

## POSITIONING OF THE INNOVATIVE ECONOMY DEVELOPMENT IN UKRAINE ON THE INTERACTION OF EDUCATION, SCIENCE AND BUSINESS IN THE CONTEXT OF INNOVATIVE GLOBALIZATION

### ПОЗИЦІОНУВАННЯ РОЗВИТКУ ІННОВАЦІЙНОЇ ЕКОНОМІКИ УКРАЇНИ НА ОСНОВІ ВЗАЄМОДІЇ ОСВІТИ, НАУКИ ТА БІЗНЕСУ В КОНТЕКСТІ ІННОВАЦІЙНОЇ ГЛОБАЛІЗАЦІЇ

*In the work, the spatial positioning of the development of the innovative economy of Ukraine is carried out on the basis of the interaction of education, science and business in the context of innovative globalization. The interdependencies between complex indicators that exert a significant influence on innovation development are determined. Evaluating the development of the innovative economy involves examining the component composition of international ratings that consider innovative activity, determining the positioning of Ukraine in these ratings in general and by component composition, and identifying strengths and weaknesses. As a result, advantages and disadvantages, problems and prospects for the development of innovative economy of Ukraine are determined. The relationship between the effectiveness of innovations according to different levels of income has been proven, which allowed to confirm the need to improve educational, scientific and entrepreneurial activities to ensure innovative development and sustainable economic growth of the country. With the help of correlation analysis of relations between the countries of the world, it has been proven that the level of public administration and infrastructure has the greatest influence on the level of competitiveness of the country, which was also taken into account when developing recommendations for economic transformation using the possibilities of innovative technologies based on the interaction of education, science and business.*

**Key words:** innovative economy, interaction of education, science and business, international ratings, indices of innovative development by components.

*В роботі здійснено просторове позиціонування розвитку інноваційної економіки України на основі взаємодії освіти, науки та бізнесу в контексті інноваційної глобалізації. Оцінено залежність між загальною позицією GCI та показниками їхнього інноваційного розвитку, що підкреслює важливість інновацій для конкурентоспроможності. Україна, за показниками інноваційного розвитку суттєво відстає від інших показників GCI, що вказує на необхідність посилення цього аспекту їх економічної конкурентоспроможності. За допомогою кореляційного аналізу зв'язків між країнами світу доведено, що на рівень конкурентоспроможності країни найбільший вплив справляє рівень державного управління та інфраструктура, що також було враховано при розробці рекомендацій для економічної трансформації із задіянням можливостей інноваційних технологій на основі взаємодії освіти, науки та бізнесу. Доведено зв'язок між ефективністю інновацій відповідно до різних рівнів доходу, що дозволило підтвердити необхідність покращення освітньої, наукової та підприємницької діяльності для забезпечення інноваційного розвитку та сталого економічного зростання країни. Україна віднесена в категорію країн, що розвиваються, і є економікою з низьким рівнем доходу та економічної конкурентоспроможності. Проте, на відміну від інших країн із відповідним рівнем добробуту, Україна має певний потенціал для переходу до зростання через інновації, і саме цей шлях є найперспективнішим як драйвер зростання. Але він наражається на декілька викликів, що потребують стратегічного підходу. Оцінювання розвитку інноваційної економіки передбачає розгляд компонентного складу міжнародних рейтингів, які розглядають інноваційну діяльність, визначення позиціонування України у цих рейтингах загалом та за компонентним складом і виявлення сильних та слабких сторін. У результаті визначаються переваги та недоліки, проблеми та перспективи розвитку інноваційної економіки України. Визначено взаємозалежності між комплексними показниками (Bloomberg Innovation Index, The Global Innovation Index, IMD World Competitiveness Ranking, The Global Talent Competitiveness Index, United Nations Development Programme and others), які здійснюють суттєвий вплив на інноваційний розвиток.*

**Ключові слова:** інноваційна економіка, взаємодія освіти, науки та бізнесу, міжнародні рейтинги, індекси інноваційного розвитку за компонентами.

UDC 330.341.1: 658.012.4 (332.05)

DOI: <https://doi.org/10.32782/dees.2-33>

#### Ostapenko Viktoriia

Candidate of Economic Sciences,  
Associate Professor,  
Doctoral Student at the Department  
of Customs and Financial Services,  
Simon Kuznets Kharkiv  
National University of Economics

#### Остапенко В.М.

Харківський національний  
економічний університет  
імені Семена Кузнеця

**Formulation of the problem.** The experience of technologically developed countries shows that today the main feature of competitiveness is innovativeness, that is, the ability of the system to systematically develop, update and accept changes in economic activity based on the introduction of innovations. Innovativeness also involves the application of existing scientific and technical, information and intellectual potential for the purpose of further development, improvement of the results of activities and the quality of life of society. The level of competitiveness of Ukrainian enterprises and the possibility of entering and maintaining positions

on the world market depends on the possibility of production and dissemination of innovative development in the economic sphere.

Innovation is a major factor in determining which countries are the most technologically advanced countries in the world. Innovation is key for a country to remain competitive on the world stage. A country's innovation includes its fiscal policies, educational policies, and innovation environment (innovation inputs), as well as its patents, technology, business performance, and economic growth (innovation outputs).

During the last decade, Ukraine has remained in the group of countries with income below the average

(according to the grouping of countries by the World Bank) and is an economy with an average level of economic competitiveness, corresponding to the 54th place. Among the group of low-income countries, Ukraine took the 2nd position, after Vietnam. However, unlike other countries with a corresponding level of well-being, Ukraine has some potential to transition to growth through innovation, and this path is the most promising as a growth driver. But it faces several challenges that require a strategic approach.

