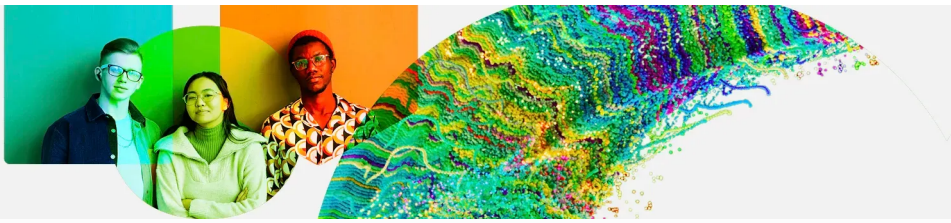
Global Innovation Index 2024



Pakistan ranking in the Global Innovation Index 2024

Pakistan ranks 91st among the 133 economies featured in the GII 2024.

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 GII aims to capture the multi-dimensional facets of innovation.

Pakistan ranks 14th among the 38 lower-middle-income group economies.

Pakistan ranks 6th among the 10 economies in Central and Southern Asia.

Pakistan GII Ranking (2020-2024)

The table shows the rankings of Pakistan over the past four years. Data availability and changes to the GII model framework influence year-on-year comparisons of the GII rankings. The statistical confidence interval for the ranking of Pakistan in the GII 2024 is between ranks 85 and 99.

Year	GII Position	Innovation Inputs	Innovation Outputs
2020	107th	118th	88th
2021	99th	117th	77th
2022	87th	111st	69th
2023	88th	113rd	68th
2024	91st	116th	70th

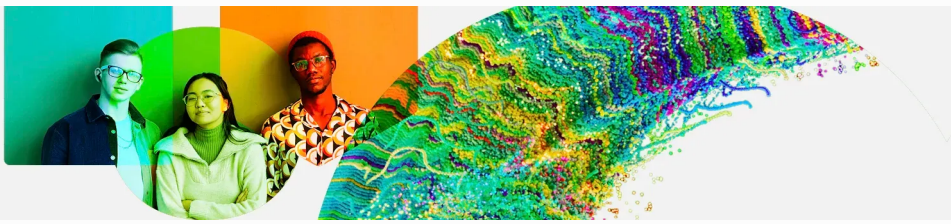
Pakistan performs better in innovation outputs than innovation inputs in 2024.

This year **Pakistan ranks 116th in innovation inputs.** This position is lower than last year.

Pakistan ranks 70th in innovation outputs. This position is lower than last year.

Pakistan has no clusters in the top 100 S&T clusters of the Global Innovation Index.

Global Innovation Index 2024



> Global Innovation Tracker

The Global Innovation Tracker 2024 shows what is the current state of innovation in Pakistan, how rapidly is technology being embraced and what are the resulting societal impacts.

For Pakistan, 4 indicators have improved in the short-term and 6 indicators have worsened.

Science and innovation investment

Scientific publications	R&D investments	Venture capital		International patent filings
		Deal numbers	Deal values	
▼ -7.6% 2022 - 2023	▼ -0.5% 2019 - 2021	▼ -50% 2022 - 2023	▼ -86.9% 2022 - 2023	▲ 150% 2022 - 2023
▲ 13.9% 2013 - 2023	▼ -2.9% 2011 - 2021	▲ 24.1% 2013 - 2023	▲ 57.9% 2013 - 2023	▲ 17.5% 2013 - 2023

Technology adoption

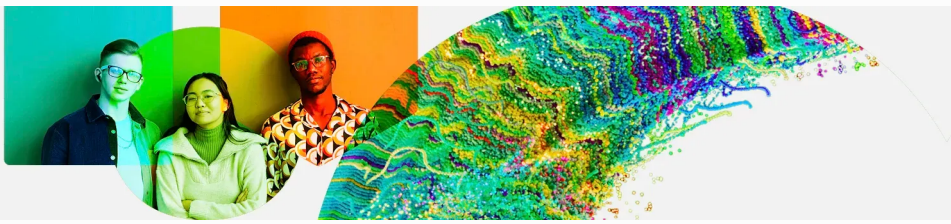
Safe sanitation	Connectivity		Robots	Electric vehicles
	Fixed broadband	5G		
n/a	▲ 4.1% 2021 - 2022	n/a	▲ 12.6% 2021 - 2022	n/a
n/a	▲ 5.9% 2012 - 2022		n/a	n/a
n/a	1.3 per 100 inhabitants in 2022	n/a		n/a

Socioeconomic impact

Labor productivity	Life expectancy	Temperature change
▼ -1.6% 2022 - 2023	▲ 0.5% 2021 - 2022	▲ 1.4°C 2023
▲ 1% 2013 - 2023	▲ 0.3% 2012 - 2022	n/a
20,328 USD in 2023	66.4 years in 2022	

Notes: Not all indicators of the Global Innovation Tracker are used to calculate the Global Innovation Index. Long-term annual growth refers to the compound annual growth rate (CAGR) over the indicated period. For each variable, a one-year growth rate is set for the short run, and ten-year CAGR is set for the long run; time windows might differ when gaps exist in data availability. The end period corresponds to the most recent available observation, which may differ among countries. Temperature change is an exception: it indicates the change in degrees Celsius with respect to the average temperature in the country from 1951–1980. Figures are rounded.

