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Article

Institutional Foundations of Innovative Economic Development in Uzbekistan

Fayzullayev Jonibek Negmatullayevich

1. Associate Professor, PhD, Department of Macroeconomics, National University of Uzbekistan (NUUz)

* Correspondence: ORCID 0000-0002-2870-307X

Abstract: The article provides a systematic analysis of the institutional foundations for the innovative development of Uzbekistan's economy. It highlights the subjects, objects, and mechanisms of the national innovation system, as well as the role of political, economic, social, and science–technology institutions in determining the effectiveness of their interaction. The stages of institutional reforms, their content, institutional gaps, and existing challenges are examined. Recommendations are given for improving the institutional foundations to accelerate innovative development.

Keywords: innovative development, institutional framework, national innovation system, political institutions, economic institutions, science and technology institutions, institutional reforms, venture financing, intellectual property, startups.

1. Introduction

In the innovative development of an economy, the formation and operational efficiency of economic relations among the subjects of the national innovation system—including the state, industrial enterprises, and households—fundamentally depend on the quality of the country's legal and institutional structures. Consequently, analyzing the legal-institutional frameworks linked to innovative economic development plays a critical role in defining the priorities of innovation reforms. In Uzbekistan, systematic reforms aimed at improving the legal and institutional foundations of economic innovation, science, technology, and overall innovative capacity are continuously being implemented. Nevertheless, enhancing the operational quality, efficiency, and transparency of these institutional foundations, as well as negative influencing factors, remains a core priority for future institutional reforms[1].

Literature Review

Although scientific research on the innovative development of national economies dates back to the mid-20th century, targeted studies on its institutional dimensions accelerated in the 1990s. In Douglas North's seminal work, Institutions, Institutional Change and Economic Performance, institutions are characterized as the primary mechanism shaping innovation[2]. Etzkowitz and Leydesdorff introduced the "Triple Helix" model, which outlines a harmonized relationship between universities, industry, and government as the bedrock of modern innovation ecosystems. This model established a new trajectory for studying the institutional mechanisms of innovative economic development. Carlota Perez analyzed how institutional frameworks adapt to the dynamics of technological change, emphasizing the pivotal role of state institutions in effectively deploying innovations into the economy[3]. Acemoglu, Johnson, and Robinson linked inclusive political and economic institutions to innovation and rapid economic growth, arguing that enforcing intellectual property rights and the rule of law are prerequisites for technological progress. Radosevic analyzed innovation institutions

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in transition economies, categorizing them into political institutions (ministries, innovation agencies), implementing institutions (science parks, incubators), and knowledge-production institutions (universities and research centers)[4].

Russian researchers V.V. Egozaryan and E.V. Maymina contrasted the approaches to state involvement in innovative economic development using the US and Japan as examples, justifying the state's leading role in advancing fundamental science. Adopting the interdisciplinary lens of Robert Shiller's narrative economics, Shiriaev, Kurysheva, and Volchik (2021) investigate how socially transmitted stories shape the institutional framework of national innovation systems. A.A.Nikonova emphasizes that a successful transition to an innovation-driven economy cannot be achieved through the fragmented replication of foreign institutional frameworks; rather, it demands a systemic and harmonious alignment of formal institutions with the country's unique socio-economic, cognitive, and cultural subsystems[5].

O Among Uzbek researchers, M.X. Kamilova identifies institutional gaps as primary barriers to innovation, emphasizing the need to reduce transaction costs, improve intellectual property protection, and forge linkages between science and industry, while shedding light on "institutional traps" and weak institutional trust. R.A. Alimov and D.M. Kurbanova note that while Uzbekistan possesses significant innovative potential, it lacks a complete institutional framework for commercialization and support; they advocate for strengthening the legal pillars of intellectual property and developing institutions like technoparks and venture financing. V. Kotov analyzed the institutional mechanisms for supporting regional innovation in Uzbekistan, underscoring the role of innovation development centers, special industrial zones, clusters, and technoparks while identifying the legal and administrative vulnerabilities slowing their growth. However, while the issues raised in previous studies were relevant to their specific periods, contemporary challenges – such as evaluating the efficiency of institutional systems at this new stage of innovative progress, the practical operational mechanisms of innovation institutions, and the dynamic interplay between the innovative process and the institutional environment- remain insufficiently analyzed [6], [7].

