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GLOBAL MONITORING OF FINANCIAL INDICATORS OF DEVELOPMENT AND INNOVATION AS A PREREQUISITE FOR WARNING OF FINANCIAL CRISES

ГЛОБАЛЬНИЙ МОНІТОРИНГ ФІНАНСОВИХ ПОКАЗНИКІВ РОЗВИТКУ ТА ІННОВАЦІЙ ЯК ПЕРЕДУМОВА ПОПЕРЕДЖЕННЯ ФІНАНСОВИХ КРИЗ

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Despite the existing developments that reveal the problems of the financial sector and financial innovations, it is worth focusing our research on such points. It is worth doing detailed monitoring of financial indicators at the level of many countries from different parts of the world, which reflect the state of financial innovation. In addition, a relevant study related to the monitoring of financial indicators is the analysis of indicators on which the stable development of society depends. It is also worth not only displaying the dynamics of financial indicators over a long period of time, but also trying to show the forecast values of such indicators in the coming years. It is this approach that will allow us to form a certain vision regarding the prevention of financial crises in the future. The article examines the indicators of net lending, gross debt and cyclically adjusted balance of payments of the countries for the period 2007–2024, and also indicates the corresponding forecast indicators for 2025–2027. The monitoring was carried out and the prospects for the development of the field of financial innovations for the countries for 2007–2027 were determined. We also investigated the need to track and understand current financial innovations that will allow us to counteract the manifestations of financial crises in the future. It was confirmed as a result of research into the state of innovation of individual states (in particular, the Fintech sphere) that precisely those countries that invest in the development of scientific and technical developments have the opportunity to develop the economy faster. It is established that the financial sector of innovation has changed significantly from the model of traditional corporate banks to powerful ecosystems of banking and non-banking markets. It has been confirmed that the prospects for the development of Blockchain technology in the field of finance are that such technology will allow the financial sector to further develop in the direction of security, stability and reliability, and therefore prevent the occurrence of financial crises in the future. It was revealed that financial innovations can exist and develop at the same time and other financial indicators can deteriorate (increase in debt and budget imbalance). Therefore, in order to understand and prevent crises, it is worth developing an appropriate level of tracking and forecasting the smallest changes in financial indicators at the global level.

Keywords: monitoring, forecasting, financial indicators, financial innovations, financial crises, innovative development, sustainable development.

Незважаючи на наявні розробки, які розкривають проблеми фінансового сектору та фінансових інновацій, зосереджено дослідження саме на актуальних питаннях детального моніторингу фінансових показників на рівні багатьох країн з різних частин світу, які відображають стан фінансових інновацій. Крім того, актуальним дослідженням, пов'язаним з моніторингом фінансових показників, був аналіз показників, від яких залежить стабільний розвиток суспільства. Також відображено динаміку фінансових показників за тривалий період часу, а й спробувати показати прогностичні значення таких показників на найближчі роки. Саме такий підхід дозволив сформулювати певне бачення щодо попередження фінансових криз у майбутньому. У статті досліджено показники чистого кредитування, валового боргу та циклічно скоригованого платіжного балансу країн за період 2007–2024 рр., а також вказано відповідні прогностичні показники на 2025–2027 рр. Проведено моніторинг та визначено перспективи розвитку сфери фінансових інновацій для країн за 2007–2027 рр. Також нами досліджено необхідність відстеження та розуміння актуальних фінансових інновацій, які дозволять протидіяти проявам фінансових криз у майбутньому. Було підтверджено в результаті дослідження стану інноваційності

окремих держав (зокрема сфери Fintech), що саме ті країни, які інвестують у розвиток науково-технічних розробок, мають можливість швидше розвивати економіку. Встановлено, що фінансовий сектор інновацій суттєво змінився від моделі традиційних корпоративних банків до потужних екосистем банківського та небанківського ринків. Доведено, що перспективи розвитку технології Blockchain у сфері фінансів полягають у тому, що така технологія дозволить фінансовому сектору далі розвиватися в напрямку безпеки, стабільності та надійності, а отже запобігає виникненню фінансових криз у майбутнє. Виявлено, що одночасно можуть існувати та розвиватися фінансові інновації та погіршуватися інші фінансові показники (збільшення боргу та бюджетний дисбаланс). Тому для розуміння та запобігання кризам розроблено відповідний рівень відстеження та прогнозування найменших змін фінансових показників на глобальному рівні.

