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EFFECTIVENESS OF STATE REGULATION OF SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT OF UKRAINE: GENERAL CRITERIA

Abstract. The article defines the general criteria for evaluating the effectiveness of state regulation of the development of scientific and technological sphere of Ukraine. By studying the legal framework of state regulation of science and technology of Ukraine, it was analyzed existing scientific approaches to defining the concept of "effectiveness of public administration", which considers it as a degree of achievement of the management goal, the expected state of the object of management, the degree of approximation of the parameters of this state to the target, etc. The correspondence of the state of the domestic scientific and technological sphere to the qualitative and quantitative parameters set by the state for the strategic perspective and measures of approaching the trajectory of development of science and technology in Ukraine to world trends has been considered. The analysis of the effectiveness of state regulation of the development of scientific and technological sphere of Ukraine according to the selected criteria - testified to the lack of focus of domestic science and technology to ensure the entry of the national economy into global trends of innovative development. As a result, there is no positive dynamics of Ukraine's rating in international comparisons of innovation and competitiveness of world economies. It has been studied the dynamic of Ukraine's rating in international comparisons of innovation and competitiveness of world economies has determined prospects for further research in this area should be recognized: the creation of theoretical and methodological foundations for quantifying the effectiveness of state regulation of scientific and technological sphere of Ukraine according to selected criteria, as well as substantiation of the principles of information and statistical base for its implementation.

Keywords: public administration, regulation, scientific and technological sphere, information and statistical base, innovation, competitiveness.

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РЕЗУЛЬТАТИВНІСТЬ ДЕРЖАВНОГО РЕГУЛЮВАННЯ РОЗВИТКУ НАУКОВО-ТЕХНОЛОГІЧНОЇ СФЕРИ УКРАЇНИ: ЗАГАЛЬНІ КРИТЕРІЇ

Анотація. У статті визначено загальні критерії оцінки результативності державного регулювання розвитку науково-технологічної сфери України. Шляхом вивчення законодавчої бази державного регулювання науково-технологічної сфери України зроблено аналіз існуючих наукових підходів до визначення поняття «результативність державного управління», які розглядають її як ступінь досягнення мети управління, очікуваного стану об'єкту управління, міри наближення параметрів цього стану до цільових тощо. Проаналізовано відповідність стану вітчизняної науково-технологічної сфери тим якісним і кількісним параметрам, які встановлені державою на стратегічну перспективу та міри наближення траєкторії розвитку науки і технологій в Україні до світових трендів. Дослідження результативності державного регулювання розвитку науково-технологічногої сфери України за обраними критеріями засвідчив недостатню зорієнтованість вітчизняних науки і технологій на забезпечення входження національної економіки до світових трендів інноваційного розвитку, внаслідок чого відсутня позитивна динаміка рейтингу України у міжнародних порівняннях інноваційності і конкурентоспроможності світових економік. Аналіз щодо динаміки рейтингу України у міжнародних порівняннях інноваційності і конкурентоспроможності світових економік визначив перспективи подальших досліджень у даному напрямі, якими слід визнати створення теоретико-методичних засад кількісної оцінки результативності державного регулювання розвитку науково-технологічногої сфери України за обраними критеріями, а також принципів формування інформаційно-статистичної бази для її здійснення.

Ключові слова: державне управління, регулювання, науково-технологічна сфера, інформаційно-статистична база, інноваційність, конкурентноспроможність.

Formulation of the problem. Most of the existing scientific approaches to defining the concept of "effectiveness of public administration" consider it as a degree of achievement of the goal of management, the expected state of the object of governance, the degree of approximation of the parameters of its state to the target [1, p. 54]. Regulation as one of the general (operational) functions of management in general terms aims to maintain the stability of the object of management by maintaining the necessary relationship between its various components (elements), timely elimination of possible deviations from established norms in its operation, ensuring positive change and development [2, c. 466]. In ensuring the effectiveness of management - regulation, among other things, has diagnostic value, as it allows to establish the magnitude and causes of deviations of

the current state of the object of regulation from the target. On this basis, the task of tracking the compliance of the domestic scientific and technological sphere with the qualitative and quantitative parameters set by the state for the strategic perspective and the degree of approximation of the trajectory of science and technology in Ukraine to world trends becomes relevant.

