

Regulatory Competition in the Digital Economy: New Forms of Protectionism

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ABSTRACT. The article examines regulatory competition in the post-industrial digital economy. It has been established that regulatory competition is realized by means of the new forms of protectionism, the neo-protectionism, the imperative of which is to stimulate social and economic development and economic growth of the country by creation of new comparative advantages in the post-industrial digital economy. The forms of manifestation of regulatory competition in the post-industrial economy include: policy to encourage and promote the development of technologies in the field of artificial intelligence (innovative neo-protectionism); discriminatory policies that restrict information and communication technologies and digital commerce (digital neo-protectionism); policy of restraint and restriction of data flows (information neo-protectionism). The phenomenon of innovative, digital and information neo-protectionism as a component of the international economic policy of the countries-leaders of their application has been revealed. Innovative neo-protectionism has been identified as a new type of protectionism that aims to increase national innovation capacity and increase exports of advanced industries by manipulating the global trade system. It has been established that digital neo-protectionism is an instrument of state intervention aimed at increase of a country's productive capacity by development of a new comparative advantages in the digital economy, which is realized through a set of stimulating (encouraging the formation and development of new sectors that will create new means of production, where new products will be produced, new services will be provided, and new business models will be promoted) and discriminatory (implementation of barriers to digital commerce, including censorship, filtering, localization and privacy regulations) measures. Information neo-protectionism has been proposed to be interpreted as a policy of restricting information flows of a commercial nature in favor of domestic companies, which reduces the ability of buyers and sellers to interact, and companies – to carry out international trade and financial transactions.

KEYWORDS: regulatory competition, neo-protectionism, post-industrial economy, digital economy, innovation.

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Introduction

At the end of the XX — beginning of the XXI century, the information sphere aggressively declared itself as the core of post-industrial society. Such a society is presented as a given in the scientific literature, which, on the one hand, characterizes developed countries and on the other hand, serves as a guide for developing countries that will transform the industrial system through the priority of science and information technology. Gradually, but steadily, traditional manufacturing sectors are under pressure from the intellectual component, which is becoming a separate segment of the productive potential of developed countries, as well as a sphere that embodies the new “intangible” wealth in conjunction with the innovation and information sector of industrial relations. The basis of the new quality of the economy is the mental activity of people, which ensures the formation of an intellectual product. It is important to emphasize that the fundamental novelty of the post-industrial stage is due to the use of information, innovation and knowledge as a separate production set in the process of creation of gross domestic product.

Like any other concept, the “new economy” can be considered in a broad and narrow sense. From the point of view of interpretation of the new (or information) economy in a broad sense, we are talking about ensuring economic growth through the development of information and telecommunications technologies (ICT). In a narrow sense, the new economy emerges as a set of areas that, through ICT, contribute to the production of software and infrastructure related to the maintenance of relevant equipment, hardware and components and spare parts, as well as communication means. In the literature, the concept of innovative economy is often identical to the concept of “knowledge-based economy” or “knowledge driven economy”.

D. Bell, M. Young, O. Toffler, P. Drucker and others are convinced that the agrarian and industrial periods are being replaced by the formation of signs of new post-industrial development of mankind due to the knowledge economy. According to the authors, the essential difference between industrial and post-industrial types of social development is that the latter is possible when the growth of wealth depends on intangible assets, i.e. on knowledge⁴.

Thus, the innovative economy, based on the development, implementation and use of the latest achievements, is a feature of the modern economy, which provides a qualitatively different management

⁴ *Sedlukho O.V.* Formation of an innovative economy as an integral element of the development of national and world economies (rus. Formirovanie innovatsionnoy ekonomiki kak neot'emlemyiy element razvitiya natsionalnoy i mirovoy ekonomik). URL: <https://rep.polessu.by/bitstream/123456789/1366/1/40.pdf>

mechanism. That is, if at the micro level innovations are a modern feature of firms and companies that determine the level of economic development, the material prerequisite for reducing costs, increasing production, quality and competitiveness of products, at the macro level they characterize the transition from extensive (resource) type of economic development to intensive economic development.

In today's world, innovation is a central driver of growth. As a result, more and more countries are striving to become innovative leaders. As the global race for innovative leadership intensifies, many countries are turning to regulatory competition based on innovative neo-protectionism. Such policies often become a variation of the “destroy your neighbor” policy⁵, which consists in replacement of imports with domestically produced products or unfairly promotion of the export of high-tech goods and services, including measures such as forced domestic production, forced technology transfer and theft of intellectual property.

The digital space, which by definition cannot have a centralized government and international standards and policies on access and use do not apply to it, is changing the nature of the Internet.

Although countries are increasingly trying to subordinate the Internet in order to achieve national strategic goals, the digital space makes it impossible to use the expansionist methods of the nineteenth century, which involve the struggle for already occupied niches in the technology market, instead offering the benefits of its expansion.

On the one hand, digital markets and related network effects contribute to market concentration. On the other hand, end users can receive digital services simultaneously through several channels. This combination of network effects and competition gives dynamism to the digital economy, which is fundamentally different from the traditional economy and radically modifies the nature of competition.

All markets are based on institutional principles — “rules of the game” of their own kind that determine them. Therefore, the foundations are laid for the formation of the so-called “market of laws” and “market of regulations”. There is a tendency to view competition as a neutral and technical process that serves no purpose other than the goal of efficiency. Since “efficiency” should be understood in terms of maximizing public welfare or, in certain alternative terms, the wealth of market participants, this is a goal that is likely to provoke general

⁵ Reznikova N.V. International cooperation in the field of economic policy: the problem of preserving sovereignty and analysis of potential benefits (ukr. Mizhnarodne spivrobitnytstvo v sferi ekonomichnoi polityky: problema zberezhenia suverenitetu ta analiz potentsiinykh vyhod) / N.V. Reznikova // *Actual problems of international affairs* (ukr. Aktualni problemy mizhnarodnykh vidnosyn), Vol. 113 (Part II). — 2013.— pp.149—159. URL: http://scholar.googleusercontent.com/scholar?q=cache:%20BR6fIH6vZqsJ:scholar.google.com/&hl=ru&as_sdt=0,5 [In Ukrainian].

approval. On the contrary, legal norms, and in particular legislative ones, are considered to contribute to the achievement of political goals, which, in essence, provide for the distributive effects of the implementation of the latter, and therefore can probably be challenged and recognized as biased. But if the markets themselves are “institutionalized” platforms for meeting the requirements of so-called “customers” who cannot interact in the absence of certain regulations that would coordinate such interactions, they can be accused of bias and to question their ability to serve goals and values, the significance of which would be reduced to an all-encompassing logic of well-being or to maximization of public welfare.

Regulatory competition by this logic appears as a process of organizing a market mechanism, the results of which critically depend on the way in which the rules of the game are developed. At the same time, the first two goals, defined by theory, namely control over the monopoly power of the regulator and the choice of the optimal “regulatory menu”, in essence, are simply the means by which the third goal of meeting the needs of the consumer is met. The idea of regulatory competition is not new, but it was first formalized in the modern welfare economy in the mid-1950s on the production of local public goods⁶.

