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INTERDEPENDENCE OF INNOVATIVE ECONOMY AND SOCIAL INEQUALITY IN THE CONDITIONS OF DIGITAL TRANSFORMATION: A GLOBALIZATION ASPECT

In the time of widespread digital transformation and innovation, economic relations are becoming more and more globalized, progressive and efficient. This is due to the automation of production and business processes, governance and various spheres of social life, accelerated development of ICT and digital technologies. The latter significantly change the market and transform the outlook of its economic agents, influence the change in behavior and thinking of buyers / clients, create a new type of business landscape based on the cluster approach, give impetus to the emergence of new business models, stimulate the production of innovations and the search for effective economic solutions, lay the foundations for sectoral, regional and national transformations. Today, more than ever before, the competitiveness and leading positions of countries in terms of economic innovation on the world map are determined by innovative and institutional structural transformations at all levels of economic aggregation. The implementation of advanced digital technologies for the purpose of increasing the economic and social well-being of mankind, modernization, and automation of production and business processes, transparency and availability of administrative services, creation of a digital space for quality life, determines the leadership in innovativeness of companies, territories (regions, agglomerations), countries, is important condition for sustainable economic development.

In the Global Innovation Index of 2023, among 132 economies of the world, the leadership belongs to the economies of European countries (Switzerland, Sweden, the Netherlands, United Kingdom) and the USA. It is noteworthy that these countries fall into the group of countries

with a high level of income, which confirms the direct relationship between the rating of innovativeness of the economy and the level of income in the country. A visualization of the spatial-geographic location of centers of innovation and digital development of the economies of individual countries of the world is presented, where the predominance of European and North American countries in the GII 2023 ranking can be traced. Established network connections and international cooperation, trust and mutual assistance, especially among the leading countries in terms of economic innovation, is what will help make the world a safe, comfortable, harmonious and balanced place for the life of every person, with a high level of economic and social well-being, environmental and information security.

Keywords: *digital transformation of the economy, digital technologies, digital divide, innovation, innovative economy, institutional structures, social inequality, enterprise, production.*

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ВЗАЄМОЗАЛЕЖНІСТЬ ІННОВАЦІЙНОСТІ ЕКОНОМІКИ ТА СОЦІАЛЬНОЇ НЕРІВНОСТІ В УМОВАХ ЦИФРОВОЇ ТРАНСФОРМАЦІЇ: ГЛОБАЛІЗАЦІЙНИЙ АСПЕКТ

У час цифрової трансформації та інноватизації, економічні відносини стають все більш глобалізованими, прогресивними і ефективними. Конкурентоспроможність і лідируючі позиції країн за інноваційністю економіки на карті світу сьогодні більше, ніж коли небуť раніше, визначаються інноваційними та інституційними структурними трансформаціями на всіх рівнях економічної агрегації. Впровадження передових цифрових технологій заради підвищення економічного і соціального добробуту людства, модернізації та автоматизації виробничих і бізнес-процесів, прозорості та доступності адміністративних послуг, створення цифрового простору для якісного життя визначають лідерство за інноваційністю компаній, територій (регіонів, агломерацій), країн є вагомим умовою сталого економічного розвитку.

У Глобальному інноваційному індексі 2023 року, серед 132 економік країн світу, лідерство належать економікам європейських країн (Швейцарії, Швеції, Нідерландам, Великій Британії) та США. Примітно, що саме ці країни потрапляють у групу країн із високим рівнем доходу, що підтверджує пряму залежність між рейтингом інноваційності економіки та рівнем доходу в країні. Представлено візуалізацію просторово-географічного розміщення осередків інноваційного та цифрового розвитку економік окремих країн світу, де простежується переважання країн Європи та Північної Америки у рейтингу GII 2023. Налагоджені мережеві зв'язки і міжнародне співробітництво, довіра та взаємодопомога, особливо серед країн-лідерів за рівнем інноваційності економіки, це те, що допоможе зробити світ безпечним, комфортним, гармонійним та збалансованим місцем для життя кожної людини, з високим рівнем економічного та соціального добробуту, екологічної та інформаційної безпеки.