2. Materials and Method

To identify the complex relationship between the country's institutional environment and innovative progress, this study employs a systematic approach and comparative-institutional analysis. The methods of deduction and synthesis are applied to classify the structural and functional composition of the national innovation system's subjects and mechanisms. To evaluate the implementation status of Uzbekistan's innovative development trends and strategic targeted indicators, statistical grouping, trend analysis, and index benchmarking methods are utilized based on empirical data from the 2015–2024 "Global Innovation Index" reports published by the World Intellectual Property Organization (WIPO). Furthermore, historical and logical analysis methods are combined to assess the evolutionary stages of the regulatory and legal framework governing innovative activities in the country.

3. Result and Discussion

When evaluating the structural components of the institutional framework for innovative economic development, it is essential to clearly distinguish institutional subjects, institutional objects, and the levers of institutional mechanisms[8]. Institutional subjects comprise all entities that engage in, regulate, and advance the relationships within the production, exchange, and consumption of innovations, technological advancements, and high-tech goods, specifically through knowledge-driven development and commercialization. Institutional objects refer to the social, economic, and political norms regulating these subjects, as well as the innovative developments, technologies, and high-tech goods and services that form economic relations[9]. The institutional mechanism for innovative economic development consists of a complex of levers and instruments applied to regulate economic relations among various institutions that establish specific norms and guidelines (Figure 1).

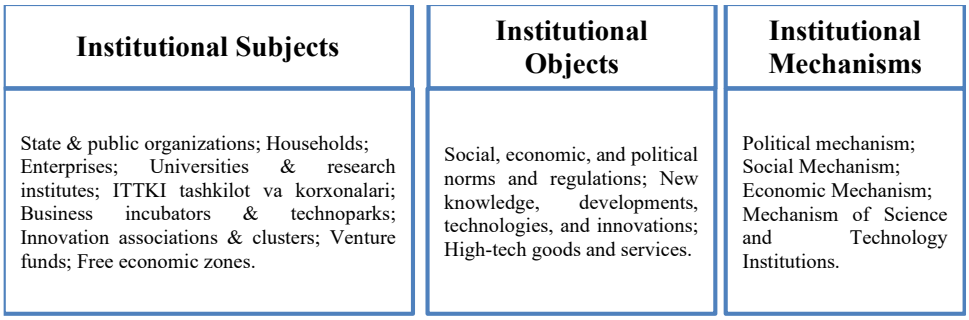

Figure 1. The Institutional Structure of Innovative Economic Development.

The political mechanism of innovative development encompasses a system of legal, administrative, and economic measures executed by state authorities and management bodies to steer the economy toward innovative growth. The political institutions comprise the network of state and societal structures responsible for formulating and executing innovation-driven policies[10]. Economic institutions for innovative development provide a set of institutional levers aimed at effectively allocating economic resources, offering financial backing, and regulating economic processes to design and implement innovations. These institutions ensure financial incentives for innovative activity, build the necessary infrastructure, mitigate risks, and optimize market mechanisms[11]. The subjects of science-technology institutions include the system of universities, research institutions, and technological organizations engaged in putting scientific achievements into practice, creating a supply of new developments through R&D and commercialization. Universities also fulfill the role of training qualified personnel and distributing them across economic sectors. Social institutions, meanwhile, consist of organizations and systems directed at cultivating a social environment conducive to an innovative economy, developing human resources, and fostering a positive public attitude toward innovation[12].

The collective levers and instruments utilized by the political institutions of innovative development can be defined as the state's innovative economic development policy (Table 1).

