Abstract

to the dissertation work of Makanova Asselya Uralbayevna titled «State Regulation of Scientific Research Activity in the Republic of Kazakhstan», submitted for the degree of Doctor of Philosophy (PhD) on the specialty «8D04103 – State and Local Administration».

Relevance of the research topic. After World War II, leading OECD countries recognized the potential military and economic benefits of research and began to channel it toward achieving national goals. This led to the emergence of the "big science" paradigm, characterized by its industrialization. With the growth of social relations in the field of science, these countries developed state scientific policies, necessitating the establishment of a system of public administration and regulation in the field of science and scientific research activity (SRA).

The importance of state regulation of SRA is linked, first, to the fact that research serves as the foundational step toward building a knowledge-intensive economy, and second, to the need for coordinating various participants in the scientific process, ensuring adherence to ethical standards, and improving the quality of research.

To implement the goals of national science policy, various regulatory instruments are developed. The primary tools include legal frameworks and public financing of research. Both external and internal factors influence the choice of these tools. For instance, Kazakhstan’s accession to the Bologna Process not only led to a fundamental shift in the system of scientific personnel training from a Soviet to a Western model but also introduced new regulatory instruments, such as those based on the evaluation of scientists’ qualifications through publications in international journals, as well as new forms of science funding (basic, grant, and program-targeted).

One of the strategic goals of Kazakhstan's development is to create a knowledge-based economy and enhance its competitiveness on the international stage. In this regard, state scientific policy aims to establish science and education as independent sectors of the economy, with SRA contributing to solving national-level applied problems. A target has been set to allocate 1% of GDP to science funding and to further integrate Kazakhstan’s science into the global scientific community. Moreover, in the context of global competition and rapid technological changes, the Kazakhstani government is developing a new model for science administration that ensures close interaction between research, business, and production.

In this context, studying the system of state regulation of SRA, its main instruments, and the objectives of Kazakhstan's science policy becomes a relevant and significant research area.

The purpose and objectives of the research. The aim of the dissertation is to develop a set of recommendations for improving the state regulation of scientific research activity in Kazakhstan based on theoretical, methodological, and empirical analyses.

To achieve this aim, the following **objectives** were defined:

– To investigate theoretical and methodological approaches and key concepts related to the formation of science policy and the public administration system for SRA, and to formulate the author's vision;

– To study national models, governance styles, and the evolution of instruments and mechanisms for state regulation of scientific research activity in foreign countries;

– To analyse the current state of the public regulation system for R&D in Kazakhstan, the functions and roles of key government agencies involved in science, and to identify factors limiting the development of the science sector;

– To identify the key internal and external factors that influenced the formation of regulatory instruments for scientific research activity in the Republic of Kazakhstan;

– To develop recommendations for improving the state regulation of SRA in Kazakhstan.

The object of the research is the state system for regulating scientific research activity in the Republic of Kazakhstan.

The subject of the research is the complex of socio-economic relations arising in the process of state regulation of scientific research activity in the Republic of Kazakhstan.

The theoretical and methodological basis of the study includes the concept of policy instruments (normative-legal, financial-economic, "soft" tools), policy diffusion, policy transfer, and policy convergence theories, as well as the theory of path dependency. These concepts were applied to evaluate external and internal factors influencing the choice and evolution of policy tools in the regulation of R&D in Kazakhstan. Additional theoretical sources include OECD reports and publications by foreign and Kazakhstani authors on public administration, state regulation of SRA, and science policy.

The research employed several scientific methods, including Historiographic method – a review of works by foreign and domestic researchers on state regulation of scientific research activity. Comparative method – a comparison of national models of science policy systems, public administration structures, and regulatory tools for SRA in foreign countries and Kazakhstan. Normative-Legal approach – a study of laws and regulations in Kazakhstan's science sector. Statistical method – use of data from official sources of Kazakhstan's government agencies and international organizations. Expert In-Depth interviewing – a qualitative study based on interviews with experts involved in decision-making processes in SRA, members of consultative bodies, and working groups drafting amendments to science-related regulations. Bibliometric method – an assessment of the impact of policy instruments on the publication activity of Kazakhstani authors in journals indexed in international databases such as Scopus and Web of Science. MS Excel was used for quantitative data analysis.

Information basis of the study. The data sources for this dissertation research include the legal-information system of regulatory legal acts of the Republic of Kazakhstan: http://adilet.zan.kz, https://online.zakon.kz, as well as official websites of state administration bodies such as www.akorda.kz and

https://primeminister.kz. Strategic documents, presidential addresses, government decrees, legislative acts, ministerial orders (Ministry of Science and Education/Ministry of Science and Higher Education), and draft laws available on websites like www.edu.gov.kz and www.legalacts.kz were utilized. Statistical indicators related to the development of SRA in Kazakhstan were sourced from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms (https://stat.gov.kz/) and the National Report on Science. International sources include reports from the World Bank, the World Economic Forum, and the Organisation for Economic Co-operation and Development (OECD). International databases such as Scopus and Web of Science, accessible via www.scopus.com, www.scival.com, and www.webofscience.com, provided data on the publication activity of Kazakhstani authors. Additionally, the official website of JSC "National Center for State Scientific and Technical Expertise" (www.ncste.kz) served as a source for data on grant financing and program-targeted financing documentation for projects and programs.

The scientific novelty of the dissertation lies in the comprehensive study of the system of state regulation of scientific research activity in the Republic of Kazakhstan through the application of the policy instruments framework, assessment of external and internal factors, and identification of the roles and functions of key actors in the science sector.

