

Global Innovation Index 2023

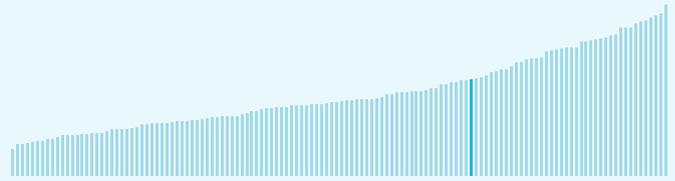


The Global Innovation Index (GII) ranks world economies according to their innovation capabilities.

Consisting of roughly 80 indicators, grouped into innovation inputs and outputs, the GI aims to capture the multi-dimensional facets of innovation.

India ranking in the Global Innovation Index 2023

> India ranks **40th** among the 132 economies featured in the GI 2023.



> India ranks **1st** among the 37 lower-middle-income economies.



> India ranks **1st** among the 10 economies in Central and Southern Asia.



> India GI Ranking (2020-2023)

The table shows the rankings of India over the past four years. Data availability and changes to the GI model framework influence year-on-year comparisons of the GI rankings. The statistical confidence interval for the ranking of India in the GI 2023 is between ranks 37 and 43.

	GII Position	Innovation Inputs	Innovation Outputs
2020	48th	57th	45th
2021	46th	57th	45th
2022	40th	42nd	39th
2023	40th	46th	35th

India performs better in innovation outputs than innovation inputs in 2023.

This year India ranks **46th** in innovation inputs. This position is lower than last year.

India ranks **35th** in innovation outputs. This position is higher than last year.

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→ Expected vs. observed innovation performance

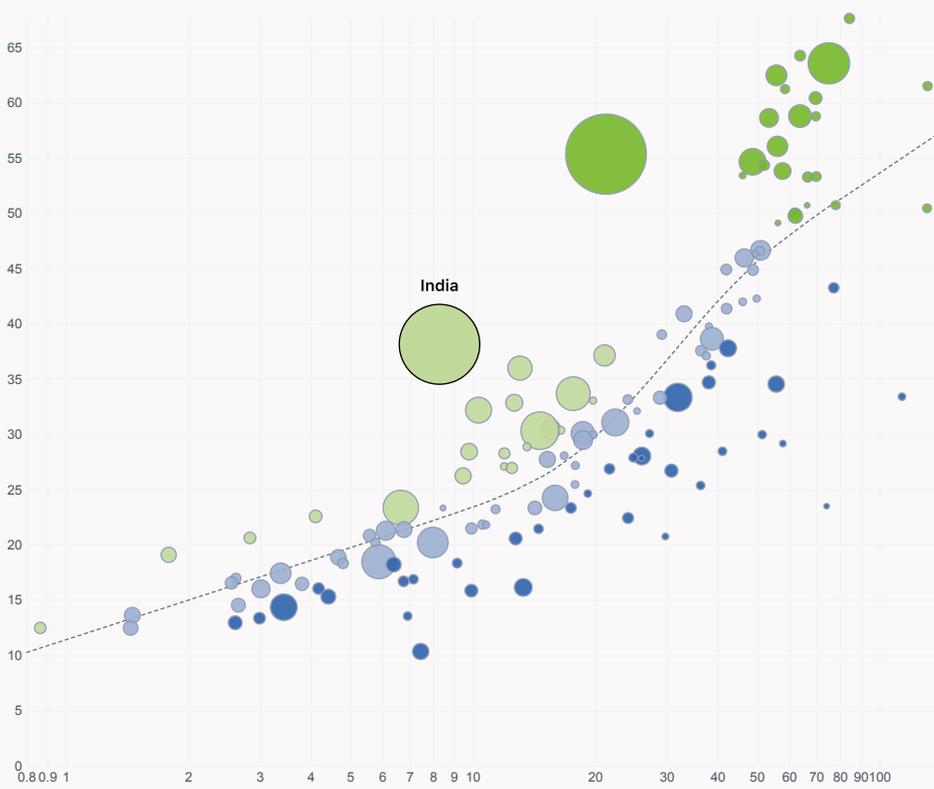
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.



> Relative to GDP, India is performing above expectations for its level of development.

> Innovation overperformers relative to their economic development

↑ **GII Score**



- Innovation leader
- Performing above expectations for level of development
- Performing at expectations for level of development
- Performing below expectations for level of development

Size legend (Population)



→ GDP per capita, PPP logarithmic scale (thousands of \$)