Ключові слова: цифрова трансформація економіки, цифрові технології, цифровий розрив, інновації, інноваційна економіка, інституційні структури, соціальна нерівність, підприємство, виробництво.

Formulation of the problem. The last few years have been marked by several of initiatives at both the national and international levels to address the digital divide and use the opportunities of advanced digital technologies for the economic and social well-being of humanity. In this context, it is important to work on eliminating the deficit of institutional and human potential, as well as on the transformation of outdated institutional structures in order to adapt and adapt to modern conditions of life, business, education, implementation of scientific research activities, governance, which are under the strong influence of the latest technologies.

Analysis of recent research and publications. The trajectory of the economic development of advanced countries of the world, taking into account the deepening of digitalization and innovation processes, are in the field of view of many researchers, experts, politicians, and businessmen. Thus, in particular, a team of scientists from some Asian countries, W. Qinqin, S. Qalati, R. Hussain, and others [8], made an attempt to find out exactly how modern digital technologies contribute to innovation, whether they allow enterprises to produce new technologies and create new products, or optimize business pro-

cesses, whether they stimulate the development of innovative business models and whether, ultimately, improve customer service. Researchers from China C. Zhang, B. Liu, Y. Yang [12] believe that the digital economy is the main engine for the development of a country focused on the creation and spread of innovations, and a group of Indonesian scientists (L. Hakam, E. Ahman, D. Disman, H. Mulyadi, D. Hakam) [4] are convinced that promoting the innovative development of the country's economy in the digital era is of undeniable importance, because it brings changes to all aspects of human existence and social life, including various modern business models and entrepreneurial trends.

Researchers Z. Songa (China), A. Mishra (India) and S. Saeidi (Ecuador) [9] focus on the technological possibilities of the innovative economy in the era of digital changes, on the other hand, scientists from China J. Xu and W. Li [11] are concerned about the development trends of the digital economy, because it is extremely fast is developing, and this creates a serious spatial imbalance. The Italian P. Magliocca [7] and the Austrian D. Herold [5] focus their research efforts on the formation of new 'rules of behavior and play' for business representatives, taking into account the modern achievements of science and technology in the era of digital transformations. The institutional basis of formation and the modern trajectory of the development of the innovative economy in the globalized world are comprehensively investigated in her works by Ukrainian scientist N. Kraus [1; 6], K. Kraus, I. Babukh, V. Lisitsa and O. Novikova [6] describe the latest digital platforms operating on principles of clustering and strategy of innovative development. We consider it necessary to continue the scientific research of the mentioned scientists, in particular in the part of the analysis of the leading countries in terms of innovativeness of the economy in the conditions of digital changes, as well as monitoring the spatial and geographical distribution of the countries with the best innovative economy on the modern world map.

The purpose of the article is to scientifically investigate interdependence of the innovativeness of the country's economy and the level of income in it, as well as to identify the impact of the spread of modern digital technologies on increasing the welfare of society, facilitating business and achieving sustainable economic growth.

Presentation of the main research material. The development of the economies of the advanced countries of the world and the promotion of their innovation is impossible without systemic and deep digital transformations in all spheres of social life and production, at all levels of economic aggregation. This, in turn, requires the elimination of the digital divide and its consequences for labor productivity and production, economic growth and human security, including the gap in connection to the global Internet, the availability of digital devices and the openness of information data, areas of application of artificial intelligence. Solving the problematic aspects of modern digital changes in the economy and the digital divide is seen by us in strengthened close cooperation and increased investment in human and technological resources to find solutions.