Global Innovation Index 2024



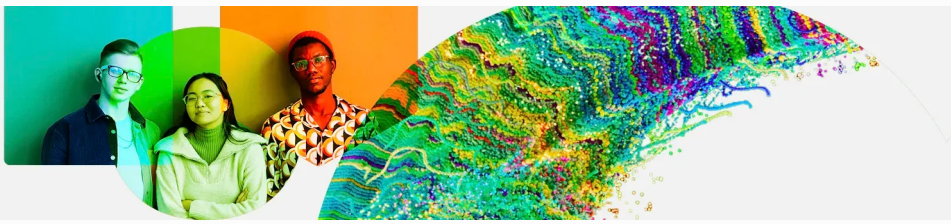
Expected vs. observed innovation performance

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, Pakistan is performing above expectations for its level of development.

> Innovation overperformers relative to their economic development

Global Innovation Index 2024

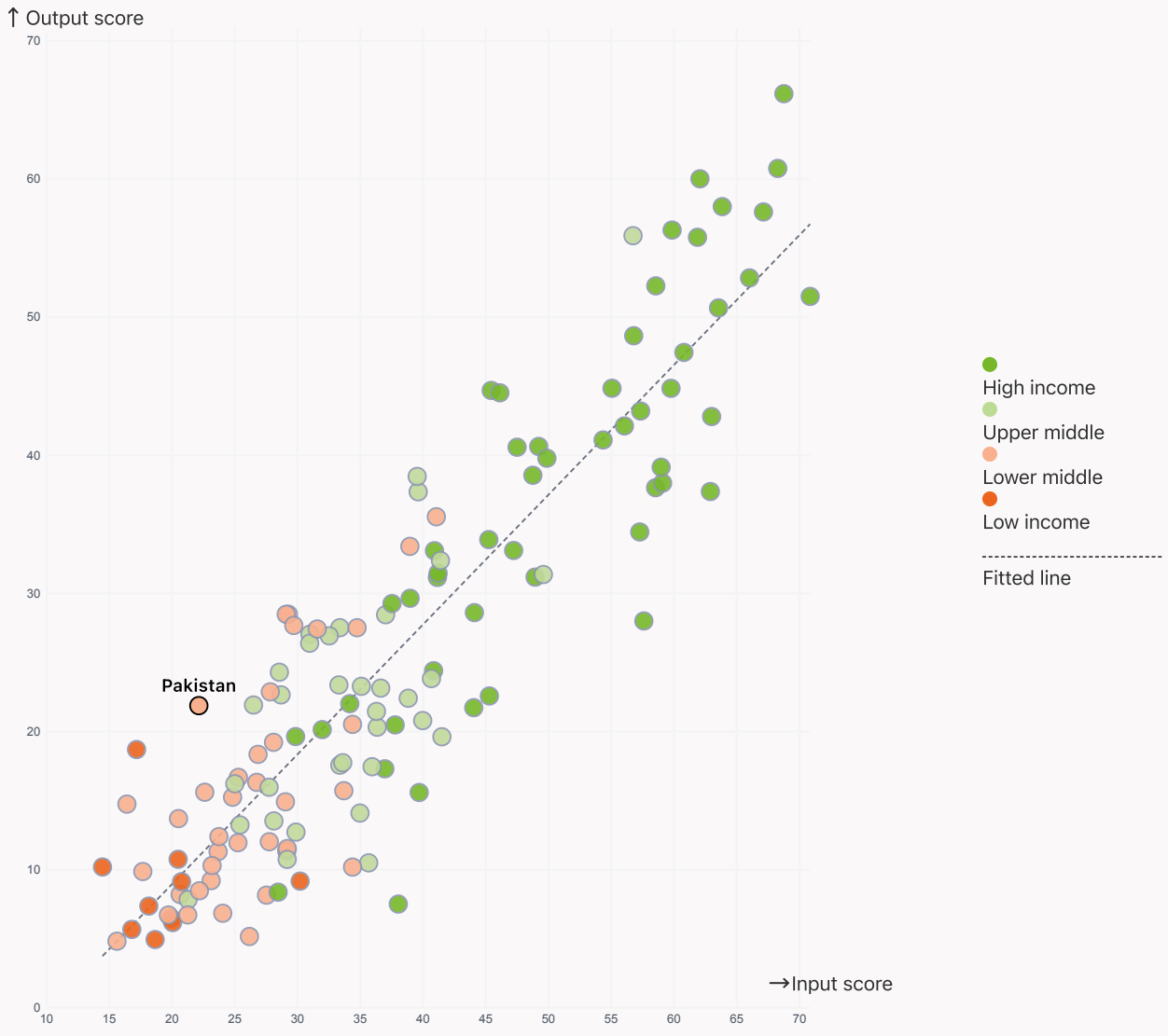


Effectively translating innovation investments into innovation outputs

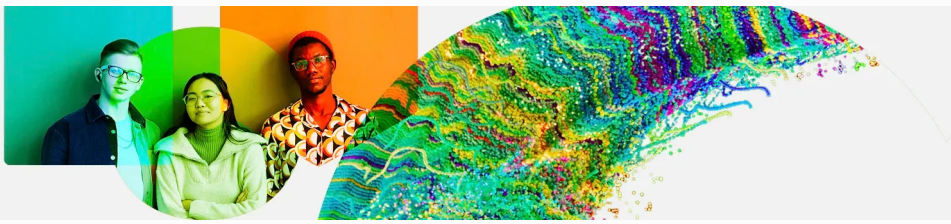
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

