

**Bohdanna Kosovych***Department of Enterprise Economics,**Ivan Franko National University of Lviv, Lviv, Ukraine (corresponding author)**E-mail: bogdanna\_k@ukr.net**ORCID: <https://orcid.org/0000-0003-4760-3098>*

## **Innovative development of Ukraine in the conditions of war and post-war period**

**Abstract**

The *purpose* of the research is to reveal the theoretical bases of innovative development, the significance of innovations for the Ukrainian economy, the importance of innovative products in the conditions of war, and the main directions of innovations in the post-war period. The *methodological* basis of the conducted study is a set of general scientific and special scientific methods, in particular: methods of analysis and synthesis are used to study ideas and existing positions on current approaches to development and components of innovation for the security of the country of the war and the post-war period, method of complex diagnostics – to study the socio-economic prerequisites of successful innovation policy in Ukrainian realities. According to the *results* of the conducted study, a number of important political, social and economic factors are outlined as components of innovation activity in modern Ukraine, aimed at ensuring national security and successful development of the Ukrainian state. *Practical implications.* In the conditions of full-scale war, there is a growing need to accelerate innovative activities, scientific and technical developments in the field of military-industrial complex; the political and economic tools for protection of citizens in the conditions of war and post-war reconstruction of Ukraine should be updated. *Value/originality.* Important role for successful innovation processes is played by economic factors, among which it is expedient to highlight such as: development of military-industrial complex with introduction of the latest technologies, strengthening of state regulation of economy, active attraction of investments, development of science and education, ensuring of social consensus, etc.

**Keywords**

innovations, economic security of the country, innovative activity, military-industrial complex, globalization challenges, development of science

**JEL:** A10, O30, O4

*This is an Open Access article, distributed under the terms of the Creative Commons Attribution CC BY 4.0*

**DOI:** <https://doi.org/10.30525/2500-946X/2022-4-1>**1 Introduction**

Russia's disgraceful full-scale military invasion of Ukrainian lands caused the need to speed up innovative development. Military action, the strategy should be managed so that the country, specific region can suffer the least loss. This should be guided by the economic security strategy of the country and its innovative development.

In the dynamic changes of modern economic systems, the transformations aimed at the development of innovation, which emerges as a complex, self-organizing system of economic relations and interactions of macroeconomic scale, gain significant importance. Governments of developed countries pay more and more attention to the institutional support of these processes in order to increase the economic security and leadership of national economies. The above-mentioned facts confirm the growing attention to

the institutional development of innovation activity as an important factor of modernization of the economy and society, increase of the gross domestic product (GDP), improvement of the population's well-being and, first of all, ensuring the country's economic security and formation of an economically strong state. These issues are particularly relevant for the Ukrainian economy at the current stage of Russian aggression and in view of the desire to improve its positions in the world rankings characterizing socio-economic and innovative development. In these circumstances, the study of the importance of innovative development activity for the security of the country in the conditions of war and as one of the driving factors for the intensification of Ukraine's economic growth is urgent and has important theoretical and practical significance.

The works of scientists O. Vlasyuk, S. Vovkanych, I. Mihasiuk, V. Horbulin, S. Kononenko, V. Kurylyak, E. Saveliev and many others are devoted to the study

of the issues of innovation and innovative development, taking into account their importance for ensuring the economic security of the country. At the same time, it is necessary to consider the innovative development and security of Ukraine in detail, especially in the conditions of war and post-war period.

Therefore, the state guarantee of the country's economic security in conditions of war, depends on the action of internal and external factors and forces, interested in changing the state political or social order. Challenges of economic security are complex, often they gain the status of a national problem. It is a matter of preserving the economic sovereignty of a state, i.e., its complete independence from other states in internal and external affairs. True state sovereignty is possible only on the basis of an efficient and competitive socially oriented economy. After all, it is the efficiency of the national economy that determines the place of a country in the current world system.

## 2 The quintessence of innovative engineering

Innovative development is, first of all, the development of scientific-technical revolution (STR) as a result of scientific and technological discoveries, as a result of which society receives fundamentally new techniques and technologies, which allow to increase productivity by tens and hundreds of times. Scientific-technological progress (STP) as a result of an invention – a small modification of the previous discovery, which contributes to the increase of labor productivity within a few percent – serves as an addition to the scientific-technological revolution.

