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KAZAKHSTAN'S POSITION IN GLOBAL INNOVATION DEVELOPMENT AND ITS CURRENT INNOVATION POLICY

This study assesses Kazakhstan's position in global innovation development and evaluates key features of its innovation policy using international benchmark indicators and qualitative interpretation. The analysis draws on the World Bank's Doing Business project (until its discontinuation), WIPO/INSEAD/Cornell's Global Innovation Index (GII), and the World Economic Forum's competitiveness benchmarking to examine trends, identify strengths and weaknesses, and interpret policy implications. The results indicate that Kazakhstan performs relatively strongly in digital public services and selected infrastructure measures, while persistent weaknesses remain in R&D intensity, university–industry collaboration, cluster development, and venture financing, factors closely linked to commercialisation outcomes. The paper argues that regulatory improvements and state-led digitalisation are necessary but insufficient for sustained innovation upgrading unless accompanied by stronger innovation

linkages, scale-up finance, and capability-building mechanisms. Policy recommendations emphasise institutional quality, targeted support for R&D collaboration and technology transfer, and measures that expand the financing and scaling capacity of innovative firms.

Keywords: innovation policy, national innovation system, Kazakhstan, Global Innovation Index, business environment, digitalization, competitiveness.

Introduction

Kazakhstan, endowed with a rich cultural heritage and abundant natural resources, is seeking to shift from a resource-based growth model towards one driven by innovation and digitalisation. As global competitiveness increasingly hinges on technological capability and knowledge-based productivity, understanding Kazakhstan's position in the global innovation landscape is essential for policymakers, researchers, and investors [1, p.37]. International benchmarks, such as the World Bank's Doing Business indicators, INSEAD's Global Innovation Index, and the World Economic Forum's Global Competitiveness Index, offer comparative insights into the country's business environment, innovation capacity, and broader competitiveness [2, p.48].

Innovation policies play a central role in shaping national development trajectories, particularly in developing and emerging economies where structural transformation remains an ongoing challenge [3, p.75]. These policies are typically embedded in long-term innovation strategies that set priorities and targets for modernisation and technological upgrading. When implemented effectively, especially in domains such as education, research, and entrepreneurship, innovation policy can catalyse systemic development and strengthen national competitiveness. Fagerberg (2018) emphasises the importance of a systemic understanding of innovation policy, highlighting interactions among multiple actors, institutions, and instruments, as well as recurrent challenges in national innovation systems [4, p.1570]. Consistent with this perspective, the literature underscores the role of universities as critical innovation actors through their contributions to knowledge creation, human capital formation, and collaborative innovation management.

Recent research further reinforces the view that innovation policy effectiveness depends on national context and institutional capacity. Pidorycheva argues for policy approaches tailored to country-specific socio-economic and cultural conditions. Liu, drawing on evidence from China, shows that targeted policy experimentation can yield measurable benefits, such as improvements in carbon-emission efficiency, illustrating the potential of well-designed innovation interventions. Similarly, Svitlychnyy and Bradley highlight that innovative

entrepreneurship depends heavily on supportive institutions, including credible legal frameworks and accessible financial mechanisms that reduce risk and enable firm experimentation and growth [5, p.62].

Taken together, these contributions suggest that innovation policy can significantly influence competitiveness, diversification, and long-term development outcomes, but that its impact is strongest when aligned with national goals, adapted to local conditions, and supported by capable institutions [6, p.183]. Building on this literature, the present study contributes by triangulating multiple international benchmarks and using indicator-level evidence to identify where Kazakhstan's innovation system is comparatively strong and where it remains constrained [7, p.215]. The analysis is guided by three questions [8, p.335]: (1) How has Kazakhstan's relative position evolved across major international indices of business environment, innovation performance, and competitiveness? (2) Which innovation pillars and indicators constitute Kazakhstan's key strengths and weaknesses? (3) What policy mix aligns most directly with the diagnosed constraints, particularly in R&D collaboration, financing, and commercialisation? The remainder of the paper reviews the relevant literature, outlines the data and methods, presents benchmark-based results and discussion, and concludes with targeted policy recommendations.

