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INTERNATIONAL EXPERIENCE IN ESTABLISHING NATIONAL INNOVATION SYSTEMS: EXPERIENCE FOR KAZAKHSTAN

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ABSTRACT

The purpose of this research is to analyze international approaches to the development of national innovation systems (NIS), with a particular focus on countries in Western Europe, the Asia-Pacific region, and the United States. The study aims to identify the most effective models and assess their applicability to Kazakhstan's national context.

The methodology of the research is based on comparative analysis, allowing for a detailed examination of various NIS models and the conditions under which they have been successfully implemented. Particular attention is given to the institutional roles of government, scientific and industrial infrastructure, and human capital in driving innovation.

The scientific novelty (originality / value) of the work lies in its comprehensive evaluation of global innovation policy frameworks and their potential adaptation to Kazakhstan's national context. The research provides valuable insights for policymakers by bridging international experience with local development needs.

The research findings reveal that successful innovation systems rely on strong collaboration between key stakeholders—government, business, academia, and civil society. In Kazakhstan, the current low level of innovation activity and weak performance in global innovation rankings underscore the urgency of reform. The study identifies tailored strategies to foster a more effective and context-sensitive national innovation system capable of supporting long-term, sustainable economic growth.

Keywords: innovation, national innovation system of the Republic of Kazakhstan, innovation policy, innovation potential, innovation development.

INTRODUCTION

Despite the presence of various approaches to NIS development, the government with management tools serves as the driver and coordinator of innovative development around the world. State innovation policy is implemented using legal, organizational, economic, and political instruments of public administration.

The Republic of Kazakhstan's Innovative Development Program (Government Decree of 2001) established the framework for Kazakhstan's innovation policy. The program's main goal is to create conditions and a favorable environment for economic development based on scientific and technological advances. Following that, a number of documents were adopted, including state programs and national projects.

Despite this, Kazakhstan has not strengthened its position as one of the world's most innovative economies. At the end of 2024, Kazakhstan was ranked 78st out of 133 countries in the Global Innovation Index (GII). Today, the problems of a weak relationship between science and business, a low level of commercialization of the results of scientific activity and financing of innovation, a poorly developed innovation infrastructure, and low human resources are still relevant.

In Kazakhstan, the Triple Helix Model of NIS has been built, establishing a connection between research institutes, industry, and the state. However, the low indicator of the national index "Share of GVA of medium-tech and high-tech industries in the total volume of GVA" calculated by the Bureau of National Statistics demonstrates the NIS model's lack of development. At the end of 2022, this share was 2.5%. Meanwhile, the United Nations Economic Commission for Europe (UNECE) reports that in Switzerland, medium and high-tech industries account for 70% of total added value, Ireland for 65%, and Germany for 57% [1].

Statistical data can be used to assess Kazakhstan's low business participation in the NIS. The Bureau of National Statistics estimates that business expenses will account for 26.3% of total R&D expenses by the end of 2022 [2]. In developed countries, the figure ranges from 50 to 80 percent.

Obviously, it is necessary to modify the current NIS and determine the next vector of development in order to put the country on an innovative track.

The research asked the following questions:

– What are the current approaches to forming NIS?

– What approaches can be tailored to Kazakhstan's conditions for developing NIS to improve innovation policy?

MAIN PART

Methodology. The study conducts a comparative analysis of international experience in NIS development using the examples of various regions of the world, including Western Europe, Asia-Pacific, and the United States, in order to identify the most appropriate models for Kazakhstan. Previous studies are reviewed to examine the theoretical approaches and models of NIS proposed by scientists from various countries. Important elements include the work of researchers who identified key NIS models and emphasized the importance of taking into account the country's historical and institutional context. The comparative analysis method is used to conduct a detailed comparison of various NIS models, allowing us to identify each model's strengths and weaknesses and assess their applicability to Kazakhstan. The comparative analysis addresses issues such as financing, the role of the government, the structure of the NIS, stages of the innovation cycle, and private sector involvement.

In addition, a statistical analysis method was used to provide data on various indicators of innovation activity in Kazakhstan and other countries.