Forms of regulatory competition in the post-industrial economy

Regulatory competition in the post-industrial economy is realized by means of neo-protectionism, which we define as a set of principles (stability, hierarchy, adaptability, complementarity, subsidiarity, balance, legitimacy), instruments (taxes, government spending, transfers, discount rate, reserve requirements, currency interventions, money supply control, exchange rate) and methods (administrative regulations, including bans, quotas, licensing, contingencies, customs regulations, technical and phytosanitary norms and safety rules, voluntary self-restraint, anti-dumping measures) of the regulatory policy of the state in the field of international trade, international movement of capital and foreign investment, as well as international monetary, financial and credit relations, the imperative of which is to stimulate socio-economic development and economic growth by creation of conditions for increasing economic activity of all economic entities, as well as ensuring the competitiveness of domestic producers in domestic and foreign markets by increasing their productivity, and thus —

⁶ Panchenko, V. From Protectionism to Neo-Protectionism: New Dimensions of Liberal Regulation / Volodymyr Panchenko, Nataliia Reznikova // *International Economic Policy*. — 2017. — No.2(27). — pp.95-117.

promoting the growth of innovation and manufacturability of their products⁷.

As globalization became one of the central scientific problems of international political economy in the 1990s, many scholars have focused on the so-called Delaware effect, which effectively means that increasing economic integration will reduce the pressure on regulatory standards. It was assumed that due to the mobility of capital and competition from imports, developed countries would have to move towards liberalization to strengthen their international competitiveness. Recent studies of globalization have criticized the Delaware effect hypothesis. Instead, more and more scholars argue that globalization and regulatory competition actually raise standards^{8,9,10}, and strict regulations sometimes benefit domestic producers in large solvent markets if they try to gain a pioneering advantage over others by introducing stronger standards. Thus, domestic producers in certain countries are able to lobby for higher standards if they can be seen as barriers to entry for foreign businesses. Other countries are able to follow their example, resorting to a competitive upward race (a policy known in the scientific literature as the “California effect”).

Despite all attempts to explain the phenomenon of national regulatory diversity, no empirically validated theory has yet identified which conditions and mechanisms lead to a choice of a “downward race” policy that leads to a weakening of standards and which conditions allow countries to pursue their national interests in global regulatory rules. However, it is undeniable that the success of finding new comparative advantages, as a way to gain competitiveness in the post-industrial digital economy, will be accompanied by competition of relevant regulations and standards that will determine the success of new technologies in artificial intelligence (AI); the process when the boundaries between the physical, digital and biological spheres are blurred, which is consolidated in the concept of “Industry 4.0”¹¹.

⁷ Reznikova N., Panchenko V.G., Bulatova O.V. The policy of economic nationalism: from origins to new variations of economic patriotism / N. Reznikova, V. Panchenko, O. Bulatova / *Baltic journal of economic studies*. — 2018. — Vol. 4. — pp. 274-281.

⁸ Garcia-Johnson R. Exporting Environmentalism: US Multinational Chemical Corporations in Brazil and Mexico / R. Garcia-Johnson. — Cambridge: MIT Press, 2000. — 310 p.

⁹ Vogel D. National Regulations in a Global Economy / D. Vogel. — 2002. — URL: <https://www.semanticscholar.org/paper/Globalization-and-the-Dynamics-of-Regulatory-Change-Williams/853afcc39a60730e93fa71a350f34b754c6e0a52UCIAS>

¹⁰ Wheeler D. Racing to the Bottom? Foreign Investment and Air Quality in Developing Countries / D. Wheeler. — Washington D.C.: Development Research Group, World Bank, 2000. — URL: https://openknowledge.worldbank.org/bitstream/handle/10986/19732/multi_page.pdf?sequence=1&isAllowed=y

¹¹ Reznikova, N.V. "Industry 4.0" in the focus of state policy to stimulate innovation development / N.V. Reznikova // *International Relations Series "Economic Sciences"* (ukr. Mizhnarodni vidnosyny, Seriiia "Ekonomichni nauky"), 2019. — URL: http://journals.iir.kiev.ua/index.php/ec_n/article/view/3801 [In Ukrainian].

If the digital economy is understood as an economic activity in which the key factor of production is data in digital form, processing large data volumes and the use of the analysis results, compared to traditional forms of management, allows to significantly increase the efficiency of various types of production, technologies, equipment, storage, sales, delivery of goods and services, then regulatory competition will be manifested in three areas — innovation, information and digital.

Classifying numerous types of regulation, Knut B. distinguishes three types of them¹². Firstly, according to the author, there is a very limited number of regulations that are specifically designed to promote innovative activity. The most relevant examples are legislation on the protection of intellectual property rights, especially patents, and several specific market rules, such as those recently adopted by the European Commission under the Lead Market Initiative. Secondly, there are a large number of regulations that aim to achieve other specific goals and do not really promote innovation. In achieving important social goals, such as health protection, safety or the environment protection, companies often cannot comply with these standards without changing their existing product range or production processes, so they must develop at least additional or even radical new solutions, i.e. innovations in products or processes. The rules of market economy formation to ensure a certain level of competition belong to this second type of regulation. Companies are obliged to offer new innovative solutions in a competitive market environment. Finally, there are other normative legal acts that affect the strategies and activities of companies, but not necessarily affect innovation in a positive sense. This last category involves a regulatory burden on innovation, which leads to a decrease in innovation activity among private entities.

Despite the diversity of regulations and their numerous impacts on innovation, only recently it was achieved some progress in understanding the impact of regulation on companies' ability to engage in innovation. Some in-depth analyses allow for further separation and structuring, reflecting the heterogeneous impact of regulation on different types of innovations. However, overall, these studies still do not provide a clear picture of whether the negative effects of regulation outweigh the positive effects or vice versa.

There are a number of areas that form a way to regulate the impact on the innovation activities of businesses. Firstly, studies of the impact of regulations should take into account the peculiarities of the sector and relate to specific industry norms. Secondly, regulation has different

¹² *Knut B.* The impact of regulation on innovation // Chapters, in: Jakob Edler & Paul Cunningham & Abdullah Gök & Philip Shapira (ed.), *Handbook of Innovation Policy Impact*, Ch. 15, pp. 450-482, Edward Elgar Publishing, 2016.

types of impact on different types of companies. In general, with the increase in the size of the company, there are relatively fewer difficulties arising, in terms of compliance with regulations. A less clear impact can be traced depending on the age of the company. On the one hand, young companies that are trying to enter new markets or have simply entered existing markets have less experience of compliance with regulatory requirements established by regulatory authorities, on the other hand, they have more flexibility to respond to future legislative innovations. In addition, the position of companies in relation to existing technological boundaries is another category of structuring regarding the impact of regulation on innovation. Thirdly, the impact of regulation on companies can be differentiated between short- and long-term consequences. In the short term, the necessary compliance with regulatory norms creates a burden for most companies, which can adversely affect innovation. In the long term, the impact on innovation is specific depending on the specific type and complexity of regulation.

Finally, the degree of flexibility in the application of regulations has a strong influence on the propensity of companies to radical or gradual innovations. Therefore, the analysis of the impact of regulations on innovation should take into account all these aspects. We proposed hypothesis (which we aim to prove by conducting an empirical analysis of existing policies and their relevant regulatory support), according to which regulatory competition in the post-industrial economy is implemented with the help of neo-protectionism tools in three areas — innovation sphere, information sphere and digital sphere, giving signs of competition to innovation, information and digital policies, respectively, which undoubtedly affect the concepts of “national security” and “national interests”¹³.

Regulatory competition in the sphere of innovation is carried out through the use of a set of incentives and the use of tools to increase national innovation potential and exports of advanced industries (innovative neo-protectionism). In the information sphere the regulatory competition involves the use of restrictions on information flows of a commercial nature in favor of domestic companies (information neo-protectionism). And in the digital sphere it is realized by setting barriers or obstacles to digital trade while promoting the appearance of national digital companies in order to the country to gain new comparative advantages (digital neo-protectionism).

¹³ *Panchenko V.H.* Politics of economic nationalism: from origins to new variations of economic patriotism (urk. Polityka ekonomichnoho natsionalizmu: vid vytokiv do novykh variatsii ekonomichnoho patriotyzmu) / V. Panchenko, N. Reznikova // *Economy and State*. 2017. No.8 (August). – pp.4-8. URL: http://www.economy.in.ua/pdf/8_2017/3.pdf. [In Ukrainian].