In scientific works, researchers Z. Songa, A. Mishra and S. Saeidi note that 'technology plays an important role in industry and the market. However, no market mechanism can provide adequate investment in the underlying technologies to offer the level of innovation that society desires... To sustain innovation in society, governments must provide thoughtful support not only for value creation but also for value capture. If this cannot be done properly, innovation incentives will be compromised and/or the government itself will be forced to fund enabling technologies at levels not yet foreseen' [9, p. 13]. Is it really so? Let's try to find out.

The Global Innovation Index of 2023 presents a ranking of 132 economies of the world, and in 2023, for the 13th year in a row, the most innovative economy in the world is Switzerland (Fig. 1), which occupies the first place in this ranking. The second was Sweden (improving its position by one point compared to 2022), the third position for the USA (down one position), the fourth place for Great Britain, and the fifth place for Singapore (rising immediately by 2 positions compared to 2022 and became a leader among the economies of the Southeast Asia, East Asia and Oceania (SEAO) region). Israel and Canada ranked 14th and 15th in the GII 2023, respectively. From Fig. 1, we can see that for the period 2015–2023, the best positive dynamics is observed in Singapore – it rose from 12th to 5th position in the ranking of innovative economies of the world, and the Republic of Korea, which overcame the most positions during this time – rose from 21st to 10th place.

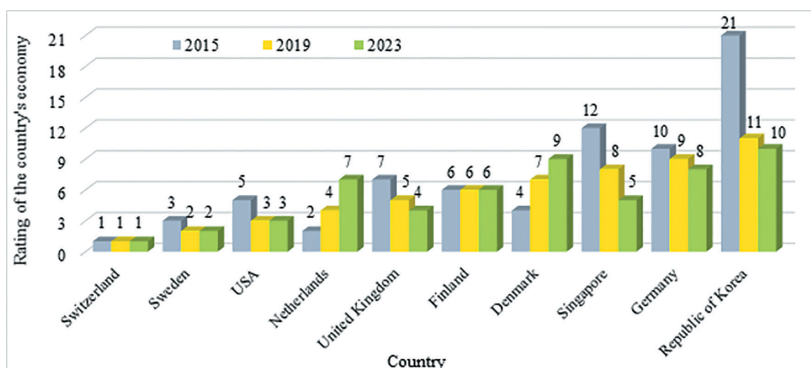


Fig. 1. Dynamics of the rating of country's innovative economy of the world (TOP-10) in 2015, 2019, 2023 according to the Global Innovation Index

Source: Built on sources [3, P. 19; 10, p. xxx; 2, P. 34]

A group of scientists from China, Pakistan, Japan and other countries, led by W. Qinqin, substantiated the dependence of the innovativeness of the country's economy on the use of digital technologies and put forward 4 hypotheses regarding the close connection between the digital economy and innovativeness: 'the degree of attention of the enterprise to the digital economy depends on its innovativeness activities...; enterprises that pay attention to the level of digital technologies improve their innovation indicators; enterprises that pay attention to the degree of digital business model improve their innovation performance...; the enterprise's attention to the level of the digital economy can change cost control, which indirectly affects its innovative efficiency' [8, Pp. 4 – 5].

At the same time, the dependence between the innovativeness of the country's economy and the income level of its citizens is no less significant. On a global scale, over the last decade there are a number of countries with average economic prosperity, which are marked by a breakthrough leap in innovativeness. Among them: Iran (up to 62nd in 2023 from 113th in 2013), Indonesia (61st GII 2023 vs. 90th GII 2013), Philippines (56th vs. 85th respectively), Vietnam (46th GII 2023 vs. 76th GII 2013), India (40th vs. 68th respectively), Turkey (39th in 2023 vs. 66th in 2013), China (12th GII 2023 vs. 35th GII 2013). It is also worth noting the countries with the best indicators of innovation growth (in order

of progression in ranks) for 2019–2023 – Saudi Arabia (48th position in GII 2023), Brazil (49th position), Mauritius (57th position), Indonesia (61 position) and Pakistan (88 position) [3, P. 49].