In particular, we used Global Innovation Index ratings and data from Kazakhstan's Bureau of National Statistics to assess the current state of the country's innovation environment. Thus, the research methods include an analytical approach with a focus on international comparison and statistical data analysis, allowing the authors to make recommendations for Kazakhstan based on other countries' successful experiences.

Literature review. The term “national innovation system” was introduced into scientific circulation by the Swedish economist Bertil Gotthard Ohlin in 1988. He explored how interactions between government, business and science contribute to economic growth. B. Ohlin emphasizes the importance of interaction between government, science and business. At the same time, the author emphasizes that the government plays a central role in fostering an environment conducive to the advancement of science and business. He highlights science as a vital component in building and sustaining a competitive innovation system [3].

The basic ideas associated with NIS were further popularized by scientists such as Benedict K. Becker, Danielle Godin and others. These researchers developed scientific research on NIS within the framework of a discussion of the role of the government, education and business in the process of innovation activity.

Richard R. Nelson described various models of national innovation systems, such as Euro-Atlantic, East Asian and alternative. At the same time, he emphasizes that NIS must consider the historical and institutional context of each country. In addition, he described the critical role of public policy in promoting innovation [4]. In this case, the classification was used to investigate an international experience.

The Euro-Atlantic model (Western European countries such as Great Britain, Germany, and France) represents the entire innovation cycle, from idea to implementation and scaling. In Western European countries that use this model, all elements of the NIS work: fundamental science, R&D, and production. As a result, governments in these countries prioritize funding for innovative projects. At universities and academic institutions, various instruments were used, such as grants and the formation of research companies.

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The East Asian model (Japan, South Korea, Hong Kong, Taiwan) does not include a stage of fundamental science. This model is based on corporate laboratories. One of the key reasons for this trend is the emphasis placed by East Asian governments on facilitating technology transfer and promoting the export of high-tech goods. This reflects a catch-up development strategy, where less developed economies advance by aligning themselves with the technological and economic trajectories of more advanced nations.

Countries such as Thailand, Chile, Turkey, Jordan, and Portugal, which historically had agricultural-based economies, have tended to follow an alternative path of innovation-driven development. Although they demonstrate potential in fundamental and applied scientific research, in practice, such capacities remain underdeveloped. Their innovation policies typically center on enhancing selected sectors of the national economy and investing in human capital. For instance, in Thailand and Chile, innovation strategies emphasize building innovation management systems within key industries and integrating new technologies into these sectors [5].

Additionally, the Euro-Atlantic approach laid the foundation for the emergence of the "Triple Helix" model [6], which presents a distinct configuration compared to previous NIS models. It redefines the relationships among government, academia, and industry. This model has proven effective in the United States and has been partially adopted in several advanced economies, including Western European nations (such as France through the poles of competitiveness), Scandinavian countries, Brazil, and Japan (through the technopolis framework). Since the 2000s, a social aspect has been added to scientists' works, taking into account the impact of social sciences on innovation processes and NIS implementation. Thus, Patrick Baert emphasizes the importance of including not only economic but also social and cultural factors in innovation systems. The author believes that social relations, market dynamics, and cultural characteristics all have a direct impact on innovation processes. He notes that social science can help us understand how these factors influence the adoption and diffusion of new technologies [7].

Carayannis G. and Campbell D. proposed the fourth helix model in 2009, which is a more complex version of the triple helix model. This structure allows for networking across the entire society, rather than just between certain leading institutions.

Clearly, innovation does not occur in a vacuum, and this study provides a new level of analysis to traditional NIS models.

Continuing the theme, Paul Michael Romer received the 2018 Nobel Prize in Economics for his work modeling the innovation system. He demonstrated how to boost economic growth by investing in education, allocating subsidies to research and development, and increasing incentives for innovation. In other words, he used macroeconomic analysis tools to demonstrate the importance of a properly structured NIS [8].

Results and discussion

According to the Euro-Atlantic model, universities and research centers serve as the foundation for Western European countries' NIS. For example, in the United Kingdom, the "base" of the innovation system consists of

a small number of world-class universities (Oxford, University of London, and Cambridge). Innovation centers are currently emerging in two primary directions. The first focuses on developing and advancing proprietary technologies tailored to business demands. The second concentrates on specific markets or economic sectors, aiming to integrate related technologies and developments to achieve a synergistic outcome.

