DOI 10.33111/vz_kneu.41.25.04.05.033.039
УДК 330.101.2

Довгаль Олена Андріївна
доктор економічних наук, професор,
професор кафедри міжнародних економічних відносин та логістики,
Харківський національний університет імені В. Н. Каразіна, Харків, Україна
e-mail: e.dovgal@karazin.ua
ORCID: 0000-0003-3219-9731

МІЖНАРОДНА ЦИФРОВА ТОРГІВЛЯ: КЛЮЧОВІ НАПРЯМИ РЕГУЛЮВАННЯ

Dovgal Olena
Doctor of Economic Sciences, Professor,
Professor of the Department of International Economic Relations and Logistics,
V.N. Karazin Kharkiv National University, Kharkiv, Ukraine
e-mail: e.dovgal@karazin.ua
ORCID: 0000-0003-3219-9731

INTERNATIONAL DIGITAL TRADE: KEY AREAS OF REGULATION

Анотація. *Стаття присвячена дослідженню проблем міжнародної торгівлі у процесі цифровізації. Цифровізація викликає фундаментальні зрушення у сфері світової торгівлі: відновлюється її динаміка, формуються невідомі раніше порівняльні переваги залучених до неї країн. З'являються нові проблеми — слабшають можливості державного регулювання та контролю транскордонного обороту товарів та послуг, виникають додаткові чинники зміцнення монополістичних тенденцій у зовнішньоторговельній сфері. Метою дослідження є аналіз ключових напрямів регулювання міжнародної цифрової торгівлі. Проведено порівняльний аналіз двох основних індексів, що використовуються з метою оцінки регуляторних бар'єрів для розвитку цифрової торгівлі в міжнародному співтоваристві — Digital Trade Restrictiveness Index (DTRI), розроблений Європейським центром міжнародної політичної економії (ECIPE), та Digital Services Trade Restrictiveness Index (DSTRI), складений Організацією економічного співробітництва та розвитку (OECD). Проведено аналіз особливостей регулювання міжнародної цифрової торгівлі в різних країнах за такими ключовими напрямами, як тарифна політика, оподаткування, захист даних та конфіденційності, ліцензування та реєстрація, вимоги щодо забезпечення локальної (комерційної) присутності, державні закупівлі, регулювання онлайн реклами, права інтелектуальної власності та конфіденційності. Пропонується державі стимулювати цифровізацію економічних процесів такими діями: 1) виступати організатором технологічних платформ, які об'єднують різні організації, або регулятором, що директивно встановлює вимоги щодо використання певних технологічних рішень; 2) удосконалювати існуючу нормативну базу, що регулює розвиток цифровізації зовнішньої торгівлі; 3) розвивати систему «Електронний уряд» та перелік держпослуг, що надаються в електронному форматі; 4) стимулювати та заохочувати впровадження інформаційних систем, електронних послуг, запроваджувати податкові стимули для розвитку онлайн-торгівлі; 5) готувати у необхідних кількостях кадри як самих IT-фахівців та програмістів, так і кваліфікованих користувачів; 6) забезпечувати безпеку від кіберзагроз; 7) розширювати міжнародне співробітництво та створювати привабливі умови для припливу та впровадження передових інформаційних технологій. Робиться висновок, що відмінності в підходах країн до регулювання цифрової торгівлі на національному рівні створюють додаткові адміністративні та транзакційні витрати для бізнесу, перешкоджаючи поширенню та впровадженню цифрових технологій. Тому все важливішим питанням сьогодні стає створення належних інструментів регулювання цифрової торгівлі, включаючи правила, що розробляються на глобальному рівні за участю міжнародних організацій.*

Ключові слова: *міжнародна цифрова торгівля, цифровізація, напрями регулювання, електронна комерція, інтернет-платформи, бар'єри в галузі цифрової торгівлі.*