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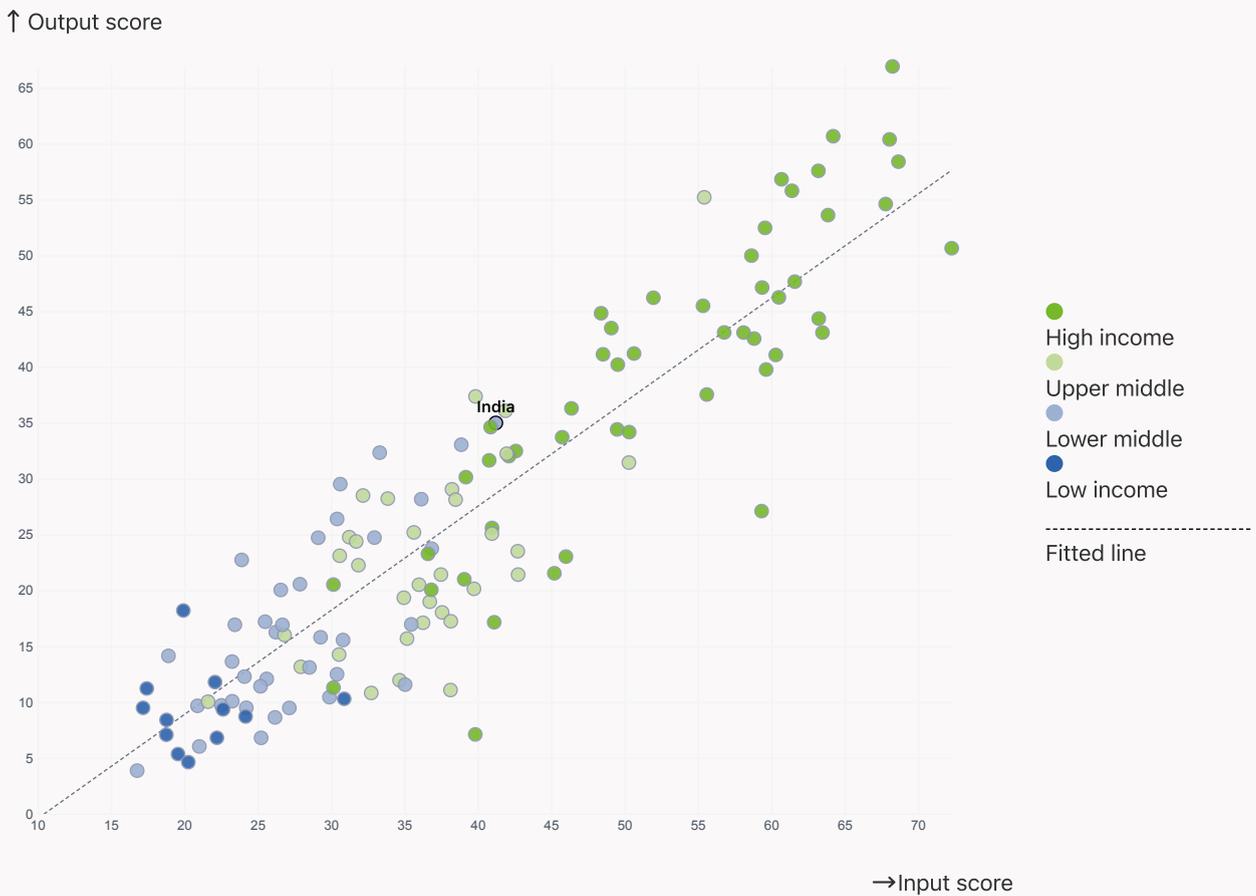
→ Effectively translating innovation investments into innovation outputs

The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

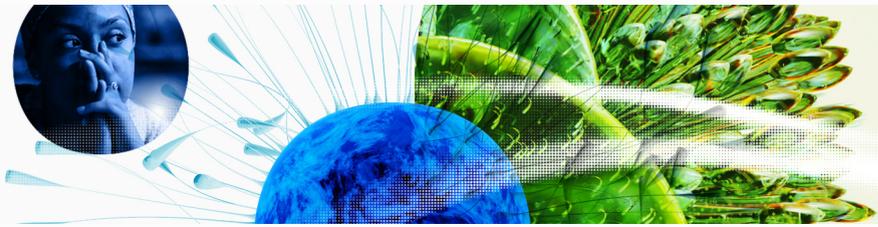


> India produces more innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

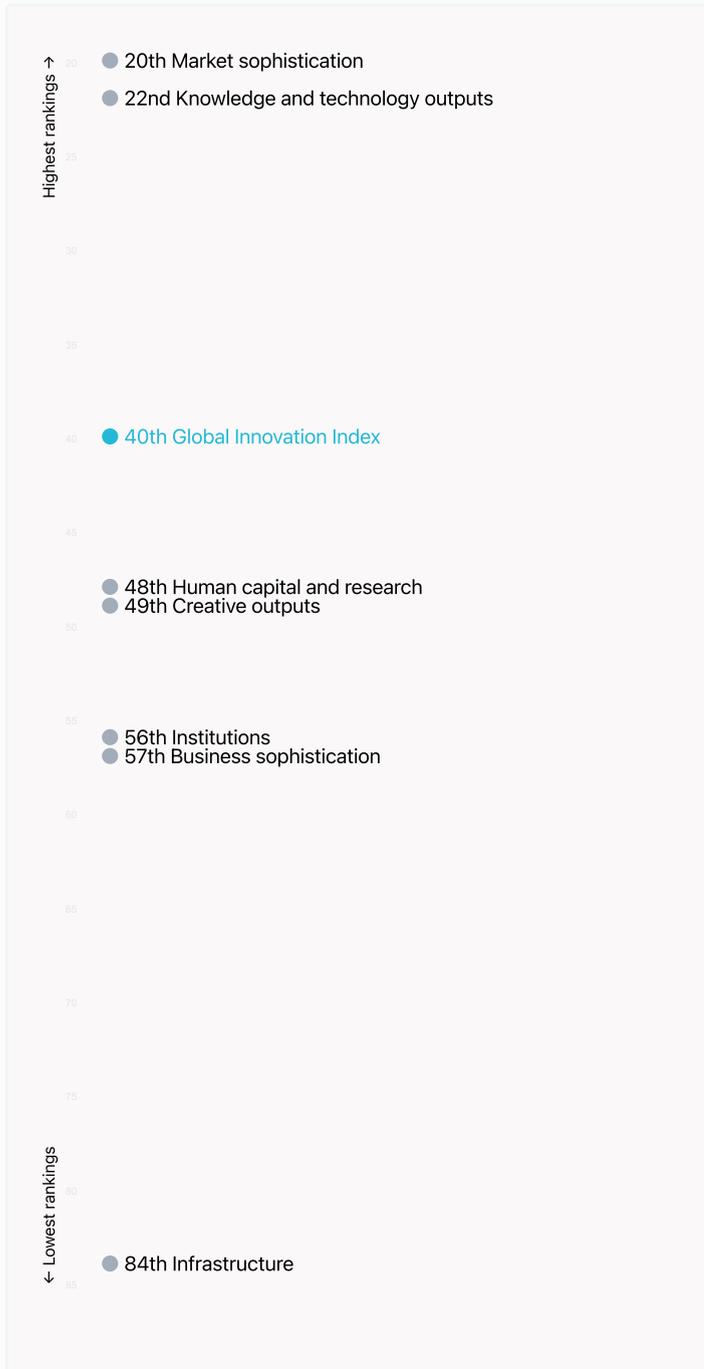


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→ Overview of India's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for India are those that rank above the GII (shown in blue) and the weakest are those that rank below.