#### **Analysis of recent research and publications.**

There has been a trend towards convergence, complementarity and interdependence of economic, educational and scientific transformations. Structural economic transformations change demand in the labor market, which determines educational transformations. Systemic educational transformations involving large-scale academic mobility, interdisciplinary, dual and informal education fill the labor market with specialists of a fundamentally different quality, which accelerates qualitative and quantitative changes in the functioning of the national economy. At the same time, the convergence of economic and educational transformations provokes the emergence of new transmission overt and latent effects, creates new security challenges in the economic and social dimensions. In the center of attention of such scientists as M. Weber, T. Veblen, V. Vernadsky, B. Hildebrand, M. Kondratiev, K. Marx, A. Marshall, T. Malthus, D. Ricardo, A. Smith, M. Tugan-Baranovsky and others are the issues of integration of economy and education with business and national security, and the impact of science and technology on changes in educational programs and business innovations.

A significant contribution to the research and solution of the scientific problem of the formation of an innovative economy, the search for ways to stimulate the innovative activity of the economy, the formation of an effective innovation and investment policy and the national economy of the innovative type in the context of reform, technological modernization and global shifts and trends was made by well-known scientists, as O. Amosha, H. Androschuk, B. Andrushkiv, Y. Bazhal, V. Bazilevich, O. Bilorus, V. Bilotserkivets, Z. Varnalii, V. Geets, A. Hrytsenko, V. Dementiev, M. Dyba, Ya. Zhalilo, Yu. Zaitsev, A. Zadoya, O. Zavorodnia, O. Zagurskyi, V. Zyanko, S. Ilyashenko, O. Ivashina, K. Kraus, G. Kleiner, P. Leonenko, V. Lipov, V. Makarov, I. Maly, I. Mazur, A. Maslov, O. Moskalenko, O. Nosova, R. Nureyev, B. Ovadaylo, V. Osetskyi, Yu. Pakhomov, V. Polterovych, A. Pokrytan, V. Reshetylo, V. Savchuk, V. Syzonenko, A. Tkach, V. Tarasevich, L. Fedulova, A. Chuhno, P. Yukhymenko, Yu. Yakovets, V. Yaku-benko and others.

The generalization of world and national studies of the levels of economic, educational and scientific and technical transformations allows us to assert their

influence on the security of the national economy, the formalization of complementarity and convergent relationships in the chain "economy – education – science – national security". Thus, there is a need to develop measures, approaches and tools aimed at the convergence of economic and educational transformations in the national economy under the influence of security challenges.

**Formulation of the goals of the article.** The purpose of this article is to determine the most authoritative international ratings that reflect the state of development of innovative activity, to clarify the positioning of Ukraine in them according to the components of the interaction of education, science and business, as well as to determine the strengths and weaknesses that prevent it from occupying higher rating positions and outlining potential ways to solve them.

**Presentation of the main research material.** The competitiveness of national economies is determined today in the world by the level of innovation. Accordingly, the indicators of innovativeness can be influenced more consciously and purposefully. That is, the state government and according to the selected economic priorities of development stimulates better cooperation between education – science – business within the framework of state policy. The development of instruments and institutions have a direct impact on the growth points and priorities of a specific target sector and stimulate this cooperation. Countries with the best indicators of the level of innovation development demonstrate remarkable stability and are high-income economies (Table 1) [1].

Thus, if we look at the distribution of countries by the level of innovation development and income level (Table 1), the ratings show that individual states change their places within the respective groups, but at the same time none of them leaves their group. This can be explained, among other things, by the fact that successful innovation activity leads to the emergence of a kind of closed circle: after reaching a certain critical level, investments attract investments, talents attract talents, and innovations generate innovations.

A long stay in a permanent crisis, be it political or security, when it is forced to defend part of its territory by military means, financial, socio-economic, increasingly feels the consequences of the COVID-19 pandemic and urgently needs systemic measures to transform the Ukrainian economy and effectively use the country's potential on increasing the competitiveness of the economy and the well-being of the population. Currently, Ukraine is represented in several international ratings that assess the innovative potential, technological and innovative competitiveness of the country (Fig. 1).

The dynamics of Ukraine's position in the Global Competitiveness Index for 2006–2019 allows us to conclude that there is no active policy and

Table 1

Innovation efficiency according to different income levels, 2019–2021

	High-income group	Upper-middle income group	Lower-middle income group	Low-income group
Efficiency above the expected level of development	Switzerland Sweden USA UK Republic of Korea Netherlands Finland Singapore Denmark Germany France Japan Hong Kong, China	China South Africa Thailand	Vietnam India <b>Ukraine</b> Philippines Mongolia Republic of Moldova Kenya	Rwanda Malawi
Efficiency according to the level of development	New Zealand Malta Cyprus Italy Spain Portugal Slovenia Hungary Latvia Poland	Malaysia Mexico Costa Rica Belarus Colombia Bosnia and Herzegovina Albania	Kyrgyzstan Honduras	Tajikistan Uganda Mali
All other economies	UAE Lithuania Saudi Arabia Qatar Kuwait Oman	Kazakhstan Dominican Republic Botswana	Nigeria	Guinea Yemen

