

## **DOMINANTS OF UKRAINE'S FOREIGN TRADE INTELLECTUALIZATION**

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The article raises the problem of identifying dominants and assessing the level of international trade intellectualization in the context of the formation of prerequisites for the optimal use of intellectual technologies under integration of Ukraine into the world economy. The purpose of the article is to define key dominants of international trade intellectualization and to assess their development in Ukraine's foreign trade. The applicable estimation is carried out by introduction of the international trade intellectualization index – an integrated index based on the sum of weighted average group indicators. Also, the nature of international trade intellectualization processes is discovered, their forms and peculiarities both in government and business are identified. Current state and problems limiting intellectualization of Ukraine's foreign trade are characterized. The dominants of Ukraine's foreign trade intellectualization and regulatory mechanisms intensifying the export potential of its economy are defined.

*Keywords: dominants, intellectualization, foreign trade, digitalization, regulation, high-tech exports, Ukraine.*

*JEL Codes: F10, F13, F14.*

### **1. Introduction**

Intellectualization induced by current technological development has become the main driving force for improving both business processes and regulatory practice of government in all spheres of economic activity, including international trade. However, the ability to fully utilize the advantages of foreign trade intellectualization depends on a number of prerequisites that have not been formed in all national economies. In this regard, the definition of the dominants of international trade intellectualization, as well as the methodological approaches to their quantification, get topical with a view to further justifying instruments and mechanisms for strengthening the country's position in international trade. Thus, the study of driving forces, prerequisites and manifestations of intellectual technologies' influence on structural dynamics and regulation of international trade becomes an important problem to be solved to integrate country into the global trading system effectively.

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No wonder this problem attracted wide attention of the scientific community, in particular: Druhov (2010), studying the investment support of intellectualization, substantiated the necessity of active government intervention in this sphere of Ukrainian economy; Azhazha (2013) substantiated the criteria for the transition to a new strategy of economic growth based on intellectualization with the extensive use of knowledge and information as the determining forces for society development; Sardak and Samoilenko (2014: a) developed a methodology for assessing the intellectualization of the national economy under globalization based on countries' positions in international rankings; Fomina (2016: a, b) paid special attention to the cluster approach defining intellectualization processes in economy; Bilenky and Kardakov (2015) defined promising mechanisms for intellectualization of the Ukrainian economy based on experience of the EU members when Tsymbal (2016) defined the typical differences in state programs and tools of economic intellectualization depending on the level of countries' development. Particularly convincing is the work by Khunchak (2016) who generalized regulatory mechanisms of national economy intellectualization. Meanwhile, despite the growing interest to intellectualization processes, scientific works still lack a thorough study of the specifics of its dominants in international trade.

**Purpose.** The purpose of the article is to define key dominants of international trade intellectualization and to assess their development in Ukraine's foreign trade.

**Object and subject of research.** The object of research is international trade intellectualization processes. The subject of the research is a set of dominants (conditions, factors, directions) of Ukraine's foreign trade intellectualization.

**Methods of research.** The research applies authors' elaboration for calculation of country's international trade intellectualization index – an integrated index based on the sum of weighted average group indicators, including exports of goods and services, investment imports, exports of high-tech products, exports of intellectual property, exports of high-intensity services, and international capital flows.

## **2. Research results and discussion**

Modern development of international economic relations is based upon intellectualization processes caused by generation of new information technologies. In addition to the dissemination of information, it provides an opportunity to gain in-depth analytical knowledge by collecting and processing large data sets. Intellectualization is also associated with the intensification of direct communications due to the global aggravation of competition, which inevitably raises requirements (rationality, reliability and high accuracy) to informational support of foreign economic activity. Intellectualization becomes a dominant and key factor in development of main forms of international economic relations (Lukianenko, 2014, Poliakov, 2016): trade, capital flows, labor migration, monetary and financial relations that involve cooperation, scientific exchange, etc.

Consequently, intellectualization processes inevitably transform the forms used by businesses to organize international trade; the way governments regulate international trade; the commodity structure of international trade in goods, services, and intellectual property rights (i.e. goods that are the object of trade relations). Actually, these changes form three key dominants of international trade intellectualization, which nowadays serve as main driving forces of its development. Let's consider each of the dominants in more detail.