GI 2023 presents the three most innovative economies of the world by income groups. Switzerland, Sweden, and the USA are represented in the group of high-income countries, China, Malaysia, and Bulgaria are in the middle-income group, and India, Vietnam, and Ukraine are in the group of low-income countries (the country entered the top three for the first time in 2023), in the group of low-income countries – Rwanda, Madagascar, Togo (Fig. 2).

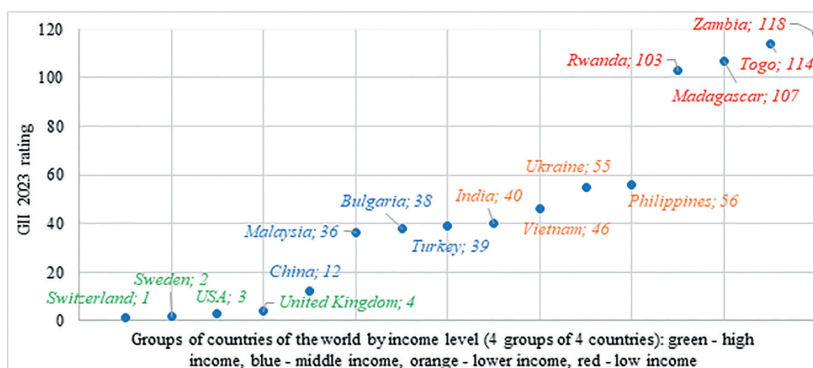


Fig. 2. Visualization of the grouping of the countries of the world according to the relationship between the rating of the innovativeness of the economy and the level of income in the country according to the GI 2023

Source: Built on sources [3, P. 53]

The development of the innovative economy today is possible with the active participation of enterprises in the use of digital technologies, which can significantly strengthen technological innovations and improve control over costs and efficiency, increase the level of income in the country. This, in turn, creates prerequisites for the emergence of new business models based on the achievements of the digital era, forms a new type of public perception and thinking, stimulates intellectual modernization and value reorientation of customers and buyers, which ultimately contributes to the sustainable development of the economy.

Scientists from China J. Xu and W. Li note that the influence of the digital economy on innovation increases together with the optimization of the industrial structure and increased urbanization [11, p. 1]. Carrying out an in-depth study of digital, innovation, and urbanization processes in China, J. Xu and W. Li draw the following conclusions: the development of the digital economy enriches innovative elements, because working with large data sets, processing, analyzing them and turning them into a valuable resource for creating innovations, makes information a new factor of production; the digital economy makes the tools of innovation digital (IoT, AI, 5G, metaverse, etc.), and the digital way of transferring information, capital, and technology increases the efficiency of innovation; the digital economy has eliminated the spatial and temporal distance of the subjects of innovation, because they are integrated by creating network connections, and this, in turn, shortens the cycle of S&R work and increases its quality, optimizes the distribution of resources and increases the efficiency of innovation, makes it possible to obtain information in real time, reduces costs for communications and data retrieval, reduces the cost of innovation; the growth of the digital economy optimized the environment for innovation, because the rapid growth of big data made new demands on economic activity, changed the concept of development, business models, industrial forms and the distribution of factors, optimized the internal and external environment of innovation [11, P. 5].

It is impossible not to agree with the generalizations made by Chinese researchers, because indeed the 21st century was marked by the deepening of scientific, technological and industrial clustering, the strengthening of the role of innovative development in order to achieve sustainable economic growth, the digital transformation of various spheres of social life, production, business, public administration, and the increasing role of urban agglomerations that become powerful centers of resource potential and innovation. In this regard, we visualize the distribution of countries with the best innovative economies by region of the world according to the version of the GII 2023 (Fig. 3), in order to have an idea of the spatial and geographical location of centers of innovation and digital development of the economy.