> Highest rankings



India ranks highest in Market sophistication (20th) and Knowledge and technology outputs (22nd).

> Lowest rankings



India ranks lowest in Infrastructure (84th), Business sophistication (57th) and Institutions (56th).



The full WIPO Intellectual Property Statistics profile for India can be found on [this link](#).

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→ Benchmark of India against other country groupings for each of the seven areas of the GII Index

The charts show the relative position of India (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

> Lower-Middle-Income economies

India performs above the lower-middle-income group average in all the pillars.

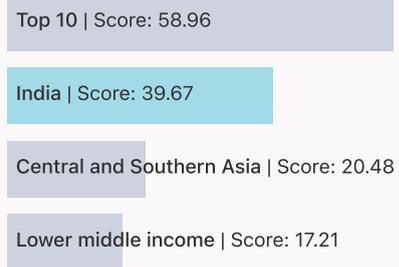


> Central And Southern Asia

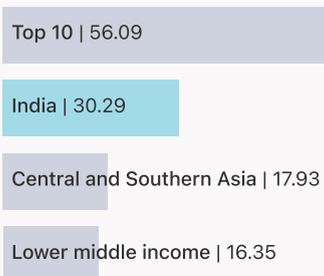
India performs above the regional average in all the pillars.



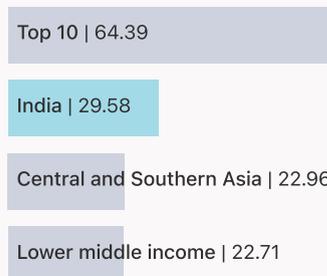
Knowledge and technology outputs



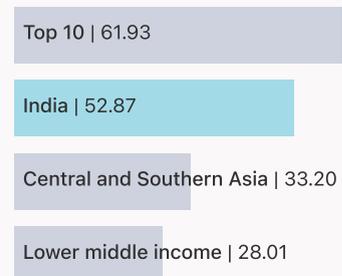
Creative outputs



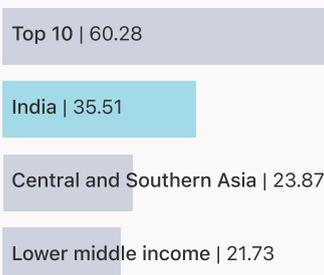
Business sophistication



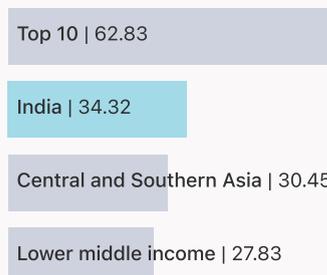
Market sophistication



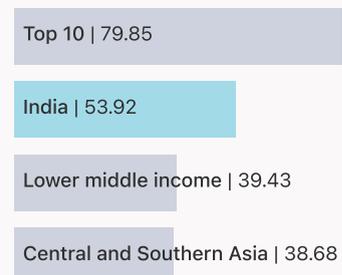
Human capital and research



Infrastructure



Institutions



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→ Innovation strengths and weaknesses in India

The table below gives an overview of the indicator strengths and weaknesses of India in the GII 2023.



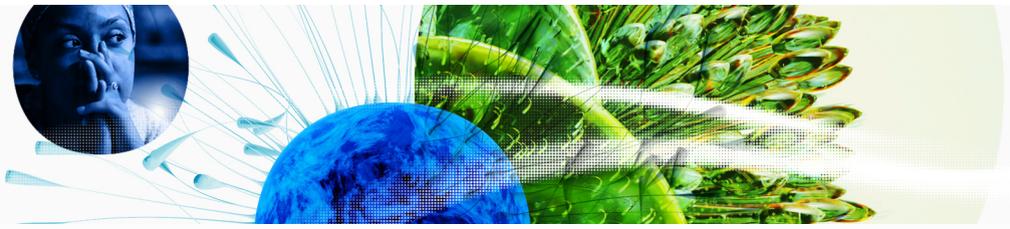
> India's main innovation strengths are **Domestic market scale, bn PPP\$ (rank 1)**, **ICT services exports, % total trade (rank 5)** and **VC received, value, % GDP (rank 6)**.

Strengths

Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
1	4.3.3	Domestic market scale, bn PPP\$	131	3.3.2	Environmental performance
5	6.3.4	ICT services exports, % total trade	110	2.2.3	Tertiary inbound mobility, %
6	4.2.4	VC received, value, % GDP	106	5.1.5	Females employed w/advanced degrees, %
8	7.1.1	Intangible asset intensity, top 15, %	103	3.1.2	ICT use
9	4.1.1	Finance for startups and scaleups	101	3.1.1	ICT access
9	6.2.2	Unicorn valuation, % GDP	101	2.1.5	Pupil-teacher ratio, secondary
10	4.3.2	Domestic industry diversification	99	5.1.1	Knowledge-intensive employment, %
11	2.2.2	Graduates in science and engineering, %	86	2.1.3	School life expectancy, years
13	2.3.3	Global corporate R&D investors, top 3, mn US\$	81	2.3.1	Researchers, FTE/mn pop.
16	3.2.3	Gross capital formation, % GDP	55	7.2.3	Entertainment and media market/th pop. 15-69

