PROBLEMS OF RESTORING THE INNOVATIVE POTENTIAL OF HUMAN CAPITAL IN THE SYSTEM OF FACTORS OF THE INFORMATION SOCIETY IN POST-WAR CONDITIONS IN UKRAINE

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Abstract. The study found that Ukraine has almost lost the industrial platform on which an innovation-type economy can develop, and industrial regions have inherited the main structural problems, the current state of the economy of which is defined as a catastrophe, which has social, economic, environmental and scientific and technical dimensions. The importance of a systemic innovation policy is emphasized, which involves the development and implementation of a system of priority areas for the development of science and innovation, focused on achieving the SDGs in detail by technologies or dimensions of sustainable development. This task is proposed to be solved by conceptualizing the connection between sustainable development and security, based on the results of which it is possible to determine the most problematic components (current, expected) of the national system "sustainable development - security" by assessing the current state and forecasting.

Basic concepts (Introduction). Any armed conflict ultimately ends in one of two outcomes: the victory of one of the parties, bilateral agreements, when the results do not satisfy either party, but reason and real calculation win over ambitions, emotions, etc. The parties understand that the continuation of hostilities will only worsen the situation and are forced to make some concessions for the sake of the well-being of their people. There is also a third way - freezing the conflict, which, as experience shows, does not solve the problems and from time to time flares up with renewed vigor. Ukraine's innovation policy is a key component of the future economic strategy and an important tool for implementing investment initiatives in the post-war period. After the end of hostilities, innovation activity should become an integral part of the processes of restoration and modernization of the economy.

This activity should be integrated with investments in innovation processes based on an active innovation policy that will promote the introduction of modern technologies and developments. Given the scale of the destruction caused by Russia during the full-scale invasion, special attention must be paid to early planning and coordination of actions to restore the country. This process should take into account both domestic resources and international assistance. Cooperation with international partners, including the European Union, will be an important component of the success of innovation policy, which will help rebuild and modernize the Ukrainian economy to a new level.

Issues of innovative transformation were addressed by prominent scientists (V. I. Kyrylenko, O. V. Tkachenko, A. G. Kotenok, G. O. Sarkisyan, A. O. Sitkovska, 2022), who identified the main problems of transforming the innovation process in ensuring the competitiveness of enterprises, considered innovative activity through industry 4.0, which in the context of globalization and localization plays an important role in determining the directions of activity (Bilorus O.G., Hrytsenko A.A, 2023); they determine the development of entrepreneurship in the context of an innovative economy in the context of activating the creation of preferential zones (Chernyaeva, O., Kulinich, T., Hutsul, T., Korolkov, V., & Gubar, O., 2022). Bila I. S., Posna V. S., Shevchenko O. O. (2023) argue that after the full-scale Russian invasion, which affected the country's innovation environment, the level of investment decreased, business risks increased, domestic demand for products decreased, the number of innovative projects and the availability of their financing decreased, and it is precisely the reconstruction of the economy that is possible through the introduction of innovations into the activities of Ukrainian enterprises.

Identification of previously unresolved parts of the problem. The main directions of the innovation transformation of Ukraine in post-war reconstruction are the stimulation of scientific research and development, support for innovative projects, promotion of technological development and development of innovation infrastructure. The scientific study considers the possibility of effective cooperation between the public sector, scientific institutions and enterprises to create a favorable innovation ecosystem in order to ensure sustainable economic development in the post-war reconstruction of the state.

Formulation of objectives. The purpose of the study is to determine how innovation systems exist today in various sectors of the Ukrainian economy. It is important that the purpose of the article is not only to define and describe these systems, but also to draw conclusions about the ways of their development in the future, in the context of post-war development. The task of the study is to investigate the general conditions for the development of Ukraine's innovation policy; to study the development and current state of individual sectors of the Ukrainian economy, the activities of which were disrupted with the beginning of martial law; to determine which areas of economic activity were affected by the war in Ukraine.