Discussion of the problem of digital neo-protectionism is predicted to be recognized a key world trade issue of the XXI century. The formation of effective and hidden tools of digital neo-protectionism, which intersects with innovation and information neo-protectionism, occurs in such a way that it is difficult to separate the forms of manifestation of each of them due to the combined nature of information and innovation in the digital economy. Innovation-information-digital regulatory competition is fast becoming a source of controversy among states, as evidenced by impressive figures: since 2012, due to changes in legislation, more than 1000 lawsuits have been filed against companies that trade online¹⁴. At the same time, both USA and the EU officially recognize the need to protect data and information, but condemn the use of information and digital protectionism¹⁵. According to G. Lynch, “Digital and innovative protectionism is the new “face” of the old problem¹⁶”. The United States International Trade Commission (USITC) suggests to interpret digital protectionism as barriers or obstacles to digital commerce, including censorship, filtering, localization, and privacy regulations. Information neo-protectionism will have an unequivocally restrictive effect on international business, hindering innovation and ultimately leading to increased trade costs and, consequently, restrictions on world trade.

For a country that implements the tools of information and digital neo-protectionism, the main intention is to protect its interests and the national digital market, but the positive effects of such a step are limited to the short term, as such a country becomes excluded from information and world trade.

Therefore, regulatory competition in the post-industrial economy can take the following forms:

- I) Policies to encourage and promote the development of technologies in the field of artificial intelligence (innovative neo-protectionism);
- II) Discrimination policy that restricts ICT and digital commerce (digital neo-protectionism);
- III) Policies of restraint and restriction of data flows (information neo-protectionism).

¹⁴ *The Rise of Digital Protectionism* // Greenberg Center for Geoeconomic Studies. 2017. URL: <https://www.cfr.org/report/rise-digital-protectionism>.

¹⁵ *Yes to data protection, No to data protectionism* // Digital Europe statement 2017. URL: http://www.digitaleurope.org/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=2371&language=en-US&PortalId=0&TabId=353.

¹⁶ *Lynch G.* Digital protectionism the new face of an old problem. 2017. URL: <https://www.gs1uk.org/our-industries/news/2017/09/04/digital-protectionism-the-new-face-of-an-old-problem>.

Innovative neo-protectionism in the context of digitalization and artificial intelligence technologies development

In general, policy, aimed to increase competition, enhances incentives for companies to invest in innovative activities to avoid, at least in part, fierce competition. However, if competition becomes so strong that simulation becomes more attractive than innovative activities, as rent payments to innovators decrease significantly over time¹⁷, the positive impact of competitive pressure on innovation may change to negative according to the “U-shape between competition and innovation intensity” model¹⁸. B. Amable, L. Demmou, I. Ledezma reasonably argued such a U-dependence, based on a detailed analysis of the various innovation strategies of flagship companies that have invested more and more in innovation in the process of fierce competition in high-tech markets¹⁹. In addition, if competition rules, such as antitrust regulations and mergers and acquisitions, restrict cooperation among companies in research and development, innovation may not be initiated and it may not be possible to use additional effective tools to accelerate innovation²⁰.

From the analysis of some empirical studies of the impact of economic norms on innovation, A. Bassanini and E. Ernst found a negative correlation between the intensity of market regulation of goods and the intensity of spending on research and development in OECD countries²¹, which was confirmed by similar studies for the EU member states by scientists N. Barbosa, A.P. Faria²². Both P. Swann, who identified the importance of innovation regulations in the field of innovation policy to promote the innovation of British companies, and²³ B. Aschhoff, W. Sofka, who has conducted similar research for German

¹⁷ *Sapra, H., Subramanian A., Subramanian, K.* Corporate Governance and Innovation: Theory and Evidence, 3rd Annual Conference on Empirical Legal Studies Papers. 3rd Annual Conference on Empirical Legal Studies Papers, Chicago, May 1, 2011.

¹⁸ *Aghion, P., Blundell, R., Griffith, R., Howitt, P., Prantle, S.* The Effects of Entry on Incumbent Innovation and Productivity / *Review of Economics & Statistics*. 2009. Vol. 91 (1). – pp. 20- 32.

¹⁹ *Amable, B., Demmou, L., Ledezma, I.* Product market regulation, innovation, and distance to frontier // *Industrial and Corporate Change*, 2009. Vol.19(1). – pp. 117-159.

²⁰ *Reznikova, N.V.* Comparative and competitive advantages in international business: theoretical and methodological approaches to the search for their synthesis (ukr. Porivnialna ta konkurentna perevahy v mizhnarodnomu biznesi: teoretykometodolohichni pidkhody do poshuku yikhnoho syntezu) / N.V. Reznikova, M.Yu. Rubtsova // *International Relations. Economic Sciences Series* (ukr. Mizhnarodni vidnosyny. Seriiia “Ekonomichni nauky”). – 2016. – No. 8. – URL: http://journals.iir.kiev.ua/index.php/ec_n/article/view/3516/3188. [In Ukrainian].

²¹ Bassanini, A.; Ernst, E., 2002. Labour Market Institutions, Product Market Regulation, and Innovation: Cross Country Evidence, Economics Department Working Papers No. 316, ECO/WKP (2002). OECD, Paris.

²² *Barbosa, N., Faria, A.P.* Innovation across Europe: How important are institutional differences? *Research Policy*, 40(9). 2011. – pp. 1157-1169

²³ *Swann, P.* Do standards enable or constrain innovation? in N/A (Ed.), *The Empirical Economics of Standards*, UK Department of Trade and Industry: London. – 2005 – pp. 76-120.

companies²⁴, insists on the controversial effects of regulatory policy, emphasizing that the latter can become an insurmountable obstacle on the way to the success of innovation. In a study of the telecommunications sector in the United States, J.E. Prieger confirms the negative impact of tighter regulation on innovative services among telecommunications service providers²⁵. In addition, there are a number of studies on the impact of competition and antitrust regulation on innovation^{26, 27, 28, 29}

The feasibility of antitrust regulation is questioned when analyzing the situation in markets where innovation is a critical aspect of competition. Traditionally, economists are quite critical of the monopoly position of companies, resulting from their success, mainly based on the introduction of radical innovations. The courts also reacted sharply to such big players as Microsoft, Google and Apple. G.A. Manne and J. Wright argue that the wrong decisions made by these companies, given their scale and market share under their control, can harm both innovative companies in general and the global economy as a whole³⁰. To give their arguments persuasiveness, they present a case study that also covers Microsoft, which does not provide clear evidence that antitrust measures can be justified because public expenses will outweigh the potential positive effects of restriction of innovation through manipulation of its monopoly position.

Similar conclusions were obtained in the analysis of Google's activities³¹. Thus, the problem of the impact of antitrust regulation on innovation is that these cases are quite specific, which does not allow to draw a general conclusion on the resolution of conflicts in court, or a general assessment of the impact of antitrust regulation on innovation.

We identify innovative neo-protectionism as a new type of protectionism that aims to increase national innovation capacity and

²⁴ Aschhoff, B., Sofka, W. Innovation on demand—Can public procurement drive market success of innovations? *Research Policy*, 2009. – Vol. 38(8). – pp. 1235-1247.

²⁵ Prieger, J.E. Regulation, innovation, and the introduction of new telecommunications services // *Review of Economics and Statistics*, 2002. Vol. 84(4). – pp. 704-715.