Innovation and intellectual property are the economic drivers of the modern global economy. These sectors are powerful engines for economic growth and prosperity, not only in a particular country, but worldwide. Today, people live and interact in a global economy based on information technology, which seeks to profit from the results of intellectual activity as intangible benefits. The role of intellectual property has changed in recent decades due to the concentration of economic interest in new knowledge (Kodynetz, 2019).

The results of the scientific and technological revolution and progress may, in some cases, have a negative impact on the biosphere, and it is necessary to somehow compensate for such an impact. The 50th anniversary of the World Economic Forum in Davos was dedicated to climate issues, and climate-related natural disasters have been implicated. All this calls for further acceleration of the development of innovation policies, especially in the field of nature protection, improvement of the quality of life and a substantial increase in funding for science.

In this sense, Ukraine should follow the example of Israel, which allocates 4.4% of its gross domestic product (GDP) to science – perhaps the largest amount of any country in the world. And as a result, it gets a sure victory in military conflicts with its neighbors (Palestine, etc.). Israel has created modern powerful weapons and imposed the highest wage among neighboring countries (\$ 2.5 thousand, against \$ 200 in the same Palestine).

Based on Israel's experience, the effectiveness of the government, which is implemented through political, social and economic functions, should be attributed first and foremost to the means of ensuring the country's economic security during military conflicts.

The current situation in the field of globalization has two key features: first, no state can cope with global challenges alone because the problems have become too complex and there are too many actors competing in the international arena. Second, most nations are facing similar problems (from pandemic diseases to international terrorism) and are therefore becoming aware of the need to transform a community of interests into a community of action (Horbulin, 2017).

Along with the formation of common globalization values, the military factor does not lose its relevance and influence on the development of economic relations. Today it operates in the context of general military block norms and military threats. This is especially the case in Ukraine in recent years, when it experienced military aggression and was objectively forced to develop an abandoned military-industrial complex.

According to V. Horbulin, in 2015 the state defense order was fulfilled by 100%, the volume of modern weapon samples increased, which facilitated the search for new markets for military goods, the conduct of state tests of weapons, as well as the development of new samples of weapons and military equipment. Despite the achievements of the defense industry in recent years, there are still serious problems that need to be solved immediately. First of all, these are the improvement of the management system of the defense industry, technological modernization of the production base, improvement of the interaction between science and production, integration into the world defense and industrial cooperation and collaboration, training of highly qualified personnel (Horbulin, 2017).

According to economists (Vovkanych, 2014), the development strategy of Ukraine should include the prospect of defining, promoting and defending the values of the Ukrainian national idea, a long-term program of its implementation by all builders of "New" Ukraine, foreseeing the comprehensive development of creative personality, improvement of systems of national education, science, post-information economy, introduction of innovations,

nanotechnologies, increase of public activity. Formation of a new Ukrainian national elite, which would become an example of imitation, preservation of identity, mentality of the people, its historical memory, gene pool, etc., especially for young people. The definition of the basic principles of the Ukrainian national idea requires the introduction of appropriate changes not only at the level of international relations, but also in the normative-legal framework of Ukraine, in the strategy of national security of Ukraine.

Russia's military aggression against Ukraine led to corrections in the new strategy of socio-economic development. It is about the development, improvement and production of the most modern weapons capable of successful confrontation in combat actions. It accelerates the growth of the number of scientific and technical developments in the sphere of the military-industrial complex of Ukraine, as well as the production of means of protection of the soldiers.

For other sectors of the economy, it is now necessary to implement a policy of political vectors. It should provide, firstly, for fundamental research aimed at the future of world leadership in certain fields; secondly, for innovative measures in the production of weapons needed by the Ukrainian Army in times of war; thirdly, for the fastest adaptation of the scientific and scientific-technological achievements of the military-industrial complex in the areas producing products of general industrial and personal consumption; fourthly, for the increase of domestic exports of weapons and military equipment to the world market and, on this basis, for the creation of special funds for the financing of scientific initiatives (Saveliev, 2015).