Source: author's development

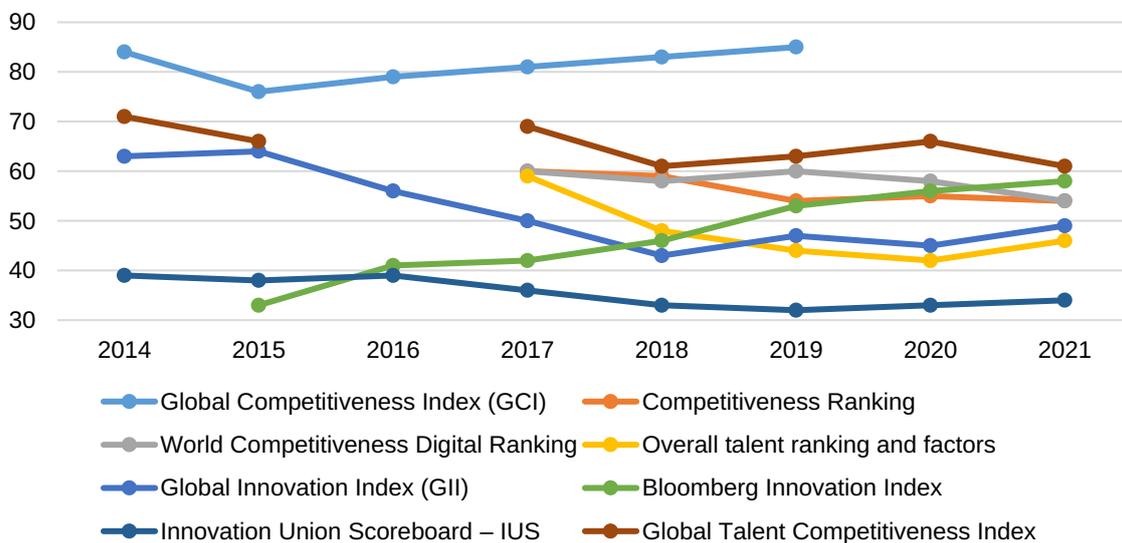


Fig. 1. Positioning of Ukraine in international rankings that assess the innovative potential, technological and innovative competitiveness of the country

Source: formed on the basis of [2]

breakthroughs in the support of innovative activities by both the state and business. In the period from 2013 to 2018, the indicators and positions of Ukraine according to the above parameters remained mostly unchanged, but the indicators for innovative products

increased significantly, mostly due to progress in the creation of new knowledge, development and dissemination of innovations, as well as in the creation of creative products (trademarks and mobile applications) (Table 2).

Table 2

Positions of Ukraine in the Global Competitiveness Index by components

Component	2006	2013	2014	2015	2016	2017	Component	2018	2019
Higher education and training	48	43	40	34	33	35	Skills	46	44
Business sophistication	76	97	99	91	98	90	Business dynamism	86	85
Innovation	73	93	81	54	52	61	Innovation capability	58	60
Technological readiness	90	94	85	86	85	81	ICT adoption	77	78

Source: formed on the basis of [3]

In 2020, new criteria were also added, reflecting the importance of achieving the UN Sustainable Development Goals. The criteria give an idea of where the economy stands in relation to various sustainable development goals to be achieved in 10 years (such as education and environment, inclusion and empowerment, aging and health). An important component of competitiveness research is bringing the used criteria into line with important problems of the world economy.

The IMD World Competitiveness Yearbook (WCY) rating study evaluated countries based on an analysis of 330 criteria for four main indicators: "State of the economy", "Government efficiency", "Business environment", "State of infrastructure". Each of the indicators has the same weight and includes five factors according to which the rating analysis was conducted. Thus, the overall competitiveness rating is based on 20 different indicators from four key aspects of the countries' economic life (Fig. 2).

There is a clear correlation between the general position of GCI and indicators of their innovative development, which emphasizes the importance of innovation for competitiveness (Table 3). Ukraine and its neighbors rank much lower according to GCI indicators. With the exception of Ukraine, their indicators

of innovative development significantly lag behind other GCI indicators, which indicates the need to strengthen this aspect of their economic competitiveness.

Despite the initiated structural reforms that have been carried out in the country in recent years, they have not contributed to the strengthening of Ukraine's international competitiveness. According to the results of various ratings of global competitiveness, the development of innovative infrastructure and its use by state institutions, business, the population, the level of access to the Internet and ensuring the freedom of its use, as well as the development of innovations and electronic government and e-commerce, Ukraine was consistently rated the worst among all countries of the European region, and currently remains the least competitive among them (Fig. 3).

They have become world leaders in competitiveness thanks to the extensive ICT infrastructure, the innovative technologies on which it is built, the speed of innovation, the ability to support the effective use of talent, the effective system of public administration and regulation in terms of ensuring wide access to ICT, etc. All this, together with a sufficiently high level of human capital, where a significant percentage of the population has a high level of digital skills, forms

