



GLOBAL INNOVATION INDEX REPORT HIGHLIGHTS

2023

WHERE DOES INDIA STAND ON GII 2023?

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ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Tracker captures key trends in innovation investments and measures the pace of technological progress and adoption, as well as the resulting socioeconomic impact.

The GII 2023 tracks global innovation trends against a background of uncertainty caused by slow economic recovery from the COVID-19 pandemic, high interest rates, and geopolitical conflict, but with the promise of the Digital Age and Deep Science innovation waves and technological progress.

The 2023 edition of the Global Innovation Index (GII) takes the pulse of global innovation trends against the background of an economic environment fraught with uncertainty. It reveals the ranking of this year's most innovative economies in the world amongst 132 economies and localizes the top 100 science and technology innovation clusters.

The GII unveils the world's innovation leaders, gauging the innovation performance of 132 economies. Switzerland continues to be the uncontested innovation world champion, Singapore makes the top five, and Indonesia joins China, Türkiye, India, the Islamic Republic of Iran and Viet Nam as most impressive innovation climbers of the last decade.

For many years, governments around the world have successfully used the Global Innovation Index (GII) to improve their economy's innovation performance and shape evidence-based innovation policies. A survey carried out by WIPO in 2022 showed 70 percent of WIPO member states were using the GII to improve innovation ecosystems and metrics, as well as it being a benchmark for national innovation policies or economic strategies. It is heartening to see that the GII is being used by a wide range of economies, from low- to high-income, across every one of the world's regions. One major benefit of the GII is that it puts evidence and metrics at the core of conceiving, deploying and evaluating innovation policies. A first step brings together statisticians, innovation actors and policymakers in order to understand a country's innovation performance, based on the GII metrics. In a second step, the policy discussion turns to leveraging domestic innovation opportunities, while at the same time overcoming countryspecific weaknesses. In select countries, the GII has facilitated just such a dialogue across innovation actors and government entities.

TOP 20 IN GLOBAL RANKINGS 2023



Country	Overall GII
Switzerland	1
Sweden	2
United States	3
United Kingdom	4
Singapore	5
Finland	6
Netherlands	7
Germany	8
Denmark	9
Republic of Korea	10
France	11
China	12
Japan	13
Israel	14
Canada	15
Estonia	16
Hong Kong	17
Austria	18
Norway	19
Iceland	20

KEY TAKEAWAYS

- Science and innovation investment showed a mixed performance in 2022 in the context of many challenges, and a downturn in innovation finance. Scientific publications continued to increase in number, albeit at a slower rate. Global government R&D budgets are expected to grow in real terms in 2022, while R&D expenditure by top corporate spenders rose substantially. However, it is unclear whether this can compensate for surging inflation. International patent filings, in turn, stagnated while venture capital investments declined sharply in value in 2022, following extraordinarily high levels in 2021, reflecting a deteriorating climate for risk finance.
- Strong technological progress in the fields of information technology, health, mobility, and energy continues to deliver new breakthroughs opening up new opportunities for global development. Computing power is historically strong, while the costs of renewable energy and genome sequencing costs are continuing to fall.
- An observed increase in technology adoption is gradually making access to safe sanitation and connectivity more widespread. Electric vehicle (EV) uptake is booming, and the desire for greater automation has increased robot installation. However, for the majority of innovation indicators, overall penetration rates remain medium-to-low, and the availability of radiotherapy for cancer treatment continues to be inadequate in many countries.
- The socioeconomic impact of innovation remains low. The COVID-19 crisis triggered volatility in labor productivity – which is currently at a standstill – and life expectancy fell for a second consecutive year (with healthy life expectancy continuing to increase, but more slowly). Carbon dioxide emissions continued to grow in 2022, albeit at a lower rate than the post-pandemic surge of 2021 – but with no global reductions in sight.
- **Who leads on unicorns?** This 2023 edition of the GII includes a new indicator showing the combined valuation of a country's unicorn companies. Of the top 25 most valuable unicorn companies and their origin, China comes first, with ByteDance (1st, artificial intelligence), followed by SHEIN (3rd, e-commerce) and Xiaohongshu (12th, e-commerce). The United States follows, with SpaceX (2nd, space and telecommunications), Stripe (4th, fintech) and Epic Games (7th, videogames). Australia has Canva (5th, graphic design and software) and Indonesia has J&T Express (13th, logistics and delivery).
- **Research and development (R&D):** The most recently available data show that global R&D investment grew strongly in 2021 at a rate of 5.2 percent (in real terms), up from 3.2 percent in 2020. This is close to the pre-pandemic growth rate of around 6 percent in 2019. In turn, business R&D expenditure – the most significant component of total global R&D – grew by 7 percent in 2021, the highest growth rate observed since 2014