Materials and methods

This study adopts a mixed-methods design that combines quantitative benchmarking with qualitative interpretation to assess Kazakhstan's innovation-related performance and the policy dynamics shaping it. Quantitatively, the analysis draws on international benchmark indicators from the World Bank's Doing Business project (for the period covered by the dataset), the INSEAD/Cornell/WIPO Global Innovation Index (GII), and the World Economic Forum's competitiveness benchmarking (GCI) to trace Kazakhstan's relative position over time and identify turning points, strengths, and persistent bottlenecks [9, p.27]. The quantitative component applies descriptive trend analysis, examining both overall ranks and selected pillar- or indicator-level measures where available to avoid over-reliance on single headline rankings. Because global indices differ in methodology, coverage, and periodicity, and some series have been discontinued or revised, the study treats ranks as relative signals rather than direct measures of policy effectiveness and explicitly notes missing or non-comparable years when interpreting changes.

Qualitatively, findings are triangulated through a structured review of peer-reviewed and policy-oriented literature, and, where applicable, semi-structured expert interviews that provide context for interpreting index movements and diagnosing underlying mechanisms. Interview evidence clarifies drivers of

observed trends, validates or challenges index-based interpretations, and identifies context-specific constraints, such as governance quality, innovation finance, and university–industry linkages, that are not fully captured by index aggregates [10, p.148]. To ensure methodological transparency, the final manuscript should specify (if interviews are included) the number of interviews, stakeholder categories, selection criteria, timing, interview mode, and the analytical approach (e.g., thematic coding), along with ethics and consent procedures. Finally, a comparative benchmarking component situates Kazakhstan against selected peer economies (e.g., upper-middle-income, regional, and resource-dependent comparators), with peer selection criteria stated explicitly, to contextualise performance gaps and derive policy-relevant lessons. Integrating index-based diagnostics with qualitative triangulation supports the development of recommendations that are both internationally comparable and grounded in Kazakhstan’s institutional realities.

Results and discussion

Prior research on Kazakhstan consistently frames innovation-led development as a strategic national priority and emphasises the shared role of the state and business in financing research, supporting technology diffusion, and creating incentives for firms to innovate. From a policy-design perspective, innovation performance typically depends not on a single instrument but on the policy mix, the combined effect of regulations, incentives, institutions, and coordination mechanisms that shape innovation across sectors and over time [11, p.19]. In Kazakhstan, this policy-mix challenge is reflected in the gap between ambitious strategic objectives and uneven firm-level capacity to undertake, absorb, and commercialise innovation.

Kazakhstan-focused studies also identify enterprise competitiveness and economic modernisation as the primary drivers of strengthening innovation policy. Temirgaliyeva (2018) links innovation activity to firm competitiveness, implying that policy should not only expand R&D inputs but also strengthen managerial and technological capabilities that translate knowledge into productivity gains [12, p. 337]. Similarly, Kurmanov et al. emphasise the need for effective innovation management within enterprises and supportive state instruments that stimulate innovative activity, particularly among SMEs, through better coordination, incentives, and enabling conditions for technology adoption and commercialisation [19, p. 58]. Taken together, this literature suggests that Kazakhstan’s innovation constraints extend beyond funding levels to include weak innovation linkages (notably between firms and universities), limited commercialisation capacity, and an insufficiently innovation-oriented competitive environment.

Benchmarking Kazakhstan through international indicators. To connect these qualitative insights with measurable outcomes, the study benchmarks Kazakhstan

using international indices that capture different layers of the innovation ecosystem. The historical patterns summarised in Table 1 demonstrate Kazakhstan's trajectories across: (i) the innovation system (Global Innovation Index), (ii) business-regulatory conditions (Doing Business), and (iii) broader competitiveness fundamentals (Global Competitiveness Index). This triangulation is analytically useful because improvements in one domain, such as administrative efficiency and business regulation, do not necessarily translate into stronger innovation outputs. Divergences across indices can therefore help identify where the innovation process is constrained, whether at the level of inputs (resources and capabilities), linkages (collaboration and diffusion), financing (risk and scale-up capital), or commercialisation outcomes.

Within this framework, the World Bank's Doing Business indicators are treated as a proxy for the enabling regulatory environment for private-sector activity. They measure conditions that affect firm entry, operating costs, and investment incentives across core business functions, including starting a business, obtaining permits and utilities, registering property, accessing credit, protecting investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency. These regulatory dimensions matter for innovation because they shape competitive pressure, market entry, and the transaction costs of scaling new products and technologies. However, regulatory quality alone does not explain innovation performance; accordingly, Doing Business indicators are interpreted alongside innovation-capability evidence from the GII and competitiveness fundamentals captured by the GCI to develop a more complete diagnosis of Kazakhstan's innovation system .