Abstract. *The article is devoted to the study of the problems of international trade in the process of digitalization. Digitalization causes fundamental shifts in the sphere of world trade: its dynamics are restored, previously unknown comparative advantages of the countries involved in it are formed. New problems appear — the possibilities of state regulation and control of cross-border turnover of goods and services are weakening, additional factors of strengthening monopolistic tendencies in the foreign trade sphere arise. The purpose of the study is to analyze the key areas of regulation of international digital trade. A comparative analysis of two main indices used to assess regulatory barriers to the development of digital trade in the international community is carried out — the Digital Trade Restrictiveness Index (DTRI), developed by the European Center for International Political Economy (ECIPE), and the Digital Services Trade Restrictiveness Index (DSTRI), compiled by the Organization for Economic Cooperation and Development (OECD). An analysis of the features of international digital trade regulation in different countries was conducted in such key areas as tariff policy, taxation, data protection and privacy, licensing and registration, requirements for ensuring local (commercial) presence, public procurement, regulation of online advertising, intellectual property rights and privacy. The state is proposed to stimulate the digitalization of economic processes by the following actions: 1) act as an organizer of technological platforms that unite various organizations, or a regulator that directively establishes requirements for the use of certain technological solutions; 2) improve the existing regulatory framework that regulates the development of digitalization of foreign trade; 3) develop the «Electronic Government» system and the list of state services provided in electronic format; 4) stimulate and encourage the implementation of information systems, electronic services, introduce tax incentives for the development of online trade; 5) train the necessary number of IT specialists and programmers, as well as qualified users; 6) ensure security against cyber threats; 7) expand international cooperation and create attractive conditions for the influx and implementation of advanced information technologies. It is concluded that differences in the approaches of countries to regulating digital trade at the national level create additional administrative and transaction costs for business, hindering the spread and implementation of digital technologies. Therefore, the creation of appropriate instruments for regulating digital trade, including rules developed at the global level with the participation of international organizations, is becoming an increasingly important issue today.*

Key words: *international digital trade, digitalization, regulatory trends, e-commerce, internet platforms, barriers to digital trade.*

JEL classification: F02, F13, O5

Problem Statement. One of the benefits of digital trade is increased transparency, traceability, and control over transactions conducted electronically. Global digital platforms offer significant opportunities for companies worldwide (especially startups and small businesses) to penetrate new markets. The spread of 3D printing and additive manufacturing technologies is facilitating the growth of cross-border flows of physical goods traded electronically.

The rapid development of the internet and new business models necessitates changes to traditional policies and regulations on issues such as market access for goods and services, regulation of data flows, censorship, intellectual property protection, privacy standards, information security, and many others.

Analysis of Research and Publications. A large number of modern studies are devoted to the study of the problems of international trade in the process of

digitalization. Thus, the works of Romalis J. [14], Casalini F., González J. L., Moïsé E. [2], Lopez-Gonzalez J., Ferencz J. [8] and other scientists focus on the openness of markets in the digital age. Meltzer J. P. [10–11], Wu M. [19], Kerber W., Schweitzer H. [7], Palfrey J., Gasser U. [12] and others study issues related to digital trade and regional trade agreements. The works of Kearney A. T. [6], Baldwin R. [1], Fefer R. F., Akhtar S. I. and Morrison W. M. [5] analyze the problems and forecast the prospects of trade policy in the context of the spread of information technologies. Despite the significant contribution of these studies, the issues related to the regulation of international digital trade remain understudied, highlighting the need for further research in this area.

Research Methodology. The article is based on an analysis of scientific papers, statistical data, and government programs regulating international digital trade. General scientific methods, systems and comparative analysis, and generalization are used.

Identification of Previously Unresolved Parts of the General Problem. Despite the extensive research devoted to international digital trade, most issues in this area remain unresolved. The key challenges in regulating cross-border and international digital trade, the realization of which requires finding new ways to develop international cooperation in regulating foreign trade exchange, require a more in-depth analysis.

The Aim of the Article. The aim of this study is to identify key areas of international digital trade regulation using examples from various countries. To achieve this goal, the author formulated the following objectives: to uncover the content of two key indices for assessing regulatory barriers to the development of digital trade in the international community and to analyze key areas of international digital trade regulation from the perspective of the measures applied by various countries.