²⁶ OECD. Demand-side innovation policies URL: <http://www.oecd.org/innovation/inno/demand-sideinnovationpolicies.htm>

²⁷ OECD // The OECD Report on Regulatory Reform URL: <https://www.oecd.org/gov/regulatory-policy/2391768.pdf>

²⁸ OECD // Regulatory Reform in Japan. URL: <https://www.oecd.org/regreform/oecdreviewofregulatoryreform-japanprogressinimplementingregulatoryreform.htm>

²⁹ OECD // Regulatory Reform in the United States URL: <https://www.oecd.org/unitedstates/2756360.pdf>

³⁰ Manne, G. A. and Wright, J. Innovation and the limits of antitrust // *Journal of Competition Law & Economics*, Vol. 6 (1)/ 2010. – pp. 153-202.

³¹ Manne, G. A., Wright, J. D. Google and the Limits of Antitrust: The Case Against the Antitrust Case Against Google. // *Harvard Journal of Law & Public Policy*. Vol. 34 (1). 2011.

increase exports of advanced industries by manipulating the global trade system³².

The World Economic Forum estimates that digitalization has a strong potential for business development and societal prosperity over the next decade and can generate additionally more than USD 30 trillion income for the global economy over the next 10 years (until 2025). Analysis of the world experience of digital transformation of industry shows that the main ideologies in this direction are concepts such as Industry 4.0, Smart Manufacturing, Digital Manufacturing, Internet of Manufacturing, Open Manufacturing^{33, 34}.

Digital strategies have been approved in the European Union – “Digital Europe 2020” (2010), Germany – “Industry 4.0”. (2011), China – “Internet Plus” (2015). About twenty approved programs in the field of digital economy and development of the Internet economy in different countries (including European Union, Germany, Great Britain, Holland, Denmark, Finland, France, Ireland, Italy, Sweden, Estonia, Brazil, Mexico, China, India, South Korea, Malaysia, Taiwan, Japan, Canada, USA, Singapore, Philippines, UAE) provide significant funding of projects that enable their implementation, as well as the use of a range of stimulating government initiatives that involve the use of tax, financial and (non) tariff incentives, and thus – make full use of the potential of regulatory competition³⁵. Governments of individual states are actively supporting the so-called “National champions” – the largest powerful production and industrial companies – if they implement development strategies in the concept of “Industry 4.0”, “Internet +” (e.g., Siemens, General Electric, SAP, Intel)^{36, 37}.

In March 2015, the international management consulting company Roland Berger published a report “Digital Transformation of Industry”³⁸, in which the example of the analysis of the economic potential of the EU demonstrated the benefits of digitalization of industry: thus, the digitalization of industry will help the EU to receive

³² Panchenko, V.H. Innovative neo-protectionism as a new tool for regulating international economic relations: new projections of neo-commercialism (ukr. Innovatsiyni neoprotektsionizm yak novyi instrument rehulivannia mizhnarodnykh ekonomichnykh vidnosyn: novi proektsii neomerkantylizmu) // *Uzhhorod Herald*, 2018. Vol. 18. Ch. 2, pp. 139-143. [In Ukrainian].

³³ The Global Competitiveness Report 2017–2018 // World Economic Forum. – 2018. URL: <https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018>.

³⁴ Introducing the digital transformation initiative / World Economic Forum. – 2015. – URL: <http://reports.weforum.org/digital-transformation/introducing-the-digital-transformation-initiative/>

³⁵ *The R&D Global Funding Forecast*. – 2017. URL: https://digital.rdmag.com/researchanddevelopment/2017_global_r_d_funding_forecast?pg=1#pg1.

³⁶ *Technology and Innovation Report 2018* // UNCTAD. – 2018. URL: https://unctad.org/en/PublicationsLibrary/tir2018_en.pdf.

³⁷ *The R&D Global Funding Forecast*. – 2017. URL: https://digital.rdmag.com/researchanddevelopment/2017_global_r_d_funding_forecast?pg=1#pg1.

³⁸ *The Digital Transformation of Industry* // Roland Berger Strategy Consultants. — Berlin, June 17th, 2015. URL: https://www.iiconsortium.org/berlin/Carsten_Rossbach_Presentation.pdf

an additional gross value added of EUR 1.25 trillion, while delays in the digitization process will result in losses of EUR 605 billion³⁹.

There are no two similar strategies among the declared ones, as each of them focuses on different aspects of AI policy. There are already the necessary regulatory mechanisms to promote the idea of new generation technologies in some countries of the world.

In Germany, for example, there is the Industrie 4.0 platform, which is a government initiative to develop high technology by 2020 and brings together several thousand companies around research, innovation, training, etc. in the field of production technology. Initiatives proposed to achieve this goal include new research centers, Franco-German research and development cooperation, funding for regional clusters, and support for small and medium-sized enterprises and startups.

The proposed plan is fully exhaustive and includes measures to attract international human resources, respond to changes in the nature of work, integrate AI into public services, increase the availability of public data and promote transparent and ethical AI. In general, the government wants the phrase “AI made in Germany” to become a globally recognized symbol of quality. It is noteworthy that there are already a number of relevant policies for the development of AI in Germany: thus, the government, in partnership with academic and industrial actors, focuses on the integration of artificial intelligence technologies into Germany's export sectors. The flagship program “Industrie 4.0” was supplemented by the “Smart services” platform, which will be based on artificial intelligence technologies. The German AI Research Center (DFKI) is a major player in this field and provides funding for research focused on the use of AI⁴⁰

France has launched “The Industry of the Future” initiative, which includes 34 initiatives aimed at various areas of the country's economy. Among other things, in 2015, during the Summit “Artificial Intelligence for Humanity”, the Strategy “For full-fledged artificial intelligence: Towards a French and European Strategy” was announced, which, among other things, stated: 1) development of an open data policy that will facilitate the introduction and application of AI in sectors where France already has the potential to achieve high levels of AI, for example in the field of health; 2) creation of a regulatory and financial basis to support the development of domestic ‘AI champions’⁴¹.

³⁹ *The Digital Transformation of Industry: How important is it? Who are the winners? What must be done now?* // Roland Berger Strategy Consultants. — Berlin, February 2015. URL: https://bdi.eu/media/user_upload/Digital_Transformation.pdf

⁴⁰ *German Research Center for Artificial Intelligence*. URL: <https://www.dfki.de/web/>

⁴¹ *The industrial future: a chance for France*. URL: <https://www.businessfrance.fr/discover-france-article-the-industrial-future-a-chance-for-france>

Denmark's Digital Growth Strategy, released in January 2018, aims to make Denmark a leader in the digital revolution in order to increase the common good of all Danes. The strategy focuses not only on advances in AI, but also on Big Data and the Internet of Things. Big Data play a significant role in the digital economy due to the positive externalities that big data analysis creates. More and more digital market players are using digital technologies to analyze big data in order to improve the quality of service provided to consumers, forecast market trends, adjust their pricing models. Denmark's strategy has three objectives: (1) to make Danish companies the best in the use of digital technologies; (2) to have the best conditions for digital business transformation; (3) to provide an environment in which every Dane has the necessary digital competition skills. In terms of funding, DKK 75 million was allocated in 2018, there is provided DKK 125 million annually until 2025, and DKK 75 million on an indefinite basis to implement the strategy's initiatives. In total, the Strategy outlines 38 new initiatives. Key aspects include the creation of a “Digital Hub Denmark” (public and private cluster for digital technologies)⁴², “SME: Digital” (coordinated scheme to support the digital transformation of small and medium-sized Danish enterprises), as well as the Technology Pact (National Digital Skills Initiative). The government has also announced initiatives to further disclose government data, experiment with a regulatory isolated software environment, and strengthen cybersecurity.