The basis for the development of the economy of the new millennium is, first and foremost, the system of corporate economic globalism, global management, the emergence of global corporations that undermine the sovereignty of states. This is reflected first and foremost in the demand that national governments introduce market deregulation. This means nothing more than the demand to transfer the economic power of states to global capital. This is the essence of the ideology, strategy and policy of the modern advocates of total globalization. Deregulation opens every national economy to international rivalry and global competition, identifies its functioning and significantly weakens both state power and the economy itself, which is no longer controlled from the inner center. The national economy is no longer self-sufficient in the development of interests. According to some scientists, the global law of internal compression of the economy is objectively effective, according to which: the stronger the external influence on the national economy, the higher the level of its integration, the greater the

strength of internal relations, the stronger the resistance to negative external influence and threats should be. The openness of the national economy should always be relatively minimal, especially in an extreme situation, especially in the conditions of war.

Military-economic dependence on financial and technical-technological security is conditioned by the level of development of the military-industrial complex, which must satisfy the needs of the army at the level of rational defense sufficiency.

According to O. Vlasjuk, hybrid aggression is primarily directed against values. Its purpose is to demoralize citizens, undermine their loyalty, sow mistrust and panic among them, thus causing disorder and destruction of all social institutions, including the institution of statehood (Vlasjuk, 2017). Increasing the capacity of the military-industrial complex with its further transformation into a factor of technological progress of the whole society, achieved by means of conversion, and a factor of growth of the economy, fulfilled by means of export, form strong positions of the state. And a strong state can be an effective and desirable member of various international associations and an attractive and reliable ally. Only a strong state can establish itself in world politics and remain in world history (Vlasjuk, 2017).

Under the extreme conditions in which Ukraine finds itself, defense capabilities should be strengthened, first of all, by modernizing the enterprises of the military-industrial complex, developing space technologies and approaching NATO standards.

### **3 Directions of innovative development**

Today there is competition between the countries of the world not only for the use of material resources of natural potential, but also for talents, ideas, innovations. Countries that export more innovations earn higher profits than those that export raw materials, yesterday's equipment. Ukraine exports no more than 0.2% of innovative products from the total exports, at this time when Poland – 0.8%, Germany – 2%.

The experience of the advanced countries of the world has shown that innovations are most often implemented in industrial parks – special industrial zones with prepared infrastructure. There is a simplified regulatory procedure for such scientific research enterprises – soft loans, tax and customs exemptions, subsidies for electricity and water tariffs, and housing for employees. However, all these incentives apply only to new industries.

Techno-parks, innovation centers, cross-border clusters are operating in Ukraine today. For some sectors, the most profitable is the creation of so-called "growth points", which stimulate only the most valuable research innovations,

especially for the enterprises of the military-industrial complex.

Industrial parks are real tools of de-offshore economy, a mechanism of decentralization. Discrepancy of issues of formation of a network of industrial parks with strategic documents standardizing the regulation of regional development. In Ukraine the network of industrial parks is formed chaotically, and the principles of its formation are not specified in the strategic document, in particular, in the state strategy of regional development for the period up to 2027 (Strategy for 2020). There is also no special separate program for the use of industrial parks in Ukraine to attract investments and balance the territorial development of the country. At the same time, the definition of national principles for the creation and promotion of industrial parks in the regions of Ukraine, which differ in socio-economic development, would contribute to their socio-economic development.

The approval by the Order of the Cabinet of Ministers of Ukraine from July 10, 2019, No. 526-p of the Strategy for the Development of the Innovation Sphere until 2030 (Strategy of development, 2019) gave impetus to the beginning of significant changes in the Ukrainian innovation ecosystem. Globalization and modern communication technologies create opportunities for the existence and development of successful innovative cluster enterprises, even in the face of general technological backwardness, low consumer purchasing power and territorial remoteness, by integrating value (cost) creation into international chains. However, innovation activities are still insufficiently integrated into regional development processes. The main barriers to the development of innovations in the regions of Ukraine are The absence of specialists in the field of innovation management, intellectual property management, marketing, legal protection, financial advisors, experts in technology transfer and business planning; the missing of necessary information about the market prospects of the proposed idea and knowledge; the lack of advisory support for the development of the project from the idea to the commercialization stage; the failure of well-established communication between scientists and business representatives interested in the development of innovations, both for the needs of business in innovation and for the data about new and improved technological solutions that can be used in production; insufficient promotion and dissemination of information about positive examples of transforming an idea into an innovative product; insufficient or limited efficiency of the innovation infrastructure that should facilitate the development of innovative entrepreneurship; inadequate independent assessment of the technological level of scientific and technical

