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Alla STEPANOVA, PhD (Econ.), Assoc. Prof.
ORCID ID: 0000-0002-1711-7948
e-mail: stepanova_alla@knu.ua
Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

CURRENT CHALLENGES IN FINANCING HIGHER EDUCATION

Background. *The key foundation for the qualitative development of a country's economy lies in the level of advancement of its education and science. Amid current challenges, this is critically important for the country's survival. The state of education and science in Ukraine largely depends on the availability of funding resources, the search for successful international models, and their implementation and adaptation to the country's present realities. It is also essential to apply rigorous criteria when prioritizing funding for education and science. The aim of this study is to analyze the state of higher education financing in Ukraine, its relationship with the Human Development Index, and to explore possible trajectories for further development of this sector.*

Methods. *To achieve the research objectives, the study employed methods of analysis and synthesis (generalization and identification of key aspects), statistical analysis (processing data on the current state of higher education financing), and graphical methods (for visual representation of the studied processes).*

Results. *The article analyzes the financing of higher education as a critically important factor in developing Ukraine's knowledge-based economy. It identifies the link between education funding, the Human Development Index, and the country's innovation potential. The paper examines international practices-specifically, Germany's competitive grant-based funding model and Israel's strategy for building a "startup nation." It highlights key domestic challenges: low efficiency of resource use, a lack of innovative financial mechanisms, and weak integration of science into the global arena. The need for infrastructure investment and support for high-potential universities is substantiated.*

Conclusions. *The study concludes that the development of a knowledge economy requires high-quality education and effective financing, including transparent use of public funds and encouragement of student loan systems. Major challenges include the absence of innovative financial mechanisms, weak business investment activity, and poor integration of Ukrainian science into the global research space, all of which reduce resource efficiency. A breakthrough in education demands investment in universities' infrastructure, optimized budget spending, and support for institutions with strong development potential.*

Keywords: *innovative development, investment, Human Development Index, innovation potential, higher education financing models.*

Background

The current situation in Ukraine compels institutions in the fields of education and science to seek alternative means of financing higher education amid declining state revenues. This raises critical questions about the accessibility of educational services for all citizens.

Since gaining independence in 1991, Ukraine's approach to education financing has been shaped by numerous factors, including the transition to a market economy, the introduction of private property, and the implementation of program-targeted and formula-based methods for allocating budgetary resources. These developments have been further complicated by political upheavals, including revolutions, annexation, and a full-scale invasion.

There is sufficient research in the scientific literature on financing higher education in developing countries, because Ukraine belongs to this group. Thus, researchers Alper Goksu and Gonca Gungor Goksu (Goksu A., & Goksu G., 2015) note in their work that each country uses a different model of financing higher education with varying levels of success. This group of countries is predominantly private-sector funding. The public sector's contribution to higher education funding varies considerably across countries. Recently, significant changes have occurred in many countries' higher education systems. As a result of developments in this area, the balance between private and public sector contributions to higher education funding has changed.

In the current study, the authors discuss the different applications of higher education funding systems and analyze the contributions of other actors involved in higher education funding. The importance of having effective mechanisms for financing higher education that ensure equitable outcomes and economic viability is discussed in their studies by Chapman and Dearden (2021). The authors raise the issue of accessibility to higher education through such an instrument as a student loan and argue for the feasibility of targeted assistance to all disadvantaged potential students for reasons of social justice and the importance of creating the right funding system. Patrick Clancy's Investing in Education (Clancy, 1996) became a foundational document for educational policy in the era of economic planning that began in the late 1950s. Researchers Loxley, Seery, & Walsh (2014) consider it to disseminate theories of human capital formation. Investing contributed to a significant shift in educational policy, based on a widespread belief among politicians, government officials, and international advisors that education was key to a country's economic salvation. This paradigm shift was driven by domestic priorities shaped by past economic failures and broader international trends inextricably linked to the Cold War. Education and technological development were given special importance as key areas of struggle in the global confrontation between the capitalist West and the Soviet Union.