Key **scientific results** include:

- Formulation of the author's vision of the state regulation system for scientific research activity, based on a synthesis of previous works by foreign and Kazakhstani scholars.
- Presentation of the evolution of key science policy tools, regulatory mechanisms for SRA, and governance styles in national models of selected countries.
- Identification of the main actors in the process of setting science development priorities in market economies and post-Soviet countries.
- Analysis of internal and external factors influencing the development of science policy and state regulation of SRA.
- Evaluation of the current state and evolution of the public regulation of SRA in Kazakhstan, key actors, government agencies involved in this sphere, and factors influencing the choice of policy instruments.
- Assessment of the effectiveness of Kazakhstan's science policy tools, identification of the outcomes of regulatory mechanisms, and the reasons limiting the development of the science sector.
- Development of recommendations for further improvement of public regulation of SRA, the organizational structure of government agencies in this field, and the digitalization model for scientific processes.

Main scientific provisions presented for defense:

1. Based on foreign and domestic scientific literature and regulatory documents on state regulation of scientific research activity in Kazakhstan, the author has substantiated and presented a definition of the concept "mechanism of state regulation of scientific research activity" as a set of methods and tools

employed by the management entity to influence relationships in the realm of research, as well as the connections between components of the research system to achieve specified goals.

2. Through a review of academic literature and expert interviews, the research identified that Kazakhstan's state science policy is influenced by the existing political system, the country's historical background (Soviet legacy), and the "path dependence" effect, wherein past decisions and events, including those in the system of state management of SRA, significantly affect future decision-making, even if they are not always optimal or efficient.

3. At the current stage, Kazakhstan exhibits a highly centralized model of SRA management, characterized by the state's presence at all levels of governance and primarily relying on administrative-legal and economic mechanisms of state regulation. This indicates a predominance of formal and direct state intervention methods in the development of the scientific sector.

4. The development of the state regulation system for SRA largely depends on the political will of top officials, such as the President of the Republic of Kazakhstan, who plays a critical role in initiating changes in SRA governance and setting science policy objectives, and the head of the relevant ministry, who oversees operational execution and implementation of presidential directives.

5. Recommendations have been developed aimed at reforming the organizational structure of government bodies involved in SRA and an author-proposed model of a research information system. These, in combination, would help to address the current challenges in Kazakhstan's scientific sphere and contribute to the creation of an effective SRA regulation system.

Alignment with science development directions or state programs. The theoretical and practical outcomes of the dissertation align with the scientific field of public and local administration, as well as the implementation of the State Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023-2029.

Theoretical and practical significance of the research results. The dissertation holds theoretical significance as it can serve as a foundation for further research into the system of state regulation of scientific research activity in Kazakhstan, including the primary tools and mechanisms involved in the implementation of state science policy. Its practical significance lies in the proposed model for a research information system, which could be one potential approach to creating an integrated information system for "Science in Kazakhstan." Additionally, the proposed model for the organizational structure of government agencies engaged in SRA governance and regulation, along with their key functions, holds practical relevance. The conclusions and scientific-practical recommendations may also be utilized by decision-making bodies in the development of strategic documents related to science, the application of science policy tools, and in analytical and scientific contexts.

The connection of the dissertation with other research works. This dissertation was carried out within the framework of the scientific project AP08051974, titled "Assessment of the Intellectual Capital of Higher Education

Institutions of Kazakhstan on the Basis of Scientometric Analysis and Ways of Their Transformation into Research Universities", under the grant financing for young scientists by the Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan for 2020-2022.

Publication of research results and the doctoral candidate's contribution to each publication: The results of the dissertation research have been published in eight scientific sources, including:

– Four articles in journals recommended by the Committee for Quality Assurance in Education and Science / Committee for Quality Assurance in Science and Higher Education. The doctoral candidate was the first author in three of these articles: "State Regulation of Scientific Research Activity: Foreign Experience," "Enhancing the Appeal of Scientific Research Activity in Kazakhstan: Current State and Measures Taken," and "Managerial Aspects of the Transformation of Research Universities: International Experience." In these publications, the doctoral candidate participated in selecting the research concept and object, as well as in data collection and analysis. In one publication, "Assessment of Researchers' Qualifications Based on Publications in Scopus and Web of Science Indexed Journals in Kazakhstan's Regulatory Acts," the candidate was the corresponding author, collecting regulatory acts (RAs) related to science and conducting content analysis of these RAs, studying the dynamics of amendments to the examined documents, and visualizing the data.

– Three publications were published in conference proceedings, including one international conference (Hungary). The doctoral candidate was the sole author of two papers: "Current Challenges in Publishing Scientific Articles by Kazakhstani Authors in International Journals" and "Planning Target Indicators as Part of the Science Policy of the Republic of Kazakhstan." In the article "Mechanisms for Evaluating Research Quality: Experience from Foreign Countries and Kazakhstan," the candidate was the first author and explored foreign experiences in establishing mechanisms for assessing research quality.

– One article was published in a journal indexed in the Web of Science database with a non-zero impact factor (3.9) and included in the Scopus database with a CiteScore percentile of 93. In this article, the doctoral candidate analyzed the influence of a regulatory tool, specifically the enactment of the 2011 Law "On Science" of the Republic of Kazakhstan and accompanying regulatory acts on SRA, on the publication strategies of Kazakhstani authors.