(experimental) development and the ability to implement it technically. Ukrainian regions are facing the challenge to modernize and create modern production, increase the competitiveness of products in domestic and foreign markets and ensure sustainable economic growth. Such changes are based on innovative models of regional economic development with the use of reasonable specialization. It is very important to create conditions for implementation of innovations and support them in different regions of the country, especially where there is an appropriate scientific base, business, modern innovation infrastructure. First and foremost, this applies to regional centers and large and medium-sized cities that have the potential to do so. The drivers of innovation and economic growth in the most economically developed countries are usually small and medium-sized enterprises.

Modern entrepreneurship in Ukraine must be based on the knowledge and skills of each employee, his or her education, ability to make innovative breakthrough decisions and use growth opportunities. This concerns, first of all, the development of innovative production, which requires greater state incentives and financing of scientific production. Development of small innovative entrepreneurship, its marketing component includes: use of available knowledge bases in practice; application of them in a competitive environment; analysis of the macro-environment of the enterprise and comparison of the capabilities of the enterprise with the actually existing demand for products; generation of creative decisions and formation of breakthrough technologies. Transfer of knowledge of the enterprise includes interaction of its knowledge with the needs of consumers and creation of a competitive advantage to meet the new requirements of consumers of products. Small innovative entrepreneurship promotes rapid commercialization of research and development of results, adaptation to changing conditions in all spheres of activity (Mihasiuk, 2019).

It is necessary to agree with the opinion of scientists (Zoymenikht, 2019) that the Ukrainian government must comply with the current legislation of Ukraine and guarantee the allocation of at least 1.7% of GDP to science. In addition, Ukraine must take concrete steps to increase this percentage to the EU target of 3%. Such funding can increase motivation and endanger the prestige of scientific research in Ukraine.

In case of continuation of the short-sighted, negative attitude of the state to the financing of science and high-tech sectors of the economy, Ukraine may disappear from the map of the developed industrial states of the world. This conclusion is not an exaggeration, because today,

when it comes to space, it is not just the starry sky and the boundless universe. National security, sustainable development conditions, resource monitoring, ecology, modern communication and navigation services, precision agriculture, combating global climate change – all these areas have a significant space component, and the competitiveness of the country directly depends on the level of space technology. Space activities in the interests of national defense and security include the implementation of targeted projects for the creation of engineering and technology, the development of new models (Horbulin, 2020).

It is possible to achieve the economic security of the country in the present situation, providing the economic balance in the state – the situation of the population of the country, under which their normal conditions of living and working are ensured. And it depends on the availability of sufficient quantity of basic resources, the sustainability of the financial-credit and monetary system, ensuring the rule of law and the effectiveness of the law enforcement system, increasing the readiness of the army to protect the state, reliability and efficiency of the system of self-government and public administration, strengthening the defense capability of the state, its military-industrial complex.

Today, the coming monetary financial crisis should be considered as the most urgent problem of the Ukrainian economy. In Ukraine, as in most countries of the world, the problem is not only the lack of currency, but the destabilization of all social programs – wages, pensions, etc. However, every crisis destroys not only the economy. In the time of crisis, a new economic climate is created and interest in new investment trends is formed. Nowadays the hope is in the middle class, in the small national businessmen, for whom Ukraine is not just an office for doing business under conditions of war. For Ukraine, the middle class is in fact a buffer zone, like the ozone layer between the very rich – at the top pole – and the very poor – at the bottom pole. And in order not to collide these poles, the middle class of Ukraine should be favored to promote.