The main ideas of "Investment" – in particular, increasing funding for education as a necessary condition for economic development, as well as expanding access to post-secondary and higher education to overcome the shortage of qualified personnel – became central to Irish education policy for two generations after the publication of this work. These are the quantitative trends analyzed in the article. Zhao (2001) examines the impact of diversification of funding sources on the quality of higher education, and concludes that a diversified funding scheme improves the current difficult financial situation in higher education. The author notes that the funding shortfall has affected the infrastructure of higher education and the quality of teaching and learning. Also, the higher education level is evaluated by the results of its achievement of economic and social goals, as well as the short-term and long-term interests of

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the nation. Chattopadhyay (2007) argues that higher education is the key to leadership in knowledge production. How higher education is financed is crucial for understanding how higher education is provided to society and at what cost. The importance of exploring alternative sources of financing for higher education remains relevant. Leshanyc, Miahkykh, & Shkoda (2018) conducted a comparative analysis of financing models for higher education institutions in Ukraine and foreign countries, which became the basis for developing the most promising areas of development of domestic legislation in this area, and also noted that the implementation of foreign experience will make financing more transparent and provide an opportunity to distribute it by the criteria for the quality of educational services and will contribute to the active attraction of investments in education, training and high technologies.

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Pisarska (2020), in her study, emphasizes the structure of sources of financing of the studied higher educational institution in the context of modern conditions of its functioning. In particular, the study provides an understanding of the share of state higher education institutions' financing in the general flow of financing their activities. The increase in the share of financial resources from the commercialization of research results in the total volume of financing of tasks, which demonstrates the growing importance of the entrepreneurial idea of the university, which has recently been one of the main types of university activity.

In their study, Ukrainian researchers Tereshchenko and Oleinikova (2017) explored the development pathways of the higher education system in EU countries. They found that the increase in the volume of state funding is inherent in more developed nations with an innovative model of economic development, where developed countries not only pay significant attention to the development of the higher education system but also allocate a significantly larger share of expenses in favor of secondary and post-secondary non-higher education (work qualification). They also analyzed the current model of financing education in Ukraine and formulated the main financing problems.

At the same time, scientists Starostina and Kravchenko (2024) in their research raise the issue of developing mechanisms for transferring scientific knowledge to business by improving the quality of education and integrating research into the educational process.

The stability of the national system depends on many factors, especially in wartime, and one of the key ones is financing, as noted in their study by Kuklin, Azmuk and Dernova (2023). The team of scientists draws attention to the fact that the domestic higher education system still has a significant margin of safety and proposes directions for post-war reform of the national higher education system based on resilience.

The publication of Bazhenova (2023) is devoted to the issues of post-war reconstruction of the economy of Ukraine, where the author concludes, when analyzing the growth rates of the economies of Japan, the Republic of Korea and Israel during 1951–2019, that one of the decisive drivers of economic growth is the provision of quality education, which leads to an increase in the level of human capital.

The aim of this study is to analyze the current state of higher education financing in Ukraine, examine its relationship with the Human Development Index (HDI), and identify potential trajectories for the future development of this sector.

Methods

The study employs a combination of analytical and statistical methods. Analytical methods include synthesis and generalization, with a focus on identifying key research perspectives. Statistical methods involve the processing and interpretation of data on the current state of higher education financing. Additionally, graphical analysis was used to visualize and interpret trends and patterns.

Results

To optimize the process of providing and functioning of higher education, it is necessary to understand the operation of the financial support mechanism, where all links are interconnected and essential. Our issue concerns the multiplicity of sources of financing for higher education, where the key forms are budget financing, self-financing, and lending. Budget financing – budget funds that are limited and are directed to cover part of the expenses of the relevant higher education institution. Self-financing – covering expenses at the expense of one's resources, which include fees for the provision of educational services, income from economic and/or production activities, rental income, grant income, and funds from patrons and benefactors. Lending - attracting loan resources on maturity, payment, security, and targeted use. These forms allow higher education institutions to perform the functions assigned to them by the state and contribute to the creation of added value in the country's economy.

To a certain extent, forms of financing are a manifestation of investment in higher education, because they have all the characteristics inherent in this phenomenon. According to the Law of Ukraine "On Investment Activities", investment is all types of property and intellectual values invested in objects of entrepreneurial and other kinds of activity, resulting in profit and/or a social and environmental effect. As for the payback of such investments, they can only be certain types of activities, and the entire complex of university activities, such as scientific research, education, and public platforms, will not have financial profit in the classical understanding of this phenomenon. However, we are talking about a macroeconomic effect, which is achieved at the country level. After all, obtaining higher education by a large number of the population allows us to talk about the training of highly educated specialists who, in the future, will bring precisely this financial effect at the country level. This is the basis of the quality of human potential and innovative development.