Presentation of the main material of the study. Today, innovation processes and their large-scale implementation in the economic life of the community are becoming increasingly relevant. This is mainly explained by the ongoing crisis in conditions of fierce competition in the world and interregional markets, especially in conditions of restrictions on imports of production. In this aspect, innovation is one of the fundamental factors of economic growth. They contribute to increasing competitiveness and strengthening the economic activity of economic systems. The fundamental normative document of the strategic development of the national economy is undoubtedly the Strategy for Sustainable Development of Ukraine until 2030, which states as strategic guidelines the improvement of the well-being of Ukrainian citizens, strengthening of national security, strengthening of Ukraine's positions in the world economic arena. According to this document, Ukraine is acquiring an innovative direction of development, which is based on the active use of knowledge and scientific achievements, stimulation of innovative activity, creation of a favorable investment climate, renewal of production funds, formation of high-tech activities and branches of the economy, increase of energy efficiency of production, stimulation of balanced economic growth based on attraction of investments in the use of renewable energy sources, in environmentally friendly production and "green" technologies.

The fact that at the present stage innovations have become an important component of social life does not require proof. According to most researchers, innovative activity is the locomotive of economic and social development. It leads to profound transformations of the technological method of production, which contributes to significant savings of resources and the emergence of new high-quality products. In a market economy, innovations are the most important factor in increasing competitiveness. They also contribute to the discovery and development of new markets. Innovations are usually considered as new directions for business development. However, their significance for state institutions and society as a whole is no less relevant. The effect of the development of innovations in general for various participants in the business system is as follows:

1. For private companies: development of new sectors of the economy, entry into new markets, growth in profits, increased business sustainability, acceleration of business growth rates. The profit of shareholders of companies that are leaders in the field of innovation significantly (by 15%) exceeds the average level in the industry (according to the results of the Granularity of Growth study).

2. For society: an increase in the standard and quality of life, an increase in incomes of the population, improved working conditions, new opportunities for employment. The availability of healthcare is increasing, the quality of the urban environment and housing is improving, the availability of state aid online is increasing, and the level of social exclusion is decreasing due to new forms of labor organization.

3. For the state as a whole: GDP growth, improving the country's position in the global economic space, reducing inequality between different segments of the population, diversification and development of the economy. Ukraine has significant growth potential in labor productivity as a result of the introduction of innovative technologies. Here it is important to determine which of the economic sectors are most attractive for the use of innovative projects.

Various approaches are used to determine the most attractive areas of business development, which are usually based on calculating the performance indicators of investment projects. However, such calculations contain many errors, since they are based on forecast indicators of costs and revenues, depend on the state of macroeconomic indicators, the actions of competitors, the presence of a market niche and many other factors. This determines their low level of reliability, the presence of investment risk in innovative projects.

A scientific approach to solving the problem of growth of innovative development of the economy requires an understanding of the source of innovation, which differs in different industries and types of activity. From this point of view, it is advisable to distinguish four groups of industries, each of which is distinguished by the specifics of the emergence and development of innovations, the peculiarities of the influence of factors on the development of industries within the group. This will allow us to develop recommendations for the accelerated development of industries in each individual group, which can be used both at the level of each company and at the industry level.

Group 1 - industries whose innovative activity is based on conducting global scientific research with its subsequent commercialization, such as: petrochemicals, healthcare, pharmaceuticals. In these industries, a significant share of revenue, up to 30%, is spent on scientific research, despite the fact that the period from the start of research to the moment of obtaining an innovative product can reach two decades.

Scientific innovations require a favorable business environment, which includes legal protection of innovators, preferential tax environment, budget support, opportunities for open cooperation in research at the national and international levels. It is necessary to take into account the specifics of Ukraine regarding centers of innovative scientific activity. As a rule, in the world this role is performed by universities in the process of conducting fundamental scientific research with the support of the state and private sponsors. In Ukraine, universities are mainly engaged in educational activities, since they are limited in terms of funding, both due to limited budget support and the underdevelopment of the institution of sponsorship in the field of scientific activity. Therefore, the main burden of financing and the actual conduct of scientific research and development lies with large companies, most of which are state-owned. It is quite difficult for Ukrainian companies included in this group of industries to compete with world leaders, whose activities are sustainable and are associated with the presence of patented scientific achievements.