Presentation of the Main Material. Digital trade regulation is still in its infancy globally. At the international level, the following has not yet been developed: common terminology in the field of digital trade; a unified methodology for calculating statistical volumes of digital trade and assessing the level of digitalization in various sectors; a unified methodology for identifying barriers to digital trade and approaches to assessing their impact on trade.

Digital trade regulation varies significantly — both at the national level in individual countries and at the regional and international levels. The development of global rules on trade-related aspects of e-commerce within the World Trade Organization (WTO) was officially launched in January 2019 [18]. Among other issues being discussed at the WTO negotiating platform are the imposition of customs duties on digital products and electronic data transmission, the introduction of a ban on requiring disclosure of software source code, and the non-application of restrictions such as data localization by countries. The United Nations Commission on International Trade (UNCITRAL) has developed a number of legal instruments promoting the use of electronic means in commerce and the harmonization of national regulations in the digital economy:

− UNCITRAL Model Law on Electronic Commerce (adopted in 1996, 72 countries have harmonized their legislation);

− UNCITRAL Model Law on Electronic Signatures (adopted in 2001, 33 countries have harmonized their legislation);

− UN Convention on the Use of Electronic Communications in International Contracts (entered into force in 2013; 18 countries have signed, 12 have ratified);

−UNCITRAL Model Law on Electronic Transferable Records (adopted in 2017, only Bahrain has so far harmonized its legislation).

It should be noted that countries are increasingly referring to the above-mentioned instruments in their free trade agreements.

According to UNCTAD, 145 countries have adopted laws on electronic transactions, 138 have legislation against cybercrime, 107 have legislation on data protection and privacy, and 97 have legislation on consumer protection on the Internet [15].

There is no international consensus on the best ways to ensure online privacy, partly due to the socio-cultural characteristics of individual countries. For example, China's Cybersecurity Law views privacy as an aspect of information security — a state prerogative. Meanwhile, the APEC Privacy Framework (of which China is a member) views privacy protection as an integral part of consumer protection, i.e., primarily human rights.

Regulating trade in the context of digitalization determines the extent to which markets are open or whether barriers are created to the movement of data, goods, services, investments, and ICT professionals [13]. Open markets facilitate access to the best available technologies and digital services, which, in turn, stimulates the development of the digital economy. However, the risks associated with the need to stimulate the development of new national technology markets and ensure information security are also undeniable. Currently, two key indices are used to assess regulatory barriers to the development of digital trade in the international community. One of these is the Digital Trade Restrictiveness Index (DTRI), developed by the European Centre for International Political Economy (ECIPE) [4]. The DTRI assesses barriers to digital trade in both goods and services for 64 countries; data is available since 2000. The main groups of measures, according to the index, include: fiscal restrictions; investment-related restrictions; data flow restrictions; and trade restrictions.

The second index, the Digital Services Trade Restrictiveness Index (DSTRI), has been compiled by the Organisation for Economic Co-operation and Development since 2014 and assesses existing restrictions only in digital trade in services for 46 countries [3]. Measures related to digital trade in services are divided into five main groups: infrastructure and communications, electronic transactions, payment systems, intellectual property rights, and other barriers. A comparison of the regulatory areas covered by the DTRI and Digital STRI indices is presented in Table 1.

In global rankings of digital openness, developed countries tend to rank highest, while developing countries rank lowest. According to the DTRI, the leaders in terms of regulatory openness are New Zealand, Iceland, Norway, Ireland, and Hong Kong—small countries heavily dependent on global markets. The leaders in terms of regulatory openness in digital trade in services, according to the Digital STRI index, are Costa Rica, Switzerland, Norway, Luxembourg, and the Republic of Korea.

Among the most closed countries in digital trade according to the Digital STRI index are China, Russia, India, Indonesia, and Vietnam. The countries with the most restrictions, according to the DTRI index, are China, Indonesia, Brazil, Saudi Arabia, and Russia. It is noteworthy that China, Russia, and Indonesia rank among the top countries with the most restrictive digital trade regulations in both rankings.