As for the first dominant – new forms of organizing trade – digitalization through the Internet is of significant importance. Thanks to development and dissemination of modern computer technologies, more and more economic agents are able to overcome barriers to foreign markets, including insignificant volumes of the domestic market, distance from major trade routes (primarily for landlocked countries) and other geographical disadvantages (UNCTAD, 2017). Digitalization through the Internet reduces asymmetry in access to information about world markets and conditions of goods and services supply that, in turn, facilitates the search for potential foreign markets, prevents a number of transaction losses and ultimately reduces the cost of international trade increasing competitiveness of international businesses that actively use electronic communication technologies (Zwillenberg, 2014).

The second dominant – new ways to regulate international trade – consists in trade flows optimization by means of customs procedures automation and bureaucratic burden relief due to promotion of paperless trade, creation of electronic document circulation platforms (for submission of customs declarations, application and issuance of trade licenses, submission of sea/air cargo manifests, application and issuance of preferential certificate of origin, payment of customs duties and fees, application for customs refunds, etc.) and engagement in trade-related cross-border electronic data exchange with other countries and international business (Guzhva, 2015). Benefits from trade facilitation through intellectualization also include more effective deployment of resources, correct revenue yield, enhanced security of international transactions and shipment, increased integrity and transparency. Moreover, it enhances business' gains from digitalization by cutting transaction costs through reducing delays, shortening the time for customs clearance, and providing predictable application and explanation of rules.

Regarding the third dominant of international trade intellectualization, it should be noted that it manifests itself in the growth of progressive goods share in export structure that should be classified as highly technological and innovative. This trend testifies, on the one hand, intellectualization of the national economy (in fact, supply), and on the other hand, the existence of a similar processes in foreign markets (that is demand).

It should be noted that the proposed list of dominants is not exhaustive. For example, an important role in the processes of international trade intellectualization is undoubtedly played by the development of human capital, which makes it possible to use

effectively the achievements in the field of intellectual technologies for both the production of goods and the organization and regulation of foreign trade transactions. Let's consider the manifestation of abovementioned dominants of international trade intellectualization in the foreign trade sphere of Ukraine.

First of all, the legislative base of Ukraine constrains the potential development of digital cross-border trade (Zatonatska, 2016). At the same time, there is no centralized single window system regulating interactions between international businesses and customs. According to Doing Business (2018), trading across the border in Ukraine remains too expensive and prolonged comparing with its main trade partners: time to documentary and border compliance comes up to 122–240 hours and costs – up to 312–367 USD, while in OECD countries average time customs clearance takes 7.5 hours and is predominantly free charge thanks to paperless procedures.

Besides, Ukraine's commodity exports consist predominantly from raw materials (share of agricultural products, metallurgical, chemical and mineral raw materials was more than 70% in 2017) and intermediate goods with a relatively low technological component – share of high-tech exports fluctuates within 5–6 per cent. Ukrainian export of goods that is partly or wholly related to high-tech is significantly lower than imports (State Statistics..., 2017), and a gap between their shares tends to increase (Table 1).

Table 1. Share of high-tech product groups in Ukraine's foreign trade in 2001–2016

HS 02	Product groups	2001		2006		2011		2016	
		Export	Import	Export	Import	Export	Import	Export	Import
28	Inorganic chemicals	3.4	0.6	2.8	0.5	2.6	0.4	1.7	0,8
29	Organic chemicals	1.3	1.2	1.6	1.2	1.0	1.1	0.2	1,4
30	Pharmaceutical products	0.3	2.2	0.2	3.1	0.3	3.5	0.5	4,1
32	Tanning and dyeing extracts	0.7	0.6	0.5	0.6	0.5	0.6	0.2	0,8
84	Machinery and mechanical appliances	7.7	10.5	5.3	11.5	9.9	15.5	4.3	11,9
85	Electrical machinery	2.9	4.5	3.3	6.0	4.7	6.9	5.7	8,2
86	Railway, tramway locomotives	0.9	0.4	2.8	0.4	5.6	0.6	0.7	0,2
87	Vehicles other than railway or tramway rolling stock	1.0	4.0	1.5	10.9	0.9	6.6	0.4	7,2
88	Aircraft, spacecraft	0.8	0.2	0.6	0.1	0.5	0.1	0.2	0,1
89	Ships, boats	0.6	0.0	0.5	0.0	0.1	0.2	0.3	0,0
90	Optical, photographic instruments and apparatus	0.5	1.7	0.4	1.5	0.4	1.2	0.4	1,4
Total		20,1	25.9	19.5	35.8	26.5	36.7	14.6	36.1

In addition, while the overwhelming majority of high-tech exports from developed countries belong to the V technological formation, Ukraine produces and exports goods belonging predominantly to the III and IV technological formations. This tendency was formed as a result of low level of goods knowledge intensity and a significant gap between science and industrial sector (Romaniuk, 2012). It should be empha-

sized that central authorities are aware of this problem because previously "National comprehensive program for the development of high-tech science" has been developed. It aimed at increasing the volume of domestic production that belongs to the V technological formation from 5 to 12 per cent, to the VI technological formation – from 1 to 3 per cent, and the share of Ukrainian high-tech export – up to 20 per cent. However, the implementation of this program, according to the data in Table 1, was not sufficiently successful.

