

Rodion Sevastyanov

The Prospects of Ukraine's Integration into Global Value Chains Within the Framework of European Integration

Abstract

Objectives: The article aims at studying Ukraine's current foreign economic activity factors within the framework of European integration.

Research Design & Methods: The research methods used in the study are as follows: analysis and study of literature, scientific description, Internet-based research, statistical and structural survey, data sheet presentation.

Findings: The research proved that the economic relations between Ukraine and the EU tended to increase significantly. Statistical trends demonstrated a considerable increase in the foreign trade within global value chains (GVCs). A gradual intensification of economic relations between Ukraine and the EU seems evident, providing integration of Ukrainian companies into global value chains. Based on a recent analytical survey, most agricultural and industrial products exported from Ukraine accounted for 42.1% of the total international sales in 2020. Furthermore, over 70% of Ukrainian IT software development exports are estimated to be outsourced to third parties.

Implications/Recommendations: Recommendations for Ukraine's integration into global business services (GBSs) can include developing services in the context of GVCs, developing international cooperation between enterprises on global business platforms. The basis for successful integration into GVCs must be the development of innovative ecosystems of industrial high technologies. It is important to develop innovative industrial high-tech ecosystems for successful integration into GVCs.

Contribution/Value Added: The author tries to formulate modern directions of development for further integration of the Ukrainian economy into global value chains in the context of cooperation with the EU's member states.

Keywords: global value chains, Association Agreement between Ukraine and the EU, regional value chains, foreign trade, fragmentation of production, innovation development

Article classification: research article

JEL classification: F620, H4, O520

List of abbreviations: GVCs (global value chains), EU (European Union), GDP (gross domestic product), GBSs (Global Business Services) IT (Information Technology), ICT (information and communication technology), PCI (product complexity index)

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Introduction

The changing world economy demands perspective innovation development and reconsidering the governmental control over the economy. This research is aimed at considering the current comparative features of innovation in the high-value-added industries as well as at integrating the emerging sectors of the Ukrainian economy into global technological chains.

The upcoming participation of Ukraine in global value chains requires further research. The economic efficiency for all the countries involved in international trade remains a challenge. Therefore, it is important to study the impact of global production networks on the development of economic regions.

This research studies the Ukrainian foreign economic activity. I also consider factors that affect the emergence of global chains. The research confirms positive dynamics in foreign trade within the economic cooperation between Ukraine and the EU. The Ukrainian economy mainly exports low-value-added goods and imports high-value-added goods. The trade quotas of the EU's member states still hinder an increase of trade. The disclosure of Ukraine's economic potential requires successful integration into the European and global production and distribution networks, with a gradual reduction in the processing of raw materials with insignificant added value.

Literature review

The category of "global production networks" was introduced by Henderson and Dicken (2002). The main principles of the functioning of a GVC are considered in the scientific papers of Stöllinger et al. (2018), Drăgulănescu and Androniceanu (2017), Drăgulănescu and Androniceanu (2017), and others. Many sources point out that integration into GVCs is a necessary tool for the economic development of emerging economies. Researchers such as Agtmael (2007), Geodecki (2021), and Hartog, Lopez-Cordova and Neffke (2020) considered

the development of regional business services' value chains and the perspectives of emerging economies. Heuser and Mattoo (2017), Koval et al. (2019), and Workman (2021) investigated the problems of development of the services trade and global value chains. The European economic activity is organised within global value chains (GVCs). At different stages of the production process, these chains are geographically located across different countries. Globalisation-driven economy motivates companies to outsource and offshore activities.

Outsourcing is an important component of global value chains. For the Ukrainian economy, one of the most common spheres of outsourcing is IT. Zawicki (2020, p. 142) notes that the business process outsourcing sector includes service activities provided by business process outsourcing centres, shared services centres, global business services, IT outsourcing centres, research and development centres, and hybrid centres.

Such an integration significantly accelerates the centres' development and level of competitiveness. GVC accelerate the economic development of countries. GVC are drivers of labor productivity growth and improving the standard of living. Ukraine can achieve an economic growth by shifting to higher value-added goods and services. This requires the introduction of new technologies in agriculture, production and services. By land, Ukraine has borders with Belarus, Hungary, Moldova, Poland, Romania, Russia, and Slovakia; by sea, Ukraine border Georgia and Turkey. The European integration of Ukraine is now institutionalised in the form of the Association Agreement. This agreement between the EU and Ukraine helps to provide Ukraine with economic support and access to EU markets. Today, Ukraine is not a major participant in GVC, although it has stable economic potential to integrate into global production networks. Economic integration is not a linear process with only a positive result. Regional and global value chains are important to global trade. The world economy is gradually becoming interdependent.

In modern economic conditions, the major part of business activity can be outsourced. Thus, developing economies can be a serious threat to advanced economies. In countries with developed economies, the majority of global value chains (GVC) has already been outsourced. The development of value chains has an impact on the international division of labour and on trade in intermediate goods and services. The final product may include several added values created and added in different countries by different companies. Services can also be provided by different companies within the value chain. Global chains created by manufacturers are represented in the fields of the electronic automotive industry, the pharmaceutical industry, and other industries. In these chains, the manufacturer invests in Research and Development. The manufacturer manages the process of research and design, and controls the part of production where the greatest value is created. Global chains created by brand owners are characterised by the creation of value in the field of marketing, and production is outsourced. This is typical of light industries. Participation in global and regional value chains for the state means increasing the number of jobs and providing economic growth (see: *Global Value Chains*, 2021).

