

UDC [339.9+330.3]/37/001.18:008

JEL Classification: M39

DOI: <https://doi.org/10.20535/2307-5651.31.2024.319012>

Yudina Nataliya

PhD in Economics, Associate Professor
(corresponding author)

ORCID ID: 0000-0002-1730-9341

National Technical University of Ukraine
"Igor Sikorsky Kyiv Polytechnic Institute"

Юдіна Н. В.

Національний технічний університет України
«Київський політехнічний інститут імені Ігоря Сікорського»**LONG-TERM IMPACT OF THE CORONAVIRUS PANDEMIC
ON THE GLOBAL ECONOMY****ДОВГОСТРОКОВИЙ ВПЛИВ ПАНДЕМІЇ КОРОНАВІРУСУ
НА ГЛОБАЛЬНУ ЕКОНОМІКУ**

Under the conditions of the sustainable development goals, the coronavirus pandemic turned into one of five reasons which defined the time state of the Doomsday Clock. In the article it was shown that the coronavirus pandemic remains to be also one of the most significant factors which may lead the global economy to the next crisis. The article analyzed and summarized integrity how the coronavirus pandemic impacted dynamically on the global economy in the long-term horizon from different points of view. On the one hand, the number of daily new cases and the dynamics of the relative variant coronavirus genome frequency per regions demonstrated the possibility of a new pandemic. It was shown that it would provoke a new global and synchronic economic crisis. This fact assumes the world economic development switching from the globalization to the national economies concentration and necessity for the companies to implement their pandemic experience to their economic activity. On the other hand, it was shown that the coronavirus pandemic and all future pandemics would turn into the catalyst of the companies' integration into information society and forming the technogenic society.

Keywords: coronavirus, pandemic, COVID-19, global economy, information society, technogenic economy, economic development concept.

В умовах актуальності концепції Глобальних Цілей Сталого Розвитку пандемія коронавірусу (COVID-2019) перетворилась в один з п'яти головних впливових причин, які визначають положення стрілок на годиннику Судного Дня. У статті було показано, що пандемія коронавірусу (COVID-2019) досі залишається бути також одним з найбільш визначальних факторів, які можуть привести глобальну економіку до наступної кризи. Стаття проаналізувала і підсумувала цілісність того, як пандемія коронавірусу (COVID-2019) вплинула у динаміці на глобальну економіку у довгостроковій перспективі з різних точок зору. З одного боку, кількість щоденних нових випадків відносної частоти варіантів генома коронавірусу у залежності від конкретного регіону демонструє високу ймовірність початку нової пандемії. Було показано, що цей факт може спровокувати нову глобальну економічну кризу, яка розпочнеться синхронно у більшості країн світу, інтегрованих у світову глобальну економіку. Це також передбачає, що концепція світового економічного розвитку продовжуватиме змінювати свій акцент з напрямку глобалізації до концентрації у межах відокремлених національних економік. Нова пандемія вимагатиме від компаній необхідності нового впровадження свого практичного досвіду, акумульованого під час пандемії коронавірусу, у їх економічну активність в умовах нової кризи у наслідок пандемії. Зокрема це стосуватиметься необхідності диверсифікації товарної пропозиції заздалегідь до прогнозованого початку наступної пандемії, що дасть змогу випередити конкурентів. З іншого боку, у статті було висвітлено, що пандемія коронавірусу і всі майбутні пандемії перетворюються на каталізатор, який прискорює інтеграцію компаній в умови інформаційного суспільства, а також сприяє формуванню техногенного суспільства. У статті було досліджено можливість перетинів різних типів суспільств між собою, що передбачає і окреслює потенційні і перспективні зони прибутку для підприємств з метою диверсифікації їх економічної діяльності. Було підкреслено, що такі тенденції можуть формувати нову концепцію економічного розвитку глобального світу у майбутньому.

Ключові слова: коронавірус, пандемія, COVID-19, глобальна економіка, інформаційне суспільство, техногенна економіка, концепція економічного розвитку.