The British government initiated the “Agreement on the Development of the AI Sector” in April 2018. It is part of a broader government industrial strategy and aims to position the UK as a world leader in artificial intelligence. It is fully integrated and includes policies aimed at increasing public and private R&D, investing in science education, improvement of the digital infrastructure, development of AI human resources and leading a global dialogue on data ethics. The main aspects concern investments in the private sector from domestic and foreign technology companies in the amount of more than GBP300 million, as well as the launch of the Center for Data Ethics and Innovation.

Ten days before the publication of the AI Sector Development Agreement, the AI Special Committee on the AI of the House of Lords of the United Kingdom published a comprehensive report entitled “AI in the UK: ready, willing and able?” The report makes a number of recommendations to the government, including calls for a review of the potential monopolization of data by technology companies, to stimulate the development of new approaches to auditing datasets, and to create a

⁴² *Building Digital Frontrunners*. URL: <https://digitalhubdenmark.dk/>

growth fund for British small and medium enterprises operating in the field of AI.

To compete with the North American and Far Eastern economies, the EU needs, in particular, EUR 600-700 billion in investment in the digital economy of member states as well as non-EU countries, including Switzerland, Ukraine and the Western Balkans, but which are part of the pan-European infrastructure. These funds should be used to develop fiber-optic networks and launch fifth-generation (5G) cellular communications.

EU4 Digital program supports trade facilitation and harmonization between the EU's eastern neighbors and the EU, promoting a common framework for e-commerce, e-customs and e-logistics, and working to create digital transport corridors. The program aims to extend the benefits of the European Union's Digital Single Market to the EU's Eastern Neighborhood, support them in reducing roaming tariffs, develop high-speed broadband access to stimulate the economy and expand electronic services, harmonize digital structures in society in various areas: logistics for healthcare, cybersecurity, skills development and job creation in the digital industry. Briefly, some initiatives and government programs of European governments are presented in Table 1.

Table 1

**INITIATIVES AND GOVERNMENT PROGRAMS OF EUROPEAN GOVERNMENTS
TO PROMOTE INDUSTRY 4.0**

Country	Initiative name	Year	Initiative aim	Budget, EUR million	Results
1	2	3	4	5	6
France	Alliance pour l'Industrie du Futur	2015	Development of transportation systems, the Internet of Things, artificial intelligence, big data, supercomputers, digital trusts, healthcare systems and smart cities	10 000	Enterprises received more than 800 loans for technology development, 3,400 companies gained access to modernization of production, 18 regions were involved in the project
Germany	Plattform Industrie 4.0	2011	Development of the Internet of Things, cyberphysical systems	200	The uneven development of the provisional sectors has been reduced, research programs have been put into practice, and a platform with 150 representatives has been launched.

Continuation of Table 1

1	2	3	4	5	6
Netherlands	Smart Industry	2014	General development of modern technologies and business environment	25	16 research laboratories have been set up, each with a turnover of EUR 0.25 – 4 million.
Sweden	Produktion 2030	2013	General development of modern technologies, promoting the development of small and medium enterprises engaged in research activities	50	30 projects were financed, including 150 enterprises, a higher school was established and 50% of enterprises received funding.
Italy	Intelligent Factory Cluster (CFI)	2012	Improving technology, promoting the development of small and medium-sized businesses, research centers, universities	45	A platform for production development was created and 4 important research projects were implemented
Spain	Connected Industry 4.0	2016	Development of digital platforms, big data, joint technological projects	97.5	An innovative and research program was created in July 2016 and a project plan to support enterprises was developed.
United Kingdom	HVM Catapult (HVMC)	2012	Development of the aerospace industry, chemical industry, automotive industry, nuclear energy production and pharmaceuticals	164 million people	The results exceeded expectations by 123%, each invested euro brought 17 euros of net profit
Czech Republic	Průmysl 4.0 (Industry 4.0)	2016	Promoting the growth of companies engaged in production activities, increasing the role of trade unions, the development of new technologies	3.8	Not yet achieved

Source: concluded by the authors on the information and data^{43, 44}

⁴³ *Key lessons from national industry 4.0 policy initiatives in Europe* / European Commission. – 2017. URL: https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/DTM_Policy%20initiative%20comparison%20v1.pdf

⁴⁴ *Czech Republic: "Průmysl 4.0"* / European Commission. – 2017. URL: https://ec.europa.eu/growth/tools-databases/dem/monitor/sites/default/files/DTM_Prmysl%2040_CZ%20v1.pdf

In the process of promoting the development of digitalization, the Chinese government has adopted such documents as the National Medium Term Program for the Development of Science and Technology (2006-2020), the State Strategy for Informatization (2006-2020), the Digital Economy 2020 Program: "Action Plan for Chinese Enterprises", "Digital China" Plan (2016-2021), which implements two programs – "Made in China – 2025", the task of which is to increase productivity using digital technologies and "green" standards, and "Internet Plus" – the transformation of the industry using digital technologies, mobile Internet, computerization of all existing enterprises in People's Republic of China till 2025. The government's goal is to ensure the transition from manufacturing to innovation (from the "Made in China" brand to the "Invented and Developed in China" brand)⁴⁵. One of the consequences of the digitalization of the Chinese economy is the appearance of new jobs: for example, 11 million companies are registered on the Alibaba platform; 30 million jobs in the small and medium business sector; 13 million drivers are registered on the Didi-taxi platform (similar to Uber); IT offers 1.4 million jobs for highly qualified professionals⁴⁶.

Unlike other countries, the US government does not have a coordinated national strategy to increase investment in AI or respond to societal AI challenges. During the last months of Barack Obama's presidency, the White House laid the groundwork for US strategy in three separate reports. The first report, "Preparing for the Future of Artificial Intelligence," developed specific recommendations related to AI regulations, government R&D, automation, ethics, and equity and security. The next report, the National Strategic Plan for Artificial Intelligence Research and Development, outlined a strategic plan for state-funded R&D in AI, and the final report, Artificial Intelligence, Automation and Economics, examined the impact of automation and policy, needed to increase the benefits of AI and reduce costs. The administration of President Donald Trump has adopted a markedly different approach to AI, focused on the free market. Donald Trump's government has four goals: (1) maintaining US leadership in AI; (2) support for the American manufacturer; (3) promotion of state R&D; (4) removing barriers to innovation. To achieve these goals, a new special Artificial Intelligence Committee has been announced to advise

⁴⁵ *Reznikova, N.V.* Expansionist imperatives and determinants of international economic policy of China (ukr. Ekspansionistski imperatyvy ta determinanty mizhnarodnoi ekonomichnoi polityky KNR) / *N.V. Reznikova, R.E. Zvarvch, O.A. Ivashchenko // Effective economy* (ukr. Efektyvna ekonomika). – 2019. – No. 9. – URL: <http://www.economy.nayka.com.ua/?op=1&z=7286> [In Ukrainian].

⁴⁶ *Reznikova N.* Approaches to identifying the form of china's economic expansion in the context of global economy transnationalization: the commercial expansion case / *N. Reznikova, R. Zvarvch, O. Ivashchenko // Effective economy* (ukr. Efektyvna ekonomika). — 2019. — No. 8. — URL: <http://www.economy.nayka.com.ua/>

the White House on interagency R&D priorities in AI, as well as the need for federal partnerships with industry and society of scientists.

Manifestations of digital neo-protectionism

Digital neo-protectionism is an instrument of state intervention aimed at increase of a country's productive capacity by development of new comparative advantages in the digital economy, which is realized through a set of stimulating (encouraging the formation and development of new sectors that will create new means of production, where new products will be produced, new services will be provided, and new business models will be promoted) and discriminatory (implementation of barriers to digital commerce, including censorship, filtering, localization and privacy regulations) measures. Thus, digital neo-protectionism becomes an effective tool for maximizing the benefits of the digital economy, which means material resources to create, expand and improve the infrastructure of cyberspace through the use of the potential of cyberspace – the ability of the digital economy to influence events to benefit from them. *Digital space makes it impossible to use expansion methods of the nineteenth century*, which involve the struggle for already occupied niches in the technological market, instead offering the use of the benefits of its expansion.

