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IMPROVING THE MECHANISMS FOR ENHANCING THE COMPETITIVENESS OF THE NATIONAL ECONOMY IN THE CONTEXT OF AN INNOVATION ECONOMY

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Abstract. The article examines mechanisms for enhancing the competitiveness of Uzbekistan's national economy in the context of an innovation economy, using data from the National Statistics Committee and WIPO's Global Innovation Index. It finds that R&D intensity fell from 0.119% to 0.091% of GDP in 2020–2025 and identifies an efficiency gap between innovation inputs (69th) and outputs (92nd). Evidence-based recommendations on financial, institutional and regional mechanisms are proposed.

Keywords: innovation economy, national competitiveness, R&D, Global Innovation Index, Uzbekistan.

INTRODUCTION

In today's global economy, national competitiveness is determined less by natural resources and cheap labour than by the capacity to commercialise knowledge, technologies and innovations. In 2025, Uzbekistan's economy grew by 7.7%, and its GDP exceeded USD 145 billion for the first time [12]. However, this growth has been driven mainly by construction, services and investment, while the contribution of science and innovation to economic growth remains limited. The "Uzbekistan – 2030" Strategy sets the goal of raising the country to higher positions in the Global Innovation Index [2; 3], which calls for a scientific substantiation of innovation-based mechanisms for enhancing competitiveness.

The aim of the study is to develop scientific recommendations for improving the mechanisms for enhancing the competitiveness of the national economy, based on a statistical analysis of innovation capacity indicators in Uzbekistan.

LITERATURE REVIEW

The decisive role of innovation in economic development was established by J. Schumpeter through the concept of "creative destruction" [11]. M. Porter explained national competitive advantage through the interaction of factor conditions, demand conditions, related and supporting industries, and firm strategy (the "diamond" model), and distinguished factor-driven, investment-driven and innovation-driven stages of development [10]. In his endogenous growth theory, P. Romer presented technological change as the outcome of purposeful R&D activity by economic agents [9]. C. Freeman, B.-Å. Lundvall and R. Nelson developed the concept of the national innovation system, emphasising the importance of institutional linkages between government, universities and business [5; 6; 8], while H. Etzkowitz and L. Leydesdorff systematised these linkages in the form of the "Triple Helix" model [4]. P. Aghion and P. Howitt empirically demonstrated an inverted-U relationship between competition and innovation [1].

Among studies on Uzbekistan, S. Siddikova and co-authors assessed the relationship between R&D expenditure and nominal GDP growth using data for 2010–2024 and noted that the country's R&D intensity is considerably below global benchmarks [13]. However, a comprehensive

assessment of the links between innovation expenditure, innovation outputs and regional disparities has not yet been sufficiently addressed.

METHODOLOGY

The study draws on data of the National Statistics Committee on science and innovation for 2020–2025 [7], official GDP data, and WIPO Global Innovation Index (GII) reports for 2020–2025 [14]. Dynamic, structural and comparative analysis, as well as correlation and elasticity methods, were applied. R&D intensity was calculated as the ratio of R&D expenditure to nominal GDP, and the elasticity of the volume of innovative products with respect to R&D expenditure was estimated using the equation $\ln(IM) = a + b \cdot \ln(RD)$. The innovation efficiency gap was measured as the difference between Uzbekistan's ranks in the GII input and output sub-indices.

ANALYSIS AND RESULTS

Table 1 presents the main indicators of Uzbekistan's innovation capacity.

Table 1

Main indicators of science and innovation activity in Uzbekistan

Indicator	2020	2021	2022	2023	2024	2025
R&D expenditure, UZS billion	838.6	971.8	1,423.3	1,389.2	1,574.1	1,680.6
R&D expenditure / GDP, %	0.119	0.113	0.137	0.110	0.103	0.091
R&D personnel, persons	30,275	34,614	36,742	36,904	37,164	…
Innovative products, UZS billion	31,142.8	27,378.6	40,451.6	55,746.5	63,604.4	…
Innovative products / GDP, %	4.42	3.18	3.88	4.42	4.14	…

Source: author's calculations based on data of the National Statistics Committee [7].

The table shows that in 2020–2025 R&D expenditure grew by an average of 14.9% per year in nominal terms, whereas nominal GDP grew by 21.3%. As a result, R&D intensity declined from 0.119% to 0.091%, which is several times lower than the world average (≈2%) and even below the level of lower-middle-income countries. The share of innovative products in GDP has stabilised at around 4%, meaning that innovation activity is lagging behind the pace of economic growth.