To estimate the current situation and dynamics of Ukraine’s international trade intellectualization, a special methodology was elaborated for calculation of country’s integrated international trade intellectualization index based on the sum of weighted average group indicators (sub-indices), which enabled to cover all pieces of international flows: goods, services, capital (investments), scientific and technical products, and human resources. For each piece a wide range of statistical indicators can be used to assess intellectualization dynamics. Introduced methodology of international trade intellectualization estimation marks off six local sub-indices, which quantitatively characterize the individual components of trade intellectualization (Table 2). Each sub-index is calculated using up to three indicators of positive or negative trends in terms of intellectualization

Table 2. Construction of the integral intellectualization index

Sphere of intellectualization	Importance	Weighting factor	Indicator	Measure
Export of goods and services	I	0.25	1. Exports of goods and services 2. Excess of exports over imports 3. Services in total exports	Growth rate Percentage Share
Investment import	III	0.15	1. Import of electrical machinery and equipment 2. Import of vehicles, ships, aircraft	Share Share
Export of high-tech products	II	0.20	1. Export of electrical machinery and equipment 2. Export of vehicles, ships, aircraft	Share Share
Intellectual property export	IV	0.10	1. Export of royalties and other services related to the use of intellectual property	Share
Export of knowledge-intensive services	II	0.20	1. Telecommunications, computer and information services 2. Business services 3. Financial services	Share Share Growth rate
International capital flows	IV	0.10	1. Inward FDI 2. Outward FDI 3. Investments in capital investment by all sources	Growth rate Growth rate Share

The integral index is calculated on the basis of six sub-indices as a generalized characteristic of international trade intellectualization. Describing the methodology for

calculating the integral index of international trade intellectualization (hereinafter IITI), it's necessary to add that: change in share is usually less dramatic than change in the growth rate, so change in the growth rate should be weighted at a generally accepted level 0.33 (Sardak, 2014b) and then compared with changes in share; sub-indices are calculated as the total value of according indicators; rates of increase are to be replaced by corresponding growth rates. The growing dynamics signifies a positive tendency for intellectualization to change and vice versa.

Based on sub-indices, the following construction of IITI is proposed:

$$IITI = SI_1d_1 + SI_2d_2 + SI_3d_3 + SI_4d_4 + SI_5d_5 + SI_6d_6$$

where: IITI – Integrated index of international trade intellectualization;  $d_1, d_2, d_3, d_4, d_5, d_6$  – weight factors;  $SI_1, SI_2, SI_3, SI_4, SI_5, SI_6$  – sub-indices for export of goods and services, investment import, export of high-tech products, intellectual property export, export of knowledge-intensive services, international capital flows respectively.

Calculations of Ukraine's IITI from 2011 to 2016 using formula are represented in Table 3.

Table 3. Dynamics of Ukraine's index of international trade intellectualization

Sphere of intellectualization	Weighting factor	2011		2012		2013		2014		2015		2016	
		Sub-index	Weighted sub-index	Sub-index	Weighted sub-index	Sub-index	Weighted sub-index	Sub-index	Weighted sub-index	Sub-index	Weighted sub-index	Sub-index	Weighted sub-index
Export of goods and services	0.25	0.6	0.15	-0.3	-0.08	-9.2	-2.3	-1.6	-0.4	2.8	0.7	0.8	0.2
Investment import	0.15	2.6	0.39	2.0	0.30	-0.8	-0.12	-2.4	-0.36	0.4	0.06	6.3	0.95
Export of high-tech products	0.20	-0.3	-0.06	1.7	0.34	-2.3	-0.46	-3.1	-0.62	-1.1	-0.22	-0.6	-0.12
Intellectual property export	0.10	-0.1	-0.01	0.1	0.01	0.3	0.03	0.1	0.01	-0.3	-0.03	-0.2	-0.02
Export of knowledge-intensive services	0.20	-0.1	-0.02	2.0	0.40	-0.2	-0.04	4.2	0.84	-0.6	-0.12	-1.2	-0.24
International capital flows	0.10	9.2	0.92	2.2	0.22	3.1	0.31	1.8	0.18	-8.7	-0.87	-6.6	-0.66
IITI			1.37		1.19		-2.58		-0.25		-0.48		0.11