The GVCs trade can accelerate economic growth. It can be presented as the gradual rising of productivity and incomes. The value chain includes components such as design, raw materials, sales of products or services, and customer support. A GVC emerges when these activities are undertaken by entities based in different countries.

Structural changes in the global economy precipitated by the Information and Communication Technologies (ICTs) revolution have – for the first time – made it possible for the emerging nations to contribute significantly to the world's services industry (Gereffi & Fernandez-Stark, 2010, p. 335).

It is important to take into account issues that are considered by the government in the management of operations. A group of scientists researched the parameters for managing by the state in the interaction with the international business

in managing the processes of GVCs' functioning. These parameters include ensuring employment, the security of local investors, national security, foreign trade, fiscal policy, priority directions of development, political stability, and other benefits (Koval et al., 2019, pp. 1929–1930).

Several studies into international trade in services inputs and into foreign direct investment in business services are potentially relevant to an examination of GVCs as seen by the researchers Heuser and Mattoo (2017). It is important for Ukraine's economy to determine the factors of interaction between authorities and companies.

Results and discussion

The key parameters for Ukraine are as follows: economic security, international trade, and stimulating fiscal policy.

The Ukrainian economy has certain advantages over countries from the EU. Such advantages include low labour costs, the quantity of labour resources, and logistics. In 2019, Ukraine ranked as the 56th economy in the world in terms of GDP (current USD), 51st in total exports, 48th in total imports, 122nd in terms of GDP per capita (current US\$), and 43rd in terms of the most complex economy, according to the Economic Complexity Index (ECI) (see: Ukraine Profile, 2019). The economic relations between Ukraine and the EU can be characterised as gradually developing. Let us take a closer look at this relationship. Table 1 shows the share of the EU's countries in Ukraine's trade relations with.

The results of the analysis show that exports of goods and services to the EU decreased slightly over the period 2018–2020. At the same time, imports of goods and services from the countries of the EU are slowly increasing.

In turn, Table 2 shows Ukraine's structure of exports of goods and services.

Analytical information contained in Table 2 shows that the export of services to the EU's countries in absolute terms has not changed. The top services exported by Ukraine include air transport

Table 1. The share of the EU's member states in Ukraine's trade relations

Indicator	2018	2019	2020	$\Delta_{19/18}$	$\Delta_{20/19}$
The share of the EU's countries in Ukraine's export of goods and services (in %)	40.3	37.7	37.1	-2.6	-0.6
Export of goods and services from Ukraine to the EU (in billion USD)	23.0	24.2	22.1	-1.2	-2.1
The share of the EU's countries in the import of goods and services to Ukraine (in %)	41.8	42.4	44.3	0.6	1.9
Import of goods and services from Ukraine to the EU (billion USD)	26.6	28.7	26.8	2.1	-1.9

Source: Author's elaboration based on Ukraine's Ministry of Economic Development and Trade (see: *Infographics of Export, 2020*).

Table 2. The structure of exports of goods and services from Ukraine to the EU for the period 2018–2020

Indicator	2018	2019	2020	$\Delta_{19/18}$	$\Delta_{20/19}$
Goods (in billion USD)	20.1	20.8	18.6	0.7	-2.2
Goods, specific weight (in %)	87.5	85.9	84.2	-1.6	-1.7
Services (in billion USD)	3.9	4.5	4.5	0.6	0
Services, specific weight (in %)	12.5	14.1	15.8	1.6	1.7

Source: Author's elaboration based on Ukraine's Ministry of Economic Development and Trade (see: *Infographics of Export, 2020*).

and sea transport, business services, professional services, technical services, IT services, and travel.

The State Statistics Service of Ukraine presented the report on foreign trade in services for 2019. In accordance with this document, in 2019, Ukraine exported \$2.43 billion-worth of IT services (see: *Ukraine Profile, 2019*).

Table 3 shows Ukraine's export of goods for the period 2018–2020.

The structure of the exports of goods shows that the largest share (on average 40%) is occupied by agricultural products. This economic status can be described as a raw material export with a relatively low degree of added value. The most recent exports are dominated by corn, seed oils, iron ore, wheat, and semi-finished iron. In order to increase added value in the agricultural sector, I would consider it relevant to develop areas such as agrotechnology, biofuel, and value-added food processing. Table 4 demonstrates the main exporting countries of the Ukrainian goods.

There is a gradual diversification of Ukrainian exports due to a gradual decrease in Ukraine's focus on the markets of post-Soviet countries. Table 4 provides information on the largest share of partner countries to which Ukraine supplied goods for the period 2019–2020. China accounts for the largest share of exports from Ukraine. The rate of exports to this country from Ukraine doubled during the analysed period.

The basis of exports from Ukraine to China includes ores, grain, fats, oil, machinery, and agriculture food wastes. In terms of prospects for the development of global value chains for exports to China, it can be recommended that Ukraine develop knowledge-intensive and innovative products of the light industry, aerospace and the aviation industry, mechanical engineering, the food industry, and the food processing industry. The Polish economy ranks 2nd among exporters, with an average of more than 6%.