- **Venture capital:** After phenomenal growth in 2021 (at a magnitude last seen just prior to the bursting of the so-called “dotcom bubble”), tighter monetary conditions in 2022 raised fears of a steep drop in venture capital (VC) investment, particularly a possible discontinuation of the VC influx that had benefitted previously underserved regions in 2021. The observed outcome in 2022 contains a nuanced combination of results, but it cannot be claimed that the feared crash materialized. Whereas deals concluded showed a healthy growth of 17.6 percent (see Dashboard) to over 23,000 deals in 2022, the total amount of money invested in VCs went in the opposite direction and was cut back sharply by 37.8 percent.
- **International patent filings:** Recent economic and political headwinds have impeded international patent filings, with growth throughout 2021 of 0.8 percent that was yet more sluggish in 2022 (0.3 percent), representing the slowest rate of increase since the decline in PCT applications seen in 2009.¹¹ Overall, this only slightly positive growth nevertheless led to the highest number of PCT filings ever recorded for a single year in 2022 (278,100). In both 2021 and 2022, Asia was the dominant force behind PCT filings, accounting for 54.7 percent of all PCT applications filed in 2022, with China, Japan and the Republic of Korea the strongest Asian international patent filers. In contrast, international patent filings from selected advanced economies, such as the United States (-0.6 percent) and the United Kingdom (-1.7 percent), underwent a decline. The marked slowdown in PCT filing growth from China – the largest filer – continued through 2022, but avoided a decline (0.6 percent growth).
- The most notable changes to the innovation landscape are as follows: –There has been a shift within this year’s top 20 innovators, with Sweden, Singapore, Finland, Denmark, France and Israel (in order of their ranking) moving up the ranking, and generally a strong showing by the Nordic and Baltic countries. –There is a mixed picture for leading emerging economies, with Indonesia rising fast over recent years, the Philippines and Viet Nam progressing again and India stable, but with China, Türkiye and the Islamic Republic of Iran falling back slightly, possibly in part due to recent COVID-19 induced effects. –India, the Republic of Moldova and Viet Nam have overperformed on innovation relative to development for a 13th year in a row, with Indonesia, Uzbekistan and Pakistan maintaining the overperformer status they first achieved in 2022, and Brazil overperforming on innovation relative to development for a third consecutive year. –There are some systematically positive innovation ranking developments in the Middle East, with the United Arab Emirates (UAE) close to the top 30, and Saudi Arabia, Qatar, Bahrain, Oman and other neighboring countries progressing up the rankings. –Mauritius and South Africa are leading Sub-Sahara Africa, with solid positions in the GII top 60, and a total of five economies within the region overperforming on innovation, with Rwanda having done so for the longest.

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
35	46	Lower middle	CSA	1,417.2	11,665.5	8,293