Pakistan produces more innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

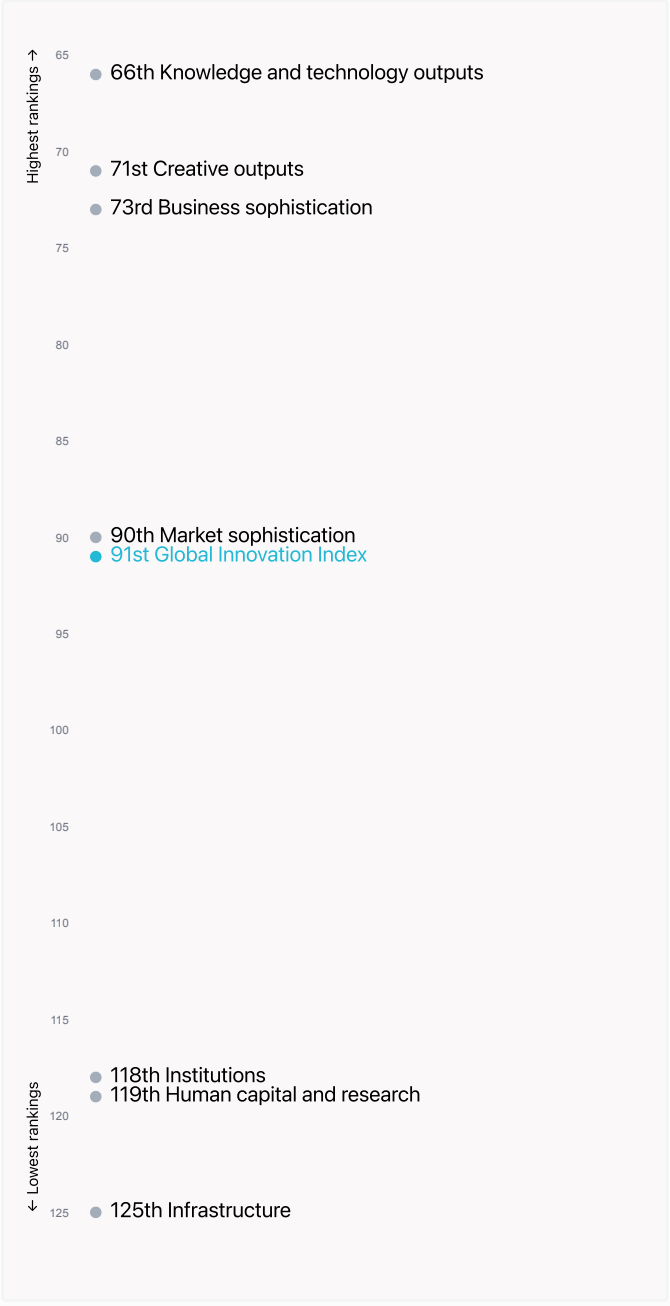


Global Innovation Index 2024



Overview of Pakistan's rankings in the seven areas of the GII in 2024

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



Highest rankings

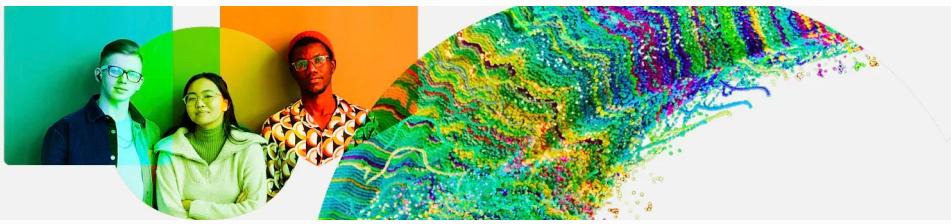
Pakistan ranks highest in Knowledge and technology outputs (66th), Creative outputs (71st), Business sophistication (73rd) and Market sophistication (90th).

Lowest rankings

Pakistan ranks lowest in Infrastructure (125th), Human capital and research (119th) and Institutions (118th).

The full WIPO Intellectual Property Statistics profile for Pakistan can be found on this link.

Global Innovation Index 2024



Benchmark of Pakistan against other economy groupings for each of the seven areas of the GII Index

The charts shows the relative position of Pakistan (blue bar) against other economy groupings (grey bars), for each of the seven areas of the GII Index.

Lower-Middle-Income economies

Pakistan performs above the lower-middle-income group average in Business sophistication, Knowledge and technology outputs, Creative outputs.