The Human Development Index (HDI) is a generalized indicator of average achievements in key aspects of human development: a long and healthy life, awareness, and a decent standard of living (Fig. 1).

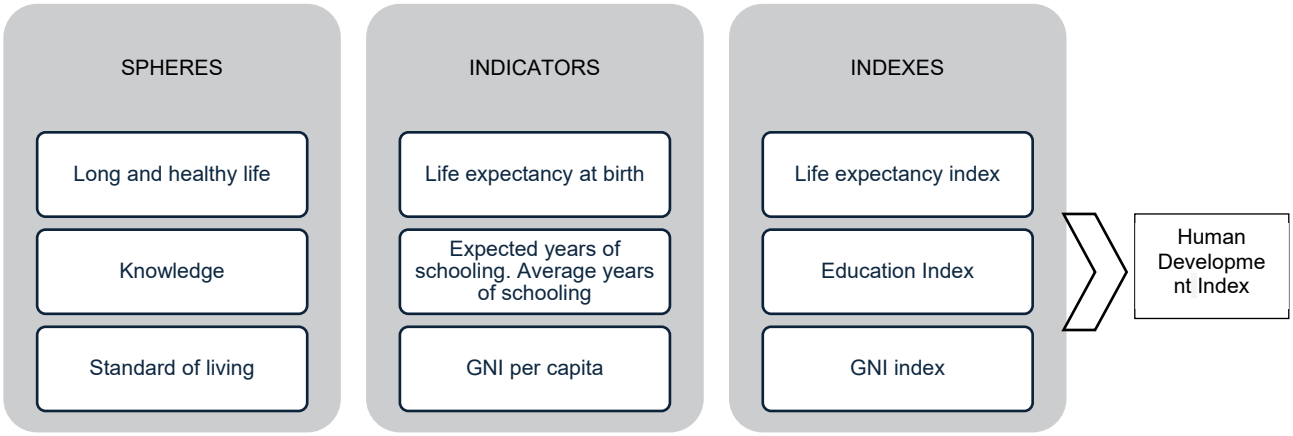

Fig. 1. Components of the Human Development Index

Source: visualized by the author based on data from the Human Development Report.

The HDI is calculated as the geometric mean of the normalized indices for each of the three dimensions. The health dimension is measured by life expectancy at birth, the education dimension by the average years of schooling for adults aged 25 and over, and the expected years of education for children starting school. The standard of living is measured by gross national income (GNI) per capita. The HDI can be used to analyze national policies, particularly considering how two countries with the same GNI per capita can have different human development outcomes. Such comparisons can stimulate discussions about public policy priorities. Ukraine performs above expectations regarding development in the HDI ranking (Fig. 2).

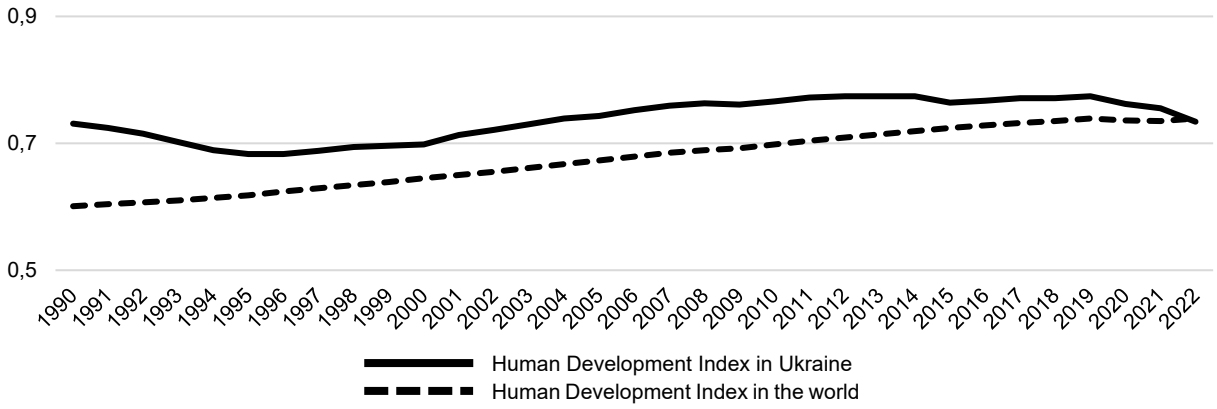

Fig. 2. Human Development Index in Ukraine and the world, 1990–2022

Source: constructed by the author based on data from the Human Development Report.