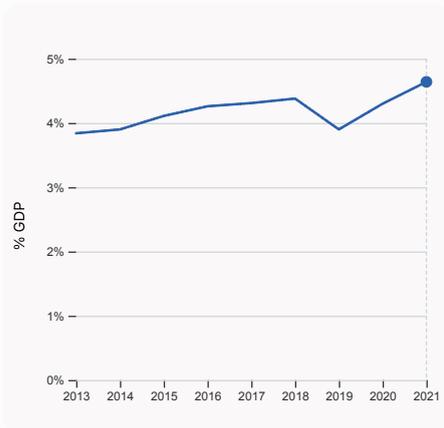
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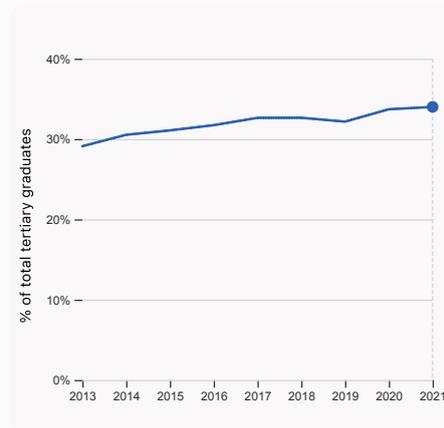
→ India's innovation system

As far as practicable, the plots below present unscaled indicator data.

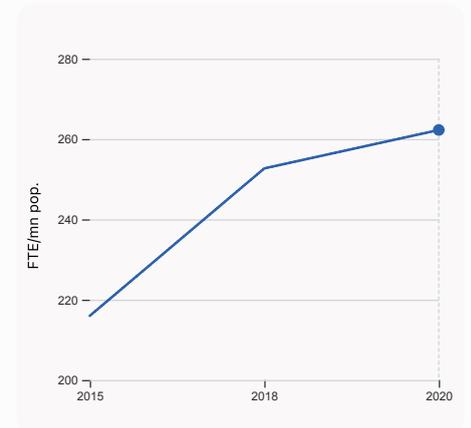
> Innovation inputs in India



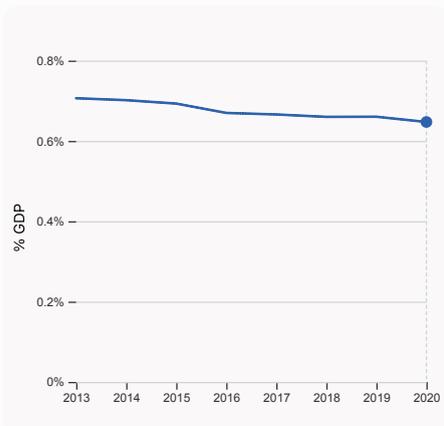
2.1.1 Expenditure on education, % GDP
was equal to 4.64% GDP in 2021, up by 0.34 percentage points from the year prior – and equivalent to an indicator rank of 49.



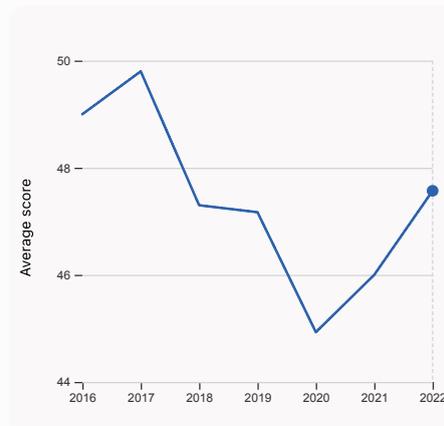
2.2.2 Graduates in science and engineering, %
was equal to 34% of total tertiary graduates in 2021, up by 0.29 percentage points from the year prior – and equivalent to an indicator rank of 11.



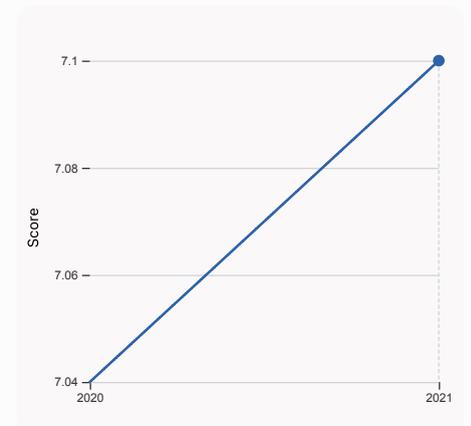
2.3.1 Researchers, FTE/mn pop.
was equal to 262.26 FTE/mn pop. in 2020, up by 3.78% from the year prior – and equivalent to an indicator rank of 81.



2.3.2 Gross expenditure on R&D, % GDP
was equal to 0.647% GDP in 2020, down by 0.013 percentage points from the year prior – and equivalent to an indicator rank of 54.

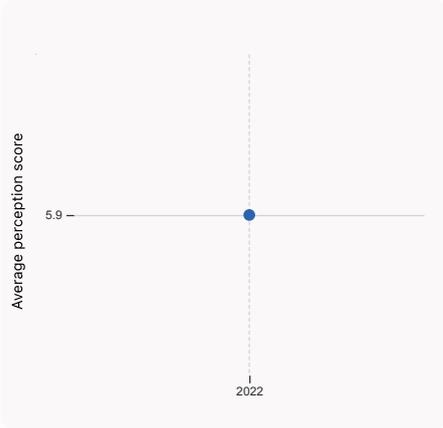


2.3.4 QS university ranking, top 3
was equal to an average score of 47.57 for the top 3 universities in 2022, up by 3.41% from the year prior – and equivalent to an indicator rank of 22.