Problem statement. Every management concept of the future development of the world has faced with various unpredicted consequences. For example, the globalization concept led to the appearance of a few number of very rich countries and simultaneously a lot of poor and underdeveloped countries and environmental destruction. The concept, been named the sustainable development concept, faced with the atypical crises of the global economy, the global economy synchronization, the chaotic period without the singular vision of the future

development of the global world. The next concept, been named the concept of the sustainable development goals, hadn't overcome the unpredicted consequences of its previous version too. In 2023 the Doomsday Clock was moved forward to 90 seconds before midnight [1] and remained without changes in 2024 [11]. It is the closest time from midnight to the manmade global catastrophe since 1947 when the Doomsday Clock was maintained. During the contemporary period there have been five reasons for this: 1) War in Ukraine; 2) the nuclear threat

from Russia, China and USA, which all modernize or expand their nuclear weapons and are increasing its financing; 3) the climate changes and evolving biological changes; 4) the rapid development of the advanced technologies of Artificial Intelligence (AI); 5) the pandemic of coronavirus and other biological threats.

The pandemic of coronavirus hasn't disappeared although information about it seems to be much less in mass media, compared, for example, with 2020. It can be explained by the appearance of more unexpected and more dangerous factors as War in Ukraine, for example. But it can not be less necessary to analyze how the pandemic of coronavirus has impacted on the global economy too in the long-term horizon because every crisis always changes the type of the economy [13]. All these challenges and there consequences will define the next concept of the global world development in the future.

Analysis of recent research and publications. Many scientists from different scientific fields are interested in possible long-term impact of the coronavirus pandemic on the global economy. Among them there are Fedyk M., Dashko I., Volk A., Demkovych T., Pokrovska N., Naseer S., Khalid S., Mishrif A. and many others. The several fields of research on the impact of the coronavirus pandemic on the global economy can be separated. The first direction analyzes changes in production and demand, in particular in some economic branches like retail, traveling, tourism, agriculture (for example, [18]). The second problem that is investigation by scientists concerns public dept that has been increasing heterogeneously in different countries, through governments' financing national economies during the coronavirus pandemic [20]. This direction also tries to resolve problems of inflation in different geographic regions. And the third area of research has emerged digital economic transformations and integration economic relations into information society, including not only changes in ecommerce, remote work, distance e-learning, but also in general understanding transformations of economic relations and changes of business models [14; 19; 21].

Despite an amount of researches of every defined directions unresolved aspects of the coronavirus pandemic impact remain because each of these directions remains to be still new enough and need to accumulate more results of dynamic study from different points of view to define and summarize integrity long-term impact of the coronavirus pandemic on the global economy.

Formulating the purposes of the article. Statement of the aim is to define the long-term impact of the coronavirus pandemic on the global economy.

Methodology. The methods of the system analysis, analysis and synthesis, the methods of the historical analogies are used in the article.

Presentation of the main research material. Until today, almost all attention has been concentrated on statistics and models to explain or predict economic changes which correspond with economic consequences of the coronavirus pandemic [2; 3]. This assumes gathering Big Data of all the economic information, making different criteria and then trying to see how these economic transformations have happened and what forces have caused these events to happen. There is also another factor and force. In fact, we must pay attention to narratives and stories, to their pervasiveness and to their

prevalence and how a story spreads. On Fig. 1 we can see the coronavirus pandemic Big Data of the number of new cases of coronavirus worldwide from January 22, 2020 to March 1, 2024.

It has to be highlighted that since April 2024 the majority of countries have stopped reporting their statistics of coronavirus cases [4; 12]. The most significant impact of decreasing of the number of new cases associates with the vaccination process in the world under the supporting by governments of the countries. And the world hopes that it will resolve this problem in the future. Nevertheless there is a forecast that in the nearest 5 years a new virus may appear like coronavirus in accordance with the dynamic of 125 years of Pandemic history [5; 14]. We can see that the coronavirus mutation frequency has been picking in some regions, in particularly some times in Africa and South America (Fig. 2). It turns into new economic threats for the global world and global economy again.

