ukraine was observed. The share of imports in domestic consumption increased for all HS headings and subheadings (Table 5). However, the expansion of imports has not yet reached the scale when it does not allow domestic production to develop. For most commodity groups, domestic production was stable during 2016–2020, and for some of them (other fermented beverages) the production increased in the same period.

Table 5

Share of import in domestic consumption, %

Indicators	2013	2014	2015	2016	2017	2018	2019	2020
Wine (HS 2204, HS 2205)	24.9	29.4	23.9	30.2	33.2	34.0	31.4	40.0
Other fermented beverages (HS 2206)	8.0	5.8	6.8	6.4	13.6	30.6	32.2	29.9
Cheese (HS 0406)	10.4	6.8	3.4	4.5	6.1	7.8	14.2	22.6
Sweet biscuits and waffles (HS 19053)	4.8	4.9	2.7	1.7	2.5	3.5	6.2	7.7
Beer (HS 2203)	1.8	1.8	1.2	1.1	1.5	2.1	2.6	3.4
Pasta (19021)	0.4	0.3	0.3	0.3	0.3	0.5	1.4	1.7

Source: calculated by the authors based on Statistic Year Book of Ukraine [27]; UN Comtrade Database [18].

Evaluation of the effectiveness of the Agreement in terms of the interests of consumers. The implementation of the Association Agreement between Ukraine and the EU did not significantly affect the domestic prices of agri-food products. Several reasons contributed to this. Firstly, there was no overall increase in imports. Secondly, if there was an increase in imports, it was insignificant compared to domestic production. Thirdly, if the growth of imports in some commodity groups was recorded both in absolute and relative terms (Table 4), it did not significantly affect the prices due to the stronger influence of other factors, in particular, this applies to such goods as cheese and alcoholic beverages (Table 6). During 2016–2020, the growth of prices for cheese and soft cheese was higher than the growth of prices for food products and non-alcoholic beverages (general group of a set of consumer goods used to calculate the consumer price index [29]).

Table 6

Consumer price indices for some food products and non-alcoholic beverages and in 2016–2020 (annual change, %)

Indicators	2016	2017	2018	2019	2020
Consumer price index	113.9	114.4	110.9	107.9	102.7
Food products and non-alcoholic beverages	109.0	112.9	111.1	108.0	102.7
Cheese and soft cheese	117.1	122.2	113.1	109.3	105.4
Alcoholic beverages	119.9	117.2	110.7	108.7	102.0

Source: Statistical outlook “Consumer price index 2020” [30].

The conducted evaluation of bilateral agricultural trade in the period before and after the beginning of the DCFTA implementation has revealed the following results (Table 7).

Table 7

Effectiveness of EU DCFTA for agricultural trade stakeholders in Ukraine: impact assessment

Stakeholders of the agricultural trade in Ukraine	Performance indicators of the DCFTA with the EU for agricultural trade in Ukraine	Impact assessment: <i>positive / negative / indifferent</i>
1	2	3
Exporters	Trends (development) of agricultural exports to the EU	<i>positive</i>
	Assessment of the effect of trade liberalization – comparison of the growth rates of export to the EU with the export growth rates to other countries, except the EU	<i>positive</i>
Domestic producers	Assessment of import expansion – the development of imports from the EU into Ukraine	<i>indifferent</i>
	Impact of the DCFTA with the EU on the competitiveness of domestic producers – the changes in domestic production	<i>indifferent</i>
Consumers (households)	The EU’s share in the growth of agri-food imports to Ukraine	<i>positive</i>
	Impact of the DCFTA with the EU on domestic prices of agri-food products	<i>indifferent</i>

Continuation of Table 7

1	2	3
Government sector	Foreign trade balance in agricultural goods with the EU (development)	<i>positive</i>
	Reduce of the agricultural raw materials in Ukrainian agricultural exports to the EU	<i>indifferent</i>
	Resilience of agricultural trade with the EU to quarantine shock	<i>indifferent</i>
	Growth in exports of goods produced by small and medium-sized agrobusinesses	<i>positive</i>
	An increase in the number of companies licensed/authorized to export their products to the EU	<i>positive</i>

Source: formed by the authors.