Table 1 – Historical ranking of Kazakhstan in different indicators

Year	Rank		
	The Global Innovation Index (GII)	Ease of Doing Business Ranking (DB)	Global Competitiveness Index (GCI)
2011	92	67	73
2012	85	47	70
2013	83	49	72
2014	77	50	50
2015	75	41	51
2016	64	41	52
2017	59	35	57

2018	56	36	59
2019	53	28	55
2020	81	25	56
2021	77	data not available	59
2022	87	data not available	54
2023	89	data not available	65

Table 1 provides a concise overview of Kazakhstan's relative performance across three benchmark frameworks: the Global Innovation Index (GII), the World Bank's Doing Business (DB) ranking, and the World Economic Forum's Global Competitiveness Index (GCI). Taken together, these series allow a layered interpretation of Kazakhstan's innovation trajectory: DB primarily reflects the regulatory and administrative environment for private-sector activity, GCI reflects broader productivity fundamentals and institutional conditions, and GII reflects the innovation system through inputs and outputs. The table therefore supports an «innovation chain» reading, in which improvements in framework conditions (regulation and competitiveness) may enable innovation but do not guarantee stronger innovation outcomes unless complementary capabilities, R&D depth, finance, and linkages, also strengthen.

The first pattern in Table 1 is a broad improvement from 2011 to 2016, during which Kazakhstan's GII rank improves from 92 to 64, DB from 67 to 41, and GCI from 73 to 52. This period is consistent with a «catch-up» trajectory, in which reforms that reduce transaction costs and increase administrative efficiency are reflected in better business-environment standings, alongside gradual improvement in innovation-related benchmarking. Analytically, the concurrent movement across the three indices suggests that early gains were driven largely by system-wide modernisation efforts rather than by narrow innovation outputs alone.

A second pattern is a peak performance period from 2017 to 2019, during which both GII and DB continue to improve (GII: 59 → 53; DB: 35 → 28), while GCI remains broadly stable in the mid-50s (57 → 55). This suggests that Kazakhstan achieved its strongest combined standing when regulatory improvements were sustained and innovation-system rankings continued to rise. However, the relative stability of GCI during this phase also indicates that deeper competitiveness fundamentals, particularly the institutional quality and innovation capability pillars, may not have improved at the same pace as administrative reforms. This helps explain the later divergence observed after 2019.

The most analytically important pattern is the post-2019 divergence. In 2020, Kazakhstan attained its best DB position in the series (25th), but the GII ranking

worsened sharply (from 53 in 2019 to 81 in 2020) and remained volatile through 2023 (77 in 2021; 87 in 2022; 89 in 2023). At the same time, the GCI rank fluctuates (56 in 2020; 59 in 2021; 54 in 2022; 65 in 2023). This pattern suggests that improvements in business regulation, while important, were insufficient to protect innovation performance during a period when the innovation system likely faced tighter constraints on R&D depth, innovation finance, and commercialisation capacity. In other words, Table 1 is consistent with an interpretation in which Kazakhstan advanced the «enabling environment» faster than it strengthened the mechanisms that convert capabilities into innovation outputs, especially in the private sector.

Table 1 also highlights a measurement and comparability constraint that should be stated explicitly in the discussion. The DB series shows «data not available» after 2020, indicating that this benchmark does not provide a continuous basis for evaluating more recent years. Likewise, the meaning of year-to-year movements in rankings can vary because methodology, coverage, and comparator performance may change. Therefore, short-run fluctuations, especially in the post-2019 period, should be interpreted as signals of relative position rather than as direct measures of policy impact. A stronger empirical strategy is therefore to use Table 1 to identify turning points and divergence and then interpret the underlying constraints using indicator-level diagnostics (Table 2) and qualitative evidence.

Overall, Table 1 supports the paper's central argument: Kazakhstan made substantial progress in regulatory and administrative modernisation and achieved meaningful gains in innovation-system benchmarking up to 2019, but subsequent innovation performance became more fragile and volatile. The key analytical implication is that the next stage of innovation policy must prioritise the «missing middle» of the innovation chain by strengthening R&D intensity and effectiveness, building university–industry collaboration, expanding venture and growth financing, and improving commercialisation and scaling pathways, so that improvements in framework conditions translate into durable innovation outcomes.

