Global Innovation Index as an Evidence-based Tool for Policy-Makers

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ABSTRACT *The World Intellectual Property Organization develops the Global Innovation Index (GII). In this paper, we studied the GII of some selected countries with a number of policies under some main themes. The GII model is studied in this paper with the publication output and its correlated indicators data.*

Keywords: Global Innovation Index, GII, STIP Compass, Science, Technology And Innovation (STI) Policy, Evidence-based Tool, Prediction Model

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1. Introduction

Rapidly developing nations are increasingly implementing policies tailored to stimulate innovation. One of the foremost instruments to assess innovation progress is the Global Innovation Index (GII) [1] devised by the World Intellectual Property Organization. Grounded in the Frascati manuals, the GII quantifies national development input and output drawing from over 70+ distinct indicators. Embracing this metric, the Republic of Uzbekistan has positioned the GII as a cornerstone of its developmental agenda, aiming to secure a position within the top 50 by 2030 [2]. This study endeavors to offer a framework for countries aspiring to develop evidence-driven policies and derive insights from open data sources.

Within the parameters of the GII, the publication indicator emerges as critical, given its substantive weight and its profound implications for innovation yield. Based on the data provided, Uzbekistan was selected as the focus of our empirical analysis. Subsequently, a GII model was crafted, predominantly centered on publication output and its correlated indicators. Our projections delineate two scenarios: the first, basic scenario maintains Uzbekistan's extant GDP allocation to R&D, and the second, successful scenario considers the augmentation in R&D funding that would be required to attain the designated GII rank.

