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INNOVATIVE SECURITY OF UKRAINE IN THE CONDITIONS OF EUROPEAN INTEGRATION

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ІННОВАЦІЙНА БЕЗПЕКА УКРАЇНИ В УМОВАХ ЄВРОІНТЕГРАЦІЇ

The article examines the essence of innovative state security, reveals its main components and implementation mechanism. The author has proven that Ukraine's need to restore the economic platform for further prospects of worthy inclusion in the commonwealth of European countries requires the construction of its own model of socio-economic space based on economic security, an important component of which is innovative security. The characteristic conditions that must be taken into account in the process of developing measures to increase the level of innovative safety have been studied. The position of Ukraine in international ratings reflecting the state of

innovative activity in Ukraine is outlined. The positions of Ukraine in international rankings testify to the existence of an ineffective mechanism for the introduction of innovations in the sphere of economic activity; insufficient level of state support for innovative projects and their financing; minimal use of opportunities provided by the Association Agreement between Ukraine and the EU, especially regarding scientific and technological cooperation, development of entrepreneurship and industrial policy. The current state of innovative activity in Ukraine was studied according to such indicators as the costs of carrying out scientific research and development, the introduction of innovations at industrial enterprises, the sources and structure of financing the innovative activity of Ukrainian industrial enterprises. The main threats to Ukraine's innovation security are the low level of innovation in industry, which should play a driving role in the recovery of the economy, insufficient funding for the innovative development of medium-sized and small businesses, and the low level of protection of intellectual property rights. The direct interest of the business environment in updating and expanding the production base on a new technological basis is an organic desire of the state to strengthen and increase its defense capability and high status in the geopolitical space of the European Union. An important condition for this is the significant activation of innovative activity of all participants of economic interaction, real motivation for generating an innovative initiative, development of mechanisms for its implementation. As measures contributing to the strengthening of the innovative security of the state, the following have been singled out: stimulation of the development and implementation of innovations, promotion of modernization, development of international cooperation in the field of innovations. The author used such scientific methods as methods of logical generalization, abstraction and formalization, synthesis and analysis, induction, analogies, etc.

У статті досліджено сутність інноваційної безпеки держави, розкрито її основні складові та механізм реалізації. Автором доведено, що потреба України у відновленні економічної платформи задля подальших перспектив гідного включення у співдружність європейських країн вимагає побудови

власної моделі соціально-економічного простору на засадах економічної безпеки, важливою складовою якої є інноваційна безпека. Досліджено характерні умови, які потрібно враховувати, в процесі розробки заходів щодо підвищення рівня інноваційної безпеки. Окреслено позицію України у міжнародних рейтингах, які відображають стан інноваційної діяльності в Україні. Позиції України у міжнародних рейтингах засвідчують наявність неефективного механізму впровадження інновацій у сферу економічної діяльності; недостатній рівень державної підтримки інноваційних проектів та їх фінансування; мінімальне використання можливостей передбачених Угодою про асоціацію між Україною та ЄС, особливо щодо науково-технологічного співробітництва, розвитку підприємництва та промислової політики. Досліджено сучасний стан інноваційної діяльності в Україні за такими індикаторами як витрати на виконання наукових досліджень і розробок, впровадження інновацій на промислових підприємствах, джерела та структура фінансування інноваційної діяльності українських промислових підприємств. Основними загрозами інноваційній безпеці України визначено низький рівень інноваційності промисловості яка має відігравати рушійну роль у відновленні економіки, недостатність фінансування інноваційного розвитку підприємств середнього та малого бізнесу, низький рівень захисту прав інтелектуальної власності. Пряма зацікавленість підприємницького середовища оновлювати, розширяти на новій технологічній основі виробничу базу є органічним прагненням держави зміцнювати і підвищувати обороноздатність та високу статусність у геополітичному просторі Європейського Союзу. Важливою умовою для цього є суттєва активізація інноваційної діяльності всіх учасників економічної взаємодії, реальної мотивації генерування інноваційної ініціативи, розвитку механізмів її реалізації. В якості заходів, що сприяють посиленню інноваційної безпеки держави виокремлено наступні: стимулювання розробки і впровадження інновацій, сприяння модернізації, розвиток міжнародного співробітництва у галузі інновацій. Автором було використано такі наукові методи як методи

логічного узагальнення, абстрагування і формалізації, синтезу та аналізу, індукції, аналогій тощо.