Table 1

COMPARISON OF REGULATORY AREAS COVERED BY THE DTRI AND DIGITAL STRI INDICES

Scope of regulation	DTRI (ECIPE)	Digital STRI (OECD)
Tariff Policy	+	–
Tax Policy	+	+
Government Procurement	+	–
Investments	+	–
Intellectual Property Rights	+	+
Competition Policy	+	+
Movement of Natural Persons	+	–
Data Transfer and Storage Policy	+	+
Information Intermediary Liability	+	+
Content Access Regulation	+	+
Quantitative Trade Restrictions	+	–
Standards	+	+
Licensing and Registration Requirements	+	+
Restrictions on Delivery Services	+	–

Source: compiled by the author based on data from [3, 4, 16]

Let’s examine the key areas of regulation of international digital trade, based on the measures applied by various countries.

1. Tariff Policy. Over the past decades, tariffs on information technology goods (IT goods) and their components have been reduced by many countries under the 1996 WTO Information Technology Agreement (ITA) and its 2015 expanded version (ITA-2) [9].

The highest tariffs and the greatest number of trade protection measures against IT goods and components are applied in some countries in Latin America and Asia (Argentina, Brazil, Pakistan, and India). For example, in Argentina, Brazil, and Pakistan, average most-favored-nation (MFN) rates on IT goods exceed 10–13 %, with tariff peaks for certain goods reaching 30–35 %. However, only a small number of countries (Hong Kong, Norway, Singapore, and Switzerland) do not impose import duties on digital products.

Since 1998, WTO member countries have applied a temporary moratorium on tariffs on international electronic data transmission, which is renewed every two years [18]. Some free trade agreements, such as certain bilateral agreements involving the EU, the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), and the United States-Mexico-Canada Agreement (USMCA), contain moratorium provisions without any time limit. Due to the differences in the parties’ positions, the introduction of a permanent moratorium at the WTO level currently seems unlikely, but a plurilateral agreement banning digital tariffs involving interested countries is possible.

2. Taxation. A recent trend has been a shift by governments from taxing businesses based on the location of the company's registered office to taxing them based on the location of the buyer of the goods or services.6 This is particularly relevant for digital companies, which can provide services anywhere in the world without requiring a physical presence.

Taxation of digital services (including electronic content) is common in both developed and developing countries and is implemented primarily in the form of indirect consumption taxes — value-added tax (VAT) or sales tax. The lowest VAT rate (5 %) is applied in Taiwan and the Gulf countries (UAE, Bahrain, Saudi Arabia); high VAT on electronic services is levied, for example, in Norway (25 %) and Iceland (22.5 %) [17].

It should be noted that these significant differences in tax rates create additional barriers to cross-border trade. The lack of harmonization of national tax laws across individual countries can place the greatest burden on micro, small, and medium-sized enterprises. Best practices in regulating digital commerce from a tax perspective include allowing non-resident companies to register with the tax authorities of the country importing their digital services and file their tax returns online. This option is available in Italy, France, Korea, Singapore, Taiwan, Argentina, Mexico, the United States, Canada, and India, but not in other countries.

3. Data and privacy protection. Companies engaged in digital commerce rely heavily on access to ancillary services and data. Countries' approaches to ensuring the protection of personal data vary significantly.

National approaches to regulating the storage, processing, and cross-border transfer of information can be divided into two groups:

• Maintaining the leading role of the state in matters of personal data protection and its cross-border transfer, with the possibility of applying localization policies based on national interests (e.g., China, Vietnam, Indonesia, India, Brazil, Malaysia, Brunei).

• Liberalization of this area, which implies the abolition of requirements for the localization of personal data and increased corporate responsibility for ensuring the secure storage of clients' personal data (primarily OECD countries). These countries establish high common standards for ensuring the privacy of personal data, with the possibility of restricting the transfer of «sensitive» data (medical and banking data) in some cases.