This needs companies to have to be ready for some new economic crises in the future. Most of the companies are strongly agree (14 %) or agree (47 %) that they will prepare their security programs [7]. However it is necessary to notice that new economic crises will have some innovative features which associate with the current coronavirus pandemic. For example, the vaccination and the state participation in the investment process into the medicine sphere have rebooted the medicine markets. A largely surge of rare and deadly fungi is accelerating helped by the coronavirus pandemic that assumes growth of various innovative markets of not only new treatment or vaccination but also innovative defense equipments [16]. These unusual markets can be very profitable the same way like various mobile phone protective cover markets (protective glasses, cases, camera sticks and so on) are. This market reached USD 23,22 billion in 2023 and is expected to grow to USD 33,6 billion by 2032 with its growth rate around 4,19 % [17]. The insurance market is also expected to increase in some economic branches that also provokes price growth and changes of logistics. Companies have to forecast and understand these different features well from the global point of view to prepare their businesses and their diversification more effective for the future.

On the one hand, in contrast to the previous attempts to desynchronize the global economy by different events in particular countries, the pandemic of coronavirus synchronized the global economy again (Fig. 3).

Although China and then Turkey were two of a few countries which had started to surpass other countries in the world during this crisis period. Such kind of economic outperforming of these countries was possible due to their innovative technological startup projects and quick diversification of their economies, particularly by medical goods, personal protective equipment. Turkey also used its strategic geographic location for transportation. But as we can see on Fig. 3, in the middle of 2021 these countries synchronized with all other countries again because of the stabilization of outside demand of other countries. The pandemic of coronavirus provoked the next new crises of the global economy. The subsequent synchronization of the global economy means that for every crisis country there are not any more other countries for resolving its domestic economic problems by its entering into foreign markets.

As we can see on Fig. 3, the consequences of the global economic crises through the pandemic of

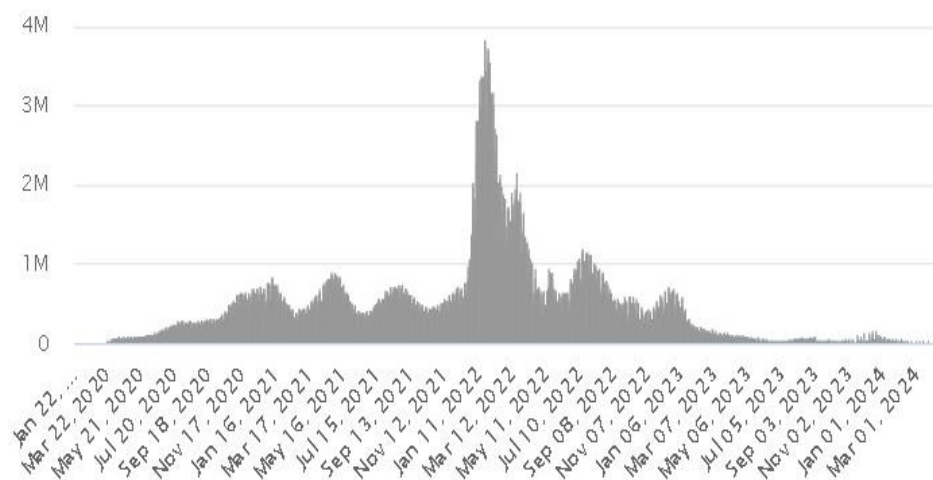


Figure 1. The number of daily new cases (7-day moving average) of coronavirus (COVID-19) worldwide from January 22, 2020 to March 1, 2024

Source: [12]