Group 2 - industries whose innovative activity is aimed at developing innovative technologies throughout the value chain. This group includes electric power, mechanical engineering, construction. Companies in these industries spend up to 10% of their revenue on research. The period of development and promotion of innovative technologies to the market is 5-10 years. The problem faced by industries in this group is the insufficient number of professionals with the necessary competencies and inclined to conduct research activities.

Group 3 - industries whose innovative activity is related to satisfying consumer preferences. These are the textile and food industries, transport, banks, education, telecommunications, entertainment, and trade. The peculiarity of innovations in this group of enterprises lies in the need to timely identify existing and potential demand, which forces a significant part of the revenue, up to 7%, to be spent on marketing research. The period of development of new products and business models and their commercialization is significantly shorter, as it is often focused on local markets, the presence of free consumer niches and unsatisfied demand. The high level of intra-industry competition forces companies to shorten the process of bringing new products and services to the market as much as possible, provided that their distinctive features are further developed.

The decisive influence on the development of companies is exerted by access to cheap capital, the presence of state protectionism, the stability of demand, legislation aimed at protecting entrepreneurs from illegal actions by other participants in the business environment.

Group 4 - industries whose innovative activity is associated with increasing the efficiency of the production process. This group includes the woodworking industry, oil and gas, textile, mining, agriculture, metallurgy, which are characterized by a high level of labor intensity and material intensity. Innovative development of these industries is ensured by a deep understanding of the features of the technological process, the ability to control the entire chain of creating a consumer product, communicate and create effective partnerships with other participants in the production chain. The goal of innovative development of such industries is to improve the quality of the product while simultaneously reducing its cost.

For industries of groups 3 and 4, the development process is often determined not so much by the significance of innovative achievements as by the commercial ability to convey information about the possibility of better satisfying the need to other market participants. Here, the growth potential of Ukrainian companies is quite high due to both the presence of significant unmet demand for Ukrainian goods and the ability of domestic entrepreneurs to creatively approach the processes of commercialization of products and services.

Thus, a number of industries in Ukraine already today have significant competitive advantages, which allows them to become drivers of innovative development of the Ukrainian economy, provided that they are purposefully supported. Innovation policy in the post-war period should become the engine of sustainable development of Ukraine, ensuring the efficient use of available resources and opening up new opportunities for economic growth.

The war in Ukraine had serious consequences for the country's industrial sector, leading to a number of problems:

1. Damage to enterprises. The military actions destroyed or seriously damaged a number of large industrial enterprises, including:

- Azovstal and Ilyich Iron and Steel Works - two of the largest metallurgical companies;
- Severodonetsk Azot - one of the leading chemical enterprises;
- Avdiivka Coke Plant - a large producer of coke products;
- Energomashspetsstal - a manufacturer of special equipment.

2. Supply chain disruptions and logistics problems. Due to the hostilities and occupation of territories, there were serious interruptions in the supply of raw materials, components and finished products. Logistic routes, including railways and roads, were also destroyed or blocked, instability, a decrease in incomes and a large number of refugees led to a significant decrease in domestic demand for goods and services. These factors had the following overall consequences for the Ukrainian economy.

3. Loss of up to 50% of the economy. The war led to a serious reduction in GDP. According to forecasts, the economy will recover over the next five years to reach pre-war levels. This effectively means the loss of a decade of economic development.

4. Failure of climate targets for 2030. Plans to reduce emissions and other environmental initiatives have been seriously undermined. In the context of war and post-war recovery, it is difficult to maintain and implement climate targets, especially regarding carbon intensity.

5. Demographic changes. The mass migration of refugees and internally displaced persons has affected the labor market and consumption, further complicating the economic situation. The recovery of the Ukrainian economy and the industrial sector in particular requires significant efforts, including the restoration of infrastructure, attracting investment, supporting innovation and cooperation with international partners. Innovation policy can become an important tool in this process, contributing to the modernization and increasing the competitiveness of Ukrainian industry in the global market. Before and during the war, the Ukrainian authorities did not have a systematic industrial policy, which significantly affected the effectiveness of supporting industrial enterprises.