The second important ranking is the Global Innovation Index. The Global Innovation Index (GII) was created with the World Intellectual Property Organization (WIPO), Cornell University, and the international business school INSEAD. This index assesses the level of innovative development, based on the creative potential and the effectiveness of innovative activities. Innovative potential is measured by the following criteria:

- institutions – political, regulatory and business environment;
- human capital and research – quality of education, development of higher education, research and innovation activities;
- infrastructure – information and communication technologies, general infrastructure and environmental sustainability;
- market environment – access to credit, investment, trade, diversification and market size;
- business environment – the level of knowledge and skills of employees, innovative cooperation and knowledge implementation.

Innovation activity results are assessed according to the following parameters:

- knowledge and technology – creation, dissemination, and impact of knowledge;
- creative results – intangible assets, production of creative goods and services, and online creativity.

Ukraine produces more innovative products than investments (Table 1, Fig. 3).

An analysis of Ukraine's macroeconomic situation suggests that the level of education spending as a percentage of GDP is extremely low after the start of the full-scale invasion (Fig. 4).

To understand the situation, the graph of education spending in some developed countries shows how much Ukraine will need to do in this direction (Fig. 5).

Ukraine spends a significant share of public funds on education, but low efficiency due to a relatively large number of educational institutions and a decrease in the number of students calls into question the effectiveness of using these resources (Fig. 6).

Table 1

Global Innovation Index of Ukraine in 2014–2024

Years	Place in the ranking by overall indicator		
	Global Innovation Index	Innovation potential ("input index")	Results of innovation activity ("output index")
2014	63	88	46
2016	56	76	40
2018	43	75	35
2019	47	82	36
2020	45	71	37
2021	49	76	37
2022	57	75	48
2023	55	78	42
2024	60	78	54

Source: compiled by the author based on data from https://www.wipo.int/en/web/global-innovation-index.

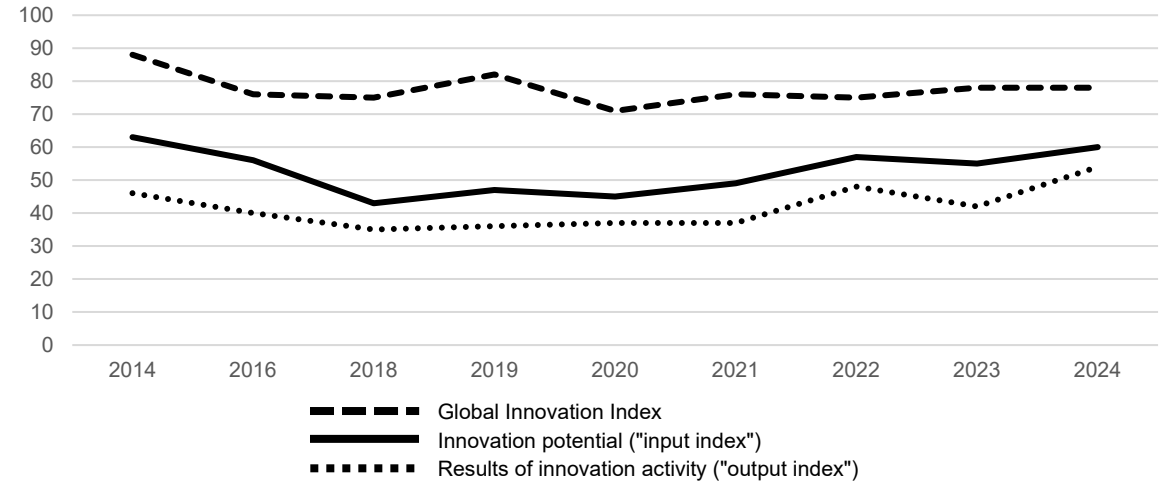

Fig. 3. Global Innovation Index of Ukraine in 2014–2024

Source: built on the basis of WIPO Statistics Database.