A model in which national innovation systems (NIS) are structured around leading universities is also applied in countries like Italy, France, and Germany. Overall, these nations implement a wide range of innovation-promoting mechanisms, including legislative frameworks, financial instruments, and tax incentives. Innovation infrastructure — such as technology parks and technopolises — is widely adopted and supported.

France serves as a notable example of applying diverse innovation-stimulating instruments:

1. Young Innovative Company (YIC) status – This designation is granted to small and medium-sized enterprises that allocate at least 15% of their total expenditures to research and have operated for fewer than eight years. Holding this status provides businesses with access to a variety of incentives aimed at facilitating R&D.
2. Creation of specialized innovation clusters and hubs.
3. Development of venture capital ecosystems.
4. Establishment of innovation-oriented mutual funds.
5. Research tax credit, which reduces a company's tax burden based on R&D spending.
6. Financial support for young researchers, encouraging their integration into tech-focused enterprises [9].

Similar tools are utilized in other nations that have modeled their innovation systems on the Euro-Atlantic framework.

In Nordic countries—such as Sweden, the Netherlands, Denmark, Switzerland, and Finland—governments predominantly finance fundamental scientific research carried out at universities. In these nations, national academies of sciences play a key role in shaping innovation policy (particularly in Sweden and the Netherlands). Meanwhile, large multinational corporations—including Shell, Phillips, Ericsson, and Volvo—primarily fund applied research initiatives through grants and project investments. Silicon Valley–inspired technology zones have also become integral to the regional innovation landscape. Notable examples include the “Energy Valley” in Groningen, Netherlands, which concentrates on energy-efficient technologies, and the “Computer Valley” in Sweden, dedicated to ICT development.

Thus, the NIS in these countries is typically characterized by a strong focus on fundamental academic research in a limited number of strategic areas, supported by government funding; applied research driven by market actors; and geographic clustering around science and technology priorities. Recently, however, smaller European nations have been moving toward the implementation of the “Triple Helix” model, which encourages closer collaboration among universities, industry, and government.

Importantly, each country’s NIS reflects its own national context and institutional structure. For instance, in Denmark, sector-specific research institutes are deeply integrated into the NIS, conducting targeted studies for the ministries that oversee them. Additionally, the country has a network of GTS (Godkendt Teknologisk Service) institutes—independent, non-profit entities that deliver applied research services to both public and private stakeholders [10].

Currently, Western European countries are making active efforts to integrate their national innovation frameworks into a unified digital innovation ecosystem. This process involves establishing technology platforms, launching collaborative programs, initiating joint technology projects, and advancing infrastructure through the ESFRI roadmap and similar strategic initiatives [11].

Japan is a classic example of the East Asian model, with its NIS focusing on cutting-edge technologies. Japan's NIS was established after the war. There are three stages to development:

First stage: mid-twentieth century. Emphasis on technology transfer (licensing agreements, opening joint ventures, participation in international research projects). In parallel, a large corporation-based research network was established.

Second stage: the end of the 20th century. Conducting own research and development. During this time, two programs were implemented such as the *Development Program for Core Technologies in Emerging Industries* and *Agile Research Frameworks for Advancing Science and Technology*, under which a system of "project leaders" (public venture entities) was formed to manage and guide innovation efforts.

The third phase of Japan's innovation policy, spanning from the early 2000s to the present, is characterized by a focus on strategic prioritization. Key development areas include biotechnology, environmental sustainability, ICT, nanotechnology, and new materials, along with targeted applied research in fields such as energy, industrial innovation, and social infrastructure.

This shift in approach has enabled Japan to evolve from a technology-importing nation to one capable of generating and advancing its own technological solutions. Presently, universities and state research institutions play a dominant role in conducting fundamental research, while applied R&D is largely driven by major corporate players.

A defining feature of Japan's national innovation system lies in its integration of all innovation cycle stages — from research and development to production, commercialization, and marketing. This is facilitated by a strong emphasis on the creation of organizational knowledge, which reflects the capacity of system participants to generate, share, and apply new ideas within the innovation ecosystem, ultimately translating them into tangible products and services. Japan is currently transitioning to a new model of innovation policy, with the goal of national companies commercializing scientific achievements and developments that competitors had not previously used. The current NIS differs from previous ones in that it incorporates the country's intellectual creation concept.