In the current extreme conditions in Ukraine, it is necessary to continue reforming Ukraine's law enforcement system and armed forces in accordance with NATO standards, to protect the population from the effects of the financial and economic crisis, and to strengthen coordination of the activities of the Ministry of Defense, the Security Service of Ukraine, the Border Guard Service, and investigative agencies. The President of Ukraine and his team must use the rational grains of past governments, the results of scientific research innovations, the inventions of individual scientists to improve both internal and external factors of national security and defense of the country against the Moscow aggressive.

State regulation of the economy in times of crisis, and especially in times of war, is first of all a struggle against informal methods of government. Instead of them, it is necessary to create a modern system of planning, forecasting, which, unlike centralized and excessively detailed ones, would provide a European methodology of indicative state planning. The plans must include clear strategic guidelines for economic development, its place and role in the world market, based on the national interests and capabilities of the state. Both short-term and long-term results of the implementation plans should determine the consequences of state regulation of the economy for the whole society. This will contribute to the construction of a new architecture of the country's development, the formation of the national economic system, a more realistic assessment of the causes of the crisis, and the development of appropriate measures to overcome it.

The economic security of any country, including Ukraine in conditions of war, is determined by the level of its economic development. Therefore, the level of economic development is one of the most important indicators of the state of economic security, and the economic policy of the state is another important factor influencing the rate of economic growth and determining the state of foreign economic security. Especially, it concerns state-owned enterprises, budgetary policy, monetary policy, currency policy, etc. The reason for this is that international economic relations can serve as an instrument for dividing the world and intensifying confrontation. This is especially true in an economy where the development of globalization processes is closely linked to the increased competitiveness of the global market for the control of natural resources, talents and information space through the use of the latest technology and engineering.

The economy of a country that is experiencing difficulties due to objective factors needs foreign investment. They will be able to provide the necessary financial support for the introduction of the latest technologies. In order to attract foreign investors, it is necessary to create certain legal and institutional conditions in the country that would guarantee their rights and interests in all regions of Ukraine. For this purpose, the government should use appropriate administrative instruments.

Under the current extreme conditions, society is experiencing an overload caused by the weakening or rupture of traditional economic and social ties, social disengagement, which requires strengthening the role of the state as a guarantor of social stability.

External aggression prompts the Ukrainian state to adjust its economic policy, first of all, by increasing the scientific and technical potential, intellectual and professional level of the workforce, stimulating the development of an innovative structure, etc. The

higher the level of economic and social consolidation of a society, the more fully its internal resources are utilized. Because the higher the degree of economic and social consolidation of a society and the more fully its internal resources are realized, the more it is able to take advantage of the confrontation with the aggressor.

In the conditions of wars Ukraine needs a strong executive power of all levels, especially on the local level, a strong state capable of radical and at the same time weighted, scientifically based actions. It is possible to stabilize the situation at the macro level with the help of a strong executive power, at the micro level (at the level of individual enterprises, organizations) – by creating conditions for the possibility of highly efficient work, which can be facilitated by deregulation, decentralization and further development of private property, the emergence of the middle class – entrepreneurs, farmers. It is necessary to work out as soon as possible the ways of reconciling the economic interests of producers, businessmen and the state, to establish law and order in the country. This is the main condition for the emergence and development of the middle class, the strategy of state structural regulation. In addition, it is an organization of state enterprise production, which should be encouraged by private producers. Enterprises in which the state is a co-owner must be subject to special control by the relevant authorities. Primarily, it is an operational and strict administrative control over the use of national wealth, the fight against monopoly power, the solution of environmental problems, the guaranteed minimum wage, the protection of national interests in foreign economic relations, the observance of laws in the field of business and financial credit activities, the activity of state judicial bodies. It is necessary to establish the strictest control over the flow of money in the country, including budgetary funds, especially for the development of scientific research; it is advisable to create a body that could make decisions on major issues of economic reform strategy and tactics, coordinate and coordinate with the regions the activity of central state executive authorities, as a guarantor of economic security in conditions of war.