The integral index is largely based on the estimation of the share change therefore it can be understood as weighted average change in the share of "intellectualized" foreign economic activity. For example, in 2016, according to the calculation, the share of intellectualized foreign trade of Ukraine increased by 0.11 percentage points. Analysis of sub-

indices can help to identify weak areas that impeded positive intellectualization trend. In 2016, these areas included reduction in share of high-tech exports of goods (–0.12), knowledge-intensive services (–1.2) and FDI (–6.6).

Identified systemic shortcomings of foreign trade intellectualization necessitate setting a number of regulatory measures to improve the quality of Ukraine's integration into the world economy. Hence, its policy to promote trade intellectualization has to follow in two directions:

- stimulating and supporting exports of national commodity producers in a wide range of quality and nomenclature of goods and services (raw materials, semi-finished, high-tech, knowledge-intensive, innovative, etc.);
- development of the national economy in terms of competitiveness and quality of goods and services, resource-saving, innovation, knowledge intensity, which will ensure the proper export opportunities of Ukrainian business.

### **3. Conclusions**

1. The current dominants of of Ukraine's foreign trade intellectualization are: forms of trade organization, the system of international trade regulation and the structure of international exchange in goods, services, rights to objects of intellectual property. Intellectualization is the driving force behind the development of the world economy because it: creates more efficient mechanisms and instruments of international relations with low transaction and information costs; promotes the development of social relationships and the creation of more perfect institutions; creates the preconditions for increasing the efficiency of production and circulation from the micro to global level.

2. Processes of Ukraine's foreign trade intellectualization are characterized by excessive share of primary commodities and low level of trade relations intellectualization that marginalize its role in the world economy development. Besides, legislative environment restricts trade digitalization. Inefficient customs procedures burden cross-border trade eliminating perspective benefits from trade facilitation.

3. To estimate the level of international trade intellectualization, a methodology was elaborated for calculation of country's integrated international trade intellectualization index based on the sum of weighted average group indicators (sub-indices). Introduced methodological approach, estimating international trade intellectualization, marks off six local sub-indices (an integrated index based on the sum of weighted average group indicators, including exports of goods and services, investment imports, exports of high-tech products, exports of intellectual property, exports of high-intensity services, and international capital flows), which quantitatively characterize individual components of trade intellectualization. Analysis of sub-indices can help to identify weak areas impeding positive intellectualization trends.

4. In authors' opinion, promising areas of international trade intellectualization research cover the creation of conditions for the speedy penetration of the achievements of the Fourth Industrial Revolution into the sphere of international trade, in particular: smart-technologies; e-commerce; digitalization of business-processes; automation of foreign trade regulation procedures; modernization of national export promotion systems, as well as stimulation of intellectual leadership and high-tech production; ensuring necessary level of competence among trade system participants.

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## UKRAINOS UŽSIENIO PREKYBOS INTELEKTUALIZAVIMO DOMINANTAI

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Tyrimo problema – identifikuoti determinantus ir įvertinti tarptautinės prekybos intelektualizacijos lygį, atsižvelgiant į intelektualinių technologijų naudojimo sąlygas, integruojant Ukrainą į pasaulio ekonomiką. Straipsnio tikslas – apibūdinti pagrindinius tarptautinės prekybos intelektualizacijos dominantus ir įvertinti jų raidą Ukrainos užsienio prekyboje. Įvertinimas atliekamas naudojant autorių pasiūlytas tarptautinės prekybos intelektualizacijos indeksą, pagrįstą vidutinių svertinių grupių rodiklių suma. Straipsnyje atskleidžiamas tarptautinės prekybos intelektualizacijos procesų pobūdis, nustatomos jų formos ir ypatumai tiek Vyriausybėje, tiek versle; apibūdinama intelektualizacijos dabartinė būklė ir problemos bei apribojimai Ukrainos užsienio prekyboje. Apibrėžiami prekybos intelektualizacijos dominantai ir reguliavimo mechanizmai, sustiprinantys prekybos ekonomikos eksporto potencialą.

*Raktiniai žodžiai: dominantas, intelektualizacija, užsienio prekyba, skaitmeninimas, reguliavimas, aukštųjų technologijų eksportas, Ukraina.*

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