One country that uses the second approach is the United States, where cross-border data movement can be freely transferred to all countries without the need to obtain the consent of the data subject (a requirement typical for most countries worldwide). However, the United States has recorded the largest fines for companies that violate general legal requirements for data storage or use. Thus, the United States (unlike the EU) uses the principle of ex-post regulation, placing full responsibility for ensuring the protection of personal data on businesses.

Data localization requirements do not directly impede trade, as they are applied for national security purposes. However, localization affects any business that uses the internet for production, delivery, and receipt of payments, as well as payroll and tax payments. Localization requirements do not apply in countries such as Singapore, Australia, South Africa, and Japan. Localization restrictions applied by other countries vary significantly [17]. Some countries restrict access (by blocking or removing content) to certain websites and content for reasons of national security and public order (Turkey, Canada, China, Malaysia, Japan).

Another data restriction affecting cross-border digital commerce is the requirement for local content in broadcast audiovisual and television products, as well as the promotion of audiovisual services from local providers. Many European countries apply local content and promotion requirements.

4. Licensing and Registration. In most countries, conducting digital commerce activities does not require any kind of permit from government authorities. However, in a number of countries, a license is required, and this requirement can act as a barrier for individual companies. This may be a standard trade license, which must be obtained by a manufacturer or supplier engaged in e-commerce (required in the Czech Republic, India, and Indonesia), a special e-commerce license (valid in Italy), or a license for specialized e-commerce activities (China) [17].

5. Requirements for Ensuring Local (Commercial) Presence. The most stringent regulation in the area of local presence is the requirement for all companies to have a postal address in the country—as, for example, is established by the Joint Stock Companies Act in Indonesia for all limited liability companies. In addition, this country has a commercial presence requirement for all exporters and importers—this requirement is the basis for obtaining the relevant permit from government authorities. To conduct online trading in China, you must establish a company or open a store in the country. An alternative is to use a local intermediary — a Chinese e-commerce platform.

Another example of local presence regulation is the duration of service provision. For example, in Portugal, only a company with a commercial presence in an EU member state can provide services for a period longer than one year. In this case, a permanent establishment in Portugal is required [17].

Registering a website with a national domain plays a crucial role in e-commerce. Therefore, requirements for citizenship or residency, and for companies, registration (legal postal address) to obtain a national domain name (DNS), are considered the most stringent, as they create additional costs for foreign service providers. Such requirements exist in Vietnam, Indonesia, Japan, Switzerland (for «.swiss» domain names), Malaysia, and South Korea. Registration of a «.eu» domain name requires localization within the EU (registered office/place of business/establishment, or place of residence in the EU). However, the rules for registering national domain names vary among EU countries.

6. Public Procurement. Regulation of access to public procurement most often involves sector-specific measures, including digital products and services. For example, in the US, only domestic companies and US partners under trade agreements are generally allowed to participate in public procurement. Countries' approaches to access to public procurement in specific service sectors or for specific products vary significantly.

7. Online Advertising Regulation. In most countries, online advertising regulation is based on the same principles and requirements as e-commerce and the advertising industry as a whole. Restrictions typically prohibit misleading advertising practices, unfair, immoral, aggressive, and offensive advertising. Comparative advertising is permitted as long as the advertiser does not violate the rights of others or applicable laws.

Additional restrictions in online advertising are found only in a small number of countries and most often take the form of barriers to the presence of foreign participants in the advertising industry as a whole.

8. Intellectual Property Rights and Privacy. In most countries, the liability of information intermediaries for infringement of exclusive and other copyrights is limited. For example, in Australia, internet service providers must remove access to content that infringes IP rights upon request from an interested party. In the United States, infringement of exclusive and other copyrights by intermediaries is considered aiding and abetting. In accordance with the updated Consumer Protection Law in the People's Republic of China, the liability of marketplaces and online platforms where goods are sold is being established in e-commerce.

The protection of confidential information (including trade secrets, company know-how, and employee personal data) is generally ensured by various regulations in the areas of intellectual property, competition, or commercial activity.

The absence of legislation directly protecting confidential information can act as a barrier to e-commerce.