South Korea's innovation strategy has historically focused on acquiring foreign technologies through mechanisms such as turnkey projects, licensing agreements, and external consultancy. In parallel, the country worked on building internal capacity for knowledge generation by encouraging the creation of joint ventures. Despite achieving a strong global position in high technology, South Korea still faces challenges related to the limited development of its domestic technology reproduction systems, which leaves it reliant on foreign innovations. A notable characteristic of the country's innovation framework is the state's active support for large industrial conglomerates, known as chaebols.

The alternative approach to national innovation systems is notably present in countries like Thailand, Chile, and Turkey. In Thailand, the innovation infrastructure is centered around the National Innovation Agency and a network of science and technology parks that integrate local universities, government and private research organizations, and international experts. In the case of Chile, fundamental research is mainly concentrated within higher education institutions. The most prominent national universities, such as the University of Chile and the University of Santiago de Chile, receive substantial backing from the government in support of their research and innovation activities. The Science and Technology Council coordinates Turkey's NIS, as does the Technological Development Fund (TTGV), which funds private-sector research and development. TTGV was established by the Council. In addition, much emphasis is placed on innovation infrastructure. In recent years, 12 technology parks and technological development zones have been established, including universities and manufacturing enterprises. In addition, much emphasis is placed on innovation infrastructure. In recent years, 12 technology parks and technological development zones have been established, which include universities and manufacturing enterprises. Turkey's NIS stands out for its emphasis on educational development.

Thus, it is possible to conclude that the alternative NIS model is a priority for countries with limited financial resources and an underdeveloped organizational structure.

The triple helix model is based on the interactions of science, government, and business. In addition to educational activities and scientific research, universities are focusing on the development of new businesses in their incubators. Governments carry out legislative and regulatory functions. At the same time, the state acts as a venture investor, bringing business into these companies. Universities form the basis of this model. Currently, the NIS of the United States is based on approximately 150 universities. Silicon Valley, in the United States, is a striking example.

The revision of the Patent and Trademark Act in 1980 played a crucial role in shaping the United States' national innovation system. Under this legislation, universities and public research institutions gained the right to retain intellectual property derived from government-funded research. As a result, academic institutions have become key players in conducting both fundamental and a substantial share of applied research.

Another important element of the U.S. innovation system is the network of National Laboratories, which specialize in targeted areas of applied science. Additionally, the innovation landscape includes a wide array of private

R&D companies. Technology transfer in the United States typically follows the university–industry collaboration model, facilitated either through venture capital funding or by establishing corporate research centers. The federal government has been instrumental in shaping and supporting the development of this system [12].

Furthermore, the U.S. has implemented favorable policies that simplify the commercialization of research outcomes. These include startup support initiatives and a flexible regulatory environment that encourages the establishment of new enterprises. The evolution of the American innovation model has been driven by a combination of strategic actions: empowering small businesses, reforming intellectual property legislation, and creating mechanisms that foster cooperation between academia and industry. *The fourth helix model* combines all of the advantages of the preceding models. When civil society (social strata) is the fourth element, the fourth helix is clearly best suited to modern economic and social conditions.

Table 1 compares four NIS models analyzed in the article, focusing on their institutional foundations, stages of the innovation cycle, government involvement, R&D financing, and innovation support mechanisms.

Table 1 – Comparative Overview of National Innovation System (NIS) models

Criteria	Euro-Atlantic model	East Asian model	Alternative model	Triple Helix model
Institutional foundation	Based on universities and public research organizations	Rooted in corporate R&D laboratories	Formed through collaboration between universities and innovation parks	Built on the dynamic interaction among science, business, and the public sector
Innovation process coverage	Encompasses the entire innovation cycle	Lacks fundamental scientific research	Largely missing both basic and applied scientific activities	Covers the full cycle from research to market implementation
Government involvement	Supports commercialization, provides funding for innovation, and fosters partnerships	Focuses on acquiring technologies and promoting tech exports	Prioritizes technology adoption and human capital development	Encourages technological advancement and R&D commercialization
R&D funding structure	Relies on innovation-focused grants and public support	Predominantly financed by private sector	Mainly funded by the state for infrastructure and training	Combination of private, public, and venture capital investments
Innovation stimulation measures	Uses legal protections (e.g., IP laws), financial instruments, and tax incentives	Creates favorable conditions for innovation without extensive legal tools	Promotes innovation through policy environments and development support	Employs legislative, financial, and tax mechanisms to enhance innovation activity
Note – compiled by the authors based on the source [13]				