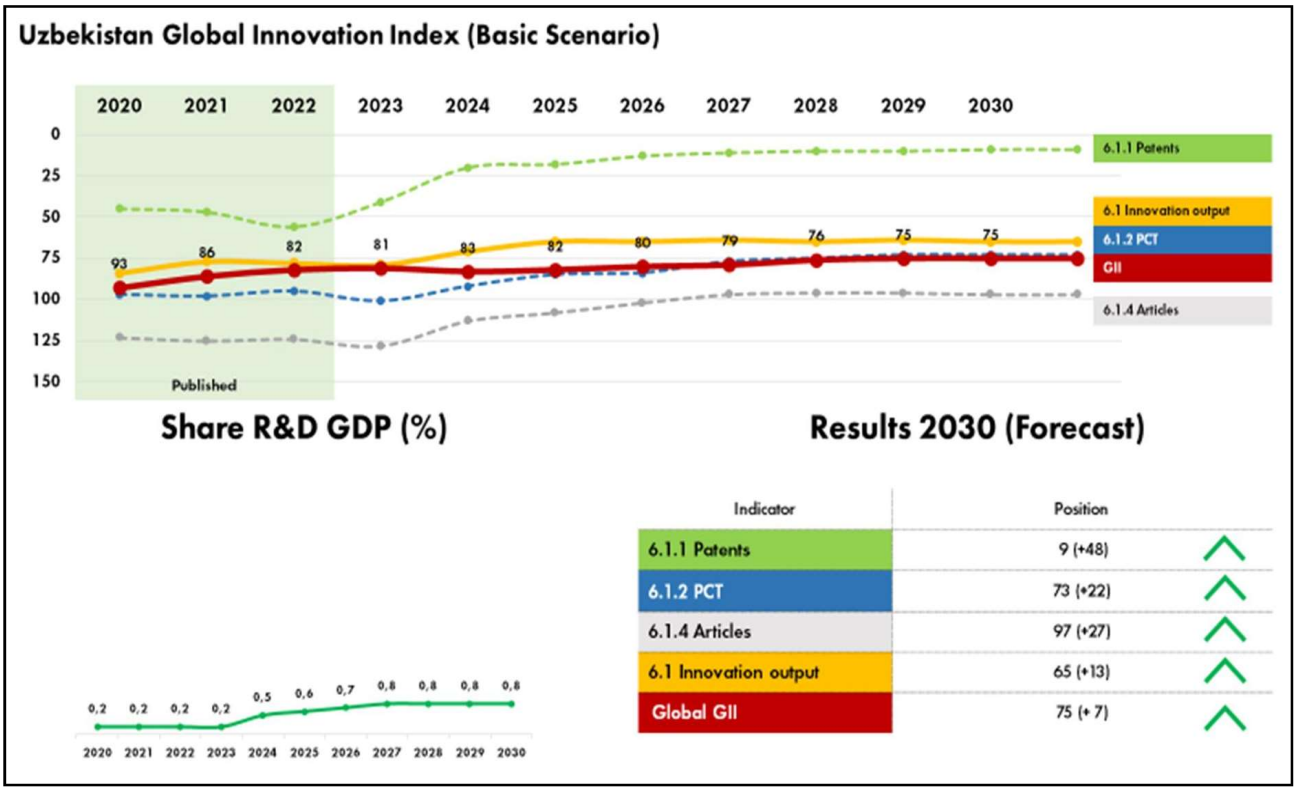

Figure 1. Basic scenario

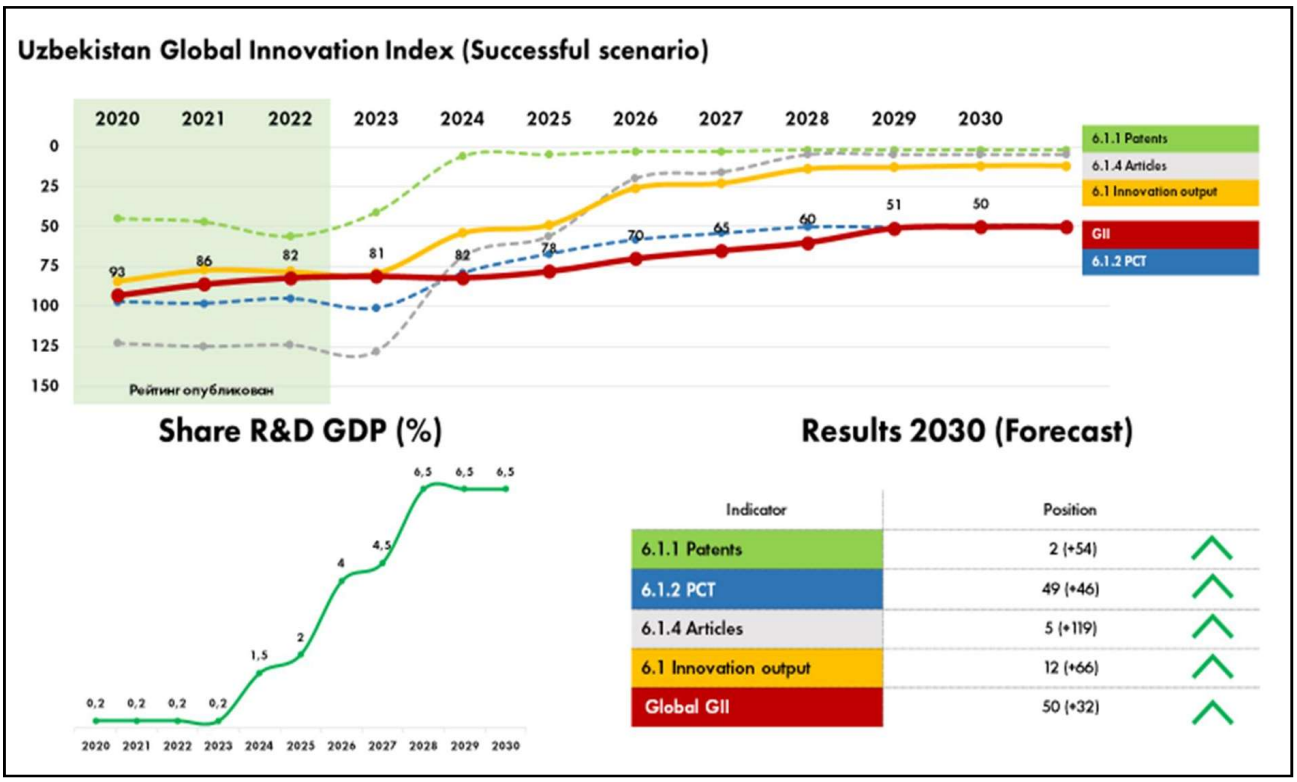

Figure 2. Successful scenario

Both of these models illuminate the pressing need for reforms within the innovation sector. In the ensuing phase, nations within the GII's top 50 were identified as benchmarks. An exhaustive analysis of publication output indicated a noteworthy ascent, surpassing global mean impact and corroborating our hypothesis concerning the strategic selection of indicators. Notably, the surge in academic productivity resonated with respective GII rankings, fortifying the credibility of our methodology.