Ключові слова: моніторинг, прогнозування, фінансові показники, фінансові інновації, фінансові кризи, інноваційний розвиток, сталий розвиток.

Formulation of the problem. During the existence of society, there are periodic changes between development and functioning. These two states in constant opposition form a crisis phenomenon. In the financial sector, the state of crisis always occurs faster than in the economy. And both internal and external causes, as well as manifestations of military, man-made and natural influences, exacerbate this condition. Note that over the past 20 years, several global crises have had a significant impact on world finances: the Global Financial Crisis (2008–2009), the Covid-19 pandemic (2020–2022), the full-scale military invasion of the Russian Federation in Ukraine (2022–2024). Each of the mentioned crises had its own characteristics, but they had a common feature – crises appeared unexpectedly, and developed sharply and unpredictably. Therefore, clarifying the prerequisites for monitoring financial indicators of development and innovations regarding the prevention of financial crises is an urgent issue.

Analysis of recent research and publications. In recent years, domestic and foreign scientists have been working on researching the problems of the financial sector and financial innovations. Since the impact of the full-scale war in Ukraine is increasingly felt on the global market, it is obvious that the subject of research of many scientists is precisely the impact of military actions on the financial sector. For example, such foreign scientists include Izzeldin M., Muradoğlu G. Y., Pappas V., Petropoulou A., Sivaprasad S. [6]. A significant amount of research is based on theoretical approaches, and generally describes the ways of development of financial relations in modern conditions, especially from the point of view of the implementation of modern innovative approaches. In particular, such scientists include: Balytska M. V. [1], Fang F. [3], Marjosola H. [8], Chynyska I. I. [10] and others. Scientists are also investigating global financial crises and the possibilities of their prevention. Such scientists

include Kozyuk V. V. [7], Tkachenko I. S. [9]. Attention is now being paid to the development of such opinions, which will allow, on the basis of quantitative research, to understand the trends in the development of world finances and to make forecasts regarding the development of individual financial indicators. The relevance of the study lies in the global monitoring of financial indicators and innovations as a prerequisite for the prevention of financial crises.

Highlighting previously unresolved parts of the overall problem. Despite the existing developments that reveal the problems of the financial sector and financial innovations, it is worth focusing our research on such points. It is worth doing detailed monitoring of financial indicators at the level of many countries from different parts of the world, which reflect the state of financial innovation. In addition, a relevant study related to the monitoring of financial indicators is the analysis of indicators on which the stable development of society depends. It is also worth not only displaying the dynamics of financial indicators over a long period of time, but also trying to show the forecast values of such indicators in the coming years. It is this approach that will allow us to form a certain vision regarding the prevention of financial crises in the future.

Formulation of the goals of the article (statement of the task). The purpose of the scientific article is to study the global monitoring of financial indicators and innovations as a prerequisite for preventing financial crises.

Presentation of the main research material. We agree with the work of such Ukrainian scientists as Tkachenko I. S., Shved V. V. and Kovtun A. V., who claim that “in the modern sense, a crisis is an extreme aggravation of contradictions in the socio-economic system, which threatens its sustainability in the environment; the crisis disrupts the stability of the system, while radically renewing it” [9].

We also claim that in order to identify such contradictions of financial phenomena that affect socio-ecological-economic development, we need to single out certain financial indicators. So, let's consider a global approach to financial monitoring, using the following indicators: net lending/borrowing, % to GDP; cyclically adjusted balance, % of potential GDP; gross public debt, % of GDP; global innovation index, %.

For the global issue of financial monitoring, it is worth highlighting the countries that we will consider. Among the European countries, we will single out United Kingdom, Poland and Ukraine, among the countries of Asia and the Pacific region – Republic of Korea and Australia, among the countries of South and North America – Canada and Brazil, among the countries of Africa and the Middle East – Israel and South Africa.

We will conduct an analysis for 2007–2024. Various global changes took place during these years. In particular, we will highlight those that had a significant impact on global finance. We are talking about the Global Financial Crisis of 2008–2009, the Covid-19 pandemic during 2020–2022, the full-scale military invasion of the Russian Federation in Ukraine in 2022–2024.