Discussion of the problem of digital neo-protectionism is predicted to be recognized a key world trade issue of the XXI century. The formation of effective and hidden tools of digital neo-protectionism, which intersects with innovation and information neo-protectionism, occurs in such a way that it is difficult to separate the forms of manifestation of each of them due to the combined nature of information and innovation in the digital economy. Innovative-information-digital neo-protectionism is fast becoming a source of controversy among states, as evidenced by impressive figures: since 2012, due to changes in legislation, more than 1,000 lawsuits have been filed against companies that trade online⁴⁷.

Regulation of market entry increases barriers to companies entering a particular market. Such a strategy can be adaptive for those already operating in the market, as its adaptation helps to reduce competitive pressure and stimulate investment of resources in risky activities, providing a fairly high level of competition. However, barriers obviously make it difficult for innovative companies to enter markets, which negatively affects the overall innovation efficiency of these markets, especially if the intensity of competition is still quite low.

⁴⁷ *The Rise of Digital Protectionism* // Greenberg Center for Geoeconomic Studies. 2017. URL: <https://www.cfr.org/report/rise-digital-protectionism>

Market entry regulations as such are not being studied, but the market entry process itself has recently been analyzed⁴⁸. It is believed that the impact of market entry regulation is different for existing companies in the case of different industries. In particular, the growth of productivity and patenting of existing companies is positively correlated with the complicated process of entry of foreign firms in technologically advanced, but not in classical industries. This result is explained by the argument that the threat of technologically advanced companies to enter the market stimulates innovation throughout the industry, if it is considered high-tech, where successful innovations allow existing companies to maintain their position. In the classic sectors, the entry of another innovative company pushes away from innovation, as the expected rent for companies generally decreases.

At present, the tariffs applied to digital goods imported into China are similar to those applied in India, but higher than those applied in the vast majority of developed countries. However, despite the fact that the coverage of products by zero tariffs is relatively high (52.9%), China has tariff “peaks” of 35% for some ICT products and materials, including lithium batteries (which are fully supported by the Chinese government), electrical parts, wiring and any audiovisual devices (music players and televisions) (see Fig.1).

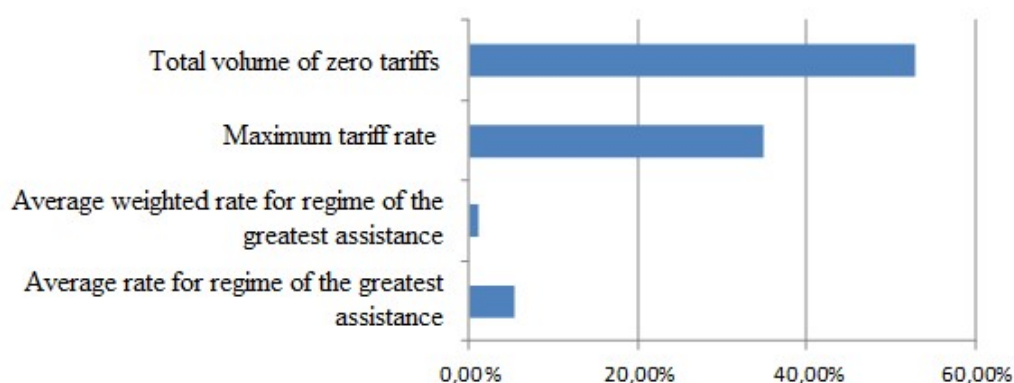


Fig. 1. Tariffs applicable to digital goods in MFN*

* MFN – Most-favoured-nation treatment

Source: UNCTAD TRAINS Tariff data

⁴⁸ Aghion P, Bergeaud A, Van Reenen J. The Impact of Regulation on Innovation. 2019. URL: https://scholar.harvard.edu/files/aghion/files/impact_of_regulation_on_innovation_dec2019.pdf

While the use of trade protection tools in the ICT sector is not common enough at this stage, China imposes anti-dumping duties on several products, including optical fibers (from the European Union, Japan, Korea, India and USA). Import licensing procedures applicable to chemicals, machines and components used by the ICT industry are also subject to customs control. As for export regulation, China has imposed a number of quantitative restrictions through export duties and quotas for rare earth metals used in electronic components.

As in many jurisdictions, China's public procurement structure contains an active "Buy Chinese" policy to support national production. Chinese government procurement measures go beyond what are considered justified security concerns and have clear commercial objectives. It is notable that as part of support for national innovation, only national businesses can apply for product accreditation in the ICT sector, which can later be considered for public procurement. In order to obtain such accreditation, the product must be manufactured by an entity that fully owns intellectual property rights in China either by creating rights or by acquiring them.

While the purpose of this policy is to encourage domestic innovation and create national champions by providing financial incentives, non-resident foreigners must appoint an officially elected Chinese for his speech as an agent in the patent application process, or pay a local joint venture to have access to the public procurement market in China. Another fiscal measure to support the innovation of Chinese innovators is the preferential corporate tax regime for high-tech firms. Chinese companies classified as high-tech pay a 15% lower corporation income tax rate compared to the set rate of 25%, provided the company is registered in China and has some part of the research and development conducted in China⁴⁹. One of the companies that benefited from the regime is Alibaba. In addition, tax incentives are offered for self-made software that reduces effective VAT payments to 3-6%.

The above measures are designed to limit foreign participation in the domestic market. However, other policy measures are focused on stimulating exports. China's Exim Bank, China Development Bank and Sinosure Bank offer their export credit and insurance schemes exclusively to Chinese companies, excluding foreign manufacturers in China. While export loans and insurance are themselves permitted by WTO rules, they can have effects that distort trade. China has not set an estimated commercial interest reference rate (CIRR) for its currency, avoiding matchings that point to subsidized loans below the base rate. In addition, interest rates are individually set for each export deal and

⁴⁹ *China-Briefing. China's Tax Incentives for High-Tech Enterprises*. August 8, 2013. URL: <http://www.china-briefing.com/news/2013/08/08/chinas-tax-incentives-for-high-tech-enterprises.html>

remain undisclosed, or local authorities allegedly take on obligations of companies⁵⁰. However, nearly half of Chinese export-import credits are classified as “products with high and new technologies” or electronics. In order foreign investment firms (whose products were held in China) get benefit from these rates, they must make sales to local partners and create a joint venture. In addition, one of the main conditions determined by the terms of the export credit is that the local content must exceed 60% of the contract value, which in fact makes export credits also requirements for local content⁵¹.

Regulatory competition in China's industrial policy has goals similar to those announced by the United States in promoting the “Buy American” policy or effectively implemented in the EU, in particular in the field of stimulating the production of consumer electronics. However, the degree of use of protective and restrictive measures taken by China in the implementation of industrial policy is unprecedented⁵².

Information neo-protectionism: instruments and consequences

Data economy is a potential-based aspect of the digital economy that carries big data analysis. According to expert estimates, the analysis of large data sets is a necessary component of digitalization of all sectors of the economy and, in combination with other advanced technologies, will allow to significantly increase GDP. Thus, in the EU, the data economy is estimated at EUR 257 billion in 2017, which amounted to 1.85% of GDP. In 2019, the EU data economy grew by 5.6% to EUR 272 billion (1.87% of GDP). It is expected that the formation of an appropriate regulatory framework for the development of the data economy will increase the market to EUR 842 billion by 2024, which will be 4.12% of EU GDP. Thus, the creation of an effective regulatory framework for the development of the data economy is an important component of building a digital economy⁵³.