It is worth noting that four Asia-Pacific countries, China, Japan, the Republic of Korea, and Singapore, have well-balanced innovation systems, as evidenced by their rankings in the top 30 of the WIPO Global Innovation Index. Furthermore, these countries have the highest exports of high-tech goods. Table 2 presents data on the top 10 countries by high-tech goods exports, highlighting global leaders and illustrating significant disparities in export volumes across nations.

Table 2 – Export of high-tech goods - Top 10 countries

Country	Most recent year	Thousands dollars
China	2021	942 314 815,52
Hong Kong	2021	431 628 771,88
Germany	2021	209 744 317,15
USA	2021	169 217 253,98
South Korea	2020	163 987 147,75
Singapore	2020	159 927 958,42
Japan	2021	116 513 861,43
Malaysia	2021	108 683 179,74
Vietnam	2020	101 534 392,93
Netherlands	2021	101 168 437,61
Note – compiled by the authors based on the source [14]		

The level of economic development, education, and science systems clearly influence the choice of one NIS model over another. Each NIS model is developed over time, with business and government interacting to perform traditional functions and acquire new ones. Countries with a high scientific and human resource potential are successful [15].

It could be argued that countries that have achieved significant success in the field of innovation share a number of characteristics. Fundamental to this has been a sustained emphasis on innovation and innovation spending over time, with China in particular demonstrating the economic value of increased R&D and IP filings.

In Kazakhstan, various support instruments have been implemented, including grants for R&D, technology commercialization, and enterprise modernization; preferential lending and subsidized interest rates; government venture and project investments; tax breaks, among others. As a result, there are currently around 100 government support instruments. However, the overall level of technological development is still too low. Low-technology goods continue to dominate production and exports.

Kazakhstan is currently on the path to establishing NIS based on the triple helix model, which describes the relationship between science, the market, and government (Figure 1).