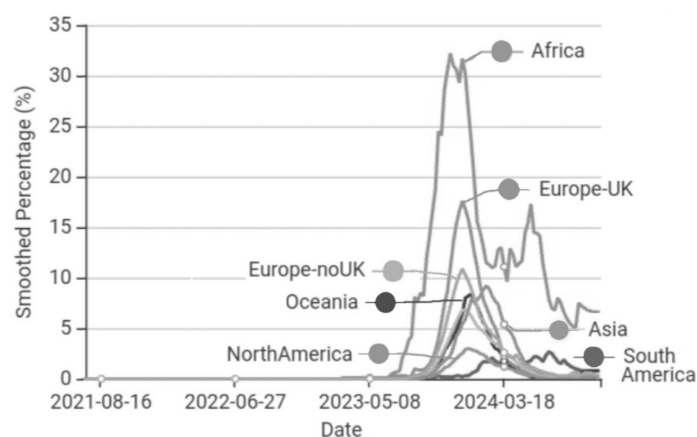


Figure 2. Relative Variant Coronavirus (SARS-CoV-2) Genome Frequency per Region (exponentially smoothed alpha=0,3)

Source: [6]

coronavirus were unpredictable for different countries in the end of 2021. War in Ukraine seemed to help resolving the problem of the global economy synchronization by the “K-recovering model” (that makes it possible for some participants of economic relationships to recover while others are under the conditions of the economic crisis [14]) for other countries after the pandemic of coronavirus. But in contrast to these expectations it hasn’t and the synchronized global economy is moving to the global economic crises again the same way as before the coronavirus pandemic beginning. Most countries in the world are still closely united and involved into the global economy. The economic problem in one country simultaneously reflects on economies of all other countries and the “K-recovering model” is not appropriate under the current conditions.

On the other hand, the pandemic of coronavirus has provoked the rapid development of the information society and then the technogenic society. All limitations and shortages make people replace their physical moving

by their online activities. For example, online ordering or online booking have started to replace the traditional shopping offline en masse. Delivery services are developing rapidly with an annual growth rate of 18.76 % and are expected to reach more than 7 billion dollars by 2025 and expanding their coverage area to other countries like China, Poland, other countries of the European Union, the USA [15]. As the consequences of such kind online activities, it restored markets of computer technologies: market of personal computers, mobile technologies, tablet computers, smartphones, modems, different computer components (central processing units, random access memory, hard disk drives and solid disk drives, motherboards, and so on). The global computer hardware market grew at a compound annual growth rate of 9,4% in 2020 (from USD 862.93 billion to USD 944,09 billion), of 7,1 % in 2022 and is expected to grow to USD 1178.15 billion in 2025 at 6 % [9].

Since 2022, in Ukraine this fact has been reinforced by War, because like the pandemic of coronavirus it creates