Table 1.
Levers and Instruments of the Political Mechanism for National Innovative Economic Development.

Levers	Primary Instruments	Supplementary Instruments
Laws & Regulations	Rule of law, equality before the law, and enforcement	State programs for specific sector development, incentive tax systems
State Policy	Ensuring political stability, regulatory quality, and governance efficiency	Public administration reform, prevention of lobbyism
Property	Inviolability and protection of intellectual property rights	Flexible and equitable property taxation
Competition	Ensuring healthy competition, anti-monopoly enforcement	Preferences for domestic producers and small businesses
Business Environment	Easing business setup and operational procedures	Facilitating company registration, utility grid connections, and simplifying tax audits
Financing	Direct state funding of R&D	Programmatic, targeted, and competitive funding for short-term goals

Human Capital	Advancing national education, science, and healthcare systems	Elevating professional skills through investments in human capital

From the early years of independence to the present day, Uzbekistan has paid particular attention to refining the scientific and technical spheres and developing the national economy on a high-tech foundation. Systematic legal-institutional reforms have been deployed to build and enhance political, economic, scientific-technical, and social institutions. These reforms can be categorized into the following historical phases:

1992–2001: Initial regulatory documents were adopted to ensure innovative economic development, strengthen scientific and technical capabilities, elevate the role of science in socio-economic progress, and provide state support for expanding research and innovation processes. The State Committee for Science and Technology, established in 1992, was tasked with implementing state scientific-technical policy and coordinating ministries, departments, enterprises, and scientific organizations to develop inventive activities, patent services, and scientific-technical information systems[13].

2002–2005: In 2002, the State Committee for Science and Technology was abolished. It was replaced by the "Council for Coordinating Scientific and Technical Progress" and the "Council for Expertise of Major Scientific and Investment Projects." The "Center for Science and Technologies" was also established under the Coordination Council. A mechanism was introduced to allocate budget funds to scientific institutions via grant contracts based on competitive tenders managed by the Center, which stimulated research activity. Although these institutional reforms enabled the integration of R&D into production, the development rate in science and technology lagged behind the rapid economic growth of the period[14]. The commercialization of research results remained unsatisfactory, ministries responsible for economic sectors were passive in developing state scientific-technical programs, and shallow peer-review processes among narrow circles of experts led to trivial research topics and inefficient use of allocated funds.

2006–2016: In 2006, the previous councils and center were dissolved to form the "Committee for Coordination of Science and Technologies Development." In 2008, a comprehensive package of measures was devised to develop medium-term innovative product manufacturing, stimulate demand for R&D, and build venture financing mechanisms for innovative activities[15]. Until January 1, 2013, educational and research institutions were exempted from taxes on contracts signed with commercial entities. Despite these reforms, structural bottlenecks hampering innovative economic growth persisted, particularly the failure to effectively leverage existing capacities for developing and deploying innovative technologies.

2017–2021: This period witnessed massive emphasis on scaling up state policy regarding the creation and market introduction of R&D outputs, expanding high-tech manufacturing, and improving legal-institutional frameworks. On November 29, 2017, the "Ministry of Innovation Development" was established as the sole state body executing policy in innovative and scientific-technical development, while the Science and Technology Agency was abolished, and the "Fund for Supporting Innovation Development and Innovative Ideas" was formed. Starting in 2018, venture funds, startup projects co-financed by venture funds, research institutes, and technology-transfer organizations were exempted from almost all types of taxes and mandatory payments (excluding the single social payment) until January 1, 2023. On September 21, 2018, the "Strategy for Innovative Development of the Republic of Uzbekistan for 2019–2021" was approved.

Crucially, the old, inefficient grant system based purely on scientist-initiated proposals (active since 2006) was replaced in 2018 by a competitive, market-driven state order mechanism for R&D aligned with industry needs. Tenders for scientific projects began to be held annually (previously occurring in cycles of 2 to 5 years depending on the project type). While funding volumes were previously declared by the scientists themselves, from 2018 onward, they became fixed based on precise state calculations. The average funding for a single project jumped from 150 million UZS to 850 million UZS.