Table 3. The structure of export of goods from Ukraine for the period 2018–2020

Indicator (in millions USD)	2018 (in millions USD)	2019 (in millions USD)	2020 (in millions USD)	2018 specific weight (in %)	2019 specific weight (in %)	2020 specific weight (in %)
agricultural products and the food industry	18,612.8	22,144.2	22,199.1	39.3	44.2	45.1
products of the metallurgical complex	11,633.1	10,255.7	9,030.3	24.5	20.5	18.3
products of mechanical engineering	5,475.1	5,528.1	5,406.3	11.5	11.0	11.1
mineral products	4,340	4,866.5	5,331.9	9.1	9.7	10.8
products of the chemical industry	2,565.8	2,652.3	2,702.9	5.4	5.3	5.5
wood and paper pulp	2,043.6	1,838.1	1,814.6	4.3	3.7	3.7
various industrial goods	1,449.4	1,585.1	1,649.3	3.4	3.2	3.3
the light industry	1,220.3	1,184.7	1,078.4	2.5	2.4	2.2
Total	47,340.1	50,054.7	49,212.8	100	100	100

Source: Author's elaboration based on Ukraine's Ministry of Economic Development and Trade (see: *Infographics of Export*, 2020).

Table 4. The share of the main countries-exporters of goods from Ukraine in 2019–2020 (in %)

Year	China	Poland	Russia	Turkey	Germany	India	Italy
2019	7,2	6,6	6,5	5,2	4,8	4,0	4,8
2020	14,4	6,7	5,5	5,0	4,2	4,0	3,9
$\Delta_{20/19}$	7,2	0,1	-1,0	-0,2	-0,6	0	-0,9

Source: Author's elaboration based on the State Statistics Service of Ukraine (see: *Foreign Economic Activity*, 2020).

The IT industry is turning into one of the flagships of the Ukrainian economy. This also affects the country's international reputation. The coronavirus crisis did not impede the powerful and dynamic development of the Ukrainian IT sphere.

Ukraine increased the export of IT services by 15 percent. Today, it equals nearly 16% of the export of all services, which brought \$15.23 billion to the country. Ukraine's export of IT services comprises the export of computer services, information services, and telecommunications services. During the study period, imports amounted to 495.8 million dollars. In imports, the share of computer services prevails (\$275.3 million) (see: *Foreign Economic Activity*, 2020).

The data sheet shows that transport services, IT, and raw material refinery are all estimated to occupy the largest export share in global value chains. For example, according to the Ambassador of the Netherlands to Ukraine J. Mol, as of 2021, more than 400 Dutch companies have actually been served by the IT cluster of Ukraine (see: *Espresso.tv*, 2021).

The analytical information in Table 5 proves that Ukraine's export of IT services tends to increase. Table 6 analyses the structure of Ukraine's imports of goods and services.

Table 6 shows the ratio of imported goods to services as about 90 to 10%. The main components in the import of goods are cars, equipment and

Table 5. The structure of Ukraine's export of services for the period 2018–2020

Indicator	2018 (million USD)	2019 (million USD)	2020 (million USD)	2018 specific weight (in %)	2019 specific weight (in %)	2020 specific weight (in %)
1 transport services	5,823.8	9,109.9	4,880.3	49.74	58.80	44.11
2 material resources processing services	2,084.3	1,640.2	1,346.1	17.80	10.59	12.17
3 IT services	2,044.2	2,575.9	2,910.5	17.46	16.62	26.31
4 business services	1,012.2	1,278.2	1,192.7	8.65	8.25	10.78
5 travel services	286.6	335.0	260.2	2.45	2.16	2.35
6 repair and maintenance services	241.5	270.1	233.9	2.06	1.74	2.11
7 other services	215.7	285.0	239.8	1.84	1.84	2.17
8 Total	11,708.3	15,494.3	11,063.5	100	100	100

Source: Author's elaboration based on *Infographics of Export* (2020).

Table 6. The structure of Ukraine's import of goods and services for the period 2018–2020 (in %)

Indicator (in %)	2018	2019	2020	$\Delta_{19/18}$	$\Delta_{20/19}$
Goods	90.8	89.8	91.2	-1.0	1.4
Services	9.2	10.2	8.8	1.0	-1.4

Source: Author's elaboration based on the Ministry of Economic Development and Trade of Ukraine (see: *Infographics of Export*, 2020).

machinery, fuel, fertilizers, petroleum products, and chemical products.

There exists a world-famous scheme of the global chain for the manufacture and sale of famous brands. Small business companies in Ukraine produce garments under foreign brands. Parts for car assembly (electrical equipment, sensors, seats, covers) are also produced. Supply-dependent production puts the system of value chain business at risk. This applies to the dependence of the final manufacturer on suppliers. Supply-dependent private vendors become a small outlet within a large corporation. This can be identified as a problem monopoly client. Table 7 demonstrates the share of the main countries-importers of goods to Ukraine for the period 2019–2020.

The leading position of imports to Ukraine is occupied by the Chinese economy. Among the EU member states, the largest volumes of imports

were recorded during the analysed period by Germany and Poland. Regarding trends that can be extrapolated to the future, one can single out the increase in the share of China, Germany, Poland, and Turkey, as well as the decrease in the share of Russia and Belarus.

Important to note are the problematic issues in Ukraine's economic relations with the EU's countries. For example, in 2020, Ukrainian agricultural exporters used 31 out of the 40 tariff quotas under the FTA agreement with the EU. Ukraine in 2020 has fully used quotas for honey, barley, groats, corn, malt, sugar, eggs and other products.