For 2020–2024, the correlation coefficient between R&D expenditure and the volume of innovative products was $r = 0.87$, and the elasticity coefficient was $b = 1.16$. This indicates that a 1% increase in R&D expenditure is associated with an average 1.16% increase in the volume of innovative products. Given the small number of observations ($n = 5$), this result should be interpreted as an exploratory estimate rather than a causal relationship; nevertheless, it suggests that increasing investment in R&D is economically justified.

Table 2

Uzbekistan's position in the Global Innovation Index

Indicator	2020	2021	2022	2023	2024	2025
Overall rank	93	86	82	82	83	79
Innovation inputs	81	75	68	72	71	69
Innovation outputs	118	100	91	88	91	92

Indicator	2020	2021	2022	2023	2024	2025
Efficiency gap (ranks)	37	25	23	16	20	23

Source: author's calculations based on WIPO GII 2025 data [14].

The data in Table 2 show that Uzbekistan's GII position improved by 14 places in 2020–2025; in 2025 the country ranked 79th among 139 economies and third in Central and Southern Asia [14]. At the same time, the gap between innovation inputs and outputs widened from 16 places in 2023 to 23 places in 2025. This means that the resources invested in institutions, human capital and infrastructure are not yet being sufficiently converted into commercialised knowledge and technology outputs.

The regional analysis reveals a high degree of concentration: in 2024, 68.4% of R&D expenditure was accounted for by Tashkent city [7]. Although Samarkand region ranks second in terms of R&D personnel (3,332 persons, 9.0%), its share of R&D expenditure was 1.7%, and its share of innovative products only 0.4%. This confirms that the mechanisms for transferring research capacity into production remain weak in the regions.

DISCUSSION

The findings reflect the challenge of transition from the "investment-driven" to the "innovation-driven" stage in Porter's model [10]. Although Uzbekistan's economy is growing rapidly, the R&D base underpinning this growth is shrinking. According to Aghion and Howitt [1], stronger market competition encourages firms to innovate; hence, WTO accession and market liberalisation may create additional incentives for innovation. However, such incentives will be effective only if the elements of the "Triple Helix" [4] – the linkages between universities, business and government – are strong. The widening gap between GII inputs and outputs is precisely an indication of the weakness of these linkages.

CONCLUSIONS AND RECOMMENDATIONS

The study leads to the following conclusions: R&D intensity has lagged behind economic growth and fallen to 0.091%; innovative products have stagnated at around 4% of GDP; the gap between innovation inputs and outputs amounts to 23 places; and research and innovation capacity is unevenly distributed across regions. On this basis, the following mechanisms for enhancing competitiveness are proposed (Table 3).

Table 3

Mechanisms for enhancing the competitiveness of the national economy

Mechanism	Statistical basis	Proposed measures
Financial mechanism	R&D/GDP – 0.091%; elasticity – 1.16	Set a target of gradually raising R&D intensity to 0.5% by 2030; introduce an enhanced tax deduction (super deduction) for corporate R&D expenditure; establish public–private co-financing schemes for venture funds.
Commercialisation mechanism	GII gap – 23 places; outputs – 92nd	Establish technology transfer offices at universities; vest intellectual property rights in the developing universities and researchers; evaluate grant effectiveness based on patent and implementation indicators.
Institutional mechanism	Low business participation in R&D	Create sectoral innovation consortia based on the Triple Helix model; introduce quotas for innovative products in public procurement;

Mechanism	Statistical basis	Proposed measures
		strengthen intellectual property protection in line with WTO requirements.
Regional mechanism	68.4% of R&D expenditure – Tashkent city; Samarkand: 9.0% of personnel, 0.4% of innovative products	Establish regional research and production clusters (university – industrial enterprise – technology park); form regional innovation funds; evaluate the performance of regional administrations (khokimiyats) through innovation KPIs.
Human capital mechanism	R&D personnel grew by 22.8% in 2020–2024	Design doctoral programmes based on industry demand; attract foreign researchers; expand upskilling systems for digital skills.

Source: developed by the author.

The comprehensive implementation of the proposed mechanisms will help improve the efficiency of converting innovation inputs into outputs, increase the share of innovative products, and ensure the national economy's transition to the innovation-driven stage of competitiveness.

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