In 2019, the "Republican Council on Science and Technologies" was formed to shape unified state policy, coordinate reforms in science and education, and design practical initiatives. To codify these changes, the Republic of Uzbekistan passed the laws "On Science and Scientific Activity" (LRU-576, October 29, 2019) and "On Innovation Activity" (LRU-630, July 24, 2020).

As a result of the 2017–2021 reforms, Uzbekistan's rank in the Global Innovation Index (GII) improved, state expenditures on R&D and innovation tripled, and the number of innovative and venture funds reached 28. However, commercialization rates and the level of science-industry collaboration remained low.

Table 2.
Institutional Indicators of Innovative Development in the Republic of Uzbekistan (Standardized Indices).

Indicator	2015	2021	2030 (target)	Annual Change (Points)		Target Achievement Rate (%)
				Target	Actual	
Political & Operational Stability	50,6	65,5	75,0	1,63	2,48	87,3
Government Effectiveness	16,1	38,8	70,0	3,59	3,78	55,4
Regulatory Quality	4,4	21,3	70,0	4,37	2,82	30,4
Rule of Law	15,6	18,5	65,0	3,29	0,48	28,5
Ease of Resolving Insolvency	46,5	43,5	70,0	1,57	-0,60	62,1

Several institutional targets outlined in the 2019–2021 Strategy were not achieved. As shown in Table 2, the Regulatory Quality index grew at a slower pace than the target annual change. Growth in the Rule of Law index occurred in minimal increments and remained very low. Furthermore, the score for Ease of Resolving Insolvency actually declined. These trends indicate that specific targeted reforms failed to yield the expected positive impacts.

2022–Present: As a new phase of innovation-driven restructuring, the "Strategy for Innovative Development of the Republic of Uzbekistan for 2022–2026" was approved on July 6, 2022, aiming to push Uzbekistan into the top 56 countries of the Global Innovation Index by 2026. To optimize state management efficiency, the Ministry of Innovative Development was restructured in early 2023 into the "Agency for Innovative Development" under the Ministry of Higher Education, Science, and Innovations of the Republic of Uzbekistan.

Alongside political entities, Uzbekistan has successfully formed institutional units supporting science, technology, and innovation infrastructure, providing intermediate technical services and brokerage (Table 3).

Table 3.
Structural Composition of Institutional Units for Innovative Economic Development in Uzbekistan.

Functions	Institutions
Formulating & Executing Innovation Policy	Republican Council on Science and Technologies; Ministry of Higher Education, Science, and Innovations; Ministry of Economy and Finance; Ministry of Digital Technologies; Agency for Innovative Development; Academy of Sciences of the Republic of Uzbekistan.
Financing Innovation Policy & Activities	Agency for Innovative Development; National Office for Innovation Introduction and Technology Transfer; Fund for Financing Science and Innovation Support; Extra-budgetary innovation development

	funds of state organizations; Venture funds and innovation investment companies.
Evaluating & Reporting Innovation Progress	Center for Scientific and Technical Information under the Agency for Innovative Development; Ministry of Economy and Finance; Statistics Agency.
Supporting Innovation Activities	National Office for Innovation Introduction and Technology Transfer; Scientific-Practical Center for the Implementation of Innovative Developments; National Agency for Perspective Projects; Centers for innovative developments and technologies.
Executing Innovation Activities	Research Institutes; Higher Education Institutions and their scientific centers; Center of Advanced Technologies; Centers for innovative ideas, developments, and technologies; Private sector R&D organizations and enterprises.
Providing Scientific, Technological & Brokerage Services	Centers for innovative ideas, developments, and technologies; Business incubators, accelerators, IT Parks, and technoparks; Free economic zones and industrial zones; Intellectual Property Department; Uzbek Agency for Technical Regulation; Chamber of Commerce and Industry.

