

UZBEKISTAN HAS IMPROVED ITS POSITION IN THE GLOBAL INNOVATION INDEX RATING

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Abstract: The article presents considerations about achievements of the innovation index of Uzbekistan, which are based on indicators such as institutions, human capital and research, infrastructure, loans, investments, business attractiveness, strategy, market attractiveness. The research relies on the statistical data published by the World Intellectual Property Organization (WIPO) in the 16th edition of the Global Innovation Index. In addition, the authors have developed relevant conclusions and proposals aimed at improving the position on low indicators.

Keywords: institutions, innovations, human capital and research, infrastructure, market attractiveness, business attractiveness, knowledge and technology output, creative output, strategy, market attractiveness.

Introduction.

Goal 52 of the Decree on the “Development Strategy of New Uzbekistan for 2022-2026” sets the task of “improving the position of the Republic of Uzbekistan in the global innovation index and entering the TOP-50 countries by 2030”. In order to achieve this aim there has been ascertained to improve Uzbekistan position on the low indicators recorded in the global innovation index, create wide opportunities for the implementation of innovation-based projects in all areas, as well as and introduce cutting-edge mechanisms for supporting research and innovation-based initiatives.

Literature review.

As a result, during the past years, the economy of Uzbekistan was the first country in Central Asia to take its place in the Global Innovation Index (GII). According to the annual tradition, the World Intellectual Property Organization (WIPO) has recently announced the 16th edition of the International Innovation Index (GII-2023) based on the indicators of 132 countries of the world. According to the information of the publication, in recent years the innovative process has been continuously developing in the world. These are mainly deep research innovations based on artificial intelligence (AI), digital innovation based on artificial intelligence (AI), supercomputing and automation, biotechnologies and nanotechnologies.

In this international ranking Uzbekistan retained its position in 2023 compared to 2022 among 132 countries. Definitely, in the various dangerous realities and processes currently occurring around the globe, including as noted by the President of the Republic of Uzbekistan, “Whether it is a pandemic, natural disasters, earthquakes, armed conflicts, global warming or drought - all of them have severely been challenged or are being challenged by humanity” and it is obviously not possible to maintain such a position in the world’s prestigious rankings in such complicated period.

The Global Innovation Index ranked Uzbekistan on 93rd place in the first year, but today it is among the top 100 countries that have risen the most in recent years (Morocco ranked 70, Uzbekistan ranked 82, Egypt ranked 86 and Pakistan ranked 88).

Analysis and results.

As mentioned above, Uzbekistan was supposed to be among the top 50 in the Global Innovation Index by 2030. It is true that we have low figures in some essential indicators of the global innovation index, however, the government of the Republic of Uzbekistan is creating the conditions required to improve our position on these low indicators and to implement innovation-based projects. As a result, we managed to at least maintain our position, rather than lowering or completely leaving the index like some countries.

The Global Innovation Index is a ranking of innovative capabilities and indicators of countries, in which the level of innovation is measured based on various evaluation criteria, such as institutions, human capital and research, infrastructure, lending facilities, investment, communications. This global innovation index consists of several assessment components divided into sub-indices. The indicators of the global innovation index rating cover the economy of the world countries and it is determined based on about 80 indicators.

The Global Innovation Index is a huge research field that ranks the countries of the world according to the level of innovation development, and it is compiled every year based on the comprehensive capabilities and success of countries in innovation. This ranking is usually used by corporations and governments to compare countries' innovations.

Well, the question arises as to which indicators of Uzbekistan with high indicators and which low indicators should be paid attention to in this international rating. We will analyze the published international publication (GII-2023) and express some opinions on these issues.

Initially, Uzbekistan, the leading country in the top three in the Central and South Asian region, became a new participant, unfortunately, in this year's results, Kazakhstan takes our place in the top three in the region with a difference of only 0.5 points (Kazakhstan with 26.7 points ranked 81, Uzbekistan with 26 points ranked 82). This year, Uzbekistan is ranked 10 out of 36 (*Lower middle-income economies*), while India ranked 40 with 38.1 points and Iran ranked 62 with 30.1 points are in the leading positions in our region.