9. Other regulatory aspects. Barriers to investment in digital commerce include the ban on foreign-invested companies participating in online publishing in China and the ban on foreign investment in the inventory-based e-commerce model in India [17].

Due to the digital transformation of the economy and business, and the resulting network effects, gaps in digital commerce regulation may create opportunities for digital companies to abuse their dominant market position and violate competition rules.

Discussion. The experience of foreign countries shows that the digitalization of international trade is developing simultaneously in a wide range of areas and cannot be achieved by a limited number of companies, even if they are endowed with special powers and resources. Therefore, the business sector with a strong entrepreneurial and innovative approach should play a key role in the digitalization of international trade, while the state should create the infrastructure and conditions for private initiative.

The state can stimulate the digitalization of economic processes through the following actions: 1) acting as an organizer of technological platforms that unite various organizations, or as a regulator, directly establishing requirements for the use of certain technological solutions; 2) improving the existing regulatory framework governing the development of digitalization of foreign trade; 3) developing the «Electronic Government» system and a list of government services provided electronically; 4) stimulating and encouraging the implementation of information systems and electronic services, and introducing tax incentives for the development of online commerce; 5) training the necessary number of IT specialists and programmers, as well as qualified users; 6) ensuring security against cyber threats. 7) Expand international cooperation and create favorable conditions for the influx and adoption of advanced information technologies.

Conclusions. Thus, differences in countries' approaches to regulating digital trade at the national level create additional administrative and transaction costs for businesses, hindering the dissemination and adoption of digital technologies. Therefore, the creation of appropriate instruments for regulating digital trade, including rules developed at the global level with the participation of international organizations, is becoming an increasingly important issue today. The author believes that the development of a mechanism for state regulation of the digitalization of international trade at the national and global levels is an appropriate area for further research.

Література

1. Baldwin R. E. (2016). The great convergence: information technology and the new globalization. Cambridge, MA: The Belknap press of Harvard university press, 344 p. https://ru.scribd.com/document/476775536/The-Great-Convergence-pdf
2. Casalini, F., J. López González and E. Moïsé (2019-01-21), «Approaches to market openness in the digital age», OECD Trade Policy Papers, No. 219, OECD Publishing, Paris. http://dx.doi.org/10.1787/818a7498-en
3. Digital Services Trade Restrictiveness Index Regulatory Database. URL: https://qdd.oecd.org/subject.aspx?Subject=STRI_DIGITAL
4. Digital Trade Estimates Project. URL: https://ecipe.org/dte/
5. Fefer R. F., Akhtar S. I. and Morrison W. M. (2018). Digital trade and U.S. trade policy. US congressional research service report, May 11. 39 p. https://www.congress.gov/crs-product/R44565
6. Kearney A. T. (2019). On thin ice: Global economic outlook 2019−2023. Research report. Global business policy council, January. https://www.kearney.com/service/global-business-policy-council/article/-/insights/on-thin-ice
7. Kerber, Wolfgang; Schweitzer, Heike (2017) : Interoperability in the digital economy, MAGKS Joint Discussion Paper Series in Economics, No. 12-2017, Philipps-University Marburg, School of Business and Economics, Marburg. https://www.econstor.eu/bitstream/10419/162658/1/880542403.pdf
8. López González, J. and J. Ferencz (2018), «Digital Trade and Market Openness», OECD Trade Policy Papers, No. 217, OECD Publishing, Paris. http://dx.doi.org/10.1787/1bd89c9a-en
9. Makiyama H.-L., Narayanan B. The Economic Losses from Ending the WTO Moratorium on Electronic Transmissions // ECIPE Policy Brief. 3/2019. https://ecipe.org/wp-content/uploads/2019/08/ECI_19_PolicyBrief_3_2019_LY04.pdf
10. Meltzer, Joshua P, A WTO Reform Agenda: Data Flows and International Regulatory Cooperation (September 17, 2019). Global Economy & Development WP 130 (2019). http://dx.doi.org/10.2139/ssrn.3595188
11. Meltzer, Joshua P. 2016. Maximizing the Opportunities of the Internet for International Trade. E15 Expert Group on the Digital Economy — Policy Options Paper. E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and WEF. https://www3.weforum.org/docs/E15/WEF_Digital_Trade_report_2015_1401.pdf
12. Palfrey, J., & Gasser, U. (2012). Interop: The Promise and Perils of Highly Interconnected Systems. Basic Books. https://www.scirp.org/reference/referencespapers?referenceid=3765322
13. Patterns of Trade Restrictiveness in Online Platforms: A First Look / ECIPE. 2019. 33 p. URL: https://ecipe.org/wp-content/uploads/2019/01/Patterns-of-Trade-Restrictivenessin-Online-Platforms-A-first-look-final.pdf
14. Romalis, J. Market Access, Openness and Growth (April 2007). NBER Working Paper No. w13048. https://ssrn.com/abstract=986898
15. Summary of Adoption of E-Commerce Legislation Worldwide. URL: https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4DLegislation/eCom-Global-Legislation.aspx
16. The OECD Digital Services Trade Restrictiveness Index. OECD. https://www.oecd.org/en/topics/services-trade-restrictiveness-index.html
17. Trade in Services Data by Mode of Supply (TISMOS) / WTO. 2025. URL: https://www.wto.org/english/res_e/statis_e/trade_datasets_e.htm
18. WTO Joint Initiative on E-Commerce State of Play. July 16, 2024. IISD. https://trade.ec.europa.eu/doclib/docs/2019/january/tradoc_157643.pdf