We will also use financial monitoring data for financial forecasting of the financial indicators mentioned above. So, let's present the net crediting data of the mentioned countries for the relevant period, as well as forecast indicators for 2025–2027 in Figure 1.

Therefore, most of the studied countries have been actively engaged in lending over the past two decades. This is mainly due to the fact that the expenses of these countries outweigh the income, and additional funds have to be raised. It is noteworthy that the need for lending grew especially in such years as 2009–2011, 2020–2021 and 2022–2024. We claim that this necessity was determined by the most crisis global phenomena during this period. It was at a time when financial markets were depreciating, as well as when the world was suffering from anti-epidemic measures or struggling with the economic consequences of the largest full-scale military aggression on the European continent since World War II.

It is worth proving that countries had to attract additional funds precisely because of budget imbalances. To do this, we will monitor and forecast the indicator of the cyclically adjusted balance of payments of the mentioned countries for 2007–2027, and we will present the results of the study in Figure 2.

So, as we can see, the data of the cyclical balance of the countries practically coincide with the data of the net crediting of the countries. In addition to the obviously expressed similar trends, it is also worth noting the difficult situation with the State Budget of Ukraine in 2022–2024. Of course, if it were not for international financial aid, which is measured in almost 100 billion dollars from February 2022, the situation with crediting for the country, which has become a victim in a full-scale war with Russia, could

ФІНАНСИ, БАНКІВСЬКА СПРАВА ТА СТРАХУВАННЯ

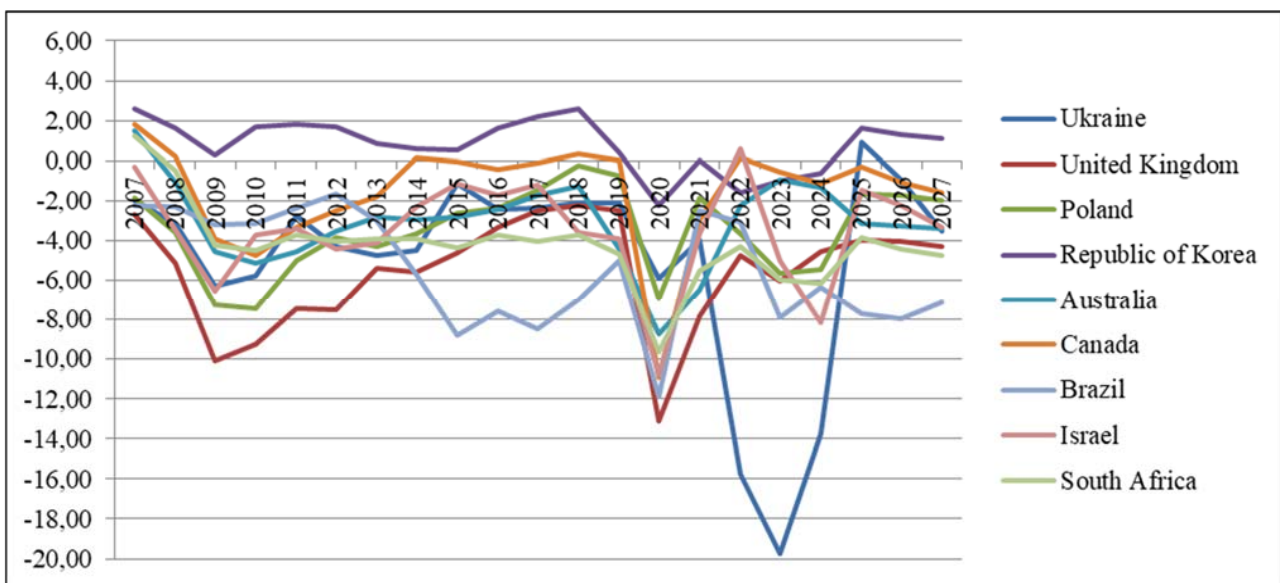


Figure 1. Net crediting of countries for 2007–2027, % of potential GDP

Source: created by the author based on the source [5]