Central And Southern Asia

Pakistan performs above the regional average in Business sophistication, Knowledge and technology outputs, Creative outputs.

Institutions

- Top 10 | Score: 80.81
- Lower middle income | Score: 34.0
- Central and Southern Asia | Score:
- Pakistan | Score: 25.27

Human capital and research

- Top 10 | Score: 61.30
- Central and Southern Asia | Score:
- Lower middle income | Score: 22.1
- Pakistan | Score: 15.42

Infrastructure

- Top 10 | Score: 58.57
- Central and Southern Asia | Score:
- Lower middle income | Score: 29.8
- Pakistan | Score: 21.11

Market sophistication

- Top 10 | Score: 62.12
- Central and Southern Asia | Score:
- Lower middle income | Score: 25.9
- Pakistan | Score: 24.34

Business sophistication

- Top 10 | Score: 63.64
- Pakistan | Score: 24.87
- Central and Southern Asia | Score:
- Lower middle income | Score: 20.8

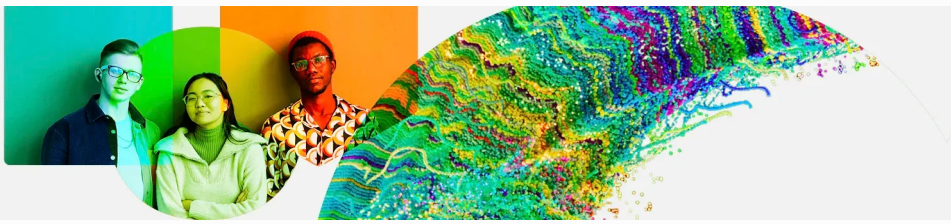
Knowledge and technology outputs

- Top 10 | Score: 57.29
- Pakistan | Score: 21.04
- Central and Southern Asia | Score:
- Lower middle income | Score: 15.6

Creative outputs

- Top 10 | Score: 56.54
- Pakistan | Score: 22.59
- Central and Southern Asia | Score:
- Lower middle income | Score: 15.7

Global Innovation Index 2024



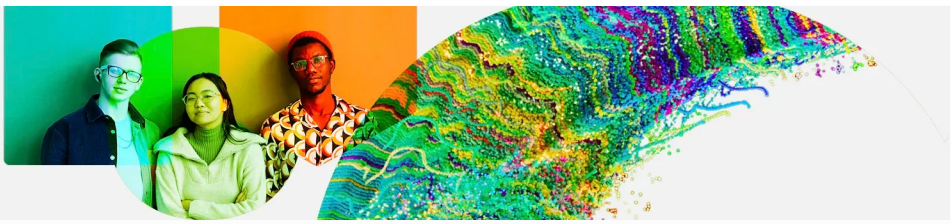
Innovation strengths and weaknesses in Pakistan

The table below gives an overview of the indicator strengths and weaknesses of Pakistan in the GII 2024.

Pakistan's main innovation strengths are **High-tech imports, % total trade** (rank 13), **Mobile app creation/bn PPP$ GDP** (rank 14) and **ICT services exports, % total trade** (rank 22).

Strengths			Weaknesses		
Rank	Code	Indicator name	Rank	Code	Indicator name
13	5.3.2	High-tech imports, % total trade	125	1.1.1	Operational stability for businesses*
14	7.3.3	Mobile app creation/bn PPP$ GDP	124	3.2.3	Gross capital formation, % GDP
22	6.3.4	ICT services exports, % total trade	123	2.1.1	Expenditure on education, % GDP
23	4.3.3	Domestic market scale, bn PPP$	121	4.1.2	Domestic credit to private sector, % GDP
24	6.2.3	Software spending, % GDP	111	2.1.3	School life expectancy, years
41	2.1.5	Pupil–teacher ratio, secondary	82	7.2.2	National feature films/mn pop. 15–69
42	6.1.5	Citable documents H-index	79	1.3.2	Entrepreneurship policies and culture+
43	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	62	7.2.3	Entertainment and media market/th pop. 15–69
44	2.3.4	QS university ranking, top 3*	49	6.2.2	Unicorn valuation, % GDP
44	6.1.4	Scientific and technical articles/bn PPP$ GDP	41	2.3.3	Global corporate R&D investors, top 3, mn USD

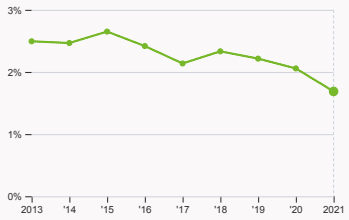
Global Innovation Index 2024



Pakistan's innovation system

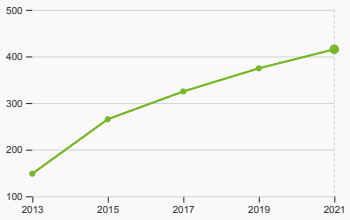
As far as practicable, the plots below present unscaled indicator data.