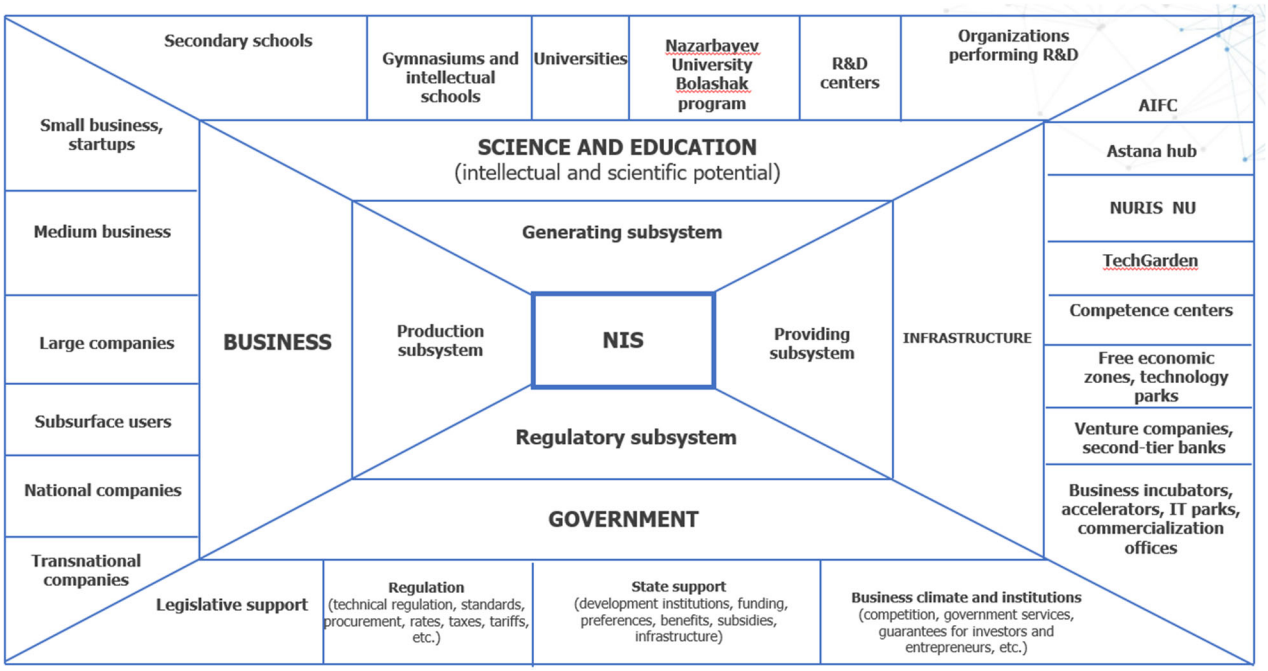

Figure 1 – The current model of Kazakhstan's NIS
Note – compiled by the authors

World Bank experts in the work "Innovation Paradox. Opportunities of Developing Countries and the Unrealized Promise of a Technological Breakthrough" emphasizes the importance of maintaining a consistent innovation policy, increasing government funding for innovation, financing related areas (e.g. equipment, training, management improvement), and developing fundamental management skills.

It is also noted that a high level of government competence is required in terms of human capital and political processes [16].

Thus, we believe that developing countries' innovation policy should begin by strengthening the managerial and organizational competencies of the subjects of the innovation system, rather than focusing solely on research and development.

CONCLUSION

Given the foregoing, it is possible to conclude that the most realistic course of action for Kazakhstan is to strengthen the government's role in the NIS. The government should become the core of the NIS until the revenue from innovation equals the costs..

As part of government regulation, it is prudent to prioritize tools that encourage private investment in innovation. For example, within the framework of technical regulation (standards policy), regulated markets (tariff in exchange for innovation and modernization), investment policy (investment preferences in exchange for modern production), procurement policy (use of various types of offset obligations), and financial and non-financial assistance measures.

At the same time, Kazakhstan's innovation policy, which is aimed at assisting the private sector, should not neglect to encourage innovation in the academic environment. However, education and science policy should not be based solely on the generation of scientific knowledge, but should also be focused on the reproduction of technological knowledge, such as patents, designs, and innovations in demand by the industry.

If successfully implemented, this strategy will logically lead Kazakhstan to the next stage of NIS development, with a strong role for science and civil society.

Proposals for structural reforms to create a fourth helix NIS:

1) Conduct an audit of all regulatory legal acts in order to significantly reduce irrelevant and unfounded regulatory requirements.

In accordance with international experience, it is now necessary to reduce licensed types of activities, accreditation requirements, and permits for personal entrepreneurship and micro-businesses. Furthermore, the legislation continues to impose many outdated technical means and methods of information transmission, such as the mandatory use of cash registers, paper copies, and so on. These requirements limit innovation, agility, and business activity.

2) Improving conditions for citizens to realize their potential in entrepreneurship, as well as equal dialogue between government and business.

One approach in this direction is to reduce the number of tax regimes for individual entrepreneurs, particularly those operating as personal businesses. Each region should have business incubators that provide qualified assistance to aspiring innovators, such as a co-working space, training and master classes, consultations on government and non-government support measures, venture investments, and so on. These measures will improve citizens' business competencies.

3) Developing technological strategies, identifying the global value chain in industries and regions.

It is necessary to create a system for identifying and integrating into global value chains (GVC). All projects funded by the government must aim to participate in the GVC. It is critical in Kazakhstan not only to establish new production facilities, but also to increase the technological complexity of production, thereby expanding existing value chains and joining new ones.

Furthermore, changes are required to the mechanisms and criteria for selecting and supporting investment projects in terms of the use of modern technologies when establishing new, expanding, and updating existing production facilities through government investment support programs.

Thus, to further improve Kazakhstan's NIS, it is recommended to continue and deepen the process of encouraging the private sector to introduce innovations. In this process, the government's proactive role is particularly important. Increasing the country's level of innovative development remains an important driver of economic growth.