Ukraine's most valuable exported products include sunflower oil, corn, wheat, iron ores, semi-finished products made from iron and other.

The Ukrainian IT industry in the service sector relies on outsourcing and freelance. This approach

Table 7. The share of the main countries-importers of goods to Ukraine in 2019–2020 (in %)

Year	China	Germany	Russia	Poland	the United States	Belarus	Turkey
2019	15,1	9,8	11,5	6,8	5,4	6,2	3,9
2020	15,3	9,8	8,4	7,6	5,6	5,3	4,5
$\Delta_{20/19}$	+0,2	0	+3,1	+0,8	+0,2	-0,9	+0,6

Source: Author's elaboration based on the Ministry of Economic Development and Trade of Ukraine (see: *Infographics of Export*, 2020).

Table 8. Ukraine's structure of import of goods for the period 2018–2020

N	Indicator (million USD)	2018	2019	2020	2018 specific weight (in %)	2019 specific weight (in %)	2020 specific weight (in %)
1	products of mechanical engineering	17,445.3	20,555.1	18,560.1	30.53	33.80	34.31
2	mineral products	14,169.3	12,984.6	8,402.7	24.79	21.35	15.53
3	products of the chemical industry	10,603.0	11,048.0	10,740.5	18.55	18.17	19.85
4	agricultural products and the food industry	5,051.7	5,736.0	6,495.4	8.84	9.43	12.0
5	products of the metallurgical complex	3,575.1	3,650.7	3,127.7	6.25	6.0	5.78
6	the light industry	2,660.9	3,132.5	2,967.6	4.65	5.15	5.48
7	various industrial goods	2,246.9	2,382.8	2,382.7	3.93	3.91	4.40
8	wood and paper pulp	1,388.8	1,310.4	1,414.5	2.43	2.15	2.61
9	Total	57,141	60,800.1	54,091.2	100	100	100

Source: Author's elaboration based on the Ministry of Economic Development and Trade of Ukraine (see: *Infographics of Export*, 2020).

provides employment for an IT specialist for a competitive salary.

Table 8 shows Ukraine's structure of imports of goods in the period 2018–2020. The largest share in the structure of imports is composed of products of mechanical engineering, mineral products, and products of the chemical industry. The analysis shows that the volume of imports of mineral products is constantly declining. Ukraine imports mainly oil products (\$4.3 billion), cars (\$2.64 billion), drugs (\$1.84 billion), coal briquettes (\$1.76 billion). The main import partners of Ukraine are such countries as China, Germany,

Poland, Russia and Belarus (see: *Ukraine Profile*, 2019).

Outsourcing is the transfer or delegation of business processes or functions to external companies. Outsourcing is common for many industries. Outsourcing of IT can be local or offshore (placing orders outside the country). It can be divided into the following areas:

- the outsourcing of information processes (hosting, cloud technologies);
- the outsourcing of internal services (call centres);
- software development.

Ukraine in the world ranking by number IT professionals competes with USA, India and Russia.

The top services imported by Ukraine involve transport services, business services, travel, and financial services (Table 9).

More than 70% of Ukrainian IT exports include software development services. Ukrainian developers are integrated into more developed ecosystems and chains of other countries. Large companies such as Luxoft, Softserve, Eleks, Global Logic, Infopulse, and others create software products for major global brands.

The basis for the successful integration of an industry into global value chains lies in innovation ecosystems. Developed sectoral and regional clusters can be based on such ecosystems.

The volume of economic relations is slowly increasing. There is potential for increasing participation in global value chains, but it still needs to be realised. The research shows a tendency for the growth rate of imports of goods to exceed the growth rate of exports in Ukraine.

The analysis of the dynamics shows that the largest volumes of export transactions from Ukraine to the EU's countries in 2018–2019 includ-

ed Poland, Italy, and Germany. Countries such as Hungary, the Netherlands, Romania, the Czech Republic, and Slovakia are in the lead in terms of exports. Luxembourg demonstrated the highest rates of imports from Ukraine (276%) in 2018–2019. Germany, Poland, and Italy were the main exporters of goods to Ukraine in 2018–2019. Bulgaria showed positive rate of export growth (177,1%) within the estimated period.

Table 11 considers the structure of Ukraine's foreign trade with the country's geographical neighbours.

The share of the EU's member states in exports is 46.44%. Poland was recognised as the largest export partner of Ukraine in 2019 in the context of neighbouring states. The share of export deliveries from Ukraine to non-EU countries was 53.56%. The Ukraine's trade balance remains passive. It proves the dependence of Ukrainian economy on high-tech supplies from abroad.

Statistical information on Ukraine's trade balance shows that the volume of export–import transactions between Ukraine and the EU as a whole increased during the period 2018–2020. This is a positive trend. However, the research revealed

Table 9. Ukraine's structure of import of services for the period 2018–2020

Indicator (in million USD)	2018	2019	2020	2018 specific weight (in %)	2019 specific weight (in %)	2020 specific weight (in %)
1. transport services	13 80.1	1 559.1	1 013.6	23.77	22.46	19.46
2. royalties and services using intellectual value	472.8	559.7	527.1	8.14	8.06	10.12
3. IT services	462.6	531.3	553.0	7.97	7.65	10.62
4. business services	1 227.1	1 359.1	973.0	21.13	19.58	18.68
5. travel services	979.4	1 299.3	697.4	16.88	18.71	13.38
6. government services	589.9	912.0	737.5	10.16	13.14	14.16
7. other services	227.9	226.1	237.0	3.92	3.26	4.55
8. services related to financial activities	466.4	495.4	470.6	8.03	7.14	9.03
9. Total	5 806.2	6 942	5 209.2	100	100	100

Source: Author's elaboration based on *Infographics of Export* (2020).