Table 2 – Kazakhstan's Strengths and Weaknesses in GII Ranking

Strengths			Weaknesses		
Indicator Name	Rank	Code	Indicator Name	Rank	Code
Government's online service	8	3.1.3	Software spending, % GDP	124	6.2.3
Utility models by origin/bn PPP\$ GDP	10	6.1.3	State of cluster development	118	5.2.2
Pupil-teacher ratio, secondary	12	2.1.5	University-industry R&D collaboration	117	5.2.1

E-participation	15	3.1.4	Gross expenditure on R&D, % GDP	100	2.3.2
Cost of redundancy dismissal	18	1.2.3	VC received, value, % GDP	99	4.2.4
Females employed w/ advanced degrees, %	32	5.1.5	VC recipients, deals/bn PPP\$ GDP	98	4.2.3
Electricity output, GW h/mn pop.	33	3.2.1	Venture Capital (VC) investors, deals/bn PPP\$ GDP	95	4.2.2
QS university ranking, top 3	33	2.3.4	GERD financed by abroad, % GDP	88	5.2.3
Tertiary enrollment, % gross	35	2.2.1	Unicorn valuation, % GDP	48	6.2.2
High-tech exports, % total trade	36	6.3.3	Global corporate R&D investors, top 3, mn US\$	40	2.3.3

Table 2 shows Kazakhstan's overall GII position in its strongest and weakest component indicators, enabling a more precise diagnosis than headline ranks alone. The profile suggests a «two-speed» innovation system. On the strength side, Kazakhstan performs well in digital governance and public-sector digital delivery, reflected in high rankings for the government's online service (8th) and e-participation (15th). It also performs relatively well in selected education and infrastructure-related indicators, such as the pupil–teacher ratio (secondary) (12th) and tertiary enrolment (35th), indicating the presence of basic enabling conditions for skills development and digital transformation. By contrast, the weakest indicators cluster around the mechanisms that typically convert capabilities into market-facing innovation: low software spending (% GDP) (124th), weak state of cluster development (118th), limited university–industry R&D collaboration (117th), and comparatively low gross expenditure on R&D (% GDP) (100th). Financing constraints are also evident in multiple venture-capital indicators (e.g., VC received, VC deal activity, and VC investors), which appear among the weaker ranks [14, p.430].

Interpretation: a strong state-led digital pillar but weak commercialisation and scaling capacity. Analytically, this configuration indicates that Kazakhstan's innovation strengths are concentrated in state-led digitisation and selected framework capabilities, while its constraints lie in private-sector innovation intensity and commercialisation capacity. In practical terms, the country appears relatively effective at building platforms and services – especially in the public sector – but less effective at developing the dense networks and incentives required

for sustained private innovation: clusters, firm–university linkages, R&D depth, and risk/scale-up capital. This helps explain why improvements in business framework conditions do not automatically translate into stronger innovation outcomes: without stronger innovation finance and collaboration ecosystems, the innovation pipeline remains thin at the stages where ideas must be transformed into competitive products, firms, and exportable technologies [15, p.604].

Implications from Table 2 for targeted policy priorities. The indicator-level breakdown points to several priorities that are more actionable than general «increase innovation» recommendations. First, Kazakhstan should strengthen the R&D–commercialisation interface by expanding incentives for joint research, shared laboratories, and industry-defined applied projects that directly address weak university–industry collaboration. Second, policy should build scale-up financing capacity, not only early-stage support: weak VC indicators and low software spending imply constraints on developing digital products and financing growth, limiting the ability of promising firms to scale. Third, cluster policy should shift from an emphasis on infrastructure and programmes to one on networks and coordination, focusing on cluster governance, anchor firms, supplier development, and export orientation, because weak cluster development often reflects fragmentation of innovation linkages rather than a lack of facilities.

Competitiveness conditions: what GCI adds to the innovation diagnosis. While GII focuses on innovation inputs and outputs, the Global Competitiveness Index (GCI) adds a broader productivity lens, highlighting how institutional and market fundamentals shape incentives and returns to innovation [16, p.28]. Kazakhstan’s competitiveness profile is commonly described as having strengths in macroeconomic stability and market size, alongside persistent weaknesses in institutional quality, transparency, and innovation capacity (including research outputs and the growth of innovative firms). Interpreted together with the GII profile, this reinforces an important point: Kazakhstan’s constraints are not only technical (R&D intensity, patents, publications) but also institutional, because predictable rules, trust, and fair competition influence investment horizons, willingness to take risk, and the effectiveness of innovation policy instruments [17, p.173].