We have identified the *information neo-protectionism* as a policy of restricting information flows of a commercial nature in favor of domestic companies, which reduces the ability of buyers and sellers to

⁵⁰ Lee-Makiyama C. Paper Tigers: Need for Caution and Priorities in EU Countervailing Duties. ECIPE, 2011. URL: <https://ecipe.org/publications/chasing-paper-tigers-2013-need-for-caution-and-priorities-in-eu-countervailing-duties-cvds/>

⁵¹ OECD // Chinese Export Credit Policies and Programmes, Working Party on Export Credits and Credit Guarantees, TAD/ECG, 2015. URL: [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=tad/ecg\(2018\)4&doclanguage=en](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=tad/ecg(2018)4&doclanguage=en)

⁵² *The missing trade war against China's digital protectionism*. Engadget. 2017. URL: <https://www.engadget.com/2017/09/15/china-digital-protectionism-firewall-trade/>.

⁵³ *The Digital Transformation of Industry* // Roland Berger Strategy Consultants. — Berlin, June 17th, 2015. URL: https://www.iiconsortium.org/berlin/Carsten_Rossbach_Presentation.pdf

interact, and companies – to carry out international trade and financial transactions.

The impact of information neo-protectionism will not be limited to the “new economy” (e-commerce and industries directly related to the Internet economy) but will extend to the “old economy” and all other sectors – manufacturing, energy, agriculture, etc. In the manufacturing sector, the digital component is becoming very important: for example, 3D printing relies on cross-border streams of information and research with large amounts of data⁵⁴.

Table 2

EXAMPLES OF INFORMATION AND DIGITAL NEO-PROTECTIONISM⁵⁵

Country or region	Activities
China	Introduction of 17% VAT for both foreign and domestic integrated circuits (ICs) used in the semiconductor industry. However, China reduced the tax only for companies that produced IM in China for export.
	Rampant Company has stolen US intellectual property, both physically and digitally.
	China has broken the wireless encryption standard without international cooperation to limit the access of foreign IT companies to the domestic market to give domestic companies a competitive advantage.
European Union	Introduction of a 14 percent duty on LCD displays larger than 19 inches. There was also a duty on televisions with communication functions, as well as on some types of digital cameras.
India	Foreign computer equipment manufacturers must pay a 4 percent compensation fee (CVD).
Italy	Common cases of digital information theft
Korea	Excessive use of antitrust laws to reduce the advantages of competitors from the United States. The country's leadership forced Microsoft to develop two different versions of software for Windows to provide a competitive advantage to domestic media player manufacturers.
	Use of unfair subsidies to support Hynix Semiconductor Inc. in order to strengthen competitive advantages in the market.
Russia	Piracy of both physical and digital intellectual property of US companies is very common.

Barriers to data/information flows can lead to the fragmentation of the digital economy and, consequently, to rising prices for goods and

⁵⁴ *Raja D.* Bridging the Disability Divide through Digital Technologies. 2015. URL: <http://pubdocs.worldbank.org/en/123481461249337484/WDR16-BP-Bridging-the-Disability-Divide-through-Digital-Technology-RAJA.pdf>

⁵⁵ Systematized by the authors.

services which production depends on such flows. In recent years, more and more restrictions have been introduced, which vary from country to country. The destructive impact of such barriers is predictable, while the information and communication technology (ICT) revolution itself makes it easier to circumvent trade barriers by promoting alternative (less costly) supply methods.

The main obstacles for trade liberalization between the countries are digital technologies, and Google, Facebook, Microsoft and a number of technology companies with a market capitalization of several billion dollars suffer the most from restrictions on the part of China. According to Statista, if in 2006 three of the top six companies by market capitalization belonged to the oil and gas sector (ExxonMobil, BP, Royal Dutch Shell), 1 – to the financial sector (Citigroup), 1 – was an example of a conglomerate (General Electric), and only Microsoft – the only representative of the technology sector, in 2016 five of the top six companies by market capitalization (Apple, Alphabet, Microsoft, Amazon, Facebook) belonged to the technology sector, and their value has doubled⁵⁶. At the same time, no response was taken either by the government or by American companies themselves, for which Tencent, Alibaba and Baidu are already serious competitors in the Chinese market. The main threat to the global network at present is the imitation of China by other countries and the transfer of control over information and Internet access to the state.

Restrictions on trade in services are not as clear as restrictions on goods, as services may continue to be provided but they will be of lower quality or will be supplied with interruption. However, the impact of such restrictions is obvious. For example, Google, which in 2010 controlled 40% of China's search market, was forced to leave the country, and today 80% of search queries are conducted through the Chinese system Baidu. It is the American digital giants – Google, Facebook, Amazon, Microsoft and Apple – that control the open Internet in the world, while in China, Google's counterpart is Baidu, and Tweeter's counterpart is Weibo. Due to the closed market, Chinese companies have been able to flood the domestic market in the absence of competition, and now Tencent, Baidu, Alibaba are Chinese digital giants.

Blocking Facebook, Google, Twitter, Instagram or YouTube has not only allowed Baidu, Weibo and Tencent to control the Chinese digital market, acting as powerful competitors for American companies, but also to promote innovation globally. The manifestation of regulatory

⁵⁶ *Lee-Makiyama C.* Paper Tigers: Need for Caution and Priorities in EU Countervailing Duties. ECIPE, 2011. URL: <https://ecipe.org/publications/chasing-paper-tigers-2013-need-for-caution-and-priorities-in-eu-countervailing-duties-cvds/>

competition applied by China in the information sphere includes the adoption of even stricter restrictive measures – a ban on the use of VPN and the introduction of a new law on cybersecurity. China has also introduced the concept of “Internet sovereignty” to reflect its own ideology for regulating the Internet. According to it, each country can make its own decisions about the functioning of the entire digital space in its territory. An Internet Content Provider License is required to run any site in China, and this applies to both domestic and foreign businesses. Licensees must be under Chinese jurisdiction, be valid in China, and prevent the dissemination of unacceptable content. Sina, a leading Internet content provider and owner of the Weibo microblogging platform, was stripped of its license in 2014 for allegedly distributing banned publications.

China has introduced a general foreign investment check, according to which foreign-invested companies cannot invest if they “harm China's sovereignty, its social or state interests”, “threaten national security”, or “do not meet the country's economic development goals”. Also, when a foreign investor intends to acquire a controlling stake in a domestic enterprise operating in any key industry, or if this intention affects or may affect national economic security, interested parties must first apply to the Ministry of Trade. If interested parties have not applied, but the purchase of a block of shares has affected or will affect national economic security, the Ministry of Trade may require the parties to terminate the transaction, or transfer shares or take other measures to address threats to national economic security. Up to this day, there has been no case of investment in the telecommunications and ICT sector being blocked for national security reasons, but the publication of a new cybersecurity law is a reminder that such a scenario is quite likely.

The Internet and cross-border data flows are a very specific problem of cybersecurity, which is often confused with the problem of personal data protection. China imposes large-scale horizontal and sectoral restrictions on the processing of digital information of both personal and non-personal nature. In general, China requires localization of information, i.e. companies must store any data on servers that are physically located in the country. This requirement was introduced in the 1990s, despite the fact that it was not originally legislated and de facto not recognized as mandatory. Another relatively new law, which is the result of a policy of “security and control”, finally formalizes this requirement. Under the new cybersecurity law, enacted in June 2017, any personal data of Chinese citizens and “important information” collected by “major information infrastructure operators” must be stored within China's borders. If there is a need to transfer such data abroad, the security of this operation should be assessed. The term “major

information infrastructure operators” needs a precise definition, which is another example of ambiguity that can lead to discrimination.