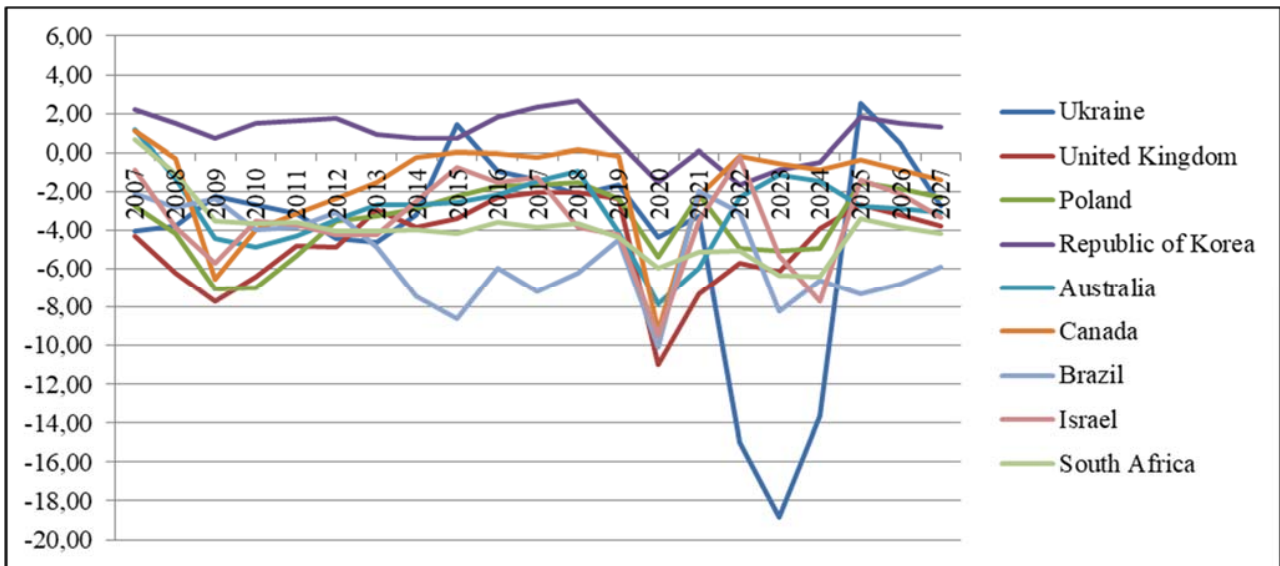


Figure 2. Cyclically adjusted balance of countries for 2007–2027, % to potential GDP

Source: created by the author based on the source [5]

be much more difficult. If we observe a clear connection between net crediting and the cyclical balance of the countries we studied, then we should also monitor such a financial indicator as the country's gross debt. So, we present the data on the gross debt of countries for 2007–2024, as well as the forecast values of the indicator for 2025–2027 in Figure 3.

Given the current state of the functioning of the financial sector and economic development of the country, it is necessary to develop such priority opportunities that will contribute to attracting funds through the introduction of innovative development in production. In this

context, we understand that the problem of lack of monetary resources must be solved in the financial sphere, including in the sphere of financial markets. The direction of studying the motivation of economic structures aimed at innovative development is quite relevant in the world today. Even more important is the development of institutional forms of financial support for economic growth. In this vision, we are talking about the formation of an innovative economy and financial innovations. That is why we will monitor and forecast the global innovation index of countries for 2007–2027, and we will present the results of the study in Figure 4.