Table 1

Comparative data between leading countries in the region

№	Name of Indicator	India		Uzbekistan	
		rating	rank	rating	rank
1.	Institutions	53,9	56	54,7	55
2.	Human capital & research	35,5	48	25,2	89
3.	Infrastructure	34,3	84	37,9	73
4.	Market sophistication	52,9	20	33,9	69
5.	Business sophistication	29,6	57	25,5	78
6.	Knowledge & technology outputs	39,7	22	19,3	78
7.	Creative outputs	30,3	49	14,7	93

Herewith it should be noted that Uzbekistan is a member of several influential international organizations, for example, one such organization is the Organization of Turkic States (OTS). The 10th summit of the organization was held on November 3, 2023 in Kazakhstan. The heads of five member states of the organization - Uzbekistan, Turkey, Kazakhstan, Azerbaijan and Kyrgyzstan, as well as the heads of observer states of Turkmenistan and Hungary attended this summit. We would like to say that one of the goals of this organization is aimed at the development and mutual support of innovation-based activities in the countries. Compared to the member countries of this organization, it has the following ranking in the global innovation index: Turkey (ranked 39), Kazakhstan (ranked 81), Uzbekistan (ranked 82), Azerbaijan (ranked 89), Kyrgyzstan (ranked 106), observer countries - Hungary (ranked 35) and Turkmenistan (not included in the rating). We did not mention these numbers for nothing, as the core indicators of the rating are compared by country.

In recent years, Uzbekistan's cooperation in the economic sphere with member states of such organizations creates an opportunity to further improve its level in international rankings.

According to the 2023 rating of the Global Innovation Index, Uzbekistan was recognized as countries with higher innovation production efficiency (India, Ukraine, Vietnam, Uzbekistan, Philippines, Pakistan, Senegal, Indonesia) and announced according to the following indicators:

Ranking in GII-2023 –ranked 82 (included among the countries that retained their position compared to last year): entry rating - 88, exit rating - 72, income level - below average 10 - place, region - Central and South Asia, GDP purchasing power by parity (RRR)-334.3 bln. USD (114.7% growth), GDP per capita (RRR) - 9.7 thousand USD (115.4% growth).

In order for Uzbekistan to take a place in the top 50 in this rating by 2030, it will be necessary to improve the overall indicators of the rating by at least 7.2. In this case, today Qatar was at the end line of the rating of 33.4 at the lower limit of the top 50. Definitely, achieving this goal will not happen by itself, based on the results of last year's analysis and achieved indicators, we predicted to conquer the top 50 by 2026 (if the average is increased by 1.2 points, we will be among the top 50 in the coming years, we should not get carried away by the correct numbers, we should only move forward towards the set goal, learn, research, innovate, gain experience, and continue creativity).

The fact that Uzbekistan has improved and maintained its position in the Global Innovation Index rating in recent years can be seen in the data on the following 7 most important indicators (these data are compared with "GII-2022").

If we consider the data on the *first* indicator, in the "Institutions" category there has been an increase by 8 scores from 63 to 55 (54.7 scores) and herewith assessment has been made according to the following parameters:

first, the political environment constitutes 40.0 scores (52.1 in 2022) or ranked 76 (ranked 94 in 2022) (political and operational stability - 48.6/74, government efficiency - 31.8/84);

second, the legislative base accounts for 51.7 scores (50.7 in 2022) or ranked 97 (104 in 2022) (quality of laws - 27.0/104, the law priority - 13.8/115.0 dismissal costs - 17.3/73),

third, the business environment amounts to 73.3 scores (69.2) or ranked 19 (21 in 2022) (ease of starting a business 73.3/23, entrepreneurship culture – no data available).

In this indicator, as the best result, the business environment and the policy of its management are highly evaluated, that is, the strengths and profitability are indicated. As it is obvious from the figures, Uzbekistan is among the top 30 in this field. Last year, the legislative base was commented as weak (a weakness), this year we do not see such a

comment (improved from 104 to 97). “Institutions” indicator compared to some countries of the Organization of Turkic States (TDT): Turkey ranked 105 - weak, Kazakhstan ranked 61 - strong, Azerbaijan ranked 42 - very strong, observer country Hungary ranked 47 – strong. It seems that in order to further improve the results of this indicator, it is necessary to study the experience of Azerbaijan and Hungary.

In the *second indicator*, Human Capital&Research, there has been 27 score decrease by 24.0 scores, amounts to 25.2 scores (30.8 in 2022) and ranked 89 (65 in 2022). This happened mainly due to the following factors:

first, education accounts for 46.4 scores (57.4 in 2022) or ranked 78 (50 in 2022). Unfortunately, according to the educational indicator, compared to 2022, it has decreased by 28 points. It does not provide any information on some columns (expenses on education in relation to GDP constitute 4.6 percent or ranked 52, public funding/student, percentage of GDP - data not available, duration of secondary education (school), year-13.9/79, PISA scale of the international student assessment program - no data available, student-teacher ratio, average -9.8/28),

second, enrollment to higher education accounts for 27.4 scores or ranked 74 (enrollment in higher education, gross percentage -21.2/99, graduates in science and engineering, percentage - 32.8/12, mobility in higher education- 0.7/97),

third, research and development (R&D) 1.9 scores (1.2 in 2022) or ranked 92 (93 in 2022) (researchers, FTE-full-time equivalent/person-523.4 (439.9 in 2022) / 89 (73 in 2022), research and development expenditures in relation to GDP, in percent - 0.1/99, research and investors, million USD - 0.0/40, QS- university rating - 0.0/71).