Table 10. The dynamics of foreign trade in goods between Ukraine and the EU's countries (thousands USD)

	Export			Import		
	2018	2019	in % to 2018	2018	2019	in % to 2018
Austria	553,191.6	598,319.5	108.2	607,884.1	657,000.3	108.1
Belgium	603,521.1	680,704.4	112.8	553,841.2	549,463.0	99.2
Bulgaria	513,862.3	482,168.2	93.8	259,422.0	459,341.9	177.1
Croatia	35,010.5	37,197.4	106.2	46,453.3	52,505.4	113.0
Cyprus	40,363.9	43,043.5	106.6	22,806.1	23,165.0	101.6
the Czech Republic	878,035.7	920,901.6	104.9	1,034,786.6	1,165,526.6	112.6
Denmark	249,974.8	254,684.7	101.9	275,633.4	274,188.2	99.5
Estonia	152,061.5	139,859.9	92.0	95,790.9	144,388.1	150.7
Finland	80,642.8	4,6178.7	57.3	326,187.7	275,264.6	84.4
France	537,647.1	596,505.8	110.9	1,480,571.5	1,652,665.3	111.6
Germany	2,208,355.5	2,383,003.1	107.9	5,983,348.8	5,986,873.6	100.1
Greece	279,900.7	274,211.5	98.0	270,459.0	311,635.1	115.2
Hungary	1,646,045.9	1,562,809.4	94.9	1,260,239.9	1,251,100.5	99.3
Ireland	77,508.5	153,235.2	197.7	143,826.1	169,564.7	117.9
Italy	2,628,763.8	2,418,875.4	92.0	2,033,022.5	2,074,753.7	102.1
Latvia	294,422.5	300,080.9	101.9	152,139.3	166,467.0	109.4
Lithuania	342,714.8	410,796.4	119.9	879,136.2	1,144,499.2	130.2
Luxembourg	7,289.8	20,179.0	276.8	82,408.3	53,130.7	64.5
Malta	65,682.5	41,427.2	63.1	6,642.8	5,220.0	78.6
the Netherlands	1,603,531.1	1,848,424.7	115.3	776,491.0	765,085.6	98.5
Poland	3,257,248.5	3,295,846.6	101.2	3,641,921.5	4,109,083.2	112.8
Portugal	247,046.4	282,174.2	114.2	61,580.7	74,806.3	121.5
Romania	932,648.6	1,005,591.3	107.8	511,105.4	645,529.3	126.3
Slovakia	863,926.4	709,620.1	82.1	525,879.4	651,805.4	123.9
Slovenia	33,306.2	38,945.3	116.9	190,509.9	245,038.8	128.6
Spain	1,369,890.1	1,500,801.3	109.6	636,756.2	844,213.8	132.6
the UK	584,229.9	628,087.7	107.5	892,120.1	769,910.5	86.3
Sweden	70,190.2	77,068.7	109.8	465,479.2	489,042.0	105.1
The total of the EU's countries	20,157,013.0	20,750,742.0	102.9	23,216,443.0	25,011,268.0	107.7

Source: Author's elaboration based on Ukraine's State Statistics Service (see: *Foreign Economic Activity*, 2020).

Table 11. Geographical structure of Ukraine's foreign trade in goods in 2019 with the neighbouring countries (in thousands USD)

Country	Export		Import		Balance
	thousands USD	specific weight (in %)	thousands USD	specific weight (in %)	
Belarus	1,549,840.8	10.20	3,751,922.9	18.48	-2,202,082.1
Bulgaria	482,168.2	3.17	459,341.9	2.26	22,826.3
Hungary	1,562,809.4	10.29	1,251,100.5	6.16	311,708.9
Moldova	726,568.7	4.78	91,250.6	0.46	635,318.1
Poland	3,295,846.6	21.69	4,109,083.2	20.24	-813,236.7
Romania	1,005,591.3	6.62	645,529.3	3.19	360,062.0
Russia	3,242,815.8	21.34	6,985,013.5	34.40	-3,742,197.7
Slovakia	709,620.1	4.67	651,805.4	3.21	57,814.7
Turkey	2,619,024.9	17.24	2,355,446.7	11.60	263,578.2
Total of the neighbouring countries belonging to the UE	7,056,036	46.44	7,116,860	35.06	-60,824
Total of the neighbouring countries non belonging to the UE	8,138,250	53.56	13,183,634	64.94	-5,045,384
Total	15,194,286	100	20,300,494	100	-5,106,208.3

Source: Author's elaboration based on Ukraine's State Statistics Service (see: *Foreign Economic Activity*, 2020).

that the indicators of export–import transactions between Ukrainian and the EU's enterprises decreased during the period 2019–2020. Reasons for this negative trend include economic problems with sales and logistics caused by COVID-19. The overall value of Ukraine's trade balance is passive. However, the trade balance of services is positive, including with the EU's member states.