Digitalisation and «Smart Country»: progress with an innovation-economy caveat. Kazakhstan’s digitalisation narrative is most convincing when supported by the same indicators: strong performance in e-government and e-participation aligns with visible advances in digital public services and infrastructure. However, Table 2 also suggests an important caveat for the «Smart Country» agenda: strong digital government does not automatically imply a strong innovation economy. To translate digitalisation into productivity growth, policy emphasis should shift from «digitising services» to «digitising and upgrading firms,» particularly SMEs

and high-impact sectors where Kazakhstan has scale (industry, mining services, energy, logistics). As adoption accelerates, cybersecurity becomes a binding enabler of trust and resilience in digital transformation; improving cyber readiness and organisational practices should therefore be treated as part of innovation capability rather than a separate technical issue [18, p.67].

Priority growth domains and implementation focus. Priority domains such as MedTech, AgriTech, GreenTech, AI, Industry 4.0, and GovTech are strategically aligned with the GII diagnosis, as they can leverage strengths in digital governance while building commercialisation capacity. To strengthen the analytical link, each domain should be explicitly tied to one diagnosed constraint [19, p.1]. For example, GovTech builds on strong e-government capability; Industry 4.0 and AI can directly address low software spending by stimulating firm demand for digital solutions; and GreenTech and health innovation can expand applied research partnerships and strengthen industry–university collaboration. Implementing these priorities at scale also requires workforce upskilling and institutionalised collaboration models (internships, applied projects, and joint curriculum design) to ensure that human capital development aligns with market needs and accelerates diffusion and adoption [20, p.10].

Conclusions

This study examined Kazakhstan's position in global innovation development by combining international benchmarking indices with the innovation-policy literature. Overall, the evidence indicates that Kazakhstan has made tangible progress in improving the framework conditions for economic activity and has developed notable strengths in digital governance and selected infrastructure-related areas. However, these gains have not consistently translated into stronger innovation capacity or commercialisation outcomes. The persistence of weaknesses in R&D intensity, university–industry linkages, cluster development, and scale-up finance suggests that the central policy challenge is no longer only improving administrative conditions but also strengthening the mechanisms that convert innovation inputs into marketable outputs and productivity growth.

Firstly, strengthening institutional quality remains a foundational priority. Improvements in governance, transparency, and anti-corruption enforcement reduce uncertainty and transaction costs, and reinforce fair competition, conditions that support long-term private investment in innovation. Further simplification of regulatory frameworks and regular updates to them, together with greater judicial independence and efficiency, would protect property rights, improve contract enforcement, and increase confidence in the predictability of the innovation environment.

Secondly, Kazakhstan should focus on improving the effectiveness of R&D investment by strengthening the research–industry interface. Beyond increasing

funding, policy should prioritise applied collaborative research, shared laboratories, competitive grants tied to measurable outputs, and credible technology-transfer mechanisms. In particular, incentives that deepen university–industry collaboration are essential for converting scientific and technological capabilities into commercially viable products and services and for narrowing the observed gap between innovation inputs and outputs.

Thirdly, human capital development should be better aligned with the skills required by innovation-driven sectors. This includes strengthening STEM education, expanding vocational and lifelong learning pathways, and institutionalising industry–academia collaboration through internships, applied projects, and joint curriculum design. These measures can improve firms’ absorptive capacity, accelerate technology diffusion, and support sustained digital and innovation upgrading.

Fourthly, improving innovation finance is critical for enabling firms to scale. The results imply that access to risk capital and growth-stage financing remains a constraint; therefore, policy should strengthen credit access for innovative SMEs through tailored financial products and guarantee mechanisms and create a more supportive environment for venture capital and angel investment through clear rules, incentives, and co-investment instruments. Complementary actions, including improved financial literacy and stronger investor protections, can further enhance the functioning of innovation finance markets.

Finally, Kazakhstan should deepen the shift from public-sector digitalisation towards economy-wide productivity gains by accelerating firm-level digital transformation, particularly in traditional and high-impact sectors. As digital adoption expands, cybersecurity and digital trust become binding enablers of sustainable digital growth; accordingly, cyber resilience measures, standards, and skills should be integrated into innovation and digital transformation strategies rather than treated as a separate technical agenda.

In sum, Kazakhstan’s innovation system is evolving, with clear achievements in digital governance and enabling infrastructure, alongside persistent weaknesses in commercialisation capacity, innovation finance, and collaborative innovation networks. Addressing these constraints through a coherent policy mix, linking institutional reform, R&D effectiveness, human capital development, and scale-up mechanisms, would strengthen Kazakhstan’s ability to convert existing strengths into sustained innovation-led growth and enhanced global competitiveness.