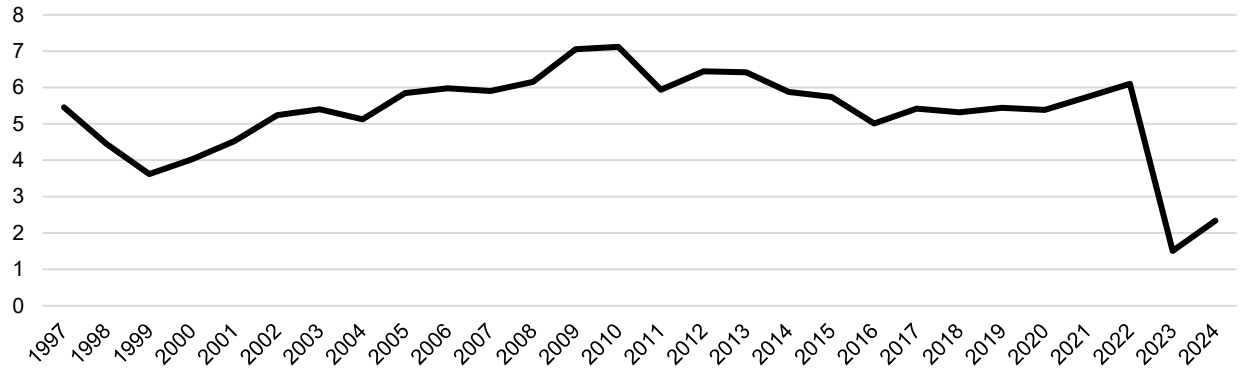

Fig. 4. Education spending in Ukraine, % of GDP, 1997–2023

Source: built by the author based on data from https://data.worldbank.org

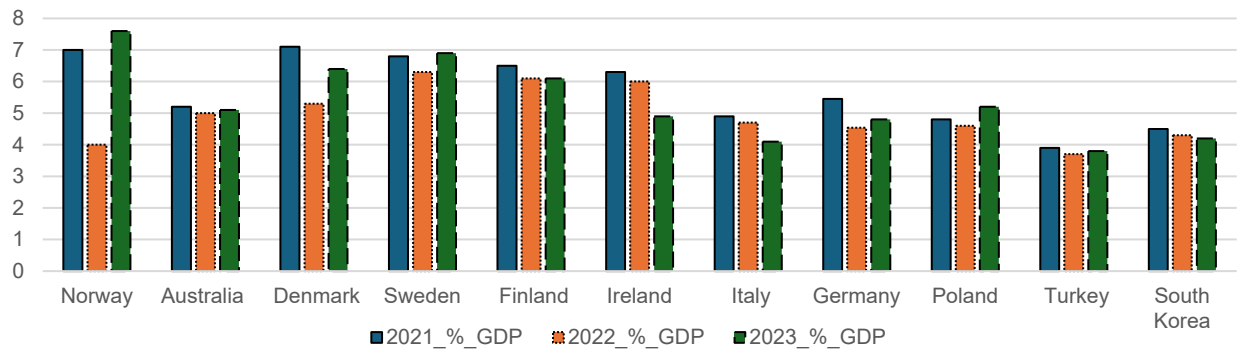

Fig. 5. Total expenditure on education in developed countries of the world during 2021–2023, % of GDP