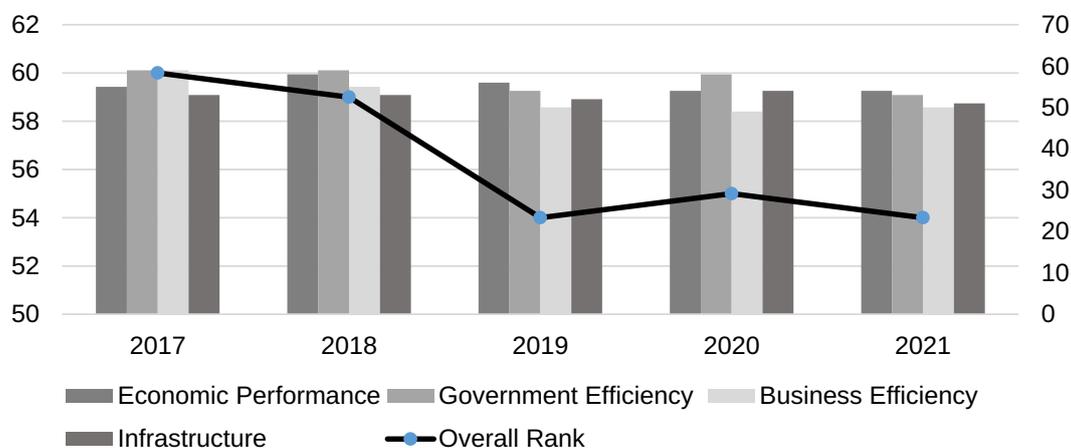


Fig. 2. World Competitiveness Ranking of Ukraine by components

Source: formed on the basis of [3]

Multiple Regression Results World Competitiveness Ranking 2018–2022

Dependent: Overall	Economic Performance $b^* = ,217$
Multiple R = ,98562547	Government Efficiency $b^* = ,465$
F = 2603,719	Business Efficiency $b^* = ,022$
R <sup>2</sup> = ,97145756	Infrastructure $b^* = ,403$
df = 4,306	
No. of cases: 311	
adjusted R <sup>2</sup> = 0,97108445	
p = 0,000000	
Standard error of estimate: 3,294834009	
Intercept: -3,291075216	
Std.Error: ,4131662 t(306) = -7,965 p = ,0000	

Source: author's development

the readiness of citizens, businesses and public authorities to use ICT and wider access to resources, creates opportunities to use innovative technologies to create economic value faster than low-income countries can achieve. Thus, they form a powerful economy with a high level of income.

The Global Innovation Index (GII) is a ranking of countries based on their innovation capacity and success. The GI is based on both subjective and objective data from several sources, including the International Telecommunication Union, the World Bank, and the World Economic Forum. The methodology used by the Global Innovation Index is based on the calculation of scores in two sub-indices (Innovation Contribution Index and Innovation Output

Index) consisting of five and two pillars, respectively. Each of these innovation frameworks describes a certain innovation attribute and contains up to five indicators. The GI rating focuses on the financing needs of entrepreneurship and measures to integrate innovation into post-crisis strategies (Table 4).

In recent years, Ukraine has been marked by strong indicators of innovative activity. In the Global Innovation Index, Ukraine occupies the highest position among LMIC countries – from 71st position in 2013 to 43rd position in 2021. Ukraine ranks relatively high in innovative products (knowledge, technologies, creative products), but has low indicators in such parameters for the development of innovations as the capacity of institutions, human capital

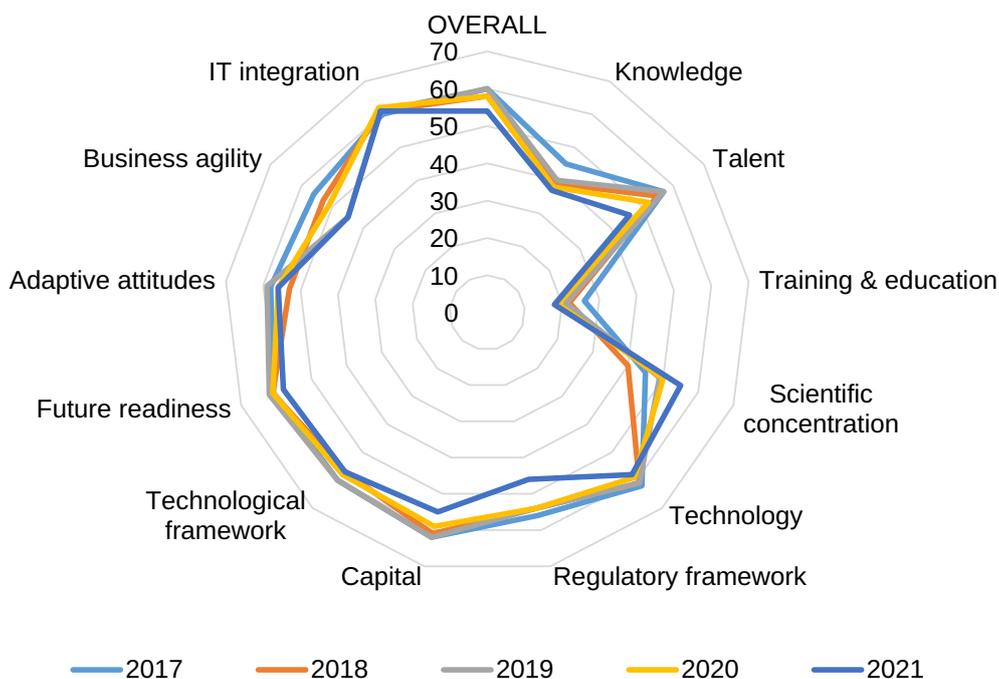


Fig. 3. Components and factors of Ukraine in the World Competitiveness Digital Ranking

Source: formed on the basis of [4]