Despite various business support instruments, their overall effectiveness was low. The main measures and their results can be summarized as follows:

1. Abolition of VAT and customs duties on imported goods. At the very beginning of the war, the authorities abolished VAT and customs duties on all imported goods to facilitate access to necessary resources. This decision was retroactively canceled as of July 1, 2022, which created some uncertainty for business.

2. Introduction of a single tax of 2% of turnover. This tax, intended to simplify the tax system, turned out to be ineffective for large system-forming companies. Its abolition is planned by the middle of this year, which also reflects the inconsistency in tax policy.3. Program "Affordable loans 5-7-9%. " Since the program began in February 2020, banks have issued 53 thousand loans worth UAH 166 billion. However, only UAH 10.9 billion of them were directed to investment purposes.

Comprehensive approach to recovery:

- development of long-term strategies to support industrial enterprises, taking into account environmental standards;
- attraction of international investments and partnerships to finance recovery projects;
- ensuring a stable and favorable regulatory environment for industrial development and innovation.

Ensuring a comprehensive approach to the recovery and development of industry in Ukraine requires systematic efforts by the government, business and international partners. The use of the best global practices and technologies will not only restore lost capacity, but also make Ukrainian industry more sustainable and competitive in the global market.

The issues of post-war recovery are closely related to ensuring security and sustainable development. “No state will achieve sustainable development without peace and a sense of security,” emphasized President of Ukraine Volodymyr Zelenskyy during his participation in the Leaders’ Dialogue at the UN Summit on Sustainable Development Goals within the framework of the 74th session of the UN General Assembly in New York (USA).

Analysis of the current and future situation in the process of making attempts to transition to a sustainable development model shows the need to develop a holistic, scientifically based plan of action, means, stages of implementation, coordination of collective actions of society and development of really effective mechanisms for ensuring the implementation of the concept of sustainable development (Geography's task in the implementation of the sustainable development paradigm and the 2030 goals in Ukraine).

The UN report contains the thesis that "there is no security without development, just as there is no development without security" (UN Report of the Secretary General. In Larger Freedom: Towards Development, Security and Human Rights for All).

In general, the issue of the dynamics of the level of security and its impact on all aspects of the socio-economic development of the state, as well as the interdependent relationship of these two defining components, is a relevant issue of modern scientific discourse and an important aspect of the substantive content of post-war recovery strategies.

The security problem is the main one from the list of priorities of the strategic development of Ukraine. It covers the complexity of transformation processes at the beginning of the 21st century. and is a condition and goal of development policy, since it requires the concentration of all forces and resources on solving the problems of post-war reconstruction. Their diversion to the neutralization of current threats complicates, and sometimes makes it impossible, the successful implementation of the development strategy.

In the most general form, the security-development nexus is designed to describe a situation in which, from the point of view of the long-term security interests of the reference object in the process of determining its goals and their practical implementation, it is inappropriate to separate the issues of development and security, when in principle they cannot be considered separately from each other (Yudin N., 2017).

Analyzing the publications of Ukrainian and foreign scientists, the author of the study "Economic Security and Innovative Development of an Industrial Enterprise: Essence and Interrelationship as Objects of Management" (Voloshchuk L.O., 2014) concludes that in defining security, in particular economic security, scientists combine two previously widespread concepts: the concept of economic security as a form of development and the concept of economic security as a counteraction to threats.

Based on the research conducted, based on the evolution of the concept-link "development - security", we can conclude that in total these trends have determined a new specific content of the link, where security and development act as mutually conditioned goals and ways to achieve them.

"We and our partners are ready to jointly open up development prospects and use growth opportunities in order to make a worthy contribution to deepening global cooperation for the purpose of development and forming a community of a common destiny for mankind." - Chinese Leader Xi Jinping.

To conceptualize the link between sustainable development and security, in particular within the framework of the Sustainable Development Goals (SDGs), as well as to develop appropriate policies, it is necessary to find the most effective management tools, one of which, as the study showed, is innovation policy.