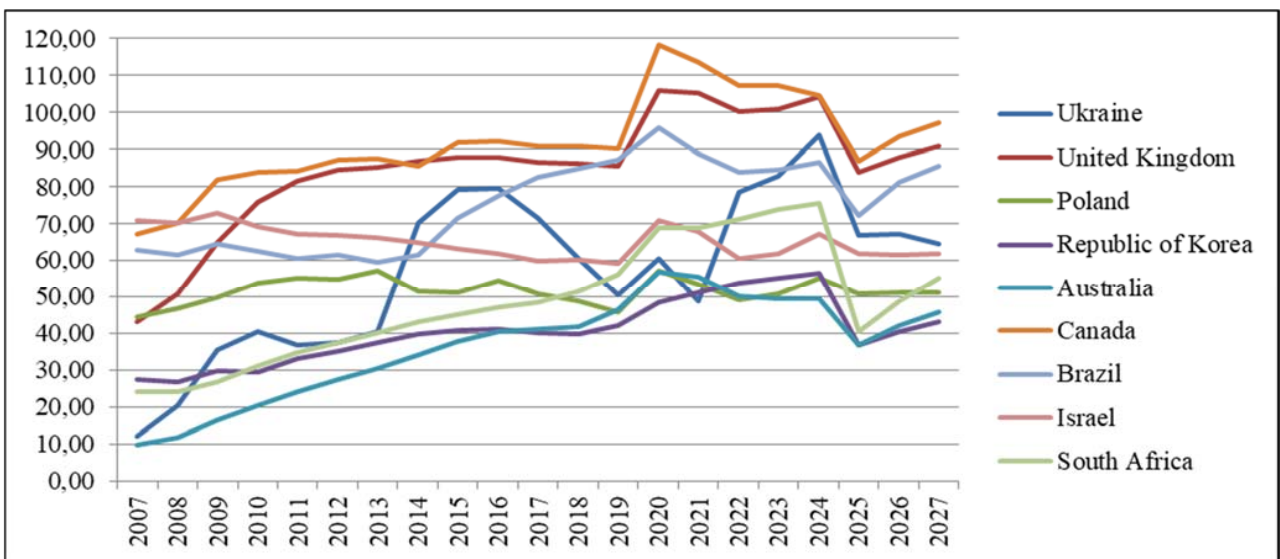


Figure 3. Gross debt of countries for 2007–2027, % of potential GDP

Source: created by the author based on the source [5]

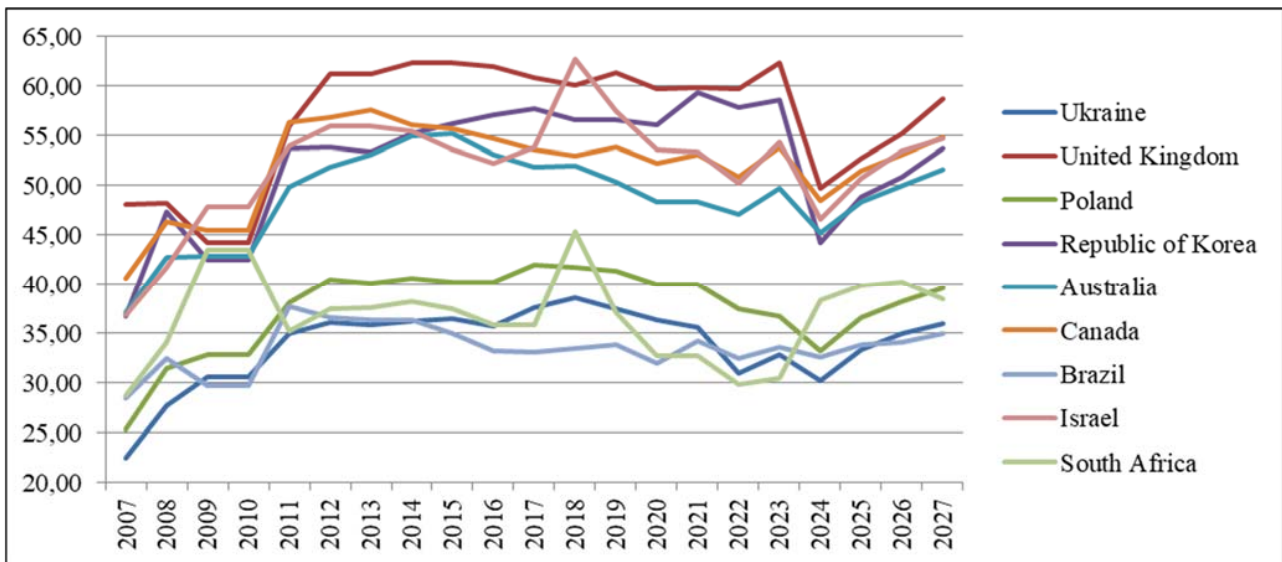


Figure 4. Global innovation index of countries for 2007–2027, %

Source: created by the author based on the source [4]

So, after conducting a study of the state of innovation of individual states, we can understand that precisely those countries that invest in the development of scientific and technical developments have the opportunity to develop the economy faster. Financial innovations are a component of the innovative development of the country. It is this understanding that contributes to the development of the gross domestic product and the sustainable development of society, and prevents the development of negative phenomena in society. In particular, it prevents the spread of various financial crises. But this is possible only if it is understood that the innovation does not accelerate the development of the “bubble effect” in the financial market or does not contribute to the development of speculative motives in the participants of the financial sector.