Innovation inputs in Pakistan



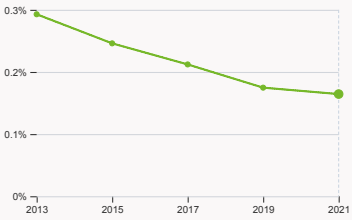
2.1.1 **Expenditure on education**

was equal to 1.69 % GDP in 2021, down by 0.37 percentage points from the year prior – and equivalent to an indicator rank of 123.



2.3.1 **Researchers**

was equal to 415.3 FTE per million population in 2021, up by 10.92% from the year prior – and equivalent to an indicator rank of 76.



2.3.2 **Gross expenditure on R&D**

was equal to 0.16 % GDP in 2021, down by 0.01 percentage points from the year prior – and equivalent to an indicator rank of 91.

2.3.4 **QS university ranking**

was equal to an average score of 28.47 for the top three universities in 2023, down by 6.44% from the year prior – and equivalent to an indicator rank of 44.

4.2.4 **VC received, value**

was equal to 40.36 thousand USD in 2023, down by 86.91% from the year prior – and equivalent to an indicator rank of 60.

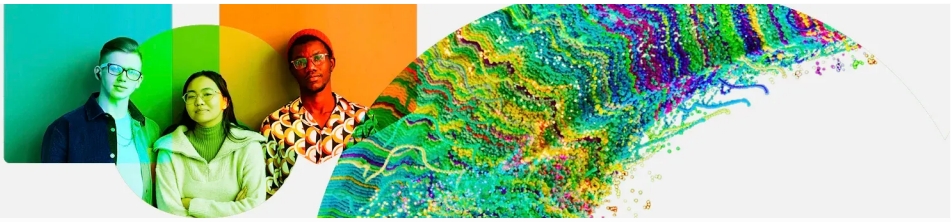
4.3.2 **Domestic industry diversification**

was equal to an index score of 0.13 in 2016 – and equivalent to an indicator rank of 45.

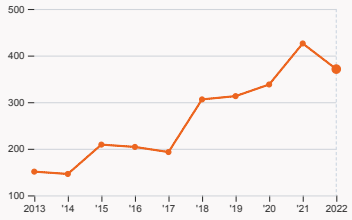
5.1.1 **Knowledge-intensive employment**

was equal to 11.44 % in 2021, down by 0.35 percentage points from the year prior – and equivalent to an indicator rank of 104.

Global Innovation Index 2024

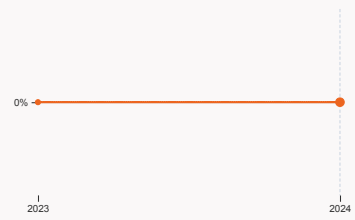


Innovation outputs in Pakistan



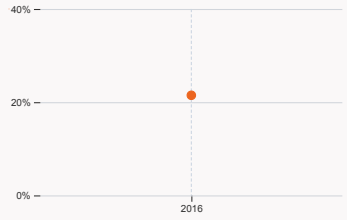
6.1.1 Patents by origin

was equal to 371 patents in 2022, down by 12.91% from the year prior – and equivalent to an indicator rank of 92.



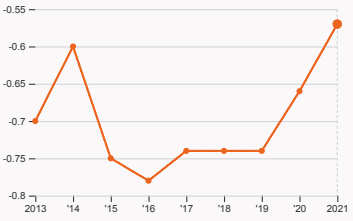
6.2.2 Unicorn valuation

was equal to 0 % GDP in 2024 with no change from the year prior – and equivalent to an indicator rank of 49.



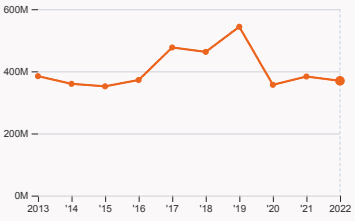
6.2.4 High-tech manufacturing

was equal to 21.48 % of total manufacturing output in 2016 – and equivalent to an indicator rank of 57.



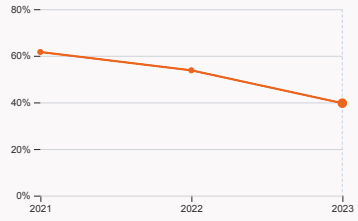
6.3.2 Production and export complexity

was equal to a score of -0.57 in 2021, up by 13.64% from the year prior – and equivalent to an indicator rank of 92.



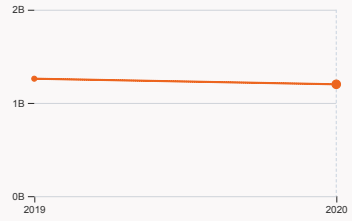
6.3.3 High-tech exports

was equal to 369.44 million USD in 2022, down by 3.6% from the year prior – and equivalent to an indicator rank of 88.



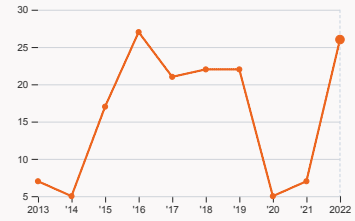
7.1.1 Intangible asset intensity

was equal to 39.67 % for the top 15 companies in 2023, down by 14.09 percentage points from the year prior – and equivalent to an indicator rank of 61.