Source: based on data from https://stats.oecd.org/

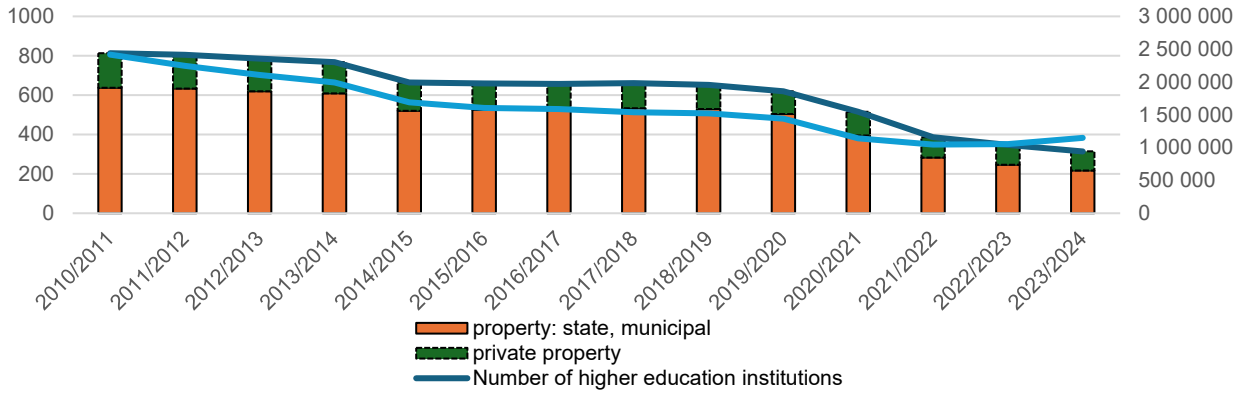

Fig. 6. Number of higher education institutions and number of students for 2010–2024 academic year, units
Source: built based on data from the State Statistics Service of Ukraine and the Ministry of Education and Science of Ukraine.

Ukraine faces extremely complex challenges and can have devastating consequences for the country if certain efforts are not made to eliminate them or, at least, respond to them. This, and macroeconomic vulnerability and fiscal burden, decreases the solvency of the population, which, in turn, limits the possibility of increasing spending on education and requires the most efficient use of available resources to implement reforms in the field of education and attract investment. Therefore, it is worth paying attention to successful examples of financing education and science that could be adapted to domestic realities. One of the most interesting and realistic is the German model of financing education and science, especially the Exzellenzinitiative program ("Excellence Initiative") and its successor – "Exzellenzstrategie" (Deutsche Forschungsgemeinschaft, 2025). Thus, the German government and the states (regions) in 2005 launched a large-scale program to stimulate the development of world-class universities, which provided for holding open competitions among universities for receiving large grants. Those who proposed realistic, ambitious strategies for developing science, innovation, and education received grants (Excellence Strategy of the German federal and state governments, 2025). Funding was competitive, public, and transparent. Top scientists from different countries were involved in the implementation of projects. As a result, Germany received high positions in world rankings in 15 years and attracted thousands of students and scientists worldwide (Federal Ministry of Research, Technology and Space, 2025).

Another interesting example is Israel, which demonstrates the algorithm of actions for creating a "startup nation" (Israel Innovation Authority, 2025). The key steps for implementing the experience are as follows: close integration of science, education and innovative business, commercialization of scientific developments, investment in the "startup nation", education as the basis for development (making higher education as accessible as possible and stimulating the creation of strong technical specialties, focusing universities on solving real needs of the economy and security). The consolidation of universities is underway, which should strengthen their positions in the education market and increase opportunities for obtaining appropriate funding. However, Ukraine is a middle-income country with significant growth potential. Ukraine traditionally benefits from its human capital, particularly its powerful education system and highly qualified labor resources. However, Ukraine has not transformed this human capital into productivity and national wealth. The rapid expansion of the education system has increased the population's education level. Still, its quality and relevance have suffered, with a lack of innovation, isolation, and corruption leading to dissatisfaction, skills imbalances, and an excessive focus on diplomas. Despite a highly educated workforce, human capital in Ukraine accounts for only 34% of national wealth (compared to the average for Europe and Central Asia of 62%), and labor productivity is only 22% of that in the European Union. This is a sign that the contribution of education to the economy does not match its potential.

Discussion and conclusions

The main goal of higher education in the knowledge economy is to create favorable conditions for the development of human capital and for the production, preservation, dissemination, and use of knowledge. This, in turn, requires ensuring the proper quality of education and adequate financing. Effective financing involves the targeted and transparent use of public funds and the further development of the higher education lending system.

Among the main problems of financing education and science in Ukraine, it should be noted: the lack of innovative financial mechanisms to ensure high quality education and science; the difficulty of attracting credit resources by households due to their high cost; inefficient use of budget funds, due to the lack of clear criteria for socio-economic efficiency and insufficient use of the principle of "evidence-based knowledge transfer"; low level of private investment in science and education due to weak business demand for innovations and insufficient applied orientation of scientific research; a small number of international grants due to weak integration of Ukrainian scientists into the global scientific space.