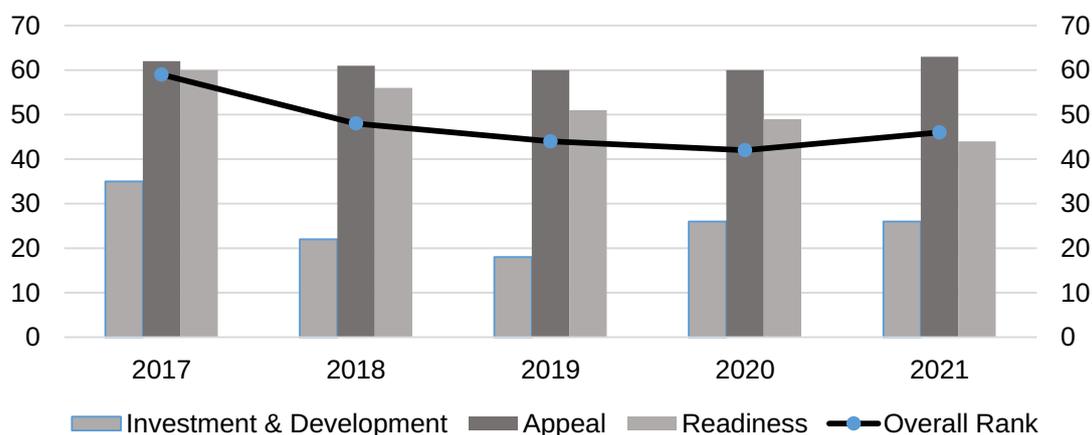


Fig. 4. Overall talent ranking and factors

Source: formed on the basis of [4]

Table 4

Global Innovation Index Ranking of Ukraine by components

Component	2019		2020		2021	
2. Human capital and research	51	35,6	39	40,5	44	38,2
2.1. Education	43	55,1	23	56,9	23	61,3
2.2. Higher Education	37	40,6	32	43,9	33	42,8
2.3. Research and development (R&D)	54	11,2	44	20,5	58	10,4
5. Business sophistication	47	34,8	54	29,5	53	28,9
5.1. Knowledge workers	45	45,4	47	39	45	38,9
5.2. Innovation linkages	55	27,4	81	18,8	84	18,0
5.3. Knowledge absorption	73	31,7	59	30,6	59	29,7
6. Knowledge and technology outputs	28	34,6	25	35,1	33	32,3
6.1. Knowledge creation	17	42,5	23	41,6	27	35,7
6.2. Knowledge impact	47	40,1	45	28,7	61	31,4
6.3. Knowledge diffusion	47	21,3	32	35,0	35	29,8

Source: formed on the basis of [5]

and scientific and research activities, infrastructure, the volume of the domestic market, access to foreign markets and business environment.

Bloomberg's annual innovation index analyzes countries on dozens of indicators grouped into seven criteria: research and development (gross value added in manufacturing, productivity, density of high-tech companies, concentration of researchers, tertiary efficiency and patent activity. Although Bloomberg's analysis ostensibly focuses on the innovativeness of a nation's economy, the categories are so broad and comprehensive, and the economy is so deeply connected to most other aspects of life, that the analysis is often interpreted as a measure not only of economic innovation, but of innovation in general. According to the rating provided by the Bloomberg agency, Ukraine has lost 12 positions since 2015, which corresponds to the 56th place in the rating among the 60 studied countries (Fig. 5).

The Innovation Union Scoreboard is published annually by the European Commission and is a reliable ranking of innovation, it was not considered for the purposes of this study because it focuses on a limited number of countries, mainly the countries of the European Union. Instead, the three other rankings used in this paper compare countries around the world. In addition, the Innovation Union Scoreboard is less known outside the European Union and by innovation researchers. The data help countries assess their innovation performance, monitor current performance and develop policies to support innovation.

According to the EIS, the most indicative dimensions of the development of innovations in Ukraine are human potential and employment, and the least significant are the presence of connections and a favorable environment for the development of innovations. Since 2010, Ukraine's performance in the innovation development sector, according to

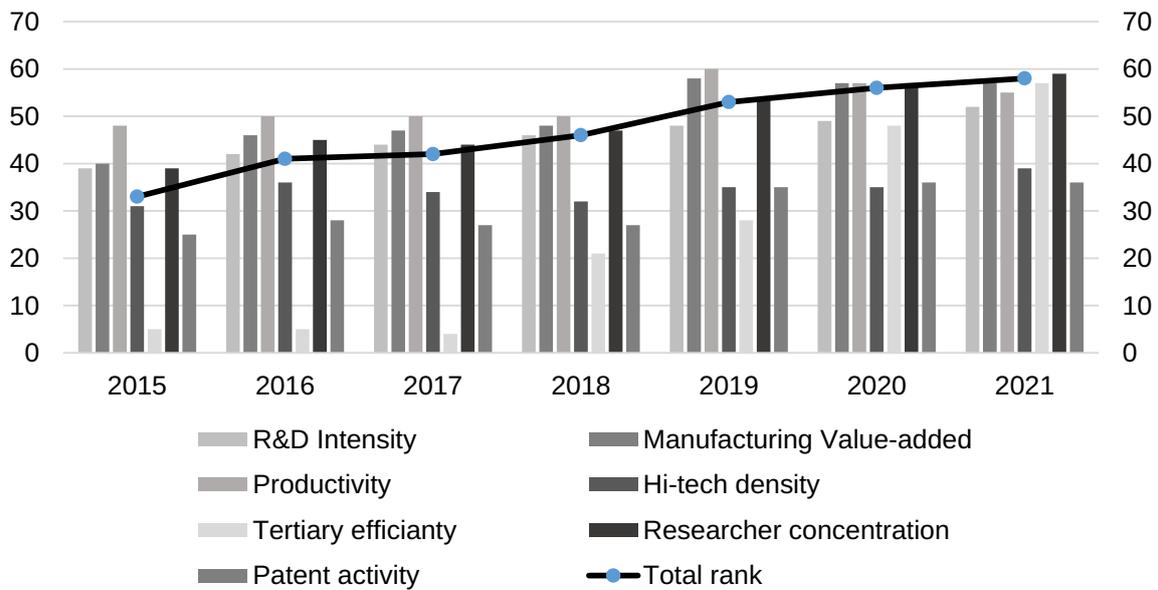


Fig. 5. Positions of Ukraine in the Bloomberg Innovation Index by components

Source: formed on the basis of [6]

