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Current Trends of Innovative Development of Ukraine

Abstract. Innovations development is very important for Ukraine. In recent years, a lot of effort has been made to create favorable conditions for investors, business, and science for the introduction of innovations in Ukraine. The article highlights Ukraine's place in terms of innovativeness among EU countries (separate ratings), as well as the main achievements in the field of innovation. The purpose of the article is to determine the impact of active military operations on the territory of Ukraine (from the beginning of 2022) on the further development of innovations. The authors identify the main problems of the development of innovations, for example, the destruction of enterprises, scientific institutions and other institutions that created innovative products; lack of financial resources; outflow of qualified personnel; outflow of investments and others. And also, they indicate promising directions for strengthening the innovative development of Ukraine.

Keywords: innovations, innovative development of the state, share of innovations in GDP, innovation scoreboard, technological development

<https://doi.org/10.58683/dnswsb.593>

1. Problem Statement

Military actions on the territory of Ukraine led to a sharp change in the political and economic situation in the country. In the new conditions of state functioning, there was a need to review economic strategies and directions of development. Therefore, the vectors of innovative development of the state have changed: if until the beginning of 2022 digitization in all spheres of the economy, attraction of investments in the development of the IT sector, creation and implementation of start-ups for small and medium-sized businesses, etc. were actively stimulated, today the main task is to support existing innovative projects, creating safe locations for innovative projects, ensuring the development of innovative projects that create military products, etc. During the war, problems arose that weakened the economic capabilities of the state. At the same time, the war necessitated the creation of a new strategy for further economic functioning. Taking into account the need for innovative development, as a guarantee of the state's competitiveness in the world market, it is necessary to examine the weak points, as well as promising directions for the development of innovations in Ukraine in the future.

2. Literature Review

In modern conditions, innovation is one of the most studied factors influencing the economic development of the state. The scientific basis for this study was referring to the works of foreign and Ukrainian scientists who defined the essence of innovation (Guerrero & Urbano, 2019; Didur, 2022), reveal the experience of active innovative development of other countries (Mushenek, 2022), as well as the development of innovations during the crisis (Klein, Gutowska & Gutowski, 2022). At the same time, statistical resources became an important information carrier (SSSU, 2023; OECD Stats, 2023). However, it is appropriate to note that the current political and economic situation in Ukraine is quite complex and non-standard. Therefore, it is necessary to study the current state of innovative development of Ukraine and search for new directions for the activation of innovative development.

3. Main Results of the Study

Ukraine has all the prerequisites for creating an innovatively developed competitive economy: high scientific and technical, personnel and intellectual potential; availability of research institutes and organizations; experience in implementing

innovative projects; the legislative basis, which is in the process of formation, for the creation of a new system of innovative activity in Ukraine and other aspects. Innovative development of the state is an important and necessary step towards establishing a competitive position of the state in the world, which includes both the application and dissemination of new knowledge and technologies, as well as the search for ways to realize the innovative potential of enterprises.

Today, Ukraine is going through special political and economic conditions, which complicate the development of innovations. Of course, during military operations on the territory of the state, there is no opportunity to actively stimulate innovative potential. However, taking into account the thorough foundation of innovative development that was laid in the pre-war period and the positive mood in the domestic business environment today, the dynamics of innovative development indicators may become positive in the future.

At the same time, it is necessary to take into account the dynamism of innovation processes in the world and the place of Ukraine in them. Therefore, even before the start of full-scale military operations on the territory of Ukraine (beginning of 2022), its place in the dynamics of innovation development and ratings of innovativeness indicators was mediocre. Therefore, in comparison with the countries of the European Union, the share of innovations in GDP in Ukraine remained quite low, and the dynamics of this indicator was downward (Figure 1). In particular, compared to neighboring EU countries, the share of innovation in GDP was several times lower in Ukraine, and this gap has been increasing over the years.