While comprehensive institutional changes created frameworks with defined functions, ensuring their ongoing effectiveness remains a challenge. For instance, according to the Global Innovation Index 2024 report, although Uzbekistan ranks 62nd globally in the Institutions pillar, its sub-indices for Government Effectiveness, Rule of Law, and Regulatory Quality remain suppressed, sitting at 91st, 111th, and 102nd respectively.

The ongoing institutional bottlenecks and their direct negative impacts on innovation are summarized in Table 4.

Table 4. Key Institutional Barriers to Innovative Development in Uzbekistan.

Institutions	Primary Barriers	Impact on Innovation
Governance & Legal-Regulatory Base	High state dominance, unfair competition, weak rule of law, complex bureaucracy, and lack of transparency.	Dampens private investment in innovation and distorts market mechanisms for innovation.
Financial System & Capital Markets	Limited startup financing for small businesses, dominant state banking system, and underdeveloped capital markets.	Stifles the scaling of startups, misallocates capital, and minimizes early-stage investments.
Human Capital & R&D Ecosystem	Shortage of skilled professionals, quality gaps in higher education and R&D, academia-industry mismatch, and the digital divide.	Limits research scope, delays technology adoption, and shrinks the talent pool for innovative firms.
National Innovation System	Bottlenecks in commercializing research, and an evolutionary (slow)	Retards the conversion of designs into products, stunts startup growth, and

	stage of protecting intellectual property rights.	restricts monetization of creative assets.
Infrastructure & Environment	Water and energy scarcities, high transportation costs, pollution, and outdated infrastructure.	inflates operational costs, drives resource inefficiencies, dampens green investments, and harms long-term sustainability.

Institutional problems in the development of an innovative economy in Uzbekistan are complex in nature and cover several interrelated areas. Therefore, in the context of the rapid reforms being implemented in Uzbekistan to form an innovative economy, the presence of deep institutional gaps, structural barriers, and persistent problems limits opportunities in this area and leads to delays in achieving the strategic results expected in the near future.

4. Conclusion

Institutional challenges in Uzbekistan possess a systemic nature, bridging multiple interdependent fields. Deep institutional gaps, structural barriers, and persistent inefficiencies limit opportunities and delay strategic outcomes targeted for the near future.

To systematically resolve the current institutional issues and bridge the identified institutional gaps, it is crucial to implement the following concrete strategic measures:

1. Strengthening the Rule of Law and Intellectual Property Protection: To elevate the Government Effectiveness and Regulatory Quality indicators in the Global Innovation Index, the enforcement mechanisms of innovation laws must be reinforced through directly applicable sub-legislative acts. Introducing a specialized "Patent Arbitration" institute between the Intellectual Property Department and the judicial system to expedite innovative dispute resolutions is essential to boosting the legal confidence of private investors.
2. Diversifying Venture Financing and the Startup Ecosystem: To reduce sole reliance on state funds, a "Public-Private Venture Funds" model should be introduced. This entails establishing a risk-sharing mechanism where a specific portion (e.g., up to 30–40%) of investments injected into startups by the private sector is guaranteed by the Fund for Financing Science and Innovation Support. Additionally, a flexible "Innovation Board" (a dedicated stock market platform for startups) should be established within the capital market.
3. Implementing the "Triple Helix" Model in Practice: To narrow the gap between higher education, science, and industry, a mechanism must be legally mandated requiring large state-owned enterprises (e.g., in metallurgy, energy, and chemical industries) to establish sectoral scientific and technical centers. Their corporate budgets should be directly channeled into purchasing and commercializing R&D designs from specific higher education institutions.

By systematically tackling these interconnected institutional challenges, Uzbekistan can build a fertile environment for innovation, attract deeper investment flows, and build a highly dynamic, competitive, and sustainable economy.

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