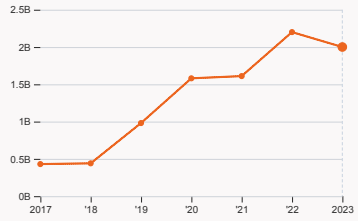
7.1.3 Global brand value

was equal to 1.2 billion USD for the brands in the top 5,000 in 2020, down by 4.76% from the year prior – and equivalent to an indicator rank of NA.



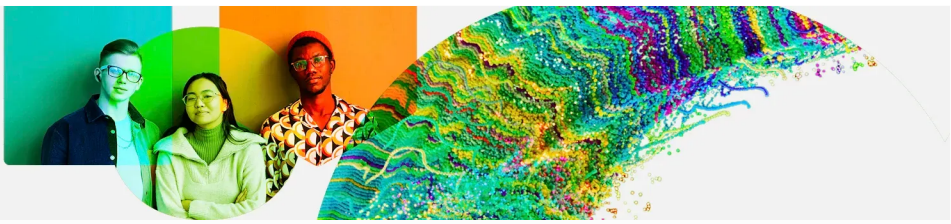
7.2.2 National feature films

was equal to 26 films in 2022, up by 271.43% from the year prior – and equivalent to an indicator rank of 82.



7.3.3 Mobile app creation

was equal to 2 billion global downloads of mobile apps in 2023, down by 9.09% from the year prior – and equivalent to an indicator rank of 14.



Pakistan's innovation top performers

2.3.4 QS university ranking of Pakistan's top universities

Rank	University	Score
315	QUAID-I-AZAM UNIVERSITY	33.40
367	NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY (NUST) ISLAMABAD	30.20
540	LAHORE UNIVERSITY OF MANAGEMENT SCIENCES (LUMS)	21.80

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".

7.1.1 Top 15 intangible-asset intensive companies in Pakistan

Rank	Firm	Intensity, %
1	SYSTEMS LIMITED	81.75
2	MEEZAN BANK LIMITED	27.72
3	MILLAT TRACTORS LIMITED	78.02

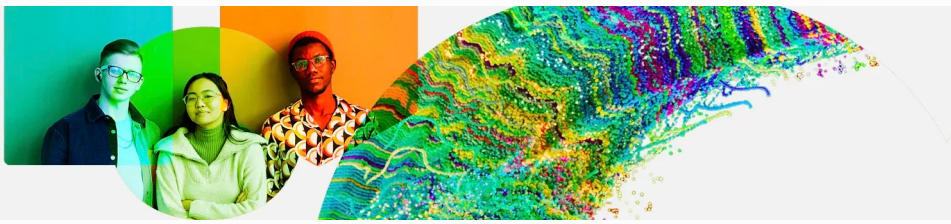
Source: Brand Finance (https://brandirectory.com/reports/gift-2022).
Note: Brand Finance only provides within economy ranks.

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

Rank	Brand	Industry	Brand Value, mn USD
1	HBL	Banking	257.1
2	JAZZ (MOBILINK)	Telecoms	228.8

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

Global Innovation Index 2024



Pakistan

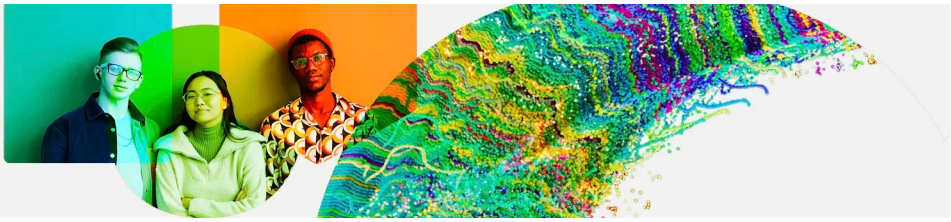
GII 2024 rank **91**

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
70	116	Lower middle	CSA	247.5	1,568.4	6,773.6