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ҚАЗАҚСТАННЫҢ ЖАҒАНДЫҚ ИННОВАЦИЯЛЫҚ ДАМУДАҒЫ ҰСТАНЫМЫ ЖӘНЕ ОНЫҢ ЗАМАНАУИ ИННОВАЦИЯЛЫҚ САЯСАТЫ

Бұл зерттеу Қазақстанның жаһандық инновациялық дамудағы ұстанымын зерделеуге және көп қырлы талдау арқылы оның ағымдағы инновациялық саясатының тиімділігін талдауға бағытталған. Дүниежүзілік банктің «Бизнесті жүргізу», INSEAD-тің «Жаһандық инновациялық индексі» және Давос экономикалық форумының «Жаһандық бәсекеге қабілеттілік индексі» рейтингтерінің деректерін пайдалана отырып, зерттеу осы статистиканың сенімділігі мен маңыздылығын бағалайды. Онда Қазақстанның цифрлық дамудың жаһандық ландшафтында орналасқан цифрлық әлемдегі «ақылды ел» ретіндегі мәртебесі ашылады. Қазақстанның инновациялық көрсеткіштеріндегі басым теріс үрдістерге қарамастан, зерттеуде технологияларды енгізуді жақсарту, инфрақұрылымды жақсарту және зерттеулер мен әзірлемелерге инвестицияларды ұлғайту сияқты индикаторлардағы оң үрдістерді көрсететін бірнеше көрсеткіштер анықталды. Инновациялық жүйенің даму динамикасын кешенді талдаудың арқасында Қазақстанның инновациялық экожүйесіндегі проблемалар да, жетістіктер де анықталды. Соңында, зерттеуде саясатты реформалау, халықаралық ынтымақтастықты кеңейту және жаһандық бәсекеге қабілеттілікті арттыру үшін орнықты эко-инновациялық тәжірибелерге назар аудару қажеттігін баса көрсететін Қазақстанның болашақ инновациялық дамуы үшін стратегиялық ұсынымдар ұсынылады. Зерттеудің мақсаты Қазақстанның инновациялық траекториясын егжей-тегжейлі түсінуді қамтамасыз ету және болашаққа бағдарланған тұрақты инновациялық ортаны құру бойынша практикалық идеяларды ұсыну болып табылады.

Кілтті сөздер: инновациялық саясат, ұлттық инновациялық жүйе, Қазақстан, Жаһандық инновациялық индекс, бизнес-орта, цифрландыру, бәсекеге қабілеттілік.

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ПОЗИЦИЯ КАЗАХСТАНА В ГЛОБАЛЬНОМ ИННОВАЦИОННОМ РАЗВИТИИ И ЕГО СОВРЕМЕННАЯ ИННОВАЦИОННАЯ ПОЛИТИКА

Данное исследование направлено на изучение позиции Казахстана в глобальном инновационном развитии и анализ эффективности его текущей инновационной политики посредством многогранного анализа. Используя данные рейтингов «Ведение бизнеса» Всемирный банк, «Глобального инновационного индекса» INSEAD и «Глобального индекса конкурентоспособности» Всемирный экономический форум, исследование оценивает надежность и значимость этой статистики. В нем раскрывается статус Казахстана как «умной страны» в цифровом мире, позиционирующий его в глобальном ландшафте цифрового развития. Несмотря на преимущественно негативные тенденции в инновационных показателях Казахстана, в исследовании выявлено несколько показателей, демонстрирующих положительные тенденции в таких индикаторах как улучшение внедрения технологий, улучшение инфраструктуры и увеличение инвестиций в исследования и разработки. Благодаря комплексному анализу динамики развития инновационной системы выявлены как проблемы, так и достижения в инновационной экосистеме Казахстана. Наконец, в исследовании предлагаются стратегические рекомендации для будущего инновационного развития Казахстана, подчеркивающие необходимость реформы политики, расширения международного сотрудничества и сосредоточения внимания на устойчивых эко-инновационных практиках для повышения

глобальной конкурентоспособности. Целью исследования является предоставление детального понимания инновационной траектории Казахстана и предложение практических идей по созданию устойчивой, ориентированной на будущее инновационной среды.

Ключевые слова: инновационная политика, национальная инновационная система, Казахстан, Глобальный инновационный индекс, бизнес-среда, цифровизация, конкурентоспособность.

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