Subsequent analyses, informed by the EC-OECD STIP Compass [3]—an extensive repository of questionnaires and knowledge on Science, Technology and Innovation Policy (STIP)—enabled the elucidation of specific policies that have undergirded the success of select nations within the GII from 2000 to 2021. This paper covers around 900 policy documents from 9 countries (4 countries from the chosen list did not provide data for the STIP survey). The STIP data was meticulously segmented into three categories by word in the tags section (elaborated upon in Appendices 1 and 2, and below):

1. Main theme: key target areas for innovation development (country level),

2. Main target group: units involved in innovation development (macro level),

3. Target group: institutions and groups (micro level).

4. General results have been also analyzed as a world cloud in Figure 3, which covers the scope of the selected information and its frequency.

Figure 3. Word cloud of STIP Compass categories

Initial findings spotlighted the emphasis on fundamental research policies and their evolution in countries ranking in the top 50 of the GII. Figure 1 and Figure 2 showed a high impact of funding basic and fundamental research on innovation development indicators. According to our results higher education and research institutes are key stakeholders in implementing national strategies and policies. Further article versions will also cover other specifics that could affect its innovation development.

References

[1] Global Innovation Index (2023). https://www.globalinnovationindex.org/Home Access date: 25.09.2023.

[2] O'zbekiston Respublikasi Presidentining farmoni PF-5544-son (2018). 2019–2021 yillarda O'zbekiston Respublikasini innovatsion rivojlantirish strategiyasini tasdiqlash to'g'risida, 21.09.2018 [Decree of the President of the Republic of Uzbekistan No. PF-5544 'On approval of the innovative development strategy of the Republic of Uzbekistan in 2019–2021' dated 21.09.2018]. https://lex.uz/ru/docs/3913188 Access date: 25.09.2023.

[3] EC-OECD STIP Compass (2023). https://stip.oecd.org Access date: 25.09.2023.

Appendix 1. Number of policies per country for the period 2000–2021

Country	Number of policies
Korea	163
Latvia	55
Lithuania	96
Malaysia	184
Montenegro	36
Romania	37
Russian Federation	164
Thailand	96
Ukraine	76
Total	907

Countries without policies in STIP compass: Viet Nam, India, Philippines and Georgia [3].

Appendix 2. Number of policies in different tag groups according to STIP Compass for the period 2000–2021

Tag group	Value	Number of policies
Main theme	Innovation in firms and innovative entrepreneurship	288
	Public research system	252
	Governance	193
	Knowledge exchange and co-creation	154
	Research and innovation for society	149
	Human resources for research and innovation	136
	Countering impacts of COVID-19 on STI systems	62
	Net zero transitions	24
	ERA-related initiatives	5
Main target group	Research and education organisations	466
	Firms by size	356
	Researchers, students and teachers	349
	Governmental entities	301
	Firms by age	241

	Economic actors (individuals)	162
	Social groups especially emphasized	137
	Intermediaries	138
Target group	Higher education institutes	409
	Public research institutes	377
	National government	286
	Established researchers	248
	Firms of any size	216
	Private research and development lab	205
	Firms of any age	191
	Postdocs and other early-career researchers	167
	Social groups especially emphasized	12
	PhD students	132
	SMES	130
	Entrepreneurs	124
	Civil society	123
	Undergraduate and master students	116
	Subnational government	106
	Teachers	99
	Academic societies / academies	86
	Secondary education students	78
	Industry associations	60
	Private investors	59
	Incubators, accelerators, science parks or technoparks	55
	Micro-enterprises	46
	Technology transfer offices	43
	International entity	41
	Young firms (1 to 5 years old)	41
	Labour force in general	30
	Large firms	30

	Nascent firms (0 to less than 1 year old)	29
	Disadvantaged and excluded groups	25
	Women	24
	Multinational enterprises	14
	Established firms (more than 5 years old)	11