According to the National Security Strategy Formulation study, each security strategy at the national level should take into account the factors of technological innovation (human resources, infrastructure, investment, support).

The analytical study by Ilyina, A. (2023) can be considered a fundamental work that reveals the relationships between national security and innovation with the corresponding financial strategy. Also important are the conclusions of the analytical report of the US National Science and Technology Committee (USAID, 2016), which provides an opportunity to get acquainted with the analysis of the impact of innovation on US national security and the definition of relevant strategic aspects, including taking into account the interaction between institutions.

In the study of Shvets, N.V., Shevtsova, G.Z. (2022), the term "sustainable security" is proposed to be used to demonstrate the critical importance of integrating national, human and environmental security and to address the three foundations of sustainable development: society, economy and nature.When analyzing "sustainable security" in the study of Khanin, S. (2023), it is proposed to use long-range sustainable management to achieve it, which covers a wide range of tasks that must be implemented at the state level.

The national (macro) level is recognized as the basic for the implementation of "human development - human security" strategies in the study of Kravchenko, O., & Kychygin, A. (2023) In that study, based on the consideration of the concept of "sustainable security" and the study of relevant opportunities and threats, emphasized that many of them arise as a result of the interaction of man and nature not at the global or local levels, but at intermediate scales, which makes management at the national level relevant.

The need for consideration at the national level and the development of appropriate policies can be confirmed by empirical studies of the problem of taking into account the interaction between the 17 SDGs and/or the corresponding sub-goals, and that the direction of interaction (mutual reinforcement or contradiction) between them in each country is different.

A similar conclusion is found in the study of the Strategic and Quantitative Analysis Centre, operating under the auspices of the Institute for Global Environmental Strategies (Kravchenko, O., & Kychygin, A., 2023), within which the analytical tool SDG Interlinkages Analysis & Visualisation Tool (V3.0) was developed, the use of which allowed the applicant to conclude that for each country the nature and strength of the connection between the 17 SDGs and/or the corresponding sub-goals are different.

In this context, the significance of innovations in the formation of a sustainable development system within the study of Illyashenko N. (2020) is considered on the basis of the following functions:

– innovations contribute to the implementation of the law of proportionality, under which the reproduction structure most accurately corresponds to the level of existing needs of society;

– innovations provide an opportunity to expand the range of produced goods and services, which contributes to the implementation of the law of increasing needs;

– thanks to innovations, the production of new products is carried out with less resource consumption;

– innovations as a means of implementing the achievements of human intelligence lead to the intellectualization of activity and an increase in its knowledge intensity, which contributes to the implementation of the laws of increasing the productivity of social labor and increasing the efficiency of production.

Based on the above, for the development of the national system "sustainable development - security" in the post-war period, it is worth considering innovation policy as a set of tools for managing the targeted implementation of innovations that will contribute to sustainable development. The need to analyze the innovative dimension of the national system "sustainable development - security" is due to the fact that narrowing national security to the military-political aspect in relation to national interests in the field of security and defense is an erroneous approach in modern conditions. In this context, innovative security can be the component that connects research areas in the interests of ensuring both national security and its high-quality socio-economic development (Bila I.S., Posna V.S., Shevchenko O., 2023).

At the level of international organizations, there is a clear understanding of the impact of innovation on sustainable development. In particular, the declared goal of the World Intellectual Property Organization, as one of the specialized agencies of the United Nations, is to contribute to the achievement of the SDGs by providing Member States with specific services that enable them to use the intellectual property system to stimulate innovation, competitiveness and creativity necessary for the implementation of these SDGs.The generalization of the conclusions of individual international resolutions provides an opportunity to confirm the understanding of the role of innovation for sustainable development within the framework of public policy. The analysis of the above positions, in particular the Resolution of the OSCE Parliamentary Assembly "Strategic foresight in the field of science, technology and innovation for sustainable development", provides an opportunity to highlight the main tasks of managing the innovation component in the context of sustainable development and post-war reconstruction:

– the use of new technologies, the digital economy and science in solving the problems of reconstruction;

– the use of new technologies as a tool for creating new jobs and development opportunities, which increase the demand for digital skills and knowledge, which, in turn, creates the need to master digital skills and knowledge so that societies can adapt and benefit from technological change;

– strategic foresight to ensure that technologies meet the demands and needs in different industries;

– strategic forecasting and assessment activities should assist policymakers and stakeholders in implementing the 2030 Agenda for Sustainable Development by identifying challenges and opportunities that can be addressed strategically, and that trends in innovation development should be analyzed in the context of broader socio-economic conditions.