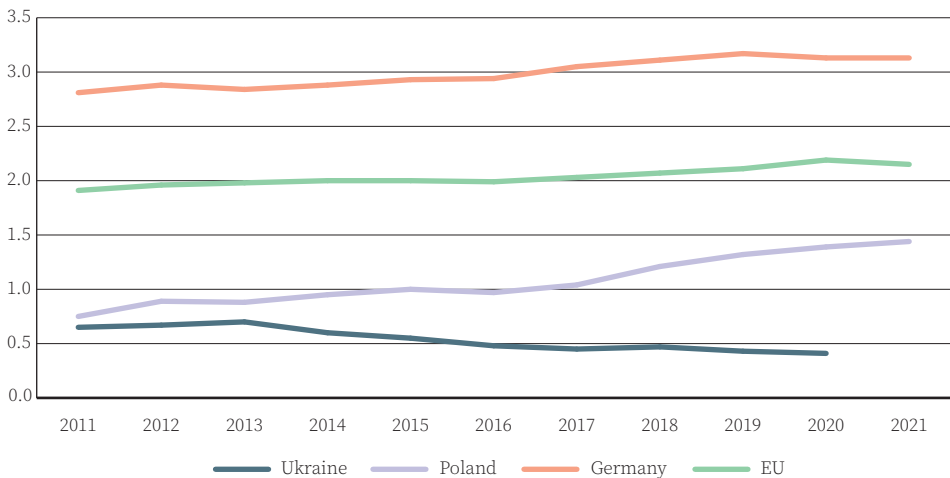


Figure 1. GERD as a percentage of GDP

Source: Based on data from SSSU (2023), OECD Stats (2023)

According to the European Innovation Scoreboard, the summary innovation index for Ukraine in 2021 was 29.8. The highest indicators were Digitalization — 72.0, Non-R&D Innovation expenditures — 82.3, Employment impacts — 78.2, Employment in knowledge-intensive activities — 87.8. The rest of the provided indicators had a value of less than 70%. In particular, the lowest (less than 10%) were Design applications — 1.6, R&D expenditures in the public sector — 2.9, Innovative SMEs collaborating with others — 4.5, Intellectual assets — 9.8 (European Innovation Scoreboard, 2023). According to the European Innovation Scoreboard, in 2021 Ukraine was included in the group of slow innovator countries. The countries included in this group have indicators of innovation about 50% lower than the countries of the European Union.

According to the Bloomberg rating agency, in 2021, Ukraine deteriorated its position in the world in terms of innovativeness, taking 58th place among the 60 countries of the world included in the rating (in 2020, Ukraine occupied the 56th position). The highest bar in the rating, the 36th place, was occupied by Ukraine for patent activity, the lowest 59th position — for the intensity of research and development (World Population Review, 2021).

Despite the rating indicators, innovative projects and technology development are being implemented in Ukraine. In particular, Ukraine ranks 4th in the world in terms of the volume of financial transactions using mobile devices, as well as 4th in the number of cryptocurrency users with legalized mining and the cryptocurrency ecosystem.

Since the beginning of the active invasion of the Russian Federation on the territory of Ukraine, the political and economic environment in the country and the strategic directions of economic development have changed significantly. However, despite the instability and disruption of the normal way of life in the country, during the last year (2022) many innovative products were created and innovative projects were implemented. In particular, those whose development was necessary due to the war, for example, the production of drones (Drone.Ua), missiles and drones (AMW Labs) and others. And also, innovative technologies, the need for the production of which is determined by the growth of demand in the market, for example, the production of electric bikes (Delfast), security systems and sensors for the home (Ajax) and others.

In addition, the IT sector was practically unaffected. The rate of growth of the number of workers employed in this industry last year did not differ from the previous year. In addition, the number of FOP in the field of IT during the year of the full-scale invasion increased by 31.8 thousand, or by 13%, to 271.7 thousand people.

Along with this, it is appropriate to note that the main trends in the economic development of Ukraine today are mainly the financing of weapons and projects

related to war, on the other hand, in other projects, state support is minimal, and innovative enterprises face a number of problems. In particular, even before the full-scale military invasion, Ukrainian producers of innovative products needed support in solving the current problems that restrained the development of innovations. For example, Ukraine was characterized by a low level of state support and financial stimulation of innovative projects, political and economic instability, an effective mechanism of cooperation between enterprises and research institutions, a low level of international cooperation for attracting foreign innovative technologies, increasing cooperation in the field of innovation development and others.