Ukraine is one of the emerging markets in Europe. This market provides a wide range of economic opportunities. Location, low costs and the availability of free trade with global markets can ensure stable economical growth.

The integration of Ukrainian companies into value chains is fundamentally important for the development of Ukrainian industry. Participation in such chains allows the participants to join forces to improve competitiveness. There are international value chains based on Ukrainian companies. Thus, Metinvest uses the full cycle of production of metallurgical products and assets abroad. Metinvest is part of global value chains. Table

12 presents Ukrainian companies participating in GVCs, including with the EU's countries.

A significant part of Nibulon's foreign trade contracts is concluded within the framework of the modernisation of trans-shipment terminals and the development of its own fleet. High-quality equipment from well-known world manufacturers was imported under direct contracts: NEUERO Industrietechnik fur Forderungen GmbH (Germany), MORILLON SAS (France), SCAFCO (the USA), Cimbria Unigrain A/S (Denmark), and others. Upgrading the material and technical base improves the process of grain circulation and increases the productivity of acceptance and shipment of agricultural products for export. The construction of ships with equipment and materials is organised within the cooperation with well-known world manufacturers of ship equipment: ZF Marine Krimpen b.v. (the Netherlands), Danfoss Fire Safety A/S (Denmark), Wiska Hoppmann GmbH (Germany), Fak-armaturen GmbH (Germany), Midif S.A.R.L. (France), DMT Marine Equipment

Table 12. Examples of integrating Ukrainian companies into international cooperation

Company	Sphere of activity	Partnerships with companies in the EU	Partnerships with companies beyond the EU
Metinvest	mining, metals, sales, logistics, service	Bulgaria, Italy	Belarus, Switzerland, the UK, Russia, the United States
Aeromeh	engineering	Bulgaria, Germany, Greece, Italy, Latvia, Lithuania, Poland, Romania, the Czech Republic, Finland, Estonia	Australia, Armenia, Belarus, Bolivia, Brazil, China, Great Britain, Georgia, India, Israel, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenia, Turkey, Switzerland
Motor Sich	aircraft and engine building	Poland, Czechia, Slovakia	Bangladesh, Belarus, Canada, Ethiopia, Myanmar, Pakistan, Singapore, South Korea, Sri Lanka, the UAE, the UK
Ukrainian Automobile Corporation	automobile maker	Poland	Egypt, Uzbekistan
Konecranes Ukraine	cranes, lifting equipment and crane services	Austria, Belgium, the Czech Republic, Denmark, Germany, Greece, Finland, France, Hungary, Italy, Latvia, the Netherlands, Poland, Portugal, Romania, Spain, Slovakia, Slovenia, Sweden	Australia, Bangladesh, Brazil, Canada, Chile, China, Colombia, India, Indonesia, Hong Kong, Mexico, Morocco, New Zealand, Norway, Peru, the Philippines, Russia, Singapore, South Africa, South Korea, Thailand, Turkey, Switzerland, the UAE, the UK, the USA, Venezuela, Vietnam, Japan
Kernel	food processing	Germany, Israel, Latvia, Lithuania, Estonia, Sweden	Bangladesh, Canada, South Korea, Norway, the USA
EKTA	LED displays, imaging equipment/software	France, Estonia, Sweden	Norway, the UAE, the UK
Luxoft	software development	Bulgaria, Germany, Italy, the Netherlands, Poland, Romania, Sweden	Australia, Canada, China, India, Malaysia, Mexico, Russia, Singapore, South Korea, Switzerland, the UK, the USA, Vietnam
Nibulon	grain and oilseeds, shipbuilding, logistics	Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Lithuania, the Netherlands, Poland, Romania, Sweden	China, Norway, Turkey, the UK
Kernel	oilseed processing, infrastructure and trading, farming, logistics	the Netherlands, Spain	China, Egypt, Indonesia, India, Kenya, the Philippines, Turkey
MHP	crop production, poultry, meat processing	Germany, the Netherlands, Slovakia, Slovenia, Romania	Armenia, Azerbaijan, China, Iraq, Hong Kong, Kuwait, Moldova, Morocco, the Philippines, Saudi Arabia, Singapore, South Korea, Tunisia, Vietnam, the UAE, Japan

Source: Author's own elaboration.

S.A. (Romania), Famor S.A. (Poland), Lanex a.s. (the Czech Republic), Kartallar Boya ve Kimya Sanayi Tic. Ltd. Sti (Turkey), and others. There is a contract with Zeppelin Power Systems GmbH & Co. KG (Germany) for the supply of components. Also, Nibulon has contracts to purchase fuel from Orlen (Lithuania).

Kernel is a famous producer and exporter of sunflower oil. The company exports agricultural products to international markets (about 80 countries). Since November 2007, the Company's shares have been traded on the Warsaw Stock Exchange (WSE) (see: *About Kernel*, 2021).