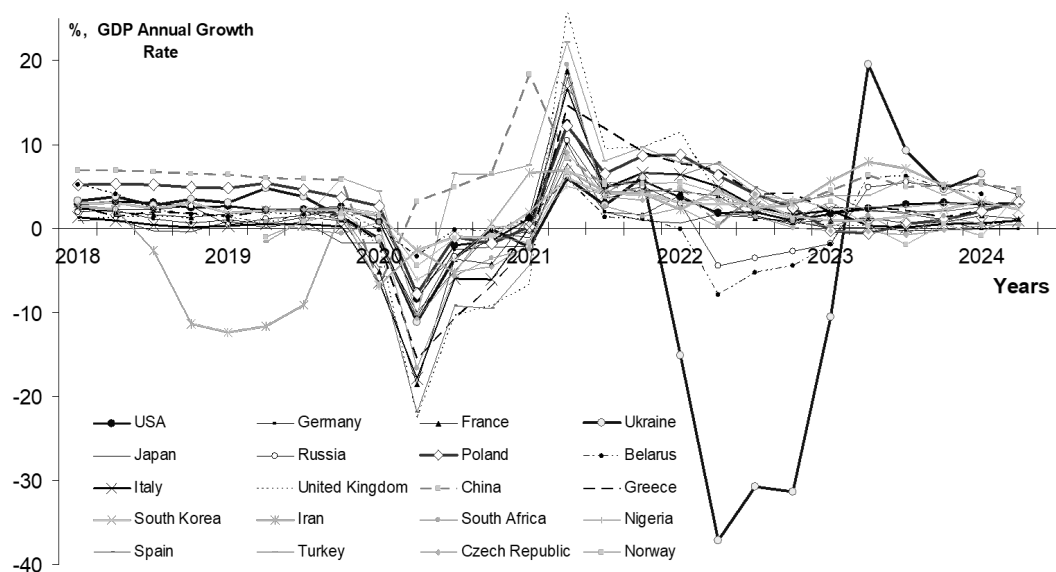


Figure 3. World economic development

Source: built by the author on the basis of data from [8]

difficult and dangerous situations of great limitations for people. These situations turn into the example for the global world and will show which economic branches have to remain in the future. These economic branches associate with some limited sphere and the profit zone where three types of economy (the industrial society, the information society and the technogenic society) intersect with each others. But it is very important for the companies to define this profit zone for their markets correctly.

For example, the blogger is a representative of the information society. The main economic values for him are his ability to manage the Big Data to generate his own unique content (Fig. 4).

The blogger shares this content with a community of his or her followers through social media. It turns into the popularity of the blogger. In the information society the followers don't pay traditional money to their blogger. But the followers seek to obtain his content because under the conditions of information chaos the blogger has turned into their guide who answers their questions. Therefore from the traditional economic point of view the blogger doesn't interested in his followers. But the blogger can intersect and become a part of the industrial society with its traditional economy. He can establish traditional economic relations with an advertiser who pays him money for transferring some advertising content to the bloggers's followers. The advertiser perceives the blogger as a traditional part of the industrial society like a mediator between makers and consumers. The advertiser is a consumer of the blogger in this case.

The same way the market of education was one of the first economic branches which faced with consequences of the coronavirus pandemic. It needed to integrate into the information society as soon as possible by launching e-learning courses, conducting educational streams online through e-learning platforms. The teacher in the information society is like a blogger (Fig. 5): from the traditional economic point of view under the conditions of the information society the teacher needn't to be interested

directly in the results of how students consumed the teacher's content. But this information should turn into answers for the students to their questions "How to live under the conditions of great uncertainty and information chaos?" and "What's next?". The traditional economic relations are established by the teacher with the state or investors who are interested in the teacher's distance e-learning courses as some innovative type of media channel for marketing communications with their target audiences of possible consumers.

Sure, many risks appear on the interceptions of different types of societies because any information may turn into advertising. Therefore the revival of the universal human values among all economic actors has to top the list of the important questions of the coronavirus pandemic consequences. When people die, the society starts to treasure some other values, not money.

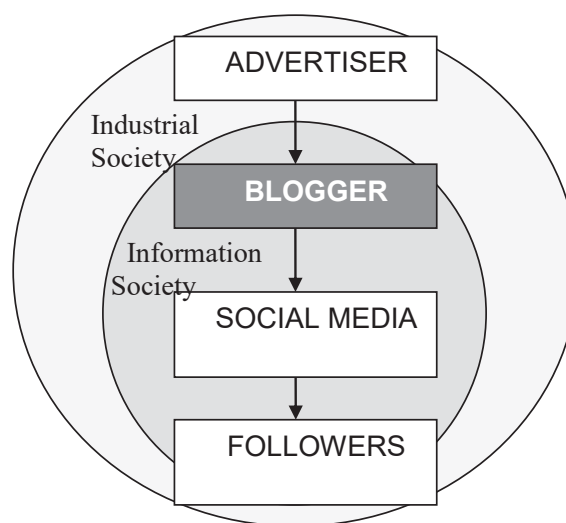


Figure 4. The profit zone for the blogger
(interception of the information and industrial societies)