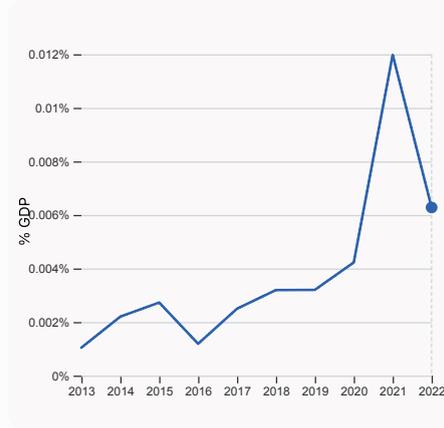


3.1.1 ICT access
was equal to a score of 7.1 in 2021, up by 0.85% from the year prior – and equivalent to an indicator rank of 101.

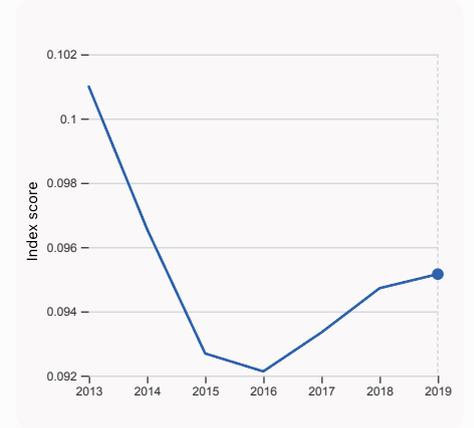
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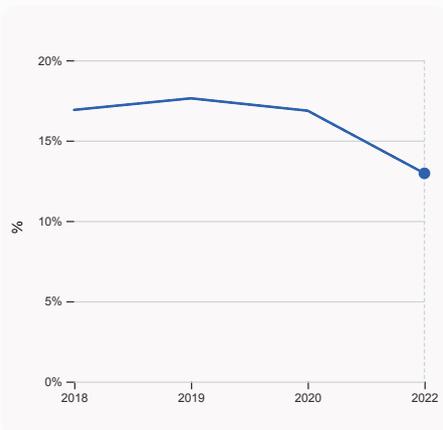
4.1.1 Finance for startups and scaleups was equal to an average perception score of 5.9 in 2022, equivalent to an indicator rank of 9.



4.2.4 VC received, value, % GDP was equal to 0.00628% GDP in 2022, down by 0.0057 percentage points from the year prior – and equivalent to an indicator rank of 6.



4.3.2 Domestic industry diversification was equal to an index score of 0.095 in 2019, up by 0.46% from the year prior – and equivalent to an indicator rank of 10.

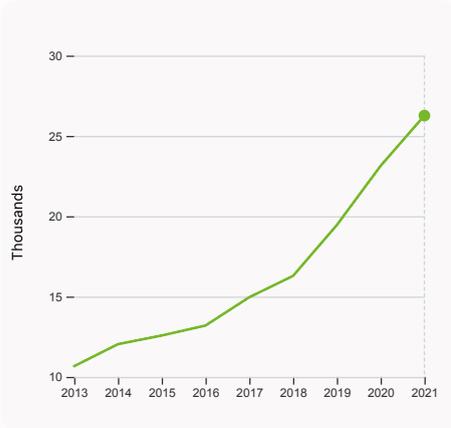


5.1.1 Knowledge-intensive employment, % was equal to 12.96% in 2022, down by 3.9 percentage points from the year prior – and equivalent to an indicator rank of 99.

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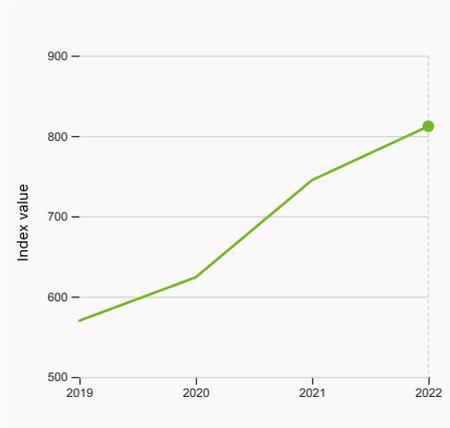


> Innovation outputs in India



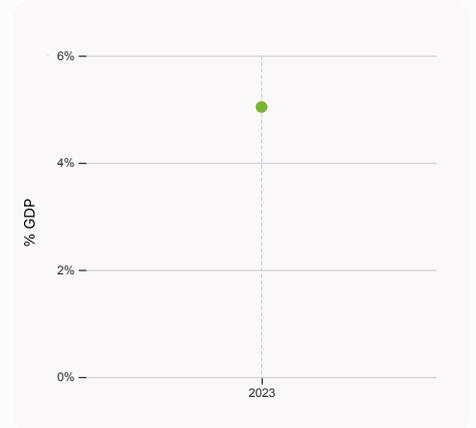
6.1.1 Patents by origin

was equal to 26.27 Thousands in 2021, up by 13.51% from the year prior – and equivalent to an indicator rank of 28.



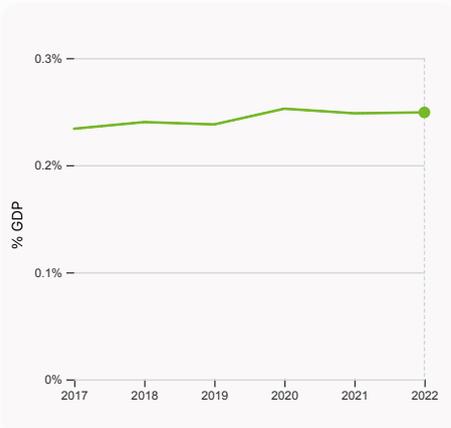
6.1.5 Citable documents H-index

was equal to an index value of 812 in 2022, up by 8.99% from the year prior – and equivalent to an indicator rank of 20.