19. Wu, Mark (2017). Digital trade-related provisions in regional trade agreements : existing models and lessons for the multilateral trade system. Geneva, Switzerland : ICTSD. https://savearchive.zbw.eu/bitstream/11159/1643/1/rta_exchange-digital_trade-mark_wu-final-1.pdf

References

1. Baldwin R. E. (2016). The great convergence: information technology and the new globalization. Cambridge, MA: The Belknap press of Harvard university press, 344 p. https://ru.scribd.com/document/476775536/The-Great-Convergence-pdf

2. Casalini, F., J. López González and E. Moïsé (2019-01-21), «Approaches to market openness in the digital age», OECD Trade Policy Papers, No. 219, OECD Publishing, Paris. http://dx.doi.org/10.1787/818a7498-en

3. Digital Services Trade Restrictiveness Index Regulatory Database. URL: https://qdd.oecd.org/subject.aspx?Subject=STRI_DIGITAL

4. Digital Trade Estimates Project. URL: https://ecipe.org/dte/

5. Fefer R. F., Akhtar S. I. and Morrison W. M. (2018). Digital trade and U.S. trade policy. US congressional research service report, May 11. 39 p. https://www.congress.gov/crs-product/R44565

6. Kearney A. T. (2019). On thin ice: Global economic outlook 2019−2023. Research report. Global business policy council, January. https://www.kearney.com/service/global-business-policy-council/article/-/insights/on-thin-ice

7. Kerber, Wolfgang; Schweitzer, Heike (2017) : Interoperability in the digital economy, MAGKS Joint Discussion Paper Series in Economics, No. 12-2017, Philipps-University Marburg, School of Business and Economics, Marburg. https://www.econstor.eu/bitstream/10419/162658/1/880542403.pdf

8. López González, J. and J. Ferencz (2018), «Digital Trade and Market Openness», OECD Trade Policy Papers, No. 217, OECD Publishing, Paris. http://dx.doi.org/10.1787/1bd89c9a-en

9. Makiyama H.-L., Narayanan B. The Economic Losses from Ending the WTO Moratorium on Electronic Transmissions // ECIPE Policy Brief. 3/2019. https://ecipe.org/wp-content/uploads/2019/08/ECI_19_PolicyBrief_3_2019_LY04.pdf

10. Meltzer, Joshua P, A WTO Reform Agenda: Data Flows and International Regulatory Cooperation (September 17, 2019). Global Economy & Development WP 130 (2019). http://dx.doi.org/10.2139/ssrn.3595188