There is some other example. The coronavirus pandemic has provoked the delivery services market to develop themselves as the participants of the information society (Fig. 5). These companies' economic activity on the information society rescued the traditional economic relations between makers of goods and their consumers on the industrial society during the coronavirus pandemic. On the one hand, this delivery companies have to be represented as the economic agents of the information society. They communicate with the consumers on internet and consumers may not pay money directly to the delivery service company. The consumers use the website of the delivery service company to watch their order tracking. This means that economic relationships between consumers and the delivery company are developing under the condition of the information society where time on site, which the consumers spend by watching the content, is very important for the site algorithm in the information society. This metric is one of the economic values of the information society. For example, AliExpress already pays some electronic coins to their website visitors for daily entering on their marketplace and some simple actions on it.

But the traditional economic relations between the delivery service company and the makers of goods are on the industrial society. From this point of view under the conditions of the industrial society the delivery service company remains simultaneously to be a mediator between a maker of goods and maker's consumers. On the other hand, with the rapid development of the information

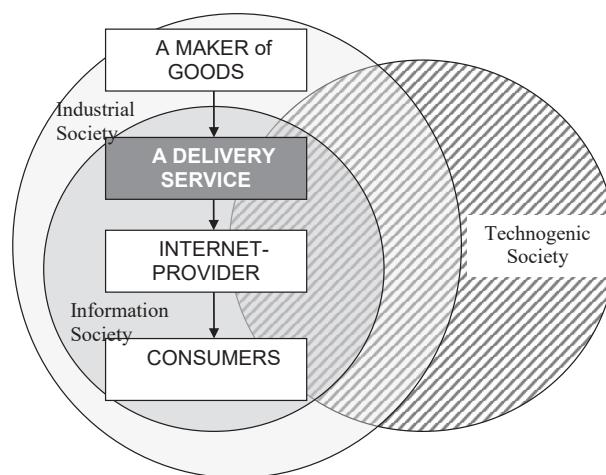


Figure 5. Transformations of the delivery services market.

society markets, Big Data of information are increasing too. It also needs the delivery service company to be integrated with the technogenic society and its Artificial Intelligence (AI) technologies for data processing if this company plans to follow the profit zone in the future. The companies have already started to plan how to use Artificial Intelligence within next two years (Fig. 6). For example, delivery service companies can use AI with data processing (forecasting demand trends and delivery volumes; optimize routes to minimize costs; translating