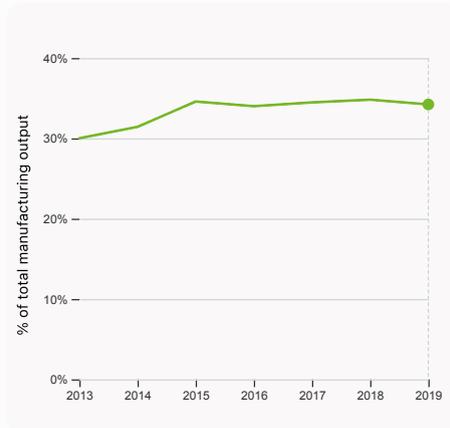
6.2.2 Unicorn valuation, % GDP

was equal to 5.04 % GDP in 2023 – and equivalent to an indicator rank of 9.



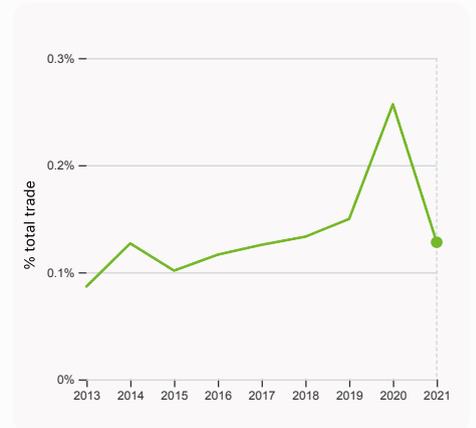
6.2.3 Software spending, % GDP

was equal to 0.249% GDP in 2022, up by 0.00084 percentage points from the year prior – and equivalent to an indicator rank of 56.



6.2.4 High-tech manufacturing, %

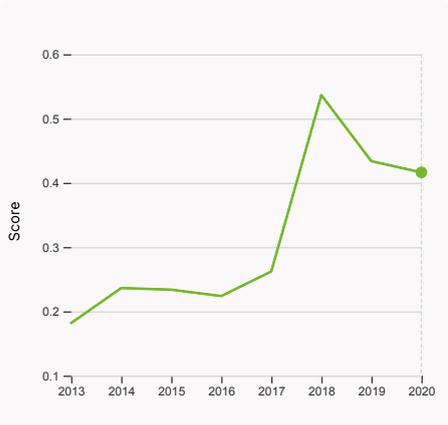
was equal to 34.23% of total manufacturing output in 2019, down by 0.59 percentage points from the year prior – and equivalent to an indicator rank of 35.



6.3.1 Intellectual property receipts, % total trade

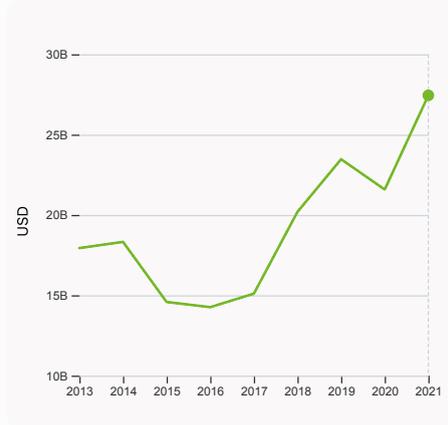
was equal to 0.128% total trade in 2021, down by 0.13 percentage points from the year prior – and equivalent to an indicator rank of 45.

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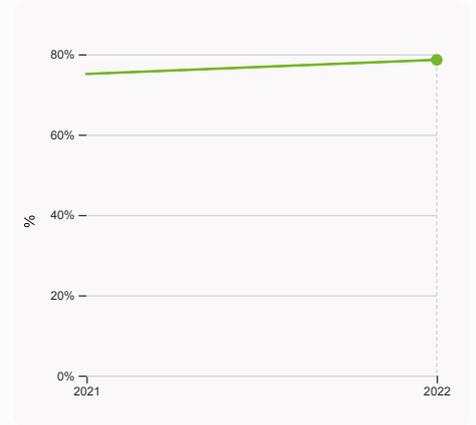
6.3.2 Production and export complexity

was equal to a score of 0.416 in 2020, down by 4.021% from the year prior – and equivalent to an indicator rank of 46.



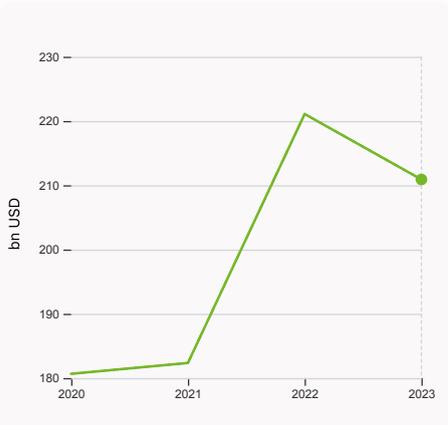
6.3.3 High-tech exports

was equal to 27,446,653,221 USD in 2021, up by 27.17% from the year prior – and equivalent to an indicator rank of 41.



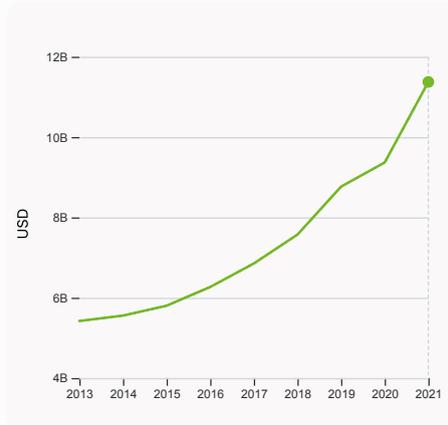
7.1.1 Intangible asset intensity, top 15, %

was equal to 78.63% in 2022, up by 3.52 percentage points from the year prior – and equivalent to an indicator rank of 8.