Keywords: *innovative safety, economic growth model, modernization, competitiveness.*

Ключові слова: *інноваційна безпека, модель економічного зростання, модернізація, конкурентоспроможність.*

FORMULATION OF THE PROBLEM

The strategic task of achieving the recovery of Ukraine's economy, bringing it to the level of the developed countries of the world, can be achieved only under the conditions of the restoration of innovative security. The formation of an adequate system of motivation and stimulation of innovative activity of business entities requires the consolidated efforts of theoreticians, practitioners, analysts, legislators and the public administration. The direct interest of the business environment in updating and expanding the production base on a new technological basis is an organic desire of the state to strengthen and increase its defense capability and high status in the geopolitical space of the European Union.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Many modern scientists direct their research in the direction of prerequisites for the development of innovative security. In most modern scientific studies of this problem, they are aimed at revealing the essence and main components of innovative safety, tools for assessing its level, means and criteria for diagnosing the condition.

The justification of the theoretical and applied aspects of innovative security of the state, conceptual principles and methods of ensuring innovative security, assessment of its effectiveness taking into account the state of the economy of Ukraine is carried out in a monograph edited by P.M. Koyudy [1].

Yes, in the monograph edited by S.A. Davymuki "Innovative development of enterprises in the field of trade: world trends and practice in Ukraine" considers the main components of investment policy in the field of trade according to the innovative vector [2].

The main aspects of the development of innovative security of the national economy, threats to the innovative security of the national economy and proposals for their elimination are considered in the article. I.O. Akhnovskaya [3].

Yu.V. Krasnoshchokova considers the innovative security of the enterprise as a guarantee of competitiveness in the conditions of European integration, examines the conditions that will allow to increase the possibilities of creating and using innovations. The introduction of innovations, in turn, contributes to the production of competitive products at the level of world standards [4].

Yu.G. Neustroev's article is devoted to the justification of the need for innovative development of the Ukrainian economy in order to increase the level of its economic security, to the study of the connection between innovation and the competitiveness of Ukrainian products. [5].

Maslak O.O. investigates innovative security both at the enterprise level and at the regional level [6]. Innovative security is considered both at the enterprise level and at the regional level and is aimed at using the scientific and technical potential, increasing the opportunities for creating and commercializing innovations, etc.

Although, despite the validity of many studies, the issues of the essence of the innovation process, sources of its financing and directions for improving innovation security have certain characteristics for each country, and are not static, especially in modern conditions in Ukraine.

FORMULATION OF THE GOALS OF THE ARTICLE

The purpose of the article is to determine the prerequisites and reserves for the improvement of innovative security, the means of ensuring it based on a state study, the sources of recovery in modern conditions in Ukraine, positioning according to the main indicators of the global evaluation space.

MATERIALS AND METHODS

To achieve the goal, general scientific methods were used, including methods of logical generalization, abstraction and formalization, synthesis and analysis, induction, analogies, etc.

PRESENTATION OF THE MAIN MATERIAL OF THE STUDY

Ukraine's need to restore the economic platform for further prospects of worthy inclusion in the commonwealth of European countries, building its own model of socio-economic space, can only be realized if innovative security is observed. An important condition for this is the significant activation of innovative activities of all participants of economic interaction, the real motivation for generating innovative initiatives, and the development of mechanisms for its implementation.

At the current stage of development of economic thought, the most relevant component of economic security is innovative security. Because it is the innovative orientation of the national economy that is the key to the development of a modern state. Innovative security is the most important component of the economic security of the state. At the same time, it is a complex multifactorial category that ensures the ability of the national economy to constantly reproduce and spread new knowledge in order to meet the needs of society in a balanced way at a certain level, which ensures the protection of national interests, resistance to internal and external threats, the ability for sustainable development, leads to improvement socio-economic processes and promotes the development of scientific and research activities [3].

The innovative vector of development determines the dynamics and quality of the progressive movement of the economy of Ukraine, strengthening in turn the potential of economic security. For the economy of Ukraine, ensuring stable rates of economic growth is possible only under the condition of dominance of the innovative model of economic reform.