the EIS, has decreased by 4.2% compared to the average of EU countries. The basis of Ukrainian innovative competitiveness is human capital, higher education, as well as knowledge and results of scientific research. However, weak state institutions, an unfavorable environment for conducting innovative business and an unfriendly financial system hinder the disclosure of entrepreneurial potential, create obstacles to the commercialization of innovations and their impact on GDP growth, which will be discussed in more detail below (Table 5).

For Ukraine, the availability of data is limited: there are no data for 12 indicators. A country is still included in the EIS for historical reasons, but if the data availability does not improve the country, it will likely be excluded from future EIS reports. Due to limited data availability, discussion of strengths or recent developments is of limited value and is therefore excluded.

According to EIS data for Ukraine, human resources and impact on employment are the most developed dimensions of innovation development, while connections and enabling environment have the worst indicators. Since 2010, according to the EIS, Ukraine's innovative indicators have decreased by 4.2% compared to the EU average. The results of the EIS show that the innovation dynamics in the EU countries is accelerating; the EU average has grown by 6% since 2010 and could rise by another 10% over the next two years. The EU continues to improve its position compared to the US, Japan and Canada, but Europe is fast catching up with China, whose growth in innovation is three times that of the EU. Leading according to the EIS, Sweden, Lithuania, the Netherlands, Malta, Great Britain, Latvia and France

show the highest improvement rates in the area of innovation development. According to the report, the largest gap between leaders and outsiders in the field of innovation is observed in such areas as human resources, attractiveness of the field of scientific research, favorable environment for the development of innovation, financing and support for innovation, investment of companies in innovation, availability of innovators and necessary connections. Structural differences with the EU include new information on different types of (innovative) enterprises (innovation profiles) and environmental indicators.

Ukraine's international position in the field of innovation development has improved over the past few years. In global rankings, Ukraine has a relatively strong position in such parameters as knowledge, technology, creative products and employment. At the same time, Ukraine ranks low in such parameters as the capacity of institutions, human potential and scientific research, infrastructure, development of the market and business environment for innovation, and the presence of connections necessary for the development of innovation.

The Networked Readiness Index (NRI) is a comprehensive indicator that characterizes the level of development of information and communication technologies (ICT) and the digital economy in the countries of the world (Table 6).

The basis of the new NRI model is the ability to assess not so much the level of development and availability of digital infrastructure, the acceptance of relevance or the perception at the individual level of the implementation of a specific technology (artificial intelligence, fintech services, e-health tools, etc.) as to assess the level of harmonization of integration

Table 5

European Innovation Scoreboard 2021

Performance and structure of the economy		
	UA	EU
GDP per capita (PPS)	6,440	30,800
Average annual GDP growth (%)	1.9	2.5
Employment share Manufacturing (NACE C) (%)	12.5	16.5
Employment share Services (NACE G-N) (%)	34.5	41.2
Business and entrepreneurship		
FDI net inflows (% GDP)	3.2	2.0
Top R&D spending enterprises per 10 million population	0.0	16.2
Buyer sophistication (1 to 7 best)	3.3	3.7
Relative to EU in 2021	2021	2014
Summary innovation index	29.8	33.6
Human resources	31.8	33.7
Attractive research systems	17.3	19.5
Digitalisation	72.0	99.7
Finance and support	17.7	21.1
Firm investments	41.0	49.6
Use of information technologies	23.4	27.1
Innovators	-	-
Linkages	10.1	13.7
Intellectual assets	9.8	8.5
Employment impacts	78.2	79.6
Sales impacts	37.5	38.2
Environmental sustainability	44.4	46.3

Source: formed on the basis of [7]

Table 6

Network Readiness Index

Network Readiness Index	Rank (out of 130)	Score
		53
A. Technology pillar	50	49,20
1st sub-pillar; Access	60	67,15
A. Technology pillar	50	49,20
1st sub-pillar: Access	60	67,15
2nd sub-pillar; Content	42	45,53
3rd sub-pillar; Future Technologies	57	34,92
B. People pillar	48	54,29
1st sub-pillar; Individuals	17	74,62
2nd sub-pillar; Businesses	50	46,44
3rd sub-pillar; Governments	71	41,80
C. Governance pillar	57	58,93
1st sub-pillar: Trust	55	49,57
2nd sub-pillar: Regulation	61	65,02
3rd sub-pillar: Inclusion	65	62,19
D. Impact pillar	47	60,40
1st sub-pillar: Economy	42	46,73
2nd sub-pillar: Quality of Life	57	69,01
3rd sub-pillar: SDG Contribution	53	65,45

Source: formed on the basis of [8]

people and technology. The index is based on the premise that there is a close connection between the development of digital technologies and economic well-being, and therefore the impact of digital information and communication technologies on the economy, the quality of life of the population and the achievement of the Sustainable Development Goals defined by the UN should be evaluated (Table 7).