In Fig. 3, the predominance of the countries of North America (USA, Canada) in the geographical space in the GII 2023 rating from the point of view of innovativeness of the economy is noticeable. Lat-

in America and the Caribbean, countries such as Brazil (49th place), Chile (52nd place) and Mexico (58th place) have the best positions on the innovation index. The situation in Europe is practically unchanged, because there the first place is behind Switzerland, the second – Sweden, and the third – after Great Britain. For comparison, let's also mention the position of Ukraine – it is 55 in 2023, which considering its military, political and economic situation is quite good.

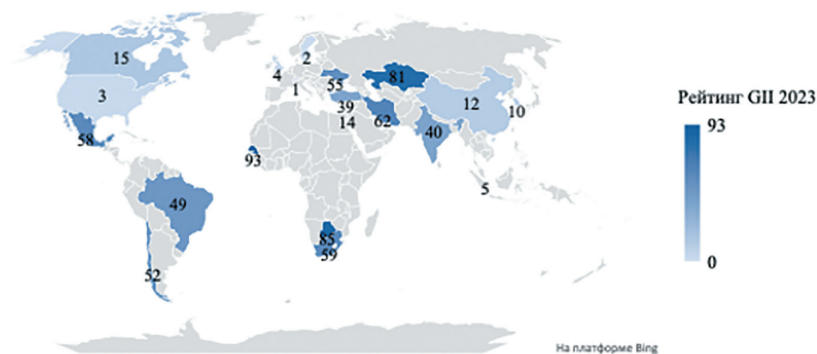


Fig. 3. Geographic distribution of countries with the best innovative economies by world region according to the GII 2023

Source: Built on sources [3, P. 19]

In Central and South Asia, the situation with the three leaders of innovative economies of countries looks like this: India – 40th position in the GII 2023 rating, Iran – 62nd place, and Kazakhstan – 81st. The region of Southeast Asia, East Asia and Oceania has its own leaders of innovative economies – Singapore (5th place in the world ranking), the Republic of Korea (10th place) and China (12th place). In North Africa and Western Asia, Israel (14th position), UAE (32nd position), Turkey (39th position) have the best indicators of economic innovation. In Africa, South Africa (59th position), Botswana (85th position) and Senegal (93rd position) became leaders in economic innovation in 2023 [3, P. 19].

It should be noted that the already mentioned countries such as China, Turkey, India, and Iran are middle-income countries, which, however, managed to achieve the greatest progress in innovation. In addition, over the past few years, and especially since the start of the

Covid-19 pandemic, Mauritius, Indonesia, Saudi Arabia, Brazil, and Pakistan have risen the most in the GII 2023 rank (in order of progression in ranks).

Thus, in the conditions of digital transformation of the economies of many countries in order to accelerate development and achieve a high level of innovation, digital technologies can act as an important accelerator and driving force, but at the same time, we should not forget about investments in education, health care, ecology, security, economic, and innovation systems to ensure benefits for all humanity. Only joint initiatives of world leaders, country governments, academic and scientific circles, businessmen, influencers and civil society can improve the quality of digital services and the effectiveness of using digital technologies to implement sustainable economic and social initiatives, such as green and circular economy, innovative economy.

Conclusions and suggestions. Focusing on deepening the use of digital technologies and modern advanced achievements of science and technology for the sake of accelerated economic growth and innovative development of the countries of the world, promoting the improvement of human well-being and overcoming social inequality, creating a competitive environment for conducting business and increasing production potential, increasing the level of environmental, cyber and information technology security, the international community of government officials, politicians, economists, businessmen, scientists, activists and all concerned people should consolidate their efforts and capabilities (scientific, financial, ideological, political, etc.) to create single effective 'rules of the game' in the digital world to reduce potential risks from digital technologies and potential harm to society. International cooperation, especially of the leading countries in terms of the level of development of the innovative economy, is necessary now to control the spread of modern digital technologies and their misuse, and to create, ultimately, a harmonious and balanced world, where a highly spiritual society for the sake of its economic well-being and increasing digital quality of life will successfully use digital technologies.

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