Ukrainian company Luxoft develops car-control technologies, including unmanned ones, for German car manufacturers. Potentially, Ukraine has a full cycle and numerous advantages in the production of aircraft (Antonov). However, this circuit does not work effectively due to system problems. Ukraine has great opportunities for integration into global value chains of sectors such as machinery for the agro-industrial complex, railway cars, sea vessels, and river vessels. The country would also be capable of supplying products to the EU from metal to complex components of construction and finished machines, units, vehicles. Ukrainian manufacturers of specialised software and hardware also have the economic potential. It is important to consider the favourable factors for the entry of Ukrainian industrial enterprises into GVCs. These factors include the proximity to European markets, developed transport, energy infrastructure and a high potential for developing information and communication technologies. The cluster 'Zakarpattya' is represented by the associations of international chains of brands, such as "Eurocar", "Jabil", "Yazaki", "Fischer", and others. This cluster was one of the first to move to a system model of global integration. Progrestech-Ukraine cooperates with Boeing. The company specialises in design, engineering consulting, and software development in the field of aircraft construction. C-Engineering (Odessa) is a Ukrainian engineering company represented on the world market by the SE Group International brand. Another feature

of integration into global chain networks includes the partnership with Siemens. "MDEM" (Nikolaev city) is a partner of the Dutch concern "DAMEN", which specialises in ship design. Infocom Ltd (the city of Zaporizhzhya) offers market products and solutions in the field of specialised software development, alternative energy, electric vehicles, robotics, computer vision, drones, etc. For this company, it is exports and integration into global value chains that are the source of its innovative development.

The National University 'Zaporizhzhya Polytechnic' is a member of the Zaporizhzhia Cluster 'Engineering – Automation – Machinery' (EAM). This organisation is based on a collaboration of a wide variety of players in engineering as well as automation and machinery. Members of the cluster include the Zaporizhzhya Chamber of Commerce and Industry, industrial enterprises (Triada Ltd Co., Blysk metal service pro), IT companies (Infocom Ltd), industrial parks (Konecranes), and other organisations. Members of the Zaporizhzhya Cluster took part in the International Machine-Building Exhibition MSV. The event took place between November 8th, 2021, and November 12th, 2021, in Brno, the Czech Republic. The result was the signing of the Memorandum of Cooperation between the IAM cluster and the INDUSTRY CLUSTER 4.0, an important Czech association of engineering and IT companies. Such measures are relevant in terms of developing global and regional value chains in the context of Ukraine's cooperation with the EU's countries.

It is necessary to highlight such an important feature as "technological multiservice". The basis of the strategy of integrating Ukrainian engineering enterprises into global value chains should include the following components:

1. introducing fiscal preferences for Ukrainian manufacturers, reasonable conditions for project fundraising, the setting up of technology parks and a free zone;
2. promoting the conclusion of Ukraine's agreement with the EU on Conformity Assessment and Acceptance of Industrial Goods (ACAA –

- Agreement on Conformity Assessment and Acceptance of Industrial Products);
3. motivating investors to buy products manufactured by Ukraine-based companies (in accordance with the Association of Industrial Automation Enterprises of Ukraine (see: *Integration into Global Value Chains: A Review of Developments and Best Practices*, 2021);
 4. developing innovative ecosystems of industrial hi-tech (the author argues that developed sectoral and regional clusters can be based on this). Deeper specialisation can take place in these clusters. Clusters should operate on the principles of integration and smart specialisation;
 5. integration into regional value chains;
 6. integration into the EU's Digital Single Market;
 7. cooperating on the European Green Deal (developing the circular economy, the prospect of hydrogen production for the EU's countries).

In order to expand the cooperation between Ukraine and the EU in the framework of global and regional value chains, it is recommended to deepen cooperation such projects such as the ACAA (Assessment and Acceptance of Industrial Products), "customs visa-free", integration into the Digital Single Market, and cooperation under the European Green Agreement. The implementation of the above-mentioned agreements can develop the potential of Ukraine's production and trade relations with the EU's member states.

Ukraine is a world leading exporter of iron products, grain and seed oils. A large part of these products are exported to EU. Ukraine has a high level of processing in the fields of crops (seed oils, other vegetable residues, rapeseed, corn) and metallurgy (pig iron). According to the product complexity index (PCI), Ukraine's highest-complexity exports include metal pickling preps, solder, brazing flux, weld cores (1.7), flat-rolled alloy steel nes (1.49), metal-rolling mills (1.38), wire of alloy steel except stainless steel (1.36), and stainless steel, angles, shapes/sections (1.26). Product Complexity Index (PCI)

measures the intensity of an economy or a product (see: *Ukraine Profile*, 2019).

The Ukrainian share of the-EU-oriented export products accounts for more than 40%. The buyers of Ukrainian products are mainly China, Poland, Russia, Germany and other countries. European countries buy 48% and Asian countries 39.8% of Ukrainian export sales (see: *Integration into Global Value Chains: A Review of Developments and Best Practices*, 2021).

In order to profit from participation in the value chain, countries need to organize trade and investment policy. COVID-19 pandemic revealed the interdependence of many countries on suppliers across the world. GVCs can play a major role for emergency economics such as Ukraine in terms of delivering growth, increasing regional and global integration, and managing external situations.

Small companies in Ukraine manufacture garments under a foreign brand. Components for car assembly (electrical equipment, sensors, seats, covers) are also produced. However, there is one danger to Ukrainian enterprises in value chains. This concerns the dependence of the final manufacturer on suppliers. Vendors can lose their independent enterprises and instead become a shop of a large corporation. This can be identified as a problem of a monopolistic client.

The finished product is essentially the result of production and assembly processes carried out in many countries. Every step in the production process enhances the value of the final product. Importing goods and services matters as much as its export to successful GVCs. GVC helps integrate the know-how of global and regional companies by the key components in the stages of production.