In the study by Ivanova T. (2020), state innovation policy is considered as "a set of measures to develop the national innovation system; a tool for implementing an innovative model of economic development and sustainable development of the country, as well as an integral part of the general state policy, which should be systematically compared with the innovation policies of technologically advanced countries, creating a national art of innovation management". The role of the innovation-technological component in sustainable development can be determined on the basis of the "IPAT" formula known in environmental studies, which states that the impact on the environment (I) is the product of the population (P), the per capita consumption rate (A) and the technologies used to

produce the goods (services) consumed (T). Even if the population and consumption increase, the overall impact on the environment and the satisfaction of demand can be reduced by applying better technologies (Homer-Dixon's inventiveness factor) (Sakevich L., 2020).

In the study by Chaykovskaya I. (2021), it is noted that the existing concept of sustainable development does not take into account the innovation component, which at the present stage determines the vector of evolution of a globalized society. Determining the innovation factors of sustainable development and substantiating the concept of "sustainable innovative development" is of strategic importance for the formation of an innovation model of the economies of the world. The author confirms this thesis by calculating the correlation between the sustainable development indices and the innovative development index (the correlation coefficient is 0.87), which shows the presence of a strong positive relationship between the indicators of innovation and sustainable development.

Therefore, in order to achieve sustainable development, it is necessary to foresee the presence of potential for possible growth and further development.

In the context of achieving the SDGs, it is also worth taking into account the results of the analysis of innovation policy, considered in the study by Syrtseva S., Ivaniuk, U., Fedotova, I., Hurina, O., Dovzhyk, O., & Nazarenko, O (2022), which, as the study showed, also correspond to the realities and needs of Ukraine:1) innovation policy should be based on a broader definition of innovation, recognizing the importance of organizational, social and public administration innovation, but currently remains largely technology-focused; the same applies to the existing innovation model, which mostly reflects a linear way of innovation, exaggerating the importance of research and development compared to the everyday practices of firms;

2) policy should recognize the importance of stakeholder involvement in the innovation process and try to identify a wide range of actors and build effective partnerships around important topics;

3) intra-organizational dynamics are poorly addressed in innovation policy, partly due to its technological focus and linear model of innovation;

4) policy is often a top-down approach and the interconnected nature of players and processes at the micro, meso and macro levels is poorly defined.

In the study by Security and Development in Global Politics (Critical Comparison, 2022), based on an interdisciplinary analysis of two subject areas – security studies and development studies – seven areas traditional for development studies but not typical for security analysis were selected: development assistance, humanitarian aspects, governance, health, poverty alleviation, trade/resources and demography.

Conclusions. Therefore, increasing the innovativeness and competitiveness of the national economy is a complex and long-term process that requires, among other things, an effective system of state management of innovative development. Currently, new requirements are being put forward for it that cannot be implemented on the basis of traditional approaches or direct borrowing of foreign experience. The complexity of managing innovative development currently lies in the need to apply such approaches to management that would take into account the new historical reality, the set of challenges of internal and external origin, and also provide for the participation of broad segments of the population in these processes. Thus, in the European Union, the so-called Quadruple Helix Model is used to manage innovation processes, according to which enterprises, scientists, state institutions and consumers closely cooperate with the aim of producing innovations. It should be noted that in this model, citizens, users, residents, organizations and other entities are considered consumers, depending on the context, who are consumers of this innovation and are interested in its development. But the EU assigns a special role in creating innovations to citizens and civil society, because involving the latter in the innovation process as co-authors and co-developers of innovations will allow more attention to be paid to their needs, and therefore, to better satisfy them.

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