The situation is further complicated by the transfer of funding for vocational education to local budgets without creating conditions for attracting private investment, in particular through public-private partnership mechanisms, as well as the underdevelopment of public control over the effective use of public resources, taking into account the specifics of the industry.

Public higher education institutions are non-profit organizations. Today, budget funding is mainly limited to covering the basic costs of educational institutions: salaries, scholarships, and payment of utility services. Universities primarily provide material and technical development at the expense of their revenues from paid educational services. Solving the problem of investing in material and technical resources could be a powerful impetus for developing the higher education system as an essential factor in the knowledge economy.

In addition, the volume of public funding for education under state orders almost does not provide for capital expenditures due to limited resources. The current demographic situation, characterized by a decrease in the number of applicants, does not allow for an unreasonable

increase in the cost of training on a contract, including investment costs. This requires optimizing available university resources to allocate funds for investments.

In improving the financing system, it is advisable to focus support on universities with high potential, while simultaneously reducing spending on institutions that do not demonstrate development prospects. It is important to remember that, regardless of the financing model, the priority should remain the renewal of the material and technical base (in particular, laboratories and scientific equipment) and proper remuneration of scientific and pedagogical staff, especially leading scientists. If these conditions are met, world-class universities will appear in Ukraine.

The prospect of further research will be to study existing successful models of financing higher education and their possible implementation in Ukraine and the search for alternative funding sources for higher education.

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Алла СТЕПАНОВА, канд. екон. наук, доц.
ORCID ID: 0000-0002-1711-7948
e-mail: stepanova_alla@knu.ua
Київський національний університет імені Тараса Шевченка, Київ, Україна

ФІНАНСУВАННЯ ВИЩОЇ ОСВІТИ В КОНТЕКСТІ СУЧАСНИХ ВИКЛИКІВ

Вступ. *Основним фундаментом якісного розвитку економіки країни є рівень розвитку її освіти та науки. В умовах поточних викликів, це критично важливо для виживання країни. Стан освіти та науки в Україні вкрай залежить від наявних ресурсів для їхнього фінансування, пошуку успішних світових прикладів та їх імплементації та адаптації до сучасних реалій країни, критичність у підходах до обрання критеріїв щодо першочерговості фінансування саме освіти та науки. Метою дослідження є аналіз стану фінансування вищої освіти в Україні, взаємозв'язок з індексом людського розвитку та пошук можливих траєкторій подальшого розвитку досліджуваної сфери.*

Методи. *Для розкриття мети і завдань дослідження використано методи аналізу і синтезу (узагальнення та виокремлення ключових позицій дослідження); статистичний (опрацювання статистичної інформації щодо поточного стану фінансування вищої освіти), графічний (для наочного відображення досліджуваних процесів).*

Результати. *Продемонстровано вплив таких результуючих показників як Індекс людського розвитку (ІЛР) та Глобальний інноваційний індекс на формування пріоритетів державної політики в Україні. Виявлено, що Україна виробляє більше інноваційної продукції порівняно з рівнем інноваційних інвестицій та те, що Україна у рейтингу ІЛР має результати, вищі за прогнозовані. Україна витрачає значну частку державних коштів на освіту, але має низьку ефективність через досить велику кількість освітніх закладів і динаміку зменшення кількості студентів, що ставить під сумнів ефективність використання цих ресурсів. Проаналізовано приклад роботи німецької моделі фінансування освіти й науки, де, через проведення відкритих конкурсів серед університетів на отримання великих грантів стан зазначеної галузі показав стрімкий розвиток, який відображено у рейтингових позиціях університетів, і приклад Ізраїлю, який демонструє алгоритм дій для створення "стартап-нації".*

Висновки. *Визначено, що розвиток економіки знань вимагає якісної освіти й ефективного фінансування, що передбачає прозоре використання державних коштів і стимулювання кредитування вищої освіти. Основними проблемами є відсутність інноваційних фінансових механізмів, низька інвестиційна активність бізнесу та слабка інтеграція науки у міжнародний простір, що знижує ефективність використання ресурсів. Для досягнення прориву у сфері освіти необхідно інвестувати в матеріально-технічну базу університетів, оптимізувати бюджетні витрати та підтримувати заклади з високим потенціалом розвитку.*

Ключові слова: *інноваційний розвиток, інвестиції, індекс людського розвитку, інноваційний потенціал, моделі фінансування вищої освіти.*

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