The purpose of the article. The purpose of the work is to determine the general criteria for assessing the effectiveness of state regulation of the development of scientific and technological sphere of Ukraine.

Materials and methods. The study is based on the study of the legal framework of state regulation of science and technology in Ukraine; materials submitted by international organizations in determining the degree of innovation of the world's economies for 2016-2020; results of analytical research of the Ukrainian Institute of Scientific and Technical Expertise and Information (UkrINTEI) of the results of scientific, scientific-technical and innovative activities in Ukraine for years 2018-2020.

Presentation of the main material. The main goals of scientific, technological and innovative development of Ukraine are enshrined in the relevant Concept [3], which has not been revised since 1999, but is formally in force. The renewal of these goals at the state level was carried out by the Law of Ukraine "On Scientific and Scientific-Technical Activities", which includes the main goals of state policy in the field of scientific and scientific-technical activities, in particular: providing scientific justification achieving a high level of development of science and technology; creating conditions for the realization of the intellectual potential of citizens in the field of scientific and scientific-technical activities; ensuring the free development of scientific and scientific and technical creativity; integration of the domestic sector of scientific research and scientific and technical (experimental) developments into the world scientific and European research space [4]. From such positions the most general criteria of conformity of a condition of domestic scientific and technological sphere to target instructions of its development it is expedient to accept:

- constancy of indicators of positive dynamics of Ukraine's place in international rankings that assess the innovativeness of the world's economies;
- the degree of compliance of priority areas of science and technology in Ukraine with global forecast trends for the period up to 2025.

Analysis of innovation capacity and technological readiness of Ukraine's economy on the basis of international comparisons based on indices that reflect the various components of innovation and their overall result for the country's economy, which I conducted on the basis of sources [5-11], allows us to draw a number of conclusions about the effectiveness of government regulation development of science and technology in Ukraine according to the first criterion.

First, there is no positive trend in Ukraine's international rankings. According to the Bloomberg Index, Ukraine dropped from 46th position in 2018 to 56th position (out of 60 overall) in 2020, falling in all sub-indices (especially in the efficiency of higher education - from 21 to 48, respectively). According to the

Global Competitiveness Index, Ukraine in 2019 ranked 85th among 141 countries. Secondly, there is a high probability that the above indicators of Ukraine will deteriorate due to the widening gap between Ukraine and the countries-innovation leaders: according to the European Innovation Scoreboard 2019, Ukraine is among the group of slow innovators. Third, among the sub-indices, the positions of "drivers" and "losers" remain virtually unchanged (Table 1), which indicates in fact the lack of regulatory influence of state policy in the field of science and innovation on its state. Fourth, the assessment of readiness for future production, which gives an idea of how well countries can shape and benefit from the changing nature of production through the adoption of new technologies [10, p. 16; 12], showed that Ukraine as of 2021, unfortunately, is neither a leading country, nor a successor country, nor a country with high potential, remaining in the group of countries with economies in transition.

To determine the effectiveness of state regulation of science and technology in Ukraine according to the second of the general criteria - compliance of priority areas of science and technology in Ukraine with global forecast trends for the period up to 2025, the results of I. Matyushenko's research were used. He summarized the predictions of the main components of the sixth technological mode by 2025 for the United States, the EU and China [13, p. 54-57]. Their comparison with the priority areas of development of science and technology in Ukraine until 2021 [14] (Table 2) shows that the domestic scientific and technological sphere is not sufficiently focused on entering the world trends of high-tech economic development.