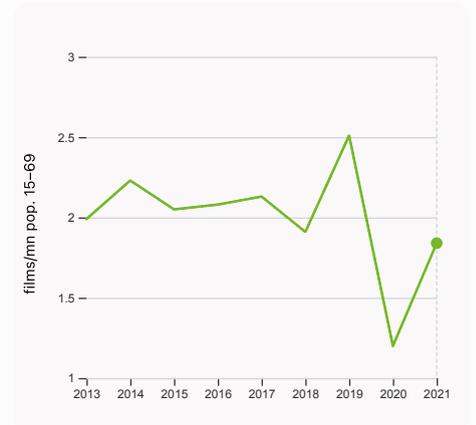
7.1.3 Global brand value, top 5,000

was equal to 210.907 bn USD in 2023, down by 4.61% from the year prior – and equivalent to an indicator rank of 31.



7.2.1 Cultural and creative services exports

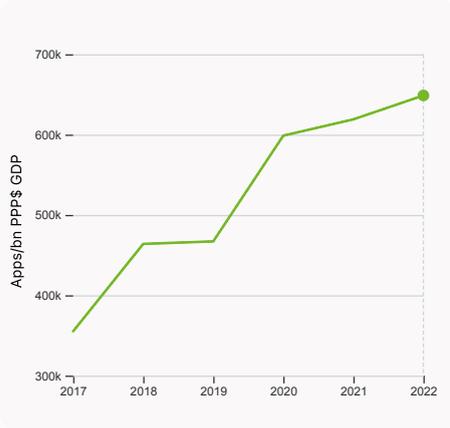
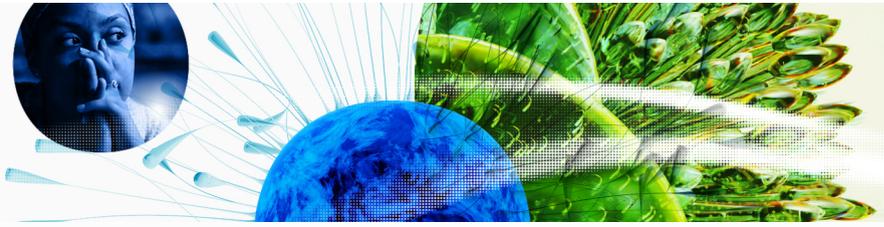
was equal to 11,373,312,000 USD in 2021, up by 21.4% from the year prior – and equivalent to an indicator rank of 18.



7.2.2 National feature films/mn pop. 15-69

was equal to 1.84 films/mn pop. 15-69 in 2021, up by 53.33% from the year prior – and equivalent to an indicator rank of 49.

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7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 648,780.24 Apps/bn PPP\$ GDP in 2022, up by 4.8% from the year prior – and equivalent to an indicator rank of 36.

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→ India's innovation top performers

> 2.3.3 Global corporate R&D investors from India

Rank	Firm	Industry	R&D [mn EUR]	R&D Growth [%]	R&D Intensity [%]
58	TATA MOTORS	Automobiles & Parts	3,067	47	9
663	SUN PHARMACEUTICAL INDUSTRIES	Pharmaceuticals & Biotechnology	248	9	5
812	AUROBINDO PHARMA	Pharmaceuticals & Biotechnology	196	5	7
816	DR REDDY'S LABORATORIES	Pharmaceuticals & Biotechnology	195	6	8

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2022-eu-industrial-rd-investment-scoreboard>).

Note: European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually.

> 2.3.4 QS university ranking of India's top universities

Rank	University	Score
155	INDIAN INSTITUTE OF SCIENCE	49.50
172	INDIAN INSTITUTE OF TECHNOLOGY BOMBAY (IITB)	46.70
174	INDIAN INSTITUTE OF TECHNOLOGY DELHI (IITD)	46.50

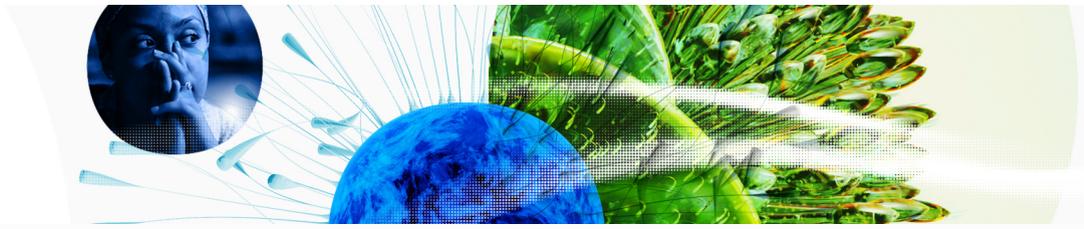
Source: QS Quacquarelli Symonds Ltd (<https://www.topuniversities.com/university-rankings/world-university-rankings/2023>).

Note: QS Quacquarelli Symonds Ltd annually assesses over 1,200 universities across the globe and scores them between [0,100]. Ranks can represent a single value "x", a tie "x=" or a range "x-y".

> 6.2.2 Top Unicorn Companies in India

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	BYJU'S	Edtech	Bengaluru	12
2	OYO ROOMS	Travel	Gurugram	9
3	SWIGGY	Supply chain, logistics, & delivery	Bengaluru	8

Source: CBInsights, Tracker – The Complete List of Unicorn Companies: <https://www.cbinsights.com/research-unicorn-companies>



> 7.1.1 Top 15 intangible-asset intensive companies in India

Rank	Firm	Intensity, %
1	RELIANCE INDUSTRIES LTD	55.31
2	TATA CONSULTANCY SERVICES LTD	88.51
3	HDFC BANK LTD	64.10

Source: Brand Finance (<https://brandirectory.com/reports/gifit-2022>).
Note: Brand Finance only provides within economy ranks.