The practical use of the study consists of identification of the positive and negative consequences of the DCFTA for Ukraine's agricultural trade stakeholders, as well as factors of these consequences, that allows developing practical agricultural trade policy recommendations, including periodic time-to-time review of trade provisions of the Agreement.

Conclusions. Based on the results, the following conclusions were drawn:

- After the beginning of the DCFTA, there was an increase in both Ukraine's agricultural exports to the EU and imports of agricultural products from the EU to Ukraine; the positive balance in agricultural trade in 2020 was 5.5 times higher than in 2009.

- The average growth rate of Ukraine's agricultural exports to the EU during the first 5 years of the Agreement (10.3 %) exceeded the average growth rate of agricultural imports from the EU to Ukraine (7.2 %).

- During 2016–2020, Ukraine's exports of agricultural goods to the EU grew faster than agricultural exports to the non-EU countries, which indicates the high effectiveness of bilateral liberalization of foreign trade regimes.

- In the beginning of the COVID-19 pandemic, the liberalized trade regime in the DCFTA with the EU was not a factor in stabilizing Ukraine's agricultural trade – in the context of growing agricultural exports to non-EU countries, agricultural exports to the EU decreased by 10.7 % in 2020 compared to 2019. The EU imposed no additional restrictions on agricultural trade with Ukraine during the pandemic, however the fall was caused by a decrease in demand on the EU market, complications in supply logistics and a drought in Ukraine.

- The share of exports of goods with higher value added has not changed significantly during 2016–2020 and remained relatively low (except for vegetable oils). The average share of the top two raw export commodities – grain and oilseeds – in agricultural exports to the EU decreased slightly from 59.9 % in the period 2009–2013 to 52.6 % in the period 2013–2020.

- The DCFTA with the EU has not yet resulted in significantly reducing the share of agricultural raw materials (or low value-added primary goods) in Ukraine's exports to the EU. The average share of the two main raw export goods – grain and

oil crops – in agricultural exports to the EU in the period 2016–2020 exceeded 50 %.

- The FTA with the EU has not yet led to a significant diversification of Ukrainian agriculture export to the EU. However, during 2016–2020, the share of the top four agricultural export HS chapters amounted to 84.8 % annually on average, against 90 % in 2009–2013, which indicates the beginning of diversification of trade within the framework of the FTA.

- During 2016–2020, both the number of TRQs that were completely used by Ukrainian exporters and volumes of export above the tariff quota limits increased. Exports of corn, honey, apple and grape juices, processed tomatoes and poultry significantly exceeded tariff quotas.

- Export of Ukrainian agricultural products to the EU, including those produced by small and medium-sized agribusinesses, is restrained by small TRQs levels, by the high EU import duty rates applied to quantities imported from Ukraine outside tariff quotas, by long duration and high costs of procedures for obtaining certificates for export of livestock products to the EU.

- During the first 5 years of DCFTA implementation, there was no significant expansion of imports of agri-food products to the domestic market of Ukraine. This happened not so much because of the high competitiveness of domestic producers, but due to the low purchasing power of the population.

- The implementation of the Association Agreement did not have a significant downward impact on domestic prices for agri-food products in Ukraine.

- The lowering of the tariff protection of the domestic market did not significantly influence on domestic production of agri-food products, which remained stable, except for the production of grape wines, which decreased during 2016–2020.

- Due to the implementation of the Association Agreement, the EU has increased its share in the import of agri-food products to Ukraine. However, for some commodity groups there was both absolute and relative decrease in imports. This happened due to competition from other importers, as well as due to import substitution processes.

Further study of the results of the DCFTA with the EU for agricultural trade in Ukraine will take into account the shocks caused by Russia's military aggression against Ukraine in 2022, which complicated Ukrainian exports during the war, and the consequences of temporary (during the year) trade liberalization supplementing trade preferences for Ukrainian products under the Association Agreement between the European Union and Ukraine.

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