Table 1

Sub-indices with the best and worst indicators of Ukraine in international comparisons for 2016-2020

Index	Sub-indices of Ukraine with the best indicators	Sub-indices of Ukraine with the worst indicators
Global Innovation Index	Knowledge and results of scientific research; Human capital and research; Creativity	Institutions; Infrastructure; Market indicators
Bloomberg Innovation Index	Penetration of high technologies; Patent activity	Intensity of scientific developments and researches; Productivity; Value added production
Global Competitiveness Index	Habits; Market size; Commodity market; Infrastructure	Macroeconomic stability; Financial system; Institutions; Healthcare
European Innovation Scoreboard	Human resources; Impact on employment; Favorable environment for innovation	Funding and support; Connections; Institutional aspects; Attractiveness of research systems
Global Talent Competitiveness Index	Global knowledge; Production skills of employees	Market and regulatory opportunities in the labor market; Talent Attraction Index
Readiness for the Future of Production	Human capital; Mobile subscribers; Cooperation between many stakeholders; R&D costs	Institutional framework conditions; LTE mobile network coverage; Foreign direct investment and technology transfer; Impact of ICT on new services and products; The state of development of clusters

In addition, according to statistics [15, p. 45], in a number of priority thematic areas there is extremely low budget funding, in particular: "The most important fundamental problems in the development of rocket and space technology"; "Supercomputer software and hardware, telecommunications networks and systems. Grid and cloud technologies "; "Genomic technologies in agriculture"; "Technologies for cleaning and prevention of air pollution", etc.

Table 2

Comparison of forecasts of development of world trends in the development of science and technology for the leading economies of the world and Ukraine until year 2025

USA, EU countries, China	Ukraine
-life science (telemedicine, nanobiology, stem cells); -biotechnology (biotechnology, genetically modified organisms (GMOs), synthetic substances); -new energy technologies (energy, alternative energy and resources, nuclear energy systems, hydrogen energy systems); -nanotechnologies and new materials (functional nanostructures, nanomeasurement and analysis, composite materials); -information and communication technologies (cloud technologies, global wireless Internet, search services, remote control, industrial control, business applications, cable and satellite technologies); -radio electronics (silicon, bio-, molecular, organic and photonic radio electronics, digital and analog electronics); -robotics and artificial intelligence technologies; the latest industrial technologies (digital house, engineering of multifunctional fabrics, robotic unmanned vehicles, power equipment for non-traditional energy sources); -aerospace technologies (space exploration, Earth monitoring, unmanned aerospace technologies); transport and logistics technologies; recirculation technologies; -knowledge dissemination technologies (knowledge management and production system, data set backup, natural disaster prevention and forecasting); -socio-cultural technologies (production technologies for the development of social infrastructure).	-fundamental scientific research on the most important problems of development of scientific and technical, socio-economic, socio-political, human potential to ensure the competitiveness of Ukraine in the world and sustainable development of society and the state; -information and communication technologies; -energy and energy efficiency; -rational use of nature; -life sciences, sciences of new technologies for prevention and treatment of the most common diseases; -science of new substances and materials.

Conclusions. Thus, determining the effectiveness of state regulation of scientific and technological development of Ukraine - as the most general, key evaluation criteria, it is advisable to take such that: first, allow to establish the degree of compliance with state priorities for development of domestic science and technology; and secondly - illustrate the effectiveness of the authorities and

management in the implementation of selected priority areas of development of scientific and technological sphere of Ukraine through international comparisons of innovation in the economy of Ukraine and other countries. The analysis of the effectiveness of state regulation of the development of scientific and technological sphere of Ukraine according to the selected criteria - testified to the lack of focus of domestic science and technology to ensure the entry of the national economy into global trends of innovative development. As a result, there is no positive dynamics of Ukraine's rating in international comparisons of innovation and competitiveness of world economies. Prospects for further research in this area should be recognized: the creation of theoretical and methodological foundations for quantifying the effectiveness of state regulation of scientific and technological sphere of Ukraine according to selected criteria, as well as substantiation of the principles of information and statistical base for its implementation.

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