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ҰЛТТЫҚ ИННОВАЦИЯЛЫҚ ЖҮЙЕЛЕРДІ ҚАЛЫПТАСТЫРУДЫҢ ХАЛЫҚАРАЛЫҚ ТӘЖІРИБЕСІ: ҚАЗАҚСТАН ҮШІН ТӘЖІРИБЕ

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АҢДАТПА

Бұл зерттеудің мақсаты – Батыс Еуропа елдері, Азия-Тынық мұхиты өңірі және АҚШ тәжірибесіне сүйене отырып, ұлттық инновациялық жүйелерді (ҰИЖ) қалыптастырудың халықаралық тәжірибесін талдау. Зерттеу нәтижелері Қазақстан үшін инновациялық саясатты жетілдіруге бейімделетін тиімді модельдерді анықтауға бағытталған.

Зерттеудің әдіснамасы салыстырмалы талдауға негізделген. Бұл түрлі елдердегі ҰИЖ модельдерінің құрылымы мен іске асырылу тетіктерін кешенді түрде зерттеуге мүмкіндік береді. Инновациялық дамудың негізгі факторлары ретінде мемлекеттік басқару, ғылыми-өндірістік инфрақұрылым және адами капиталдың рөліне ерекше назар аударылады.

Зерттеудің ғылыми жаңалығы (бірегейлігі / құндылығы) – халықаралық инновациялық саясат үлгілерін Қазақстан жағдайына бейімдеу мүмкіндіктерін жүйелі түрде бағалауында. Бұл жұмыс отандық саясаткерлер мен сарапшыларға арналған нақты ұсыныстар мен стратегиялық бағдарларды ұсына отырып, елдің инновациялық әлеуетін арттыруға үлес қосады.

Зерттеу нәтижелері табысты ҰИЖ модельдері мемлекет, бизнес, ғылым және азаматтық қоғам арасындағы тиімді ынтымақтастыққа негізделетінін көрсетті. Қазақстанда инновациялық белсенділіктің төмендігі мен халықаралық рейтингтердегі әлсіз позициялар қазіргі ҰИЖ-ды түбегейлі қайта қараудың өзектілігін айқындайды. Зерттеу нәтижесінде Қазақстан жағдайына сәйкес келетін, ұзақ мерзімді және теңгерімді экономикалық дамуды қамтамасыз етуге қабілетті стратегиялар ұсынылды.

Түйін сөздер: инновация, ұлттық инновациялық жүйе, инновациялық саясат, инновациялық әлеует, инновациялық даму.

МЕЖДУНАРОДНЫЙ ОПЫТ ФОРМИРОВАНИЯ НАЦИОНАЛЬНЫХ ИННОВАЦИОННЫХ СИСТЕМ: ОПЫТ ДЛЯ КАЗАХСТАНА

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АННОТАЦИЯ

Целью данной работы является изучение международного опыта формирования национальных инновационных систем (НИС) на примере стран Западной Европы, Азиатско-Тихоокеанского региона и США. Исследование направлено на выявление эффективных моделей, которые могут быть адаптированы для совершенствования инновационной политики Казахстана.

Методология исследования основана на сравнительном анализе, что позволяет детально рассмотреть различные модели НИС и условия их успешной реализации. Особое внимание уделяется институциональной роли государства, уровню развития научной и производственной инфраструктуры, а также человеческому капиталу как ключевым факторам инновационного роста.

Научная новизна (оригинальность / ценность) исследования заключается в комплексной оценке международных подходов к построению инновационной политики с акцентом на возможность их адаптации к казахстанским реалиям. Работа представляет практическую ценность для органов государственной власти, предлагая стратегические ориентиры по усилению инновационного потенциала страны.

Результаты исследования показали, что эффективные инновационные системы опираются на тесное взаимодействие между основными участниками – государством, бизнесом, научным сообществом и гражданским обществом. В условиях Казахстана, характеризующегося низким уровнем инновационной активности и слабыми позициями в международных рейтингах, актуальным становится внедрение адаптированных моделей, способствующих устойчивому и сбалансированному экономическому развитию.

Ключевые слова: инновация, национальная инновационная система, инновационная политика, инновационный потенциал, инновационное развитие.

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