As we can see from the study, China has a positive trend of innovation development in the country. For this country, understanding investing in the latest developments and science is an identical concept of country development. Ukraine, of course, has innovative potential in all spheres of economy and social experience. And a relatively stable trend of innovative development during the last 2011–2021. Even during active hostilities, Ukraine does not lose the possibility of developing the latest developments. Based on our research, during 2025–2027 the scientific potential will remain for Ukraine, and therefore innovative development in the economy and financial sphere will play a big role. At the same time, the country's highly developed economic

terms will encounter shortly with some slowdown in innovative development. The situation will be possible to align the situation by 2027. Although, of course, the financial capacity of such countries, investment in scientific and technical developments, as well as the absence of crisis phenomena, create a favorable environment for innovative, and therefore sustainable, development of such countries.

Based on research, we argue that innovative development is an important prerequisite for ensuring a steady improvement in the financial condition of enterprises and the national economy. It is worth noting that nowadays one of the main problems in many developing economies is quite small, to say the financial support of innovative development. Language concerns the updating of the technologies used, as well as the logistics and technological base of various enterprises. Also, when we are making topical financial innovations, we should assume that they should be aimed mainly at the modernization of the forms of financial transactions themselves. For example, we should be aware that the development of financial transactions will facilitate banking institutions to instantly overflow funds. Particular attention should be paid to the point of view of innovative development of the central bank. It is the state regulator of the financial sector that, based on the legislative foundations, and understanding the benefits of innovative development, introduces the latest developments in developing countries. It should be understood that central

banks should simply become headliners in the reassessment of legal frameworks that affect a variety of payments and financial transfers. Then we can be certain that innovative development will increase competitiveness. In addition, this process will facilitate technological renewal.

Of course, if we can stabilize the economy, and overcome the risks that exist in society, then we can confidently attract investment funds for the development of innovative technologies. As scholars' research is known, public financial support for R&I increases the probability of engaging in all activities considered for both firm-size groups. That is, obtaining financial resources from domestic sources increases small-sized firms' probability of engaging in scientific research and development activities.

It is possible to achieve an improvement in overcoming the negative impact of the globalization risk of military aggression and the accompanying negative effects – an increase in the public debt and a decrease in the inflation index while maintaining the stability of the national currency – by introducing the latest financial technologies. At the same time, several scientists see exactly this kind of progress in the digitalization of financial institutions. We emphasize that it is the leading technology companies that are deepening the convergence of data and financial services. In addition, distributed databases and Blockchain technology provide an opportunity to increase security. The gradual increase in the use of cryptocurrencies is developing business relationships, because cryptocurrencies are part of an ecosystem based precisely on Blockchain technology. In addition, the efficiency of storing and downloading financial data of financial institutions is important. At the same time, cloud computing and artificial intelligence reduce the cost of data operations, which is extremely important in today's financial environment. Undoubtedly, this approach increases the efficiency of data analysis and support of business structures. It is worth highlighting the relevant opinion that “the speed with which technological advances and other innovations enter the market can create challenges for the regulators tasked with ensuring a stable, safe, and equitable financial system, and for the consumers to whom new products and services appeal” [2].

We agree with the work of scientists Fang, F., Ventre, C., Basios, M., Kanthan, L., Martinez-Rego, D., Wu, F., Li, L., “cryptocurrencies are the tokens used in these networks to send value and pay for these transactions. They can be thought

of as tools on the Blockchain, and in some cases can also function as resources or utilities. In other instances, they are used to digitize the value of assets. In summary, cryptocurrencies are part of an ecosystem based on Blockchain technology” [3].