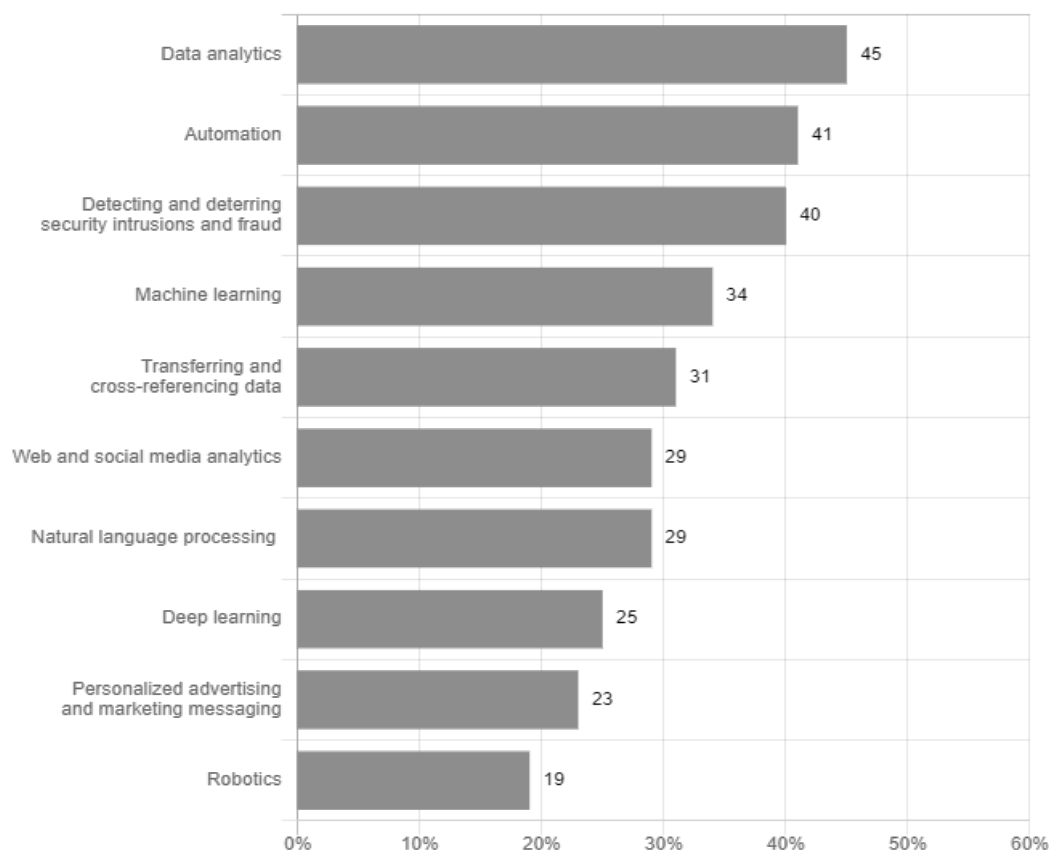


Figure 6. Use cases for Artificial Intelligence

Source: [10]

delivery materials for global markets; generation clear customer communication in multiple languages; providing instant responses to customer queries; assisting with complaint resolutions, claims and feedback analysis; monitoring performance metrics; customer preferences for service improvement and so on).

It is necessary to highlight that the pandemic of coronavirus has turned into a catalyst for the mass implementation of advanced technologies of AI in the world. It seemed to help with the solution of various difficult problems which are associated with the coronavirus pandemic. For example, the face recognition technology was represented as the tool to decreasing of new cases of coronavirus. It seemed to be natural and important to implement AI, then Generative Artificial Intelligence (GAI) and later Decision Making Artificial Intelligence (DMAI) for these goals. AI and its types have started spreading into many other human life spheres that means the technogenic society rapid development beginning.

Conclusions. The concept of Sustainable Development Goals faced with unexpected challenges. In 2023 the conjuncture became worst. One of the five main reasons was the coronavirus pandemic that exposed the vulnerability of globalization philosophy. Before the coronavirus pandemic

the global economy was often based on efficiency more than resilience. And now there is a tend toward rethinking supply chains, diversification of goods, relocation of manufacturing and some economic relations to the national level. A new model of the global economy is developing under the conditions of a new reality and great possibility of the pandemic repeating.

In contrast to the detrimental direct consequences of the coronavirus pandemic to the global economy, there are some not fully understood long-term consequences on it. On the one hand, the coronavirus pandemic provoked private companies and the states to concentrate their economic and mental forces and prepare themselves to the next difficult challenges in the future, which were associated with diversifications of a range of goods, services and the definition of the real profit zones. On the other hand, the coronavirus pandemic accelerated the rapid development of the information and technogenic societies, total digitalization of economy and integration most companies into the information society, implementing the tools of the technogenic society and correct definition their profit zones. It also provoked the outperforming development of Artificial Intelligence and its types for forming the global technogenic economy.

References:

1. Mecklin J. (2023) A time of unprecedented danger: It is 90 seconds to midnight. Science and Security Board. *Bulletin of the Atomic Scientists*.
2. Khalaf A. T., Wei Y., Wan J., Kadir S.Y. (2023) How did the Pandemic Affect Our Perception of Sustainability? Enlightening the Major Positive Impact on Health and the Environment. *Sustainability*. 2023. No. 15(2). DOI: <https://doi.org/10.3390/su15020892>
3. Yao X., Bandyopadhyay S., Rodrihuez J. G. (2023) COVID-19 Pandemic and Economic Stimulus Policies : Evidence From 156 Economies. Mobility and Inequality Trends. *Research on Economic Inequality*. Emerald Publishing Limited, Bingley. Vol. 30, pp. 243-266. DOI: <https://doi.org/10.1108/S1049-258520230000030011>
4. Number of new cases of coronavirus (COVID-19) worldwide from January 23, 2020 to June 23, 2023, by day. ECDC: OWID, Statista (2024). Available at: <https://www.statista.com/statistics/1103046/new-coronavirus-covid19-cases-number-worldwide-by-day/>
5. European Center for Disease Prevention and Control. An Agency of the European Union. Available at: <https://www.ecdc.europa.eu/en>
6. Tracking of hCov-19 Variants. *GISAID.org*. Available at: <https://gisaid.org/hcov19-variants/>
7. Global Risk Survey 2022. *Control Risks* (2022). Available at: <https://www.controlrisks.com/>
8. Trading Economics. Available at: <https://tradingeconomics.com>
9. Computer Hardware Global Market Report 2023. Available at: <https://www.thebusinessresearchcompany.com/report/computer-hardware-global-market-report>
10. State of IT 2023. SWZS's Annual Report on IT Budgets and Tech Trends. Available at: <https://swzd.com/resources/state-of-it/>
11. Mecklin J. (2024) A moment of historic danger: It is still 90 seconds to midnight. Science and Security Board. *Bulletin of the Atomic Scientists*.
12. Coronavirus Cases. Worldometer. (2024). Available at: <https://www.worldometers.info/coronavirus>
13. McConnell C. R., Brue S. L. (1990) Economics: Principles, Problems, and Policies: 2 V. Eleventh Edition. Mc Fraw-Hill Publishing Company. V. 1. 399 p.
14. Yudina N. (2020) Business Forecasting of Marketing Activity Riskiness of Companies in Markets. *Economic Bulletin of National Technical University of Ukraine «Kyiv Polytechnic Institute»*, no. 17, pp. 372-383. DOI: <https://doi.org/10.20535/2307-5651.17.2020.216380>
15. Shchytyov D. M., Zhadko K. S., Mormul M. F. (2024) Development Trends of the Electronic Commerce Market in the World and in Ukraine. *Naukovi perspektivi*, no. 7(49). Available at: <http://perspectives.pp.ua/index.php/np/article/download/13585/13651>
16. Hong J., Shrivastava B. (2024) Deadly Fungal Outbreaks Are on the Rise Since Covid. *Bloomberg*. Available at: <https://www.bloomberg.com/news/articles/2024-11-03/deadly-fungal-outbreaks-are-on-the-rise-globally-since-covid>
17. Gupta S. (November 2024) Global Mobile Phone Protective Cases Market Overview. *Market Research Future*. 128 p. Available at: <https://www.marketresearchfuture.com/reports/mobile-phone-protective-cases-market-27886>
18. Khmelevskiy D. (2024) Negative Impact of the Covide-19 Pandemic on Agriculture. *Economy and Society*, is. 62. DOI: <https://doi.org/10.32782/2524-0072/2024-62-87>
19. Dashko I., Mykhailichenko L. (2024) Digitalization of the Economy in the Conditions of the COVID-19 Pandemic as a Strategic Platform for the Development of the State Economy. *Economy and Society*, no. 47. DOI: <https://doi.org/10.32782/2524-0072/2023-47-63>
20. Fedyk F. (2021) Macroeconomic Consequences of the Impact of the Covid-19 Pandemic on the Global Economy. *Ekonomika ta derzhava*, vol. 7, pp. 40–46. DOI: <https://doi.org/10.32702/2306-6806.2021.7.40>
21. Mishrif A. (2024) COVID-19 Effects on the Global Economy: An Overview. *Economic Effects of the Pandemic: Implications for the Economy, Finance and Tourism*, pp. 3–23. Available at: https://link.springer.com/chapter/10.1007/978-981-97-4367-4_1

Стаття надійшла до редакції 04.12.2024

Стаття опублікована 21.01.2025