In this indicator only student-teacher ratio (average-9.8/28) and researchers FTE-full-time equivalent/person-523.4 (439.9) / 89(73) were able to show their strengths.

“*Human Capital & Research*” indicator: Turkey ranked 41 - strong, Kazakhstan ranked 59 – strong, Azerbaijan ranked 87 - weak, Hungary, which is an observer ranked 36 - strong. It is appropriate to use the experiences of Hungary and Turkey in this indicator.

The *third parameter* in the ranking –“Infrastructure”–37.9 scores or ranked 73 in 2023.

According to this, *first*, information and communication technologies (ICT) constituted 71.4 scores or ranked 63 (ranked 75 in 2022), where access to ICT 79.1/75, use of ICT 74.5/63, online government service –71.7/57, electronic users 60.5 /55),

second, general infrastructure accounts for 27.3 scores or ranked 62 (electricity generation -11942, 6/ 83, logistics – 22.7/82, gross capital formation in percent in relation to GDP -42.1/6),

third, ecological balance accounts for 15.1 scores or ranked 102 (GDP/energy consumption unit 5.8/110, environmental impact -32.7/79, ISO 14001 environmental certificates/billion USD in relation to GDP-0.3/99).

In fact, we have very strong points in the “Infrastructure” indicator, including ranking 63 in information and communication technologies (ICT), the online services of our government ranked 57, even though the online services of our government have decreased by 9 scores, we are not without an indicator that can even compete for the top 10 in E-electronics. for example, investments in gross capital ranked 6 in relation to GDP!

According to “*Infrastructure*” indicator: Turkey ranked 41 - strong, Kazakhstan ranked 59 - strong, Azerbaijan ranked 95- very weak, Hungary, which is an observer country, ranked 42 - strong. We have almost positive indicators in this indicator, however, the experiences of Turkey and Hungary, which have a high rating, will be the basis for our further improvement in the rating in the future.

“*Market sophistication*” is considered another important indicator of the global rating, which has demonstrated a decrease. In other words, this indicator accounts for 33.9 scores or ranked 69.

first, the lending is rated at 7.0 scores or ranked 121 (ease of borrowing –no data available for two years, domestic loans to the private sector in percent in relation to GDP - 35.7/90, microfinance gross loans in percent in relation to GDP -0.2/59),

second, in terms of investments no data available for 2022-2023. However, in 2021 this indicator was rated at 70.0 scores or incomplete data (ease of protection of minority investors - 70.0/36, market capitalization- no data available, venture capital investors, transactions/billion USD - no data available, venture capital recipients, transactions/ billion USD - no data available),

third, trade, diversification and market size have been rated at 60.8 or ranked 51 (applicable tariff rate, average weight, 2,6/68, local industry diversification - 92,4/42, domestic market size, billion USD (PPP) –33.4 (291,2 in 2022)/56 (59 in 2022)).

Concerning “*Market sophistication*” indicator: Turkey ranked 36 - as strong, Kazakhstan ranked 87 as weak, Azerbaijan ranked 85 as weak, observer country Hungary ranked 64 as weak. This rating includes the best indicators of Uzbekistan. Almost the same results as Hungary. Nevertheless, the experience of Turkey is important for us to improve.

According to “*Business sophistication*”, the fifth indicator, has declined by 4 scores compared to 2022 and constitutes 25.5, ranked 78. It should be noted that in 2022 is admitted as an absolute record of the rating, which has increased by 49 points compared to 2021 (improved its position from 123 ranking to 74).