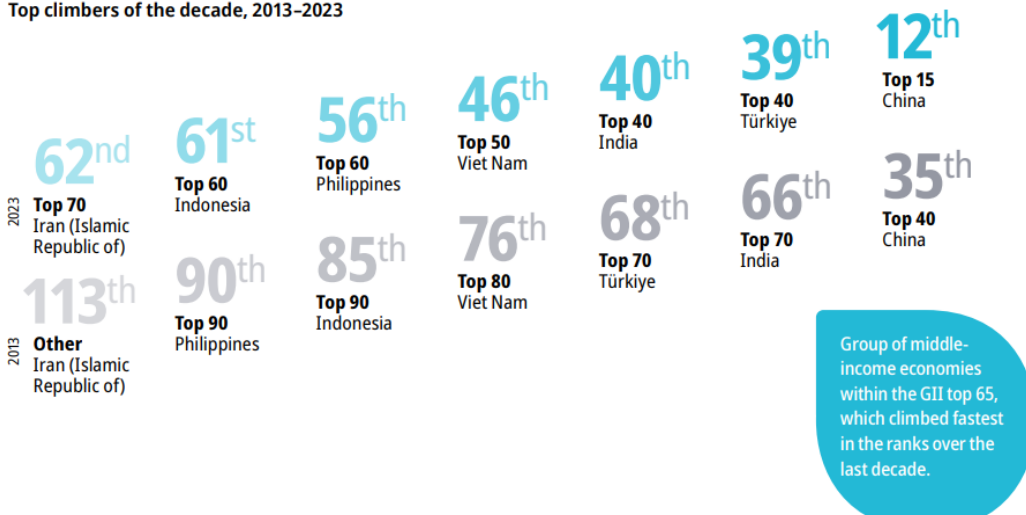
		Score/Value	Rank			Score/Value	Rank
Institutions		53.9	56	Business sophistication		29.6	57
1.1 Institutional environment		44.5	69	5.1 Knowledge workers		24.4	81
1.1.1 Operational stability for businesses*		44.4	82	5.1.1 Knowledge-intensive employment, %		13.0	99
1.1.2 Government effectiveness*		44.5	53	5.1.2 Firms offering formal training, %		35.9	43
1.2 Regulatory environment		61.7	68	5.1.3 GERD performed by business, % GDP	⊙	0.2	50
1.2.1 Regulatory quality*		40.1	76	5.1.4 GERD financed by business, %		40.6	41
1.2.2 Rule of law*		37.3	66	5.1.5 Females employed w/advanced degrees, %		2.6	106
1.2.3 Cost of redundancy dismissal		15.8	63	5.2 Innovation linkages		23.4	59
1.3 Business environment		55.6	47	5.2.1 University-industry R&D collaboration†		44.4	66
1.3.1 Policies for doing business†		37.9	92	5.2.2 State of cluster development†		28.3	98
1.3.2 Entrepreneurship policies and culture†		73.3	13	5.2.3 GERD financed by abroad, % GDP		n/a	n/a
Human capital and research		35.5	48	5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP		0.0	28
2.1 Education		42.8	88	5.2.5 Patent families/bn PPP\$ GDP		0.2	46
2.1.1 Expenditure on education, % GDP		4.6	49	5.3 Knowledge absorption		40.9	41
2.1.2 Government funding/pupil, secondary, % GDP/cap		18.0	61	5.3.1 Intellectual property payments, % total trade		1.4	25
2.1.3 School life expectancy, years		12.8	86	5.3.2 High-tech imports, % total trade		10.0	37
2.1.4 PISA scales in reading, maths and science		n/a	n/a	5.3.3 ICT services imports, % total trade		2.1	32
2.1.5 Pupil-teacher ratio, secondary		20.8	101	5.3.4 FDI net inflows, % GDP		1.9	77
2.2 Tertiary education		30.5	65	5.3.5 Research talent, % in businesses	⊙	30.7	43
2.2.1 Tertiary enrolment, % gross		32.1	85	Knowledge and technology outputs		39.7	22
2.2.2 Graduates in science and engineering, %		34.0	11	6.1 Knowledge creation		23.6	44
2.2.3 Tertiary inbound mobility, %		0.1	110	6.1.1 Patents by origin/bn PPP\$ GDP		2.6	28
2.3 Research and development (R&D)		33.2	32	6.1.2 PCT patents by origin/bn PPP\$ GDP		0.2	43
2.3.1 Researchers, FTE/mn pop.	⊙	262.3	81	6.1.3 Utility models by origin/bn PPP\$ GDP		n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	⊙	0.6	54	6.1.4 Scientific and technical articles/bn PPP\$ GDP		8.9	81
2.3.3 Global corporate R&D investors, top 3, mn USD		70.6	13	6.1.5 Citable documents H-index		42.8	20
2.3.4 QS university ranking, top 3*		48.2	22	6.2 Knowledge impact		53.3	9
Infrastructure		34.3	84	6.2.1 Labor productivity growth, %		1.6	43
3.1 Information and communication technologies (ICTs)		60.2	82	6.2.2 Unicorn valuation, % GDP		5.0	9
3.1.1 ICT access*		56.2	101	6.2.3 Software spending, % GDP		0.2	56
3.1.2 ICT use*		49.2	103	6.2.4 High-tech manufacturing, %	⊙	34.2	35
3.1.3 Government's online service*		77.2	42	6.3 Knowledge diffusion		42.1	29
3.1.4 E-participation*		58.1	61	6.3.1 Intellectual property receipts, % total trade		0.2	45
3.2 General infrastructure		33.1	46	6.3.2 Production and export complexity		61.2	46
3.2.1 Electricity output, GWh/mn pop.	1,185.0	93		6.3.3 High-tech exports, % total trade		4.0	41
3.2.2 Logistics performance*		59.1	37	6.3.4 ICT services exports, % total trade		12.1	5
3.2.3 Gross capital formation, % GDP		32.8	16	6.3.5 ISO 9001 quality/bn PPP\$ GDP		3.6	69
3.3 Ecological sustainability		9.7	128	Creative outputs		30.3	49
3.3.1 GDP/unit of energy use		9.8	71	7.1 Intangible assets		42.2	38
3.3.2 Environmental performance*		0.0	131	7.1.1 Intangible asset intensity, top 15, %		78.6	8
3.3.3 ISO 14001 environment/bn PPP\$ GDP		0.9	67	7.1.2 Trademarks by origin/bn PPP\$ GDP		42.7	54
Market sophistication		52.9	20	7.1.3 Global brand value, top 5,000, % GDP		5.5	31
4.1 Credit		34.0	56	7.1.4 Industrial designs by origin/bn PPP\$ GDP		1.7	47
4.1.1 Finance for startups and scaleups†		78.6	9	7.2 Creative goods and services		16.9	56
4.1.2 Domestic credit to private sector, % GDP		54.7	67	7.2.1 Cultural and creative services exports, % total trade		1.7	18
4.1.3 Loans from microfinance institutions, % GDP		0.3	42	7.2.2 National feature films/mn pop. 15-69		1.8	49
4.2 Investment		38.6	17	7.2.3 Entertainment and media market/th pop. 15-69		0.7	55
4.2.1 Market capitalization, % GDP		87.5	19	7.2.4 Creative goods exports, % total trade		1.8	27
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP		0.1	39	7.3 Online creativity		19.8	66
4.2.3 VC recipients, deals/bn PPP\$ GDP		0.1	24	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69		1.0	99
4.2.4 VC received, value, % GDP		0.0	6	7.3.2 Country-code TLDs/th pop. 15-69		0.8	96
4.3 Trade, diversification and market scale		85.9	9	7.3.3 GitHub commits/mn pop. 15-69		3.9	78
4.3.1 Applied tariff rate, weighted avg., %		6.2	97	7.3.4 Mobile app creation/bn PPP\$ GDP		73.6	36
4.3.2 Domestic industry diversification	⊙	97.9	10				
4.3.3 Domestic market scale, bn PPP\$		11,665.5	1				