In particular, L.M. Zabrodska believes that the modern model of economic growth, which is based on an innovative type of development, requires effective stimulation of innovations, a new financial and credit policy, the development of science-intensive industries and the reduction of nature-exploiting industries - at the macro level; changes in the type of entrepreneurial activity, active involvement in the production of small and medium-sized businesses - at the micro level [7].

Even in the pre-war period, Ukraine was characterized by political and economic instability, a weak state policy in the face of internal and external threats, insufficient stimulation of the development of the industrial base.

Achieving the country's economic recovery depends primarily on increasing

the technological level of the economy's production potential. This is a long-term and systematic process that requires long-term investment, justification of the state strategy of economic development. The innovative vector of the national economic development strategy is possible only under the condition of state support.

Granting Ukraine the status of a candidate for the EU opens up new opportunities for Ukraine. However, Ukraine must become a full member of the EU and meet the established requirements.

The high innovation potential of the EU is one of the most powerful and motivating factors for Ukraine's European integration choice. This confirms the success of the Baltic countries: in particular, Estonia, in terms of the level of innovative development, has already reached the average indicators of the Netherlands, Austria and exceeded the indicators of Denmark and France [8, 136p.]

Important indicators of the state of innovative security are the position of Ukraine in the relevant international ratings.

Assessment of the level of development of innovative sectors of the economy of different countries is provided by the Global Innovation Index.

Table 1. Ukraine's position in international rankings in 2017–2020

Indicators	2017	2018	2019	2020
Global Innovation Index	50	43	47	45
Bloomberg Innovation Development Index	46	46	53	56
Global Competitiveness Index	85	81	83	84
European innovation scoreboard	35	36	36	33

compiled according to the data [9]

The global innovation index provides indicators on the innovative development of individual countries and the world economy. The index consists of 80 indicators that examine a wide range of issues, including the political environment, education, infrastructure and other aspects of business. In 2020, Ukraine's position among the studied countries improved: from 47th place in 2019 to 45th place in 2020.

According to the innovation rating compiled by the Bloomberg agency, in 2020 Ukraine fell 3 places compared to 2019. Ukraine received the fewest points for the

field of intensive high-technology and for the activity of patent activity.

Ukraine's position in the global competitiveness index dropped from 83rd in 2019 to 84th in 2020.

The innovation index of the European Innovation Scoreboard allows to evaluate the results of the implementation of the innovation policy based on 27 indicators. This approach makes it possible to compare the innovative activities of the countries of the European Union, the candidate countries for joining the EU and some other countries. In 2020, Ukraine's position in the European Innovation Scoreboard improved - Ukraine moved up 3 places.

The positions of Ukraine in international rankings reflecting the state of development of innovative activity testify, on the one hand, to the presence of a high level of scientific potential, which is the basis for the production of innovations, scientific developments, new equipment or technology, etc. But, on the other hand, a whole spectrum of problems is clearly demonstrated: the presence of an ineffective mechanism for the introduction of innovations in the sphere of economic activity and further commercialization; insufficient level of state support for innovative projects and their financing both from the state budget and at the expense of private investors; minimal use of opportunities provided by the Association Agreement between Ukraine and the EU, especially regarding scientific and technological cooperation, development of entrepreneurship and industrial policy [10].

Compliance of Ukraine's economy with the high level of development of European countries, as a candidate for EU membership, can be achieved in the long term only on the basis of innovative transformation.

The state of innovative activity in Ukraine is difficult to consider satisfactory. Despite the presence of significant scientific potential and experience in the creation of technologically complex products, the country loses its position in the markets of high-tech goods and services, which are developing most dynamically in the modern world, from year to year. The idea of an economy based on knowledge, the driving force of which is innovation, has been largely discredited in Ukrainian society due to inefficient and inconsistent actions of the authorities and the announcement of measures that were never implemented [12, p.8].