Herewith, *first*, no data available in terms of educated employees (however, this indicator amounted to 22.8 scores in 2021r), knowledge-intensive employment in percent – 16.9/88, firms offering formal training in percent compared to GERD in relation to GDP – 0.1/69, GERD funded by business in relation to GDP – 42.4 scores or ranked 40 (13.7/56), it is possible to highlight the indicator of highly employed women, because last year there was no data on this, and as of 2023, for the first time, it got 8.4 scores and ranked 84,

second, innovation relations have been scored at 26.3 or ranked 51 (8 score increase). University-industry collaboration-data on research – 62.4 scores ranked 32, development status of the cluster –66.1 scores ranked 32, foreign-funded GERD in percent in relation to GDP - 0.0/92, joint ventures/strategic partnership agreements/billion USD (PPP) in percent in relation to GDP -0.0/96, patent families/billion USD in percent in relation to GDP - 0.0/95),

third, mastering knowledge- 27.0 scores and ranked 92 (intellectual property fees, total sales percentage - 0.5/75, high technology imports, total sales in percent – 10.9/27, ICT services import, total sales in percent - 0,6/101, net inflow of foreign direct investment in percent in relation to GDP – 3.3/41, research potential at enterprises in percent - 12.9/57).

None of these business attractiveness indicators of the rating have strengths, with the exception of GERD, which is funded by business.

“*Business sophistication*” indicator: Turkey ranked 46 - strong, Kazakhstan ranked 75 - weak, Azerbaijan ranked 64 - strong, observer country Hungary ranked 30 - extremely strong points. In this indicator, Hungary and Turkey have high results, so it is necessary to study indicators of business attractiveness in these countries.

In terms of Knowledge & technology outputs, the *sixth* indicator, the figure accounts for 19.3 scores and ranked 78. However, last year our country demonstrated 2 score increase. In the last three years, it has risen from being ranked 90 to 78, so the growth trend is observed in this indicator. These are mainly determined by the following aspects:

first, knowledge creation (creative approach) - 12.4 scores or ranked 77 (ranked 78 in 2022), patents billion dollars (PPP) in percent in relation to GDP, 1.4/47, RST patents/billion USD (RRR), 0.0/99 percent in relation to GDP, utility models /billion USD, in percent in relation to GDP 1.3/17, research and technical articles/billion USD (PPP), 2.8/117 in percent in relation to GDP, h-index of cited documents 4.1/115),

second, the impact of knowledge - 33.9 scores or ranked 44 in the rating! (labor productivity growth in percent - 5.0/6, new businesses - 24.8/51, software costs, in percent in relation to GDP - 0.2/80),

third, the spread of knowledge - 11.6 scores or ranked 100 in the rating (revenues on the object of intellectual property, 0.0/104 in percent, attractiveness of production and exports 42.7/77, exports of high technologies, 0.1/122 in percent in relation to the overall trade, exports of ICT services, in percent in relation to overall trade - 0.8/82).

On the basis of the socio-economic reforms implemented in our republic, the emergence of entrepreneurial entities and their high labor productivity have been considered worthy of a high place in the international ranking. That is, ranked 6 in the rating on the growth of labor productivity! Therefore, the analytical data presented in these indicators were able to show their strengths.

Indicators of “Knowledge & technology outputs”: Turkey ranked 44 - strong, Kazakhstan ranked 83 - weak, Azerbaijan ranked 114 - extremely weak, and observer country Hungary ranked 26 - very strong. No matter how much we are proud of the results of this indicator, we also have results that are among the top 10. Nevertheless, it is necessary to note better results as a result of studying the experiences of Turkey and Hungary in the future.

In the *seventh* indicator “*Creative outputs*” Uzbekistan has improved by 9 scores and ranked 93 (ranked 102 in 2022). At the same time, it has reached 14.7 scores in the rating.

first, intangible assets have been assessed at 19.5 scores or ranked 86 (last year was the first time to be included in the rating), on trademarks/billion USD (PPP) in relation to GDP 35.3/65, global brand value with the highest value of 5000 in GDP - no data available, on industrial samples/billion USD (PPP) in relation to GDP - 0.8/77;

second, creative goods and services - 3.0 scores or ranked 96 in the rating (export of cultural and creative services, in percent to total trade - 0.1/88, national feature films - 0.4/73, entertainment and media market - 3.2/49, (this is the first time when this indicator has been introduced in the rating), printing and other media, production as a percentage, exports of creative products, as a percentage of total trade - 0.4/64),

third, online creativity - 16.2 scores or ranked 90 in the rating (total top-level domains (TLDs) - 0.0/132, country code TLD - 1.4/78, wikipedia edits - 2.6/94, mobile application creation/billion USD (RRR), in relation to GDP - 60.8/79). It should be noted that last year this indicator ranked 107 and the increase was 28 scores.

According to “*Creative outputs*” indicator: Turkey ranked 27 - very strong, Kazakhstan ranked 90 - weak, Azerbaijan ranked 100 - weak, and observer country Hungary ranked 36 - strong. In this indicator, it is obvious that the position of Uzbekistan is good after the indicators of Turkey and Hungary.