	Score / Value	Rank	
Institutions	**25.3**	**118**	
1.1 Institutional environment	**25.8**	**122**	
1.1.1 Operational stability for businesses*	24	125	○ ◇
1.1.2 Government effectiveness*	27.7	106	
1.2 Regulatory environment	**21.6**	**111**	
1.2.1 Regulatory quality*	18.6	116	
1.2.2 Rule of law*	24.6	107	
1.3 Business environment	**28.4**	**104**	
1.3.1 Policy stability for doing business†	48.2	67	
1.3.2 Entrepreneurship policies and culture†	8.6	79	○ ◇
Human capital and research	**15.4**	**119**	
2.1 Education	**31.1**	**119**	
2.1.1 Expenditure on education, % GDP	1.7	123	○ ◇
2.1.2 Government funding/pupil, secondary, % GDP/cap	17.1	62	
2.1.3 School life expectancy, years	7.6	111	○ ◇
2.1.4 PISA scales in reading, maths and science	n/a	n/a	
2.1.5 Pupil–teacher ratio, secondary	11.1	41	● ◆
2.2 Tertiary education	**6.3**	**[121]**	
2.2.1 Tertiary enrolment, % gross	13.4	111	
2.2.2 Graduates in science and engineering, %	n/a	n/a	
2.2.3 Tertiary inbound mobility, %	n/a	n/a	
2.3 Research and development (R&D)	**8.9**	**62**	
2.3.1 Researchers, FTE/mn pop.	415.3	76	
2.3.2 Gross expenditure on R&D, % GDP	0.2	91	
2.3.3 Global corporate R&D investors, top 3, mn USD	0	41	○ ◇
2.3.4 QS university ranking, top 3*	28.8	44	● ◆
Infrastructure	**21.1**	**125**	○ ◇
3.1 Information and communication technologies (ICTs)	**46.2**	**105**	
3.1.1 ICT access*	36.3	119	◇
3.1.2 ICT use*	61.7	97	
3.1.3 Government's online service*	52	88	
3.1.4 E-participation*	34.9	97	
3.2 General infrastructure	**2.2**	**133**	○ ◇
3.2.1 Electricity output, GWh/mn pop.	673.4	103	
3.2.2 Logistics performance*	n/a	n/a	
3.2.3 Gross capital formation, % GDP	14.5	124	○ ◇
3.3 Ecological sustainability	**14.9**	**92**	
3.3.1 GDP/unit of energy use	10.1	69	
3.3.2 Low-carbon energy use, %	16.4	68	
3.3.3 ISO 14001 environment/bn PPP$ GDP	0.7	84	
Market sophistication	**24.3**	**90**	
4.1 Credit	**13.2**	**102**	
4.1.1 Finance for startups and scaleups†	28.9	69	
4.1.2 Domestic credit to private sector, % GDP	14.8	121	○
4.1.3 Loans from microfinance institutions, % GDP	0.7	37	
4.2 Investment	**5.1**	**77**	
4.2.1 Market capitalization, % GDP	12.3	71	
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	0.02	82	
4.2.3 VC recipients, deals/bn PPP$ GDP	0.03	75	
4.2.4 VC received, value, % GDP	0.0006	60	
4.3 Trade, diversification and market scale	**54.8**	**71**	
4.3.1 Applied tariff rate, weighted avg., %	6.9	111	
4.3.2 Domestic industry diversification	87.3	45	
4.3.3 Domestic market scale, bn PPP$	1,568.4	23	● ◆

	Score / Value	Rank	
Business sophistication	**24.9**	**73**	
5.1 Knowledge workers	**20.2**	**[103]**	
5.1.1 Knowledge-intensive employment, %	11.4	104	
5.1.2 Firms offering formal training, %	32	52	
5.1.3 GERD performed by business, % GDP	n/a	n/a	
5.1.4 GERD financed by business, %	n/a	n/a	
5.1.5 Females employed w/advanced degrees, %	2	111	
5.2 Innovation linkages	**25.1**	**59**	
5.2.1 Public Research-Industry co-publications, %	0.5	120	
5.2.2 University-industry R&D collaboration†	52.6	50	
5.2.3 State of cluster development†	57.3	45	
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.03	43	● ◆
5.2.5 Patent families/bn PPP$ GDP	0.008	96	
5.3 Knowledge absorption	**29.3**	**57**	◆
5.3.1 Intellectual property payments, % total trade	0.4	79	
5.3.2 High-tech imports, % total trade	16.7	13	● ◆
5.3.3 ICT services imports, % total trade	1.1	74	
5.3.4 FDI net inflows, % GDP	0.6	106	
5.3.5 Research talent, % in businesses	n/a	n/a	
Knowledge and technology outputs	**21**	**66**	
6.1 Knowledge creation	**18.8**	**[59]**	
6.1.1 Patents by origin/bn PPP$ GDP	0.2	92	
6.1.2 PCT patents by origin/bn PPP$ GDP	n/a	n/a	
6.1.3 Utility models by origin/bn PPP$ GDP	-	-	
6.1.4 Scientific and technical articles/bn PPP$ GDP	15	44	● ◆
6.1.5 Citable documents H-index	20.2	42	● ◆
6.2 Knowledge impact	**28.9**	**58**	
6.2.1 Labor productivity growth, %	0.7	63	
6.2.2 Unicorn valuation, % GDP	0	49	○ ◇
6.2.3 Software spending, % GDP	0.4	24	● ◆
6.2.4 High-tech manufacturing, %	21.5	57	
6.3 Knowledge diffusion	**15.4**	**76**	
6.3.1 Intellectual property receipts, % total trade	0.02	85	
6.3.2 Production and export complexity	28.7	92	
6.3.3 High-tech exports, % total trade	0.7	88	
6.3.4 ICT services exports, % total trade	4.7	22	● ◆
6.3.5 ISO 9001 quality/bn PPP$ GDP	2.2	88	
Creative outputs	**22.6**	**71**	
7.1 Intangible assets	**31.2**	**59**	
7.1.1 Intangible asset intensity, top 15, %	39.7	61	
7.1.2 Trademarks by origin/bn PPP$ GDP	25.3	74	
7.1.3 Global brand value, top 5,000, % GDP	n/a	n/a	
7.1.4 Industrial designs by origin/bn PPP$ GDP	0.3	93	
7.2 Creative goods and services	**1.5**	**115**	
7.2.1 Cultural and creative services exports, % total trade	0.1	85	
7.2.2 National feature films/mn pop. 15–69	0.2	82	○
7.2.3 Entertainment and media market/th pop. 15–69	0	62	○ ◇
7.2.4 Creative goods exports, % total trade	0.07	105	
7.3 Online creativity	**26.5**	**61**	
7.3.1 Top-level domains (TLDs)/th pop. 15–69	0.3	113	
7.3.2 GitHub commits/mn pop. 15–69	2.2	103	
7.3.3 Mobile app creation/bn PPP$ GDP	77.1	14	● ◆