We note that the reduction of population savings for investing in securities on the stock market is increasing interest in modern innovative developments. However, the investment of funds takes place primarily in such a segment of the financial sector as Fintech. It should be noted that the financial sector has undergone quite powerful changes over the last decade. What happened during this time? It is worth noting that over the years this sector has significantly changed from the model of traditional corporate banks to powerful ecosystems of banking and non-banking markets. We see that Fintech currently occupies the role of one of the most attractive markets for potential venture investors. In addition, this segment is known for the image of the financial industry with high potential. And image support is especially important during open banking business. We should single out quite promising areas of Fintech for implementation, in particular Regtech/ Suptech, payment systems, cyber security, Wealthtech, artificial intelligence, Proptech, and biometric technologies. From previous studies, it can be concluded that taking into account the development of the traditional banking sector of the advanced countries of the world, the market in the process of gaining stability increasingly invests in the development of interaction with the innovative segment, creating accelerators/incubators. The focus on the continuous development of innovative products is also important. One of the indicators of the development of the segment should be the number of deals with venture investors. Such an indicator is exactly a sign of the development of a stable Fintech ecosystem. Then we can say that the greater the amount of venture capital investment, the higher the activity of Fintech.

It is worth noting that the use of Blockchain technology in the financial sector is becoming more and more relevant. After all, the geopolitical impact of military aggression requires the creation of the foundations for the future recovery of the economy, primarily of the victim countries, by implementing the best practices of the digital economy. Today, we are witnessing a rapid increase in interest in Blockchain technology, which can solve many problems in the financial sphere. And this technology itself is an

innovative development. The prospects for the development of Blockchain technology in the field of finance are that such technology will allow the financial sector to further develop in the direction of security, stability, and reliability. In addition, it will change methodological approaches to the organization of financial activities of economic entities.

Certainly, contemporary innovative technologies like Blockchain will witness heightened utilization within the financial sector. Particularly, the significance of such innovative advancements will be pronounced in nations keen on transformation and prepared to overhaul their financial systems. Modern technologies will also actively use countries that hurt various shocks. Countries that are experiencing a sharp decline in the economy and the decline of the financial sphere as a result of hostilities, the consequences of the pandemic, and the destructive influence of natural and techno factors, will use more and more to develop modern digital technologies in various fields, and especially in financial. It should be understood that this will give some impetus to the active development of society, which has experienced various negative influences.

In the European Union, the legislative and constitutional framework for administrative rule-making is struggling to keep pace with the role of the European Commission and Union agencies in the implementation of EU legislation. By the way, it is worth understanding that most of this occurs through unofficial acts known as "soft law". It is implied that, without formal binding force, soft law must comply with all the mandatory formalities that apply to ordinary rule-making [8].

We note that financial crises that may arise always have positive and negative manifestations. We can call innovative developments in various fields, deep transformation of the financial sector, and changes in the organization of economic processes as positive manifestations of crises. Negative manifestations of the financial crisis definitely cause an imbalance of the State budget, a sharp increase in lending to the population, an increase in state indebtedness, loss of capital

and a reduction in capital investments, and various negative socio-economic consequences. As we can see, financial innovations can exist and develop at the same time and other financial indicators can deteriorate. Therefore, in order to understand and prevent crises, it is worth developing an appropriate level of tracking and forecasting the smallest changes in financial indicators at the global level.

Conclusions. The article carried out a detailed monitoring of financial indicators at the level of many countries from different parts of the world, reflecting the state of financial innovation. In particular, financial indicators were studied among the countries of Europe (Great Britain, Poland and Ukraine), among the countries of Asia and the Pacific region (Republic of Korea and Australia), among the countries of South and North America (Canada and Brazil), as well as among the countries of Africa and the Middle East (Israel and South Africa). As a result of the study, the need to track and understand current financial innovations was revealed, which will allow to counteract the manifestations of financial crises in the future. We also confirmed as a result of the research on the state of innovativeness of individual states that precisely those countries that invest in the development of scientific and technical developments have the opportunity to develop the economy faster. It is worth noting that the financial innovation sector has changed significantly over the past two decades from the model of traditional corporate banks to powerful ecosystems of banking and non-banking markets. We also confirmed that it is necessary to pay special attention during monitoring to the research of such issues in the field of Fintech, both Blockchain and cryptocurrency. We discovered that financial innovations can exist and develop at the same time, and other financial indicators (increasing debt and budget imbalance) can deteriorate. Therefore, in order to understand and prevent crises, it is worth developing an appropriate level of tracking and forecasting the smallest changes in financial indicators at the global level.

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