Rational strategies can help Ukraine optimise and maximise its participation in GVCs. Trade-transparent borders and the presence of investment can help rapid integration into GVCs. The country can benefit by harnessing the potential of the domestic economy and strengthening links with GVCs. Economic policy affects trade policy, logistics, business services, investment, taxation, and

industrial development. Ukraine has difficulties with some of these factors. Regional and global value chains are significant for the world trade. They play a role in stimulating economic growth, employment, and development, as well as addressing the need to increase the participation of developing countries in such value chains. Technological backwardness of developing countries affects the sphere of GVCs. The Ukrainian strategy of participation in the GVC can become the basis for the economic growth of the state. The functioning of industries with a high degree of integration into regional and global value chains allows for a synergistic effect. In this area, the most developed countries are the United States, UK, Germany, France, Japan and China. The Ukrainian economy concentrates mostly on getting adequate shares in European GVCs. For Ukraine, priorities are to be set in terms of new directions in technological leadership in GVCs and in security, health, ecology, energy dependence. In recent years, there has been a geographical reorientation of Ukrainian industry to global production networks. This was the result of the almost twofold reduction in cooperation with Russia and an increase in exports of intermediate industrial products to European countries. As the author of this article sees it, Ukrainian exporters are gradually becoming part of European production chains. Strategic cooperation between the government and the private sector is needed for further development. It is also important for the Ukrainian economy to use trade policy instruments in order to maximise value added at the national and global levels.

Concluding remarks

The phrase 'global value chains' does not really always fully reveal the economic essence of the concept. In this context, most chains are regional, not global. Integration into regional value chains, in particular with the EU's member states, can be seen as important to Ukraine. Integration into the GVCs is a necessary tool for Ukraine's economic development. Such an integration accelerates the development and level

of competitiveness of the country. The current level of Ukrainian tools, programmes, and policies for integration into GVCs can be assessed as initial. The commodity structure of Ukraine's foreign trade is dominated by exports of intermediate goods and imports of consumer goods. The structure of the Ukrainian export is dominated by metallurgical and agricultural products. Its feature is the high proportion of intermediate goods used as a source material for the production of other final consumer goods.

The analysis of research data reveals that the leading position of Ukraine's imports is occupied by the Chinese economy. Among the EU's member states, the largest volumes of imports during the analysed period involved Germany and Poland. With regard to trends that can be extrapolated to the future, one can single out the increase in the share of China, Germany, Poland, and Turkey, as well as the decrease in the share of Russia and Belarus.

Under the current conditions, trade in finished goods and services is growing at almost the same rate as trade in intermediate products. Therefore, the structure of the world economy is gaining the features of multi-levelness and interdependence. Recommendations for Ukraine's integration into global business services can include developing services in the context of GVCs and developing international cooperation between enterprises on global business platforms. The basis of a successful integration into GVCs involves the developed innovative ecosystems of industrial high-tech. These products include sunflower-seed or safflower oil, corn, iron ores or concentrates, wheat, and semi-finished products made from iron or non-alloy steel. More than 70% of the Ukrainian IT exports include software development services.

The Ukrainian economy is about to be incorporated into regional and global business service centres. The essence and characteristics of the phenomenon of global value chains is a practical embodiment of the activities of transnational companies in the principle of "made in the world". The study herein contains a review of the global turnover of goods and services through value chains.

It also uncovers aspects of Ukraine's position in the global value chains. The work of GVCs starts with economic agreements of the business entities. Ukraine has a number of benefits in terms of developing participation in global economic processes. It delivers examples of the Ukrainian companies' global value chains integration. The economic relations between Ukraine and the EU tend to grow significantly. Cooperation between Ukraine and the EU will provide the development of trade. Diversifying services within the framework of GVCs and the development of cooperation between companies on global business platforms will result in the integration of Ukraine into the global business. The article provided examples of the involvement of Ukrainian enterprises in international cooperation within GVCs.

The ways to integrate Ukrainian companies into GVCs are as follows: flexible fiscal policy for Ukrainian manufacturers; the adjustment of Ukrainian technical norms and standards to the European ones; working out incentives for investors to buy at Ukraine-based companies; providing innovative ecosystems for high-technology industries; integration into regional chains. The National University 'Zaporizhzhya Polytechnic' is a member of the Zaporizhzhia Cluster 'Engineering – Automation – Machinery' (EAM) and takes an active part in the development of the cluster towards participating in GVCs.

Successful integration into GVCs is based upon elaborate innovative ecosystems of the industrial high-tech. Advanced sectoral and regional clusters can be based upon these ecosystems. Profound and smart specialisation should result in the emergence of these clusters.

International R&D centres should contribute to the development of GVCs in Ukraine. These research centres carry out both research and the production of test samples of goods. It can be applied to brand owners that build their own marketing strategy. This can also add to the value of product. The development of this segment requires investment and the setting up of venture business. For Ukraine, successful integration into

European and global value chains means abandoning raw materials. This is necessary to achieve a higher degree of processing. The introduction of the latest digital technologies in industry requires the creation of a holistic innovation ecosystem. Deep specialisation, a higher degree of processing, and, in general, the rapid growth of the processing industry and its digitalisation are key factors for Ukraine's better integration into the EU. Ukraine has the potential to create the EU's modern production-and-technology hub.

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