Ukraine (61st place) is the best lower-middle-income country and the only economy in its income group that is positioned in the upper half of the GTCI 2021 ranking. This is primarily due to the positive impact of high-level skills (24th place) on the global knowledge skills pool (39 place). A country's formal

education (ranked 46th) enhances its ability to develop (ranked 57th) talent, hampered by a weaker lifelong learning system (ranked 60th) and lower access to growth opportunities (ranked 72nd). Ukraine has a strong business and labor landscape (ranked 52nd), but to further strengthen the enabling (ranked 85th) environment for talent, it is necessary to encourage greater competition in the market (ranked 75th) and, above all, to take steps to improve the regulatory landscape (ranked 109th place) is his lowest rated resistance (Table 8).

An overview of Ukraine's strengths and weaknesses according to international rankings is In the Tab. 8.

Table 7

Best performers by income group: Lower-middle-income countries

	2015-2016		2017		2018		2019		2020		2021	
	1)	2)	1)	2)	1)	2)	1)	2)	1)	2)	1)	2)
GTCI	66	5	69	3	61	2	63	2	66	3	61	1
Enable	91	-	103	-	99	-	96	-	94	-	85	8
Attract	97	-	94	-	98	-	105	-	93	-	80	8
Grow	72	5	64	2	66	7	68	4	68	6	57	2
Retain	54	3	54	1	58	1	66	2	73	5	59	1
Vocational and technical skills	40	2	66	6	44	1	45	1	56	2	69	5
Global knowledge skills	61	4	53	3	42	2	37	2	46	2	39	1

Note: 1) Place in the general rating; 2) Place among the countries of the group by income level

Source: formed on the basis of [8]

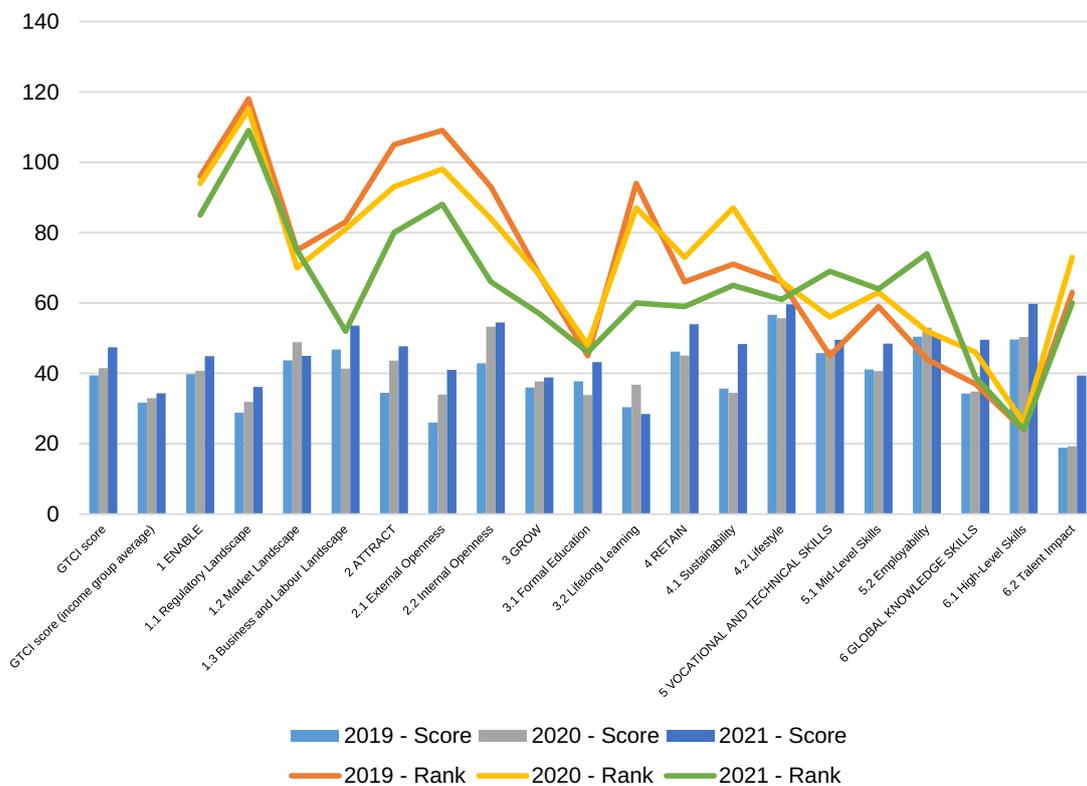


Fig. 6. The Global Talent Competitiveness Index

Source: formed on the basis of [9]

Table 8

Innovation strengths and weaknesses

Strengths			
Indicator name	2019	2020	2021
<b>Global Innovation Index</b>			
Utility models by origin/bn PPP\$ GDP	1	1	1
Females employed w/advanced degrees, %	2	3	2
Pupil-teacher ratio, secondary	3	3	7
2.1.2. Government funding/pupil, secondary, % GDP/cap	23	12	7
<b>Network Readiness Index</b>			
E-commerce legislation	1	1	1
Adult literacy rate	1	1	1
Income inequality	1	6	7
<b>The Global Talent Competitiveness Index</b>			
Workforce with tertiary education	2	5	3
Tertiary enrolment	11	18	13
Women in high-skilled jobs	39	10	23
<b>Weaknesses</b>			
<b>Global Innovation Index</b>			
Joint venture/strategic alliance deals/bn PPP\$ GDP	88	113	116
State of cluster development and depth	98	91	100
Scientific and technical articles/bn PPP\$ GDP	54	55	90
<b>Network Readiness Index</b>			
Handset prices	107	113	103
SDG 7: Affordable and Clean Energy	-	128	125
4G mobile network coverage/ Population covered by at least a 3G mobile network	119	129	97
<b>The Global Talent Competitiveness Index</b>			
Social mobility	123	117	121
FDI and technology transfer	111	120	119
Prevalence of foreign ownership	118	119	119

Source: author's development

Thus, studies of international ratings indicate that the formation of an innovative economy, its implementation, as well as the introduction of innovations in Ukraine in recent years are characterized by rather low indicators. Moreover, it should be noted that such criteria as human capital, education, and science receive relatively higher marks, which creates prerequisites for transition to an innovative path of development.