Table 2. Threats of innovative security and ways to minimize them

Threat type	Signs of manifestation	Ways of reduction or elimination
Production	<ol style="list-style-type: none"> 1. Weak development of innovative infrastructure and a low level of technology transfer 2. Lack of a systematic approach to the development of the innovative sphere. 3. Physical destruction of innovative infrastructure objects as a result of military operations. 	<ol style="list-style-type: none"> 1. Development of dual purpose technologies. 2. Stimulate the creation of technologies that are competitive on world markets and can become the basis for the formation of an innovative economy. 3. The potential of developing the domestic market of high-tech products. 4. Stimulate the development of information and communication technologies.
Resource	<ol style="list-style-type: none"> 1. Migration of scientists and specialists. 2. Aging of scientific staff. 3. An insufficient amount of specialists is from innovative activity. 4. Insufficiency of sourcing. 	<ol style="list-style-type: none"> 1. To promote the remuneration of labour in scientific and innovative spheres. 2. To create terms for storage of scientific work. 3. To attract greater sponsorship of innovative activity through expansion and increase of international cooperation.
Infrastructural	<ol style="list-style-type: none"> 1. Physical destruction of innovative infrastructure objects as a result of military operations. 2. Not enough defense of right of intellectual ownership. 	<ol style="list-style-type: none"> 1. Coordinations between the organs of management in innovative sphere and clearly to execute state strategies and programs. 2. Development of state partnership in an innovative sphere. 3. To carry out the system monitoring of innovative strength security and analysis of threats.
External economic	<ol style="list-style-type: none"> 1. Lag of Ukraine in development of innovative safety. 2. Dependence on an import. 	<ol style="list-style-type: none"> 1. Participating in international cooperations and innovative projects. 2. To stimulate the innovative-directed foreign investments.

complemented by an author after [11]

Research and development expenses decreased from UAH 17,254.6 million. in 2019 up to 17,022.4 million hryvnias. in 2020 (Table 3) and this trend will continue to increase in connection with the conduct of hostilities on the territory of Ukraine. Starting from 2019, there is also a reduction in the share of R&D expenses as a

percentage of the gross domestic product, which in 2020 is only 0.41% of the gross domestic product.

**Table 3. Costs of scientific research and development
by types of work for 2017-2020**

Indicators	2017	2018	2019	2020
Costs for carrying out scientific research and development - total, million hryvnias	13379,3	16773,7	17254,6	17022,4
including for execution				
of fundamental scientific research, million hryvnias	2924,5	3756,5	3740,4	4259,0
of applied scientific research, million hryvnias	3163,2	3568,3	3635,7	3971,4
of scientific and technical (experimental) developments, million hryvnias	7291,6	9448,9	9878,5	8792,1
The share of expenditures on scientific research and development in GDP, %	0,45	0,47	0,43	0,41

compiled according to the data [13]

The share of R&D expenditures in GDP in the EU countries (according to 2019 data) averaged 2.2%. It was higher than the average in Sweden – 3.4%, Austria – 3.19%, Germany – 3.18%, Denmark – 2.96%, Belgium – 2.89%, Finland – 2.79%, France – 2.19%; smaller - in North Macedonia, Romania, Malta, Latvia and Cyprus (from 0.37% to 0.64%) [14].

Therefore, the domestic knowledge intensity of the gross domestic product is five times less than the average value of this indicator for EU countries, not to mention the leading countries with a knowledge intensity of 3% or more. That is, Ukraine can compete only with countries that are not suppliers of new technologies or products with a high degree of added value.

Despite the slight increase in the number of industrial enterprises that introduced innovations in 2020, their specific weight in the total number of enterprises remains quite low - only 14.9%. Also, the share of the volume of sold innovative products (goods, services) in the total volume of sold products (goods, services) of industrial enterprises remains consistently low - 1.9% in 2020.

**Table 4. Implementation of innovations at industrial enterprises
of Ukraine for 2017-2020**

Indicators	2017	2018	2019	2020
Share of the number of industrial enterprises that introduced innovations (production and/or technological processes) in the total number of industrial enterprises, %	14,3	15,6	13,8	14,9
The number of types of innovative products (goods, services) introduced in the reporting year, total units	2387	3843	2148	4066
of them				
new for the market	477	968	418	691
implemented machines, equipment	751	920	760	647
The share of the volume of sold innovative products (goods, services) in the total volume of sold products (goods, services) of industrial enterprises, %	0,7	0,8	1,3	1,9

compiled according to the data [13]

This situation is due to systemic problems that have existed in the industry for the past decades. In particular, the lack of modernization, low level of innovation implementation, low level of capital investments, high level of wear and tear of fixed assets. As a result, the gradual loss of Ukraine's position as a country that can create competitive products. The loss of the leading industrial branches undermined the basis of the development of the related enterprises of machine tool construction, tool production, metrology, material science, and industrial chemistry. Increasing the level of innovative security of Ukraine requires, among other things, re-equipment with the application of innovations of many enterprises, changes in production technologies, improvement of management methods, etc.