It must be admitted that we still have a lot of work to do in terms of these indicators, let's not rise from 102 to 93 rank, after all, we are still far behind foreign experience in the matter of creating intellectual property objects and commercializing them (creating an

intellectual property ecosystem), as the President has repeatedly stated, it was emphasized, even defined as one of the priority tasks.

Conclusion and proposals

As a conclusion, it can be noted that Uzbekistan has strengthened its position on some indicators of the global innovation index and shows a tendency to constantly rise. For example, “*Institutions*” increased by eight points in one year, that is, from 63 to 55, which is due to the effective reforms implemented in our country in recent years, we have had positive indicators in the political environment, legal framework, and administrative reforms.

For example, category “*Institutions*” increased by eight scores in one year, i.e. from 63 to 55, which means that due to the effective reforms implemented in our country in recent years, we have had positive indicators in the political environment, legal framework and administrative reforms.

The results of the international index “*Human capital and research*” cannot be evaluated positively, we will continue to look at education, the international student assessment program PISA scale, the mobility of access to higher education, research and development (R&D), spending on research and development, it is necessary to focus on improving the results in sub-indicators such as research and investors and QS-university rating.

The “*Infrastructure*” indicator recorded good results for us in the international index. This includes investments in information and communication technologies (ICT), access to ICT, use of ICT, online government service and e-users, capital infrastructure and capital. However, in the future, we need to develop necessary measures to improve low performance indicators such as logistics, ecological balance, environmental impact and environmental certificates.

The rating indicator “*Market sophistication*” is in a satisfactory condition, with a tendency to increase year by year. However, some sub-indicators are decreasing, such as lending, access to lending, domestic loans to the private sector, market capitalization, venture capital investors and venture capital recipients, or there is no data available. However, it is necessary to pay attention to the following sub-indicators that highly rated this indicator, including microfinance gross loans, ease of protection of minority investors, trade, diversification and market size, diversification of local industry, and the size of the domestic market.

The indicator “*Business sophistication*” showed a decrease compared to last year, but it has a better indicator compared to our overall rating. In order to further improve this indicator, we need to focus on the following: knowledge workers, firms offering formal training, foreign-funded GERD, joint venture/strategic partnership agreements, patent volume, knowledge acquisition and intellectual property payments. However, we do not have any top 50 figures in this indicator, including business-implemented GERD, business-financed GERD, highly employed women, innovative connections, university-industry R&D cooperation, cluster development status, overall trade, high technology imports, foreign direct investment and research capacity. The measures implemented by our government to further improve these indicators, will definitely continue.

An increase of 2 scores has been achieved in the indicator of “*Knowledge & technology outputs*”. The growth trend is driven by, among others, knowledge creation (creative approach), impact of patents, labor productivity growth, high technology production, manufacturing and export attractiveness, software costs, utility models. However, it is necessary to pay attention to the following sub-indicators for further improvement in the indicator and to improve such the indicators as research and technical

articles, RST patents, h-index of cited documents, knowledge dissemination, income from intellectual property, export of high technologies and export of ICT services.

In the “*Creative outputs*” indicator, Uzbekistan improved by 9 positions. These include exports of intangible assets, trademarks, industrial designs, cultural and creative services, national feature films, entertainment and media markets, mobile application development, print and other media, and creative products.

Further improvement in this indicator depends more on the following lower indicators, including global brand value, creative goods and services, online creativity, top-level domains, country code TLDs, and Wikipedia edits.

We can say that in our country, 2024 will be a year of further improvement and promotion of our indicators in international indexes and ratings based on the tasks set in the “Year of Youth and Business Support” and the “Third Renaissance”, which is considered the basis and core principle. As it has been noted, the main legal bases of these are “*Development Strategy of New Uzbekistan for 2022-2026*”, “*Strategy “Uzbekistan-2030*” and “*Concept of Science Development until 2030*” and currently they are widely being applied in practice. As a result we will be able to enter not only the index of “*The Global Innovation Index*” — *GII*, but also some other reputable foreign indices, such as *Global Competitiveness Index*, *World Economic Forum*, *INSEAD International Business School*, *Cornell University*, *World Intellectual Property Organization*, *WIPO*, *Global Green Economy Index*, *Dual Citizen LLC*, as well as *Competitive Industrial Performance Index*, *United Nations Industrial Development Organization*, *UNIDO*). Moreover, it is a clear proof that we have decent grades and are improving year by year.

In the international Global Innovation Index Uzbekistan has proven itself to be among the countries that have been making economic progress for a long time. I think that we will definitely achieve the set goals in our rapid development.

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