## References

- [1] Kodynetz, A., & Maidanyk, L. (2019). Commercialization of Intellectual Property Rights as Foundation for Innovation. *Science and Innovation*, vol. 15, no. 4, pp. 91–102. E-source: <http://scinn.org.ua/sites/default/files/pdf/2019/N4/Kodynetz.pdf>
- [2] Horbulin, V. (2017). *World Hybrid War: The Ukrainian Front*. Monograph [Online] / by General. ed. V. Horbulin. Kyiv: NISD, 496 p. E-source: [http://www.niss.gov.ua/public/File/book\\_2017/HW\\_druk\\_fin+site\\_changed.rar](http://www.niss.gov.ua/public/File/book_2017/HW_druk_fin+site_changed.rar)
- [3] Vovkanych, S. Y. (2014). Ideological foundations of state formation in the system of strategicization of regional policy, national economy and security of Ukraine. *Regional economy*, vol. 4, p. 18. (in Ukrainian)
- [4] Saveliev, E., & Kurylyak, V. (2015). Priorities in reforming the Ukrainian economy. *Ukraine economy*, vol. 5, p. 86. (in Ukrainian)

## 4 Conclusions

In the period of military aggression, there is an urgent need to accelerate scientific and technical progress in all spheres of the state economy and to create a system of new international guarantees for the protection of national interests. This has a positive impact on society. Thus, new types of weapons were created in Ukraine and successfully used on the Russian-Ukrainian front. The military industry is developing and the space industry is reorienting itself in the interests of national defense and security. Ukraine is adapting its military-industrial complex to NATO standards.

The state in the conditions of war acts as a guarantor of the development of high technologies, innovations, knowledge and information networks. An important function of the state in the conditions of post-industrialization is the fulfillment of its role as one of the main actors ensuring the progressive development of the main spheres of the economy, especially innovations. It is expedient to generate and transfer research results in Ukraine in a timely manner through the support of techno-parks, business incubators – through state orders, preferential loans, allocation of grants, subsidized financing, etc. The success of innovative development in the state depends on a complex of political, economic and social factors. Economic guarantees, which require constant development, serve as the material basis of innovative processes ensuring the security of modern Ukraine.

The decisive factor for the successful development of the Ukrainian state today is a breakthrough innovative economic activity, which includes the introduction of modern advanced technologies, the use of advanced forms of production, the development of preferential loans, the attraction of domestic and foreign investments, the support of national producers, the improvement of state regulation of economic relations, the increase of the qualification of the personnel potential, the support of science, the protection of intellectual property rights, the creation of creativity. The ideological basis of innovation activity in Ukraine should be the close cooperation of science and business, the nationwide idea of protection and development of an economically strong country.

- [5] Vlasyuk, O., & Kononenko, S. (2017). *Kremlin aggression against Ukraine: reflections in the context of war*. Kyiv: NISD, 304 p. (in Ukrainian)
- [6] "On the approval of the State Regional Development Strategy for 2021–2027": Resolution of the Cabinet of Ministers of Ukraine dated August 5, 2020. No. 695. E-source: <https://zakon.rada.gov.ua/laws/show>
- [7] Strategy of development of the sphere of innovative activity for the period till 2030. E-source: <https://zakon.rada.gov.ua/laws/show/526-2019>
- [8] Mihasiuk, I., & Kosovych, B. (2019). State regulation of modern trends of entrepreneurship, trade and exchange activities development, *Visnyk Lvivskoho universytetu (seriia ekonomichna)*, vol. 57, pp. 49–59. (in Ukrainian)
- [9] Zoymenikht, O., Harashchuk, O., & Ladokhin, O. (2019). White Paper: Ideas and Recommendations How to Move Forward to Ukrainian Science? View of the Ukrainian scientific diaspora. *Science and innovation*, vol. 15, no. 5, pp. 106–119. E-source: <http://scinn.org.ua/sites/default/files/pdf>
- [10] Horbulin, V. (2020). Space strategy and development prospects. *Bulletin of the National Academy of Sciences of Ukraine*, vol. 2. E-source: <http://files.nas.gov.ua/PublicMessages/Documents.pdf>

Received on: 11th of November, 2022

Accepted on: 17th of December, 2022

Published on: 30th of December, 2022