> 7.1.3 Top 5,000 companies in India with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	TATA GROUP	Engineering & Construction	26,380.8
2	INFOSYS	IT Services	13,009.9
3	LIC	Insurance	9,755.6

Source: Brand Finance (<https://brandirectory.com>).
Note: Rank corresponds to within economy ranks.

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GII 2023 rank

40

India

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
35	46	Lower middle	CSA	1417.2	11,665.5	8,293.2
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 n/a n/a		
2.3.3 Global corporate R&D investors, top 3, mn US\$ 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 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, ● indicates that the economy's data are older than the base year; see appendices for details, including the year of the data, at <https://www.wipo.int/gii-ranking>. Square brackets [] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.



→ Data availability

The following tables list indicators that are either missing or outdated for India.



> India has missing data for three indicators and outdated data for seven indicators.

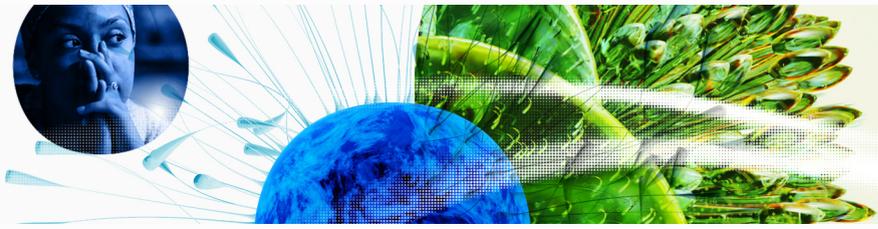
> Missing data for India

Code	Indicator name	Economy Year	Model Year	Source
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
5.2.3	GERD financed by abroad, % GDP	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund

> Outdated data for India

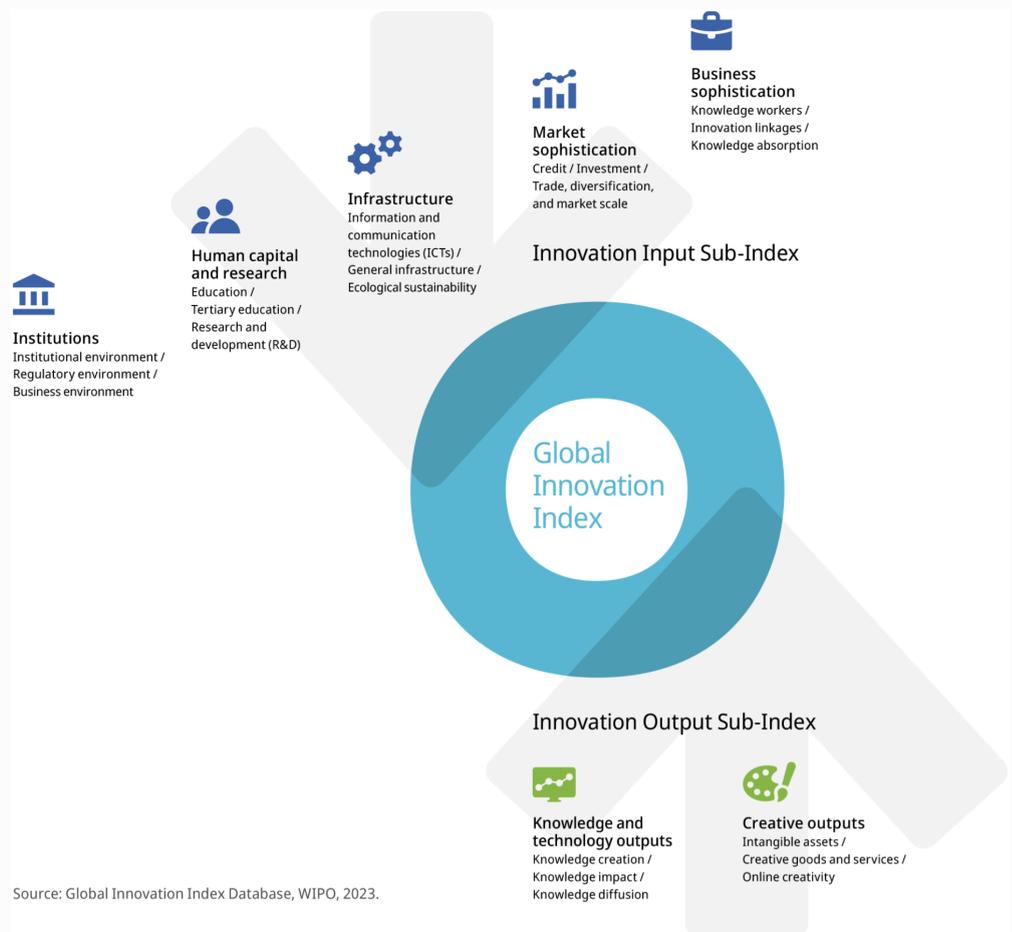
Code	Indicator name	Economy Year	Model Year	Source
2.3.1	Researchers, FTE/mn pop.	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
4.3.2	Domestic industry diversification	2019	2020	United Nations Industrial Development Organization
5.1.2	Firms offering formal training, %	2014	2019	World Bank Enterprise Surveys
5.1.3	GERD performed by business, % GDP	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.2.4	High-tech manufacturing, %	2019	2020	United Nations Industrial Development Organization

Global Innovation Index 2023



→ About the Global Innovation Index

- The Global Innovation Index (GII) is published by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations.
- Recognizing that innovation is a key driver of economic development, the GII aims to provide an innovation ranking and rich analysis referencing around 130 economies. Over the last decade, the GII has established itself as both a leading reference on innovation and a “tool for action” for economies that incorporate the GII into their innovation agendas.



The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that include institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption and diffusion of knowledge; and creative outputs.

The GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each consisting of three sub-pillars.