The country's strengths are still the level of education of the population, namely: literacy of the adult population, the percentage of those with higher education, directly the quality of education and the professional level of those involved in business; creativity and innovation; as well as legislation in the field of e-commerce, the possibility of adapting the legal framework to new technologies, ensuring gender equality, the affordability of mobile communication services, the ease of starting a business, e-democracy, the availability of innovative technologies and the number of patent applications in the field of ICT, the possibility of using large data, etc.

The main negative factors restraining the development of the innovative economy include the imperfection of the legislation in determining new priority directions for the development of innovative activities in Ukraine; non-compliance of legislation in the field of protection of intellectual property rights with international standards; under development of innovative infrastructure (innovative business incubators, technology parks, science parks, clusters of high-tech innovative enterprises); insufficient development of the infrastructure, which ensures the solution of certain issues of commercialization of scientific developments at various stages of their readiness; the inconsistency of the corporate structure that is being formed in Ukraine with the requirements of innovative development, the slow formation of a modern and large-scale market for innovative products and the infrastructure of innovative activities.

**Conclusion.** So, after analyzing and summarizing a number of recommendations of influential international experts, the following can be highlighted. In order to restore the economy, which should

become more productive, sustainable and inclusive, it is proposed to carry out an economic transformation using the possibilities of innovative technologies based on the interaction of education, science and business according to the following priority directions of action:

- implementation of strong management principles based on long-term forecasting and planning of the country's development, ensuring strengthening of citizens' trust in the actions of the authorities;
- modernization of infrastructure, ensuring the acceleration of the transition to alternative energy, expanding access to energy resources and ICT;
- transition to more progressive taxation, rethinking of the methods of taxation of corporations, wealth, and labor resources at the national level, agreed within the framework of international cooperation;
- updating educational programs and increasing investment in the development of skills necessary to create jobs and "markets of the future";
- reconsideration of labor legislation and social protection taking into account the realities of the needs of the new economy in terms of labor resources;
- expanding the infrastructure of healthcare facilities, as well as care for the elderly, children, as well as providing access to innovations for the benefit of people and the economy;
- stimulating an increase in the direction of financial resources for long-term investment in development to strengthen stability and international integration;
- rethinking competition and antimonopoly legislation in accordance with the requirements of the fourth industrial revolution, ensuring access to markets both at the national and international levels;
- encouraging increased investment in research, innovation and inventions that can create new "markets of tomorrow";
- encouraging companies to embrace diversity, equity and inclusion to increase their creativity.
- attract more of the private sector to invest in the development of digital infrastructure, thus closing the need for investments in the country;
- ensure the cooperation of enterprises and the government to increase the sustainability of the existing infrastructure. The government and operators, ISPs should expand the exchange of information about critical infrastructure threats to

study and timely eliminate key physical and system vulnerabilities;

- improve coordination between the public and private sectors regarding the design of critical infrastructure networks in urban planning and develop joint emergency response plans in the event of natural disasters, cyber attacks and other crisis situations.

In order to effectively use the country's potential for innovative development and direct it to achieve political stability and sustainable economic growth, it is recommended:

- implement a clear policy on encouraging innovation and further development of education and science;
- to expand the country's integration into global chains of added value creation and innovation networks;
- to form a state policy aimed at finding and attracting the talents of the future, forming incentives to retain qualified labor in the country, which will become a decisive factor in Ukraine.

#### REFERENCES:

1. Global Innovation Index 2021. Tracking Innovation through the COVID-19 Crisis Soumitra Dutta, Bruno Lanvin, Lorena Rivera León and Sacha Wunsch-Vincent. Available at: [https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2021.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf).
2. The IMD World Competitiveness Yearbook (WCY). Available at: <https://www.imd.org/centers/world-competitiveness-center/publications>.
3. World Competitiveness Ranking. Available at: <https://www.imd.org/centers/world-competitiveness-center/rankings/world-competitiveness>.
4. Country Overview/ Ukraine. Available at: <https://worldcompetitiveness.imd.org/countryprofile/overview/UA>.
5. Global Innovation Index Ranking. Available at: <https://www.globalinnovationindex.org/analysis-economy>.
6. Bloomberg Innovation Index. Available at: <https://www.bloomberg.com/news/articles/2021-02-0>.
7. European Innovation Scoreboard 2021. Available at: <https://www.kowi.de/Portaldata/2/Resources/fp/EIS-2021-Report.pdf>.
8. Network Readiness Index. Available at: <https://networkreadinessindex.org/country/ukraine>.
9. The Global Talent Competitiveness Index. Available at: <https://www.insead.edu/sites/default/files/assets/dept/fr/gtci/GTCI-2021-Report.pdf>.