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question, 🕒 that the economy's data is outdated. Square brackets [ ] indicate the the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level; n/a represents missing values; a dash - indicates an indicator which is not relevant to this economy and thus not considered for DMC thresholds.



Data availability

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

Pakistan has missing data for ten indicators and outdated data for seventeen indicators.

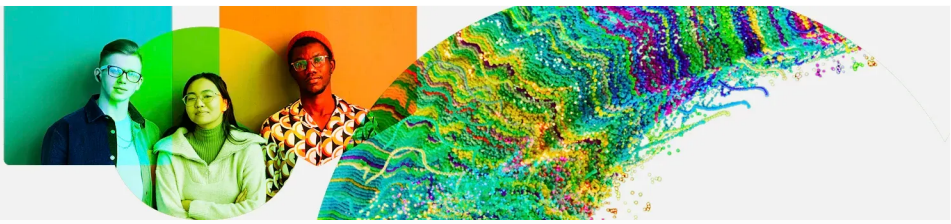
Missing data for Pakistan

Code	Indicator name	Economy Year	Model Year	Source
2.1.4	PISA scales in reading, maths and science	n/a	2022	OECD, PISA
2.2.2	Graduates in science and engineering, %	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD
2.2.3	Tertiary inbound mobility, %	n/a	2022	UNESCO Institute for Statistics
3.2.2	Logistics performance*	n/a	2023	World Bank, Logistics Performance Index 2023 (https://lpi.worldbank.org/); and World Bank 2023, Connecting to Compete 2023: Trade Logistics in the Global Economy The Logistics Performance Index and its Indicators.
5.1.3	GERD performed by business, % GDP	n/a	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.4	GERD financed by business, %	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	n/a	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.1.2	PCT patents by origin/bn PPP$ GDP	n/a	2023	World Intellectual Property Organization; International Monetary Fund
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2022	World Intellectual Property Organization; International Monetary Fund
7.1.3	Global brand value, top 5,000, % GDP	n/a	2024	Brand Finance; International Monetary Fund

Outdated data for Pakistan

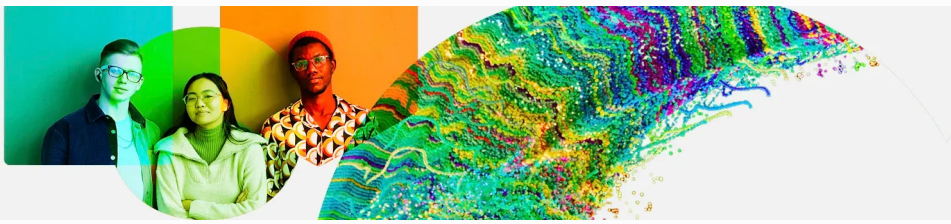
Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture+	2019	2023	Global Entrepreneurship Monitor
2.1.1	Expenditure on education, % GDP	2021	2022	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	2015	2020	UNESCO Institute for Statistics

Global Innovation Index 2024



Code	Indicator name	Economy Year	Model Year	Source
2.1.3	School life expectancy, years	2019	2022	UNESCO Institute for Statistics
2.1.5	Pupil–teacher ratio, secondary	2021	2022	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2021	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2021	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
3.2.1	Electricity output, GWh/mn pop.	2021	2022	International Energy Agency
4.1.1	Finance for startups and scaleups[+]	2019	2023	Global Entrepreneurship Monitor
4.3.2	Domestic industry diversification	2016	2021	United Nations Industrial Development Organization (UNIDO), Industrial Statistics Database (INDSTAT) Rev.3 and 4
5.1.1	Knowledge-intensive employment, %	2021	2022	International Labour Organization
5.1.2	Firms offering formal training, %	2013	2023	World Bank Enterprise Surveys
5.1.5	Females employed w/advanced degrees, %	2021	2023	International Labour Organization
5.3.2	High-tech imports, % total trade	2021	2022	United Nations Comtrade Database; World Trade Organization and United Nations Conference on Trade and Development
5.3.3	ICT services imports, % total trade	2021	2022	World Trade Organization Global Services Trade Data Hub
6.2.1	Labor productivity growth, %	2021	2023	The Conference Board
6.2.4	High-tech manufacturing, %	2016	2021	United Nations Industrial Development Organization

Global Innovation Index 2024



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.

Source: Global Innovation Index Database, WIPO, 2024.

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.