In addition to horizontal regulation, there are a number of burdensome sectoral provisions: personal information of citizens collected by commercial banks or medical institutions must be stored, processed and analyzed in China, it is not allowed to transfer it abroad. Services that support the operation of online cards must keep their servers in China, as well as have an official certificate. Finally, in 2016, China has set up an online taxi licensing system that requires application user data to be stored on Chinese servers. China also verifies the terms of the transfer of personal information abroad, including the consent of the data subject, as well as governmental or statutory permission, although in most cases only the consent is required.

Information control also extends to the telecommunications sector, where most operators are state-owned. Prohibition of foreign investment in Internet publishing in the “Catalog for foreign investors in 2015” relied on the same arguments; it was updated in a new set of guidelines published in March 2016, which define: what can and what cannot be published online; how providers should do business in China; foreign companies, banned from becoming content providers. These principles also provide for the storage of any online content, including texts, images, maps, games, animations, audio and video materials on the necessary technical equipment, appropriate servers and storage devices located in China. In 2017, the Cyberspace Administration of China has issued additional rules that extend the range of restrictions to news that can be distributed via Internet platforms. The new regulation requires that all services, including political, economic, military or diplomatic information, whether published on blogs, websites, forums, search systems, messengers or other platforms, should be controlled by an authorized party editorial team (PET). PET members are elected by the national or local Internet authorities, while their staff are trained and qualified under government supervision.

The goal of “public safety” is present in a number of recently adopted laws. The new 2016 anti-terrorism law requires companies to monitor user behavior to ensure public order. Internet and television providers should cooperate with security monitoring and control programs, take steps to prevent the spread of information about extremism, and report any data, that may be related to terrorism, to the authorities in a timely manner. In addition, they must keep original records of prohibited publications or messages that are quickly removed from public access. The same law requires television, Internet, and financial service providers to authenticate their customers and refuse to provide services to users who do not provide the required information or

are not verified. Another law on mobile applications or “mobile Internet applications” requires application developers to monitor online content, archive cases of violations by users, and report them to the appropriate authorities.

New laws on online services and applications complement existing laws that require Internet intermediaries to monitor user behavior on their platforms. Extended responsibilities now also apply to storage service providers through amendments to the Criminal Code, which stipulate that failure to take measures to prevent “illegal use of the Internet” equates to complicity in the commission of an Internet crime. This creates a legal basis for prosecuting developers, providers and even hosts of tools used to bypass the system.

Most of these restrictions, which are imposed in order to maintain public order, are easily identified as barriers to trade, as they discriminate against similar services that contain similar content. The only difference is that the authorities cannot control them. It is clear that domestic services or providers fall under this control, while foreign ones do not. However, control is becoming increasingly decentralized, moving from the Great Firewall to non-state actors, from censorship to intermediary liability, which extends to developers, operators and hosts, who have almost no legal certainty or confidence in the rule of law. Due to this decentralization, China has successfully avoided WTO lawsuits.

Regulatory acts regulating the protection of personal data are also an instrument of information neo-protectionism. The main problem in the context of information security is that the vast majority of legislation was created before the advent of the Internet in its modern form and therefore did not take into account the widespread commercialization of cyberspace. It is noteworthy that after the abolition of the Data Protection Directives in 2006, the introduction of the EU-USA Privacy Program and the creation of the General Data Protection Regulation, GDPR⁵⁷ have formed the basis for the protection of information and the rights of their citizens. This raised questions about the harmonization of domestic legislation by EU member states in accordance with the ruling of the European Court of Justice from 2014. This is especially true of the regulation of information protection in the UK in connection with its exit from the EU. Some governments still do not understand the mechanism for applying the adopted changes at the domestic level. Among the most high-profile cases is the US Department of Justice's requirement dated 2016 for Microsoft to provide email addresses of all users outside USA and referral of this matter to the US

⁵⁷ *General Data Protection Regulation*. URL: <https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/>

Court of Appeals. Due to the confidentiality requirements by the European legislation, the situation may end either with the fulfillment of the requirements for information protection, or Microsoft's withdrawal from the EU market, or the total suspension of information exchange between the EU and USA.

The implementation of the GDPR is facing serious problems in Europe. Thus, according to a Dell survey conducted in 2016, 97% of companies do not have a plan to use the regulations. Another way to improve data protection is to introduce ePrivacy regulations. In general, the introduction of common standards for information protection in the EU can also be seen as an instrument of industrial policy and a manifestation of neo-protectionism. Thus, the EU can impose fines of EUR 500 thousand for each case of transfer of personal information of EU citizens without the proper permission of the European Court.

Restrictions on information flows may be of a commercial nature. Such restrictions reduce the ability of buyers and sellers to interact and the ability of companies to conduct international trade and financial transactions. In many cases, these constraints are driven by the success of Internet-based companies, as governments seek to replicate their success by applying a digital version of industrial policy to emerging or developing sectors by protecting domestic Internet companies from foreign competition. These commercial restrictions on Internet activity include directing traffic to domestic companies while blocking certain sites or restricting Internet access in such a way as to force local consumers to turn to alternative sites, usually domestic companies' sites.

Such restrictions on the Internet are extremely difficult to capture and prove, as they are carried out in an arbitrary and non-transparent manner. For example, a foreign company may not be aware that access to its website has been blocked. Foreign Internet providers usually also do not have information on what criteria governments use to determine the reason for blocking a web-site. This creates the risk that accessible sites or Internet services may be blocked unexpectedly, making it difficult to conduct online business, as interrupting access to or slowing down the site pushes customers away, encouraging them to use another (usually domestic) online business. These restrictions negatively affect sales, advertising budgets, and the nature and volume of international trade. In addition, it is becoming increasingly common for governments to encourage businesses to locate data storage facilities in the country where they operate. In many cases, this increases the cost of services that depend on data flows, such as cloud services.

In addition, governments' access to data stored in the countries where the services are provided reduces the willingness of businesses

and ordinary consumers to provide personal data and use cloud services. In some cases, providers of such services leave the market, leaving the business to local companies, which may provide less efficient services, which may reduce their ability to compete in local and global markets.

Conclusions

Just as protectionist measures more than three hundred years ago became an effective way to achieve an industrial breakthrough in today's most developed countries, which actually implemented the industrial revolution, relying on the innovative sectors of the economy, now the use of information, innovation and digital neo-protectionism is intended with the same expansionary by nature intentions — the desire to control the most profitable areas of business and industries that have the potential for the most dynamic development and they are associated with the Fourth Industrial Revolution. Innovation control has the same determinant role for global dominance, so the information and digital space will become an arena for both developed and developing countries to compete, with the only difference that protection will take covert forms to maximize the use of de jure liberalized world economic relations.

The analyzed convinces that the development of normative rules of cooperation in the conditions of formation of digital space of global interaction in the foreseeable future will become almost the most actual issue of global economic management. Regulatory competition has been defined by us as the process by which legal norms are selected and abolished through competition among decentralized, rule-making structures, which may be nation-states or other political units, such as regions or localities. This process is expected to have a number of beneficial effects. As regulatory competition avoids the imposition of rules by a centralized “monopoly” regulator, this can potentially contribute to diversity and experimentation in finding effective laws. In addition, by correlation of the effectiveness of certain mechanisms for regulation of market relations, it becomes possible to identify those that contribute to maximizing public welfare and consumers in particular, who are citizens of certain jurisdictions, which these laws formulate, implementing a policy in practice. Thus, it allows to choose such a “pool” of rules that would more effectively contribute to the realization of the transformational potential of both countries and companies in their desire to gain new comparative advantages in the context of digitalization of international economic relations.

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