The ability to finance the innovative activities of industrial enterprises is important for ensuring innovation security.

Table 5. Sources and structure of financing innovative activities of Ukrainian industrial enterprises in 2017-2020

Indicators	2017	2018	2019	2020
Innovation costs	9117,5	12180,1	14220,9	14406,7
including:				
own funds of enterprises	7704,1	10742,0	12474,9	12297,7
in % to the total volume of innovation costs	84,5	88,2	87,7	85,4
state budget funds	227,3	639,1	556,5	279,5
in % to the total volume of innovation costs	2,5	5,2	3,9	1,9
funds of non-resident investors	107,8	107,0	42,5	125,3
in % to the total volume of innovation costs	1,2	0,9	0,3	0,9
funds from other sources	1078,3	692,0	1147,0	1704,2
in % to the total volume of innovation costs	11,8	5,7	8,1	11,8

compiled according to the data [13]

The largest share of financing innovative activity of Ukrainian industrial enterprises is accounted for by the enterprises' own funds (85.4% in 2020), the smallest - by non-resident investors' funds (0.9% in 2020). Borrowed and involved sources of investment support for the enterprise include: investment loans from banks, targeted financing, targeted state credit, grants, credit lines from international financial institutions. State financing of innovative activities of Ukrainian industrial enterprises is quite insignificant and amounts to 1.9% in 2020. And in the near future, the volume of state funding will decrease due to the conduct of military operations on the territory of Ukraine.

The economic policy of the state as a whole and of an individual enterprise in the difficult conditions of war cannot be based on the basis of effective use of the existing innovation potential, on its development, including through strengthening the role of scientific research, project development and their commercialization. In turn, it is possible for the economy to enter the path of sustainable development under the conditions of ensuring innovative security. Threats to the innovative security of Ukraine are primarily military actions on the territory of Ukraine, a low level of innovation in industry, which should play a driving role in the recovery of the economy, insufficient funding for the innovative development of medium-sized and

small businesses, and a low level of protection of intellectual property rights. In Ukraine, there are currently no conditions for the formation of an innovative development model. The following measures contribute to the priority measures of strengthening the innovative security of the state: ensuring the priority of innovative development, stimulating the development and implementation of innovations, promoting modernization, and developing international cooperation in the field of innovations.

Mechanisms for the implementation of innovation policy in Ukraine, as a rule, suffer due to insufficient attention of the state authorities specifically to innovation policy. Legislative acts on innovation support in many cases have a lower priority compared to some other regulatory acts of the state. This leads to the blocking of innovative initiatives. This adverse development created a gap between science, education and economy. It is necessary to improve the legislative support and strengthen the mutual coherence between the main legislative acts of Ukraine regulating activities in the innovation sphere. The formation of an innovative development strategy involves radical shifts in Ukraine's development paradigm and corresponds to the purposefulness of Ukraine's transition to the European path of development. A necessary prerequisite for this is the development of an appropriate state strategy [12].

In the conditions of globalization, international partnership is becoming more and more important for the positioning of Ukraine on the world market of high-tech goods and services. The attraction of foreign investors to the development of the domestic innovation sphere and the use of opportunities for Ukraine's participation in innovation programs, in particular those implemented by the European Union, are especially relevant for Ukraine in modern conditions.

CONCLUSIONS

The current stage of development of many countries, including Ukraine, is connected with the need to transition to an innovative model of economic development. In order for the country to take a prominent place among developed European states, special attention should be paid to innovative security. Recovery of the Ukrainian economy is possible only on the basis of an innovative model of

economic development. This is a very complex process and requires a systematic approach and a clear justification of priority measures, taking into account the influence of external environmental factors.

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