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question. ⊙ is used when the available economy data are older than the base year; see appendices for details, including the year of the data, at wipo.int/gii-ranking. Square brackets [] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

INDIA'S OUTLOOK

- 2023 is a momentous year for India. It not only marks 75 years of Independence, but also the country's G20 Presidency, when for the first time it will convene the G20 Leaders' Summit. During its Presidency, India aspires to promote universal collaboration under the theme "Vasudhaiva Kutumbakam," that is, "One Earth · One Family · One Future." The Confederation of Indian Industry (CII) has been designated as the B20 India Secretariat, the G20 business engagement group. The theme for B20 India is RAISE, which stands for responsible, accelerated, innovative, sustainable, equitable businesses. Under this banner, the CII is working toward nurturing innovation as a movement, not only across India but around the globe, instilling innovative business practices through a heightened focus on technological development, R&D, automation and artificial intelligence, digital transformation and data-enabled business models for greater efficiency and competitiveness.
- India (40th) is in the group of middle-income economies within the GII top 65. India leads the middle-income economies group and this group has climbed the GII rankings fastest over the last decade.
- Another noteworthy trend is the ascent of India in terms of publication output (ranking fourth in 2022), overtaking the United Kingdom (fifth) and close behind Germany (third).
- India stands at 9th in the Unicorn indicator.
- India, however, does make it into the top 100 by S&T intensity for four clusters: Bengaluru, Chennai, Delhi and Mumbai.
- It holds top ranking within the Central and Southern Asia region for Human capital and research (48th), Business sophistication (57th) and Knowledge and technology outputs (22nd). Strong indicators include ICT services exports (5th), Venture capital received (6th), Graduates in science and engineering (11th) and Global corporate R&D investors (13th).

Top climbers of the decade, 2013-2023



ABOUT THE IP PRESS

The IP Press is a team of IP-Holics, who started this blog to ensure access to the latest intellectual property (IP) issues for all the IP hopefuls. Our focus would be to address IP concerns of stakeholders, students, academicians, researchers, start-ups, etc. and guide them to attain and enforce their IP rights.

We, not only hold expertise in law and IP, but our team of technically-skilled professionals, IP specialists and patent agents gives us a better understanding to deal with technical issues in IP. To focus on national and international issues, we are supported with international IP experts as well.

Below is an insight into the objectives of starting this initiative:

- Spread awareness on the latest IP issues;
- Conduct workshops for the IP professionals;
- Seminars and video lectures for the IP aspirants;
- Review and comment on the IP policies;
- Encourage and foster the IP culture;
- Career counselling for students who are interested in building their career in IP;
- A team of academicians and practitioners to research and advice on the IP disputes.

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