4. Conclusion

Taking into account the state of innovative development of Ukraine, it is possible to the main problems that have arisen in modern political and economic conditions are grouped as following:

- ▶ decrease in the level of financing of innovative projects. This is due to the need to direct available financial resources to the development of the state's defense capabilities and maintaining economic balance during wartime. Therefore, in the 2023 budget, 20–25% less funds are allocated for financing science and education compared to the previous year;
- ▶ low investment attractiveness. The instability and uncertainty of the future political and economic situation and development priorities of the state led to a decrease in investment attractiveness, the level of which will be restored after the stabilization of the political situation in the state;
- ▶ instability of the legislative framework. Today, a favorable legislative basis for the transparency and openness of the work of enterprises, the simplification of the conditions of cooperation with international partners and the implementation of innovative projects is being actively formed. However, at this stage, we can say about the formation of the Ukrainian legislative framework regarding the accessibility of the implementation of innovative projects;
- ▶ outflow of qualified personnel. Since the beginning of the full-scale military invasion of Russian troops on the territory of Ukraine, there has been a mass migration of the population, both within the country and abroad. Therefore, for 2022, the labor market decreased by 7%. Accordingly, many enterprises and institutions faced a shortage of highly qualified workers, who are difficult to replace;

- ▶ destroyed research institutes, enterprises, institutions. There was physical destruction of fixed assets, buildings, and in some places, entire enterprises throughout the country. Therefore, according to rough calculations, by the beginning of 2023, due to the large-scale invasion of the Russian Federation, at least 109 large and medium-sized Ukrainian enterprises of various forms of ownership have suffered direct losses. The total amount of damages is about 13 billion dollars;
- ▶ a decrease in the level of education and science due to the difficult conditions in which they function (lack of electricity, remote
- ▶ lack of a single system and strategy for the development of innovations. Undoubtedly, the difficulty of forming a functional system for the implementation of innovative projects in Ukraine is caused by the instability of the political and economic environment.

Against the background of the problems that have arisen, it is appropriate to mention the measures that have been taken. In particular, significant support from international partners for Ukrainian business, including its innovative development. For example, the EBRD implements programs in Ukraine to support projects in the fields of industry, energy, agriculture, finance, tourism, transport, and real estate. They mainly include consulting assistance, partial compensation of the project cost, assistance in the implementation of production strategies (in particular, innovative projects). In addition, many countries of the world expressed their intention to join the reconstruction of Ukraine. Therefore, joint international projects are planned that will contribute to the development of the economy and stimulate its reproduction at a new innovative level.

In addition, at the state level in Ukraine, a plan for the recovery of the country has been created – a strategy that is designed for 10 years and received a favorable assessment and support at the international level. This strategy aims to bring Ukraine's economy from the level of "transitional economy" to "developing economy". Achieving this goal is possible thanks to the development of innovative projects that require investment. Therefore, to attract investors in Ukraine, a unique electronic platform Advantage Ukraine (Advantage Ukraine, 2023) has already been created, which collects more than 500 investment projects and opportunities in 10 sectors of the economy. This platform allows you to familiarize yourself with possible projects for investment and helps attract funds to the economy of Ukraine.

For the active development of the economy of our country, it is expedient to increase the innovation potential, in particular, by taking the following measures:

- ▶ gradual growth of state funding of scientific developments and innovative projects;
- ▶ promoting the introduction of innovations in production activities and the growth of demand for such products in the domestic market;
- ▶ establishment of international ties and cooperation in the field of innovation;
- ▶ development of digitalization of the state;
- ▶ promoting the creation and activation of technology parks and innovation parks, etc.

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Aktualne tendencje w innowacyjnym rozwoju Ukrainy

Streszczenie. Rozwój innowacyjności jest dla Ukrainy bardzo ważny. W ostatnich latach podjęto wiele wysiłków, aby stworzyć na Ukrainie sprzyjające warunki do wprowadzania innowacji dla inwestorów, biznesu i nauki. W artykule zwrócono uwagę na miejsce Ukrainy pod względem innowacyjności na tle krajów UE (oddzielne rankingi), a także główne osiągnięcia w dziedzinie innowacyjności. Celem artykułu jest określenie wpływu aktywnych operacji wojskowych na terytorium Ukrainy (od początku 2022 roku) na dalszy rozwój innowacji. Autorzy identyfikują główne problemy rozwoju innowacji, np. niszczenie przedsiębiorstw, instytucji naukowych i innych instytucji, które tworzyły innowacyjne produkty; brak środków finansowych; odpływ wykwalifikowanej kadry; odpływ inwestycji i inne. Wskazują również obiecujące kierunki wzmocnienia innowacyjnego rozwoju Ukrainy.

Słowa kluczowe: innowacje, innowacyjny rozwój kraju, udział innowacji w PKB, innowacyjność, rozwój technologiczny