11. Meltzer, Joshua P. 2016. Maximizing the Opportunities of the Internet for International Trade. E15 Expert Group on the Digital Economy — Policy Options Paper. E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and WEF. https://www3.weforum.org/docs/E15/WEF_Digital_Trade_report_2015_1401.pdf

12. Palfrey, J., & Gasser, U. (2012). Interop: The Promise and Perils of Highly Interconnected Systems. Basic Books. https://www.scirp.org/reference/referencespapers?referenceid=3765322

13. Patterns of Trade Restrictiveness in Online Platforms: A First Look / ECIPE. 2019. 33 p. URL: https://ecipe.org/wp-content/uploads/2019/01/Patterns-of-Trade-Restrictivenessin-Online-Platforms-A-first-look-final.pdf

14. Romalis, J. Market Access, Openness and Growth (April 2007). NBER Working Paper No. w13048. https://ssrn.com/abstract=986898

15. Summary of Adoption of E-Commerce Legislation Worldwide. URL: https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4DLegislation/eCom-Global-Legislation.aspx

16. The OECD Digital Services Trade Restrictiveness Index. OECD. https://www.oecd.org/en/topics/services-trade-restrictiveness-index.html

17. Trade in Services Data by Mode of Supply (TISMOS) / WTO. 2025. URL: https://www.wto.org/english/res_e/statis_e/trade_datasets_e.htm
18. WTO Joint Initiative on E-Commerce State of Play. July 16, 2024. IISD. https://trade.ec.europa.eu/doclib/docs/2019/january/tradoc_157643.pdf
19. Wu, Mark (2017). Digital trade-related provisions in regional trade agreements : existing models and lessons for the multilateral trade system. Geneva, Switzerland : ICTSD. https://savearchive.zbw.eu/bitstream/11159/1643/1/rta_exchange-digital_trade-mark_wu-final-1.pdf

Стаття надійшла 09.09.2025; прийнята до друку 02.10.2025 року

DOI 10.33111/vz_kneu.41.25.04.06.040.046
УДК 005; 005.52; 005.334; 658; 004.8; 519.8.

Дворник Олексій Вячеславович
здобувач третього (освітньо-наукового) рівня вищої освіти
Київський національний економічний університет імені Вадима Гетьмана
ORCID ID: 0009-0001-8453-4186

Гарафонова Ольга Іванівна
доктор економічних наук, професор,
Київський національний економічний університет імені Вадима Гетьмана,
e-mail: ogarafonova@ukr.net
https://orcid.org/0000-0002-4740-7057
+380503531239

МЕТОДОЛОГІЯ РАННЬОГО ВИЯВЛЕННЯ СЛАБКИХ СИГНАЛІВ ДЛЯ АДАПТИВНОГО МЕНЕДЖМЕНТУ ПІДПРИЄМСТВ

Dvornyk Oleksii
PhD student
Kyiv National Economic University named after Vadym Hetman
ORCID: 0009-0001-8453-4186

Garafonova Olga
Doctor of Economic Sciences, Professor,
Kyiv National Economic University named after Vadym Hetman,
e-mail: ogarafonova@ukr.net
ORCID: 0009-0003-5387-7455

METHODOLOGY FOR THE EARLY DETECTION OF WEAK SIGNALS FOR ADAPTIVE ENTERPRISE MANAGEMENT

Анотація. *У статті запропоновано практично орієнтовану методологію раннього виявлення слабких сигналів для систем адаптивного менеджменту підприємств у мінливому середовищі. Головна ідея полягає у створенні інтегрованого індикатора, який поєднує числові, текстові та поведінкові потоки даних у єдину систему аналітичних сигналів, що дозволяє передбачати ризики, порушення та відхилення ще до їхньої матеріалізації у ключових бізнес-процесах.*
Метою дослідження є трансформація розрізнених даних різної природи в узгоджений індикатор раннього попередження, який надає управлінцям вимірюваний часовий запас для ухвалення рішень і гнучко налаштовується під допустимий рівень управлінських помилок. Запропонована методологічна рамка базується на поєднанні інтегрального індикатора, системи «сигнальних воріт» (Signal Gates) для