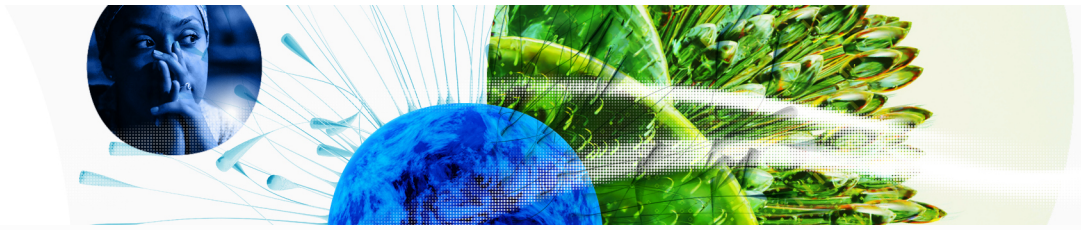


Global Innovation Index 2023

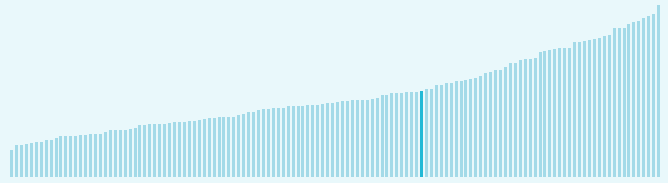


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

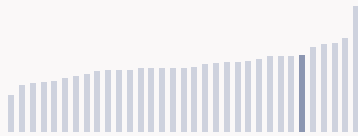
Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation.**

Brazil ranking in the Global Innovation Index 2023

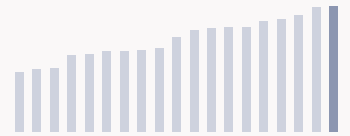
> Brazil ranks **49th** among the 132 economies featured in the GII 2023.



> Brazil ranks **6th** among the 33 upper-middle-income group economies.



> Brazil ranks **1st** among the 19 economies in Latin America and the Caribbean.



> Brazil GII Ranking (2020-2023)

The table shows the rankings of Brazil 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 Brazil in the GII 2023 is between ranks 48 and 53.

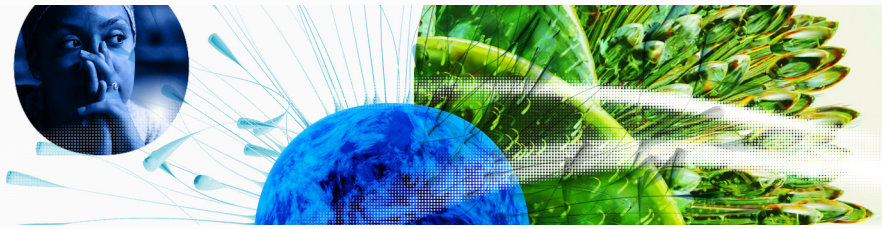
	GII Position	Innovation Inputs	Innovation Outputs
2020	62nd	59th	64th
2021	57th	56th	59th
2022	54th	58th	53rd
2023	49th	59th	49th

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

This year Brazil ranks **59th** in innovation inputs. This position is lower than last year.

Brazil ranks **49th** in innovation outputs. This position is higher than last year.

Global Innovation Index 2023



→ Expected vs. observed innovation performance

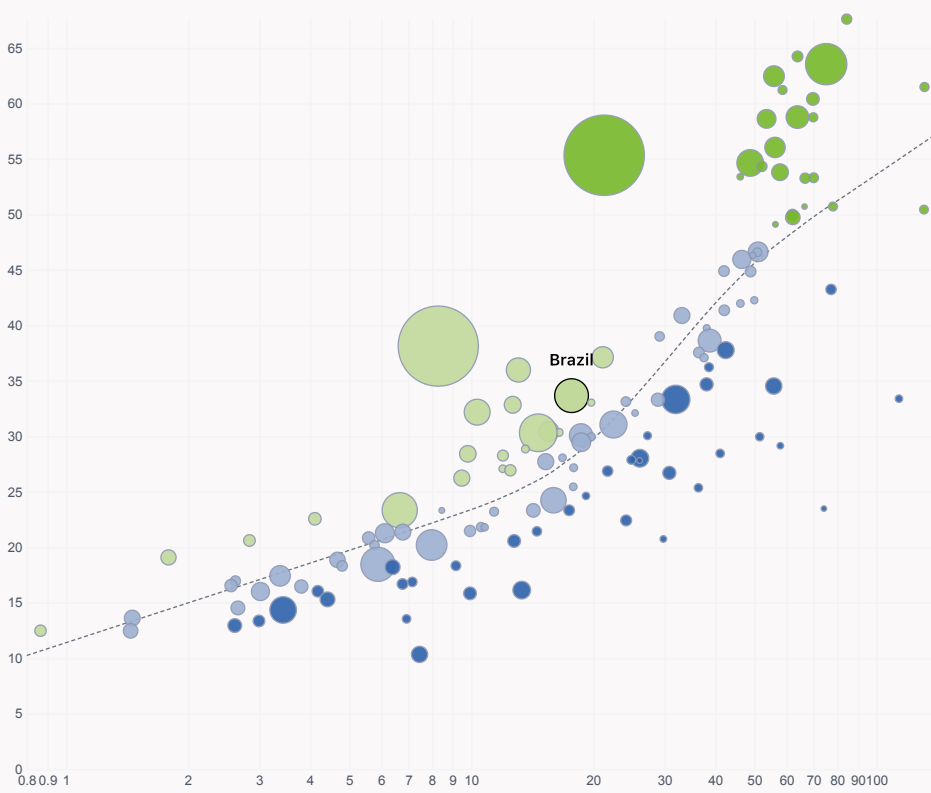
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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



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

> Innovation overperformers relative to their economic development

↑ GII Score



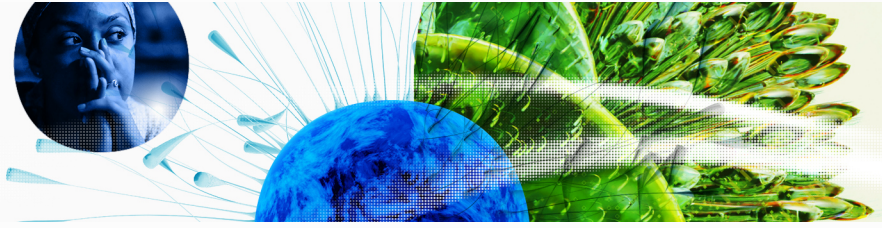
- Innovation leader
- Performing above expectations for level of development
- Performing at expectations for level of development
- Performing below expectations for level of development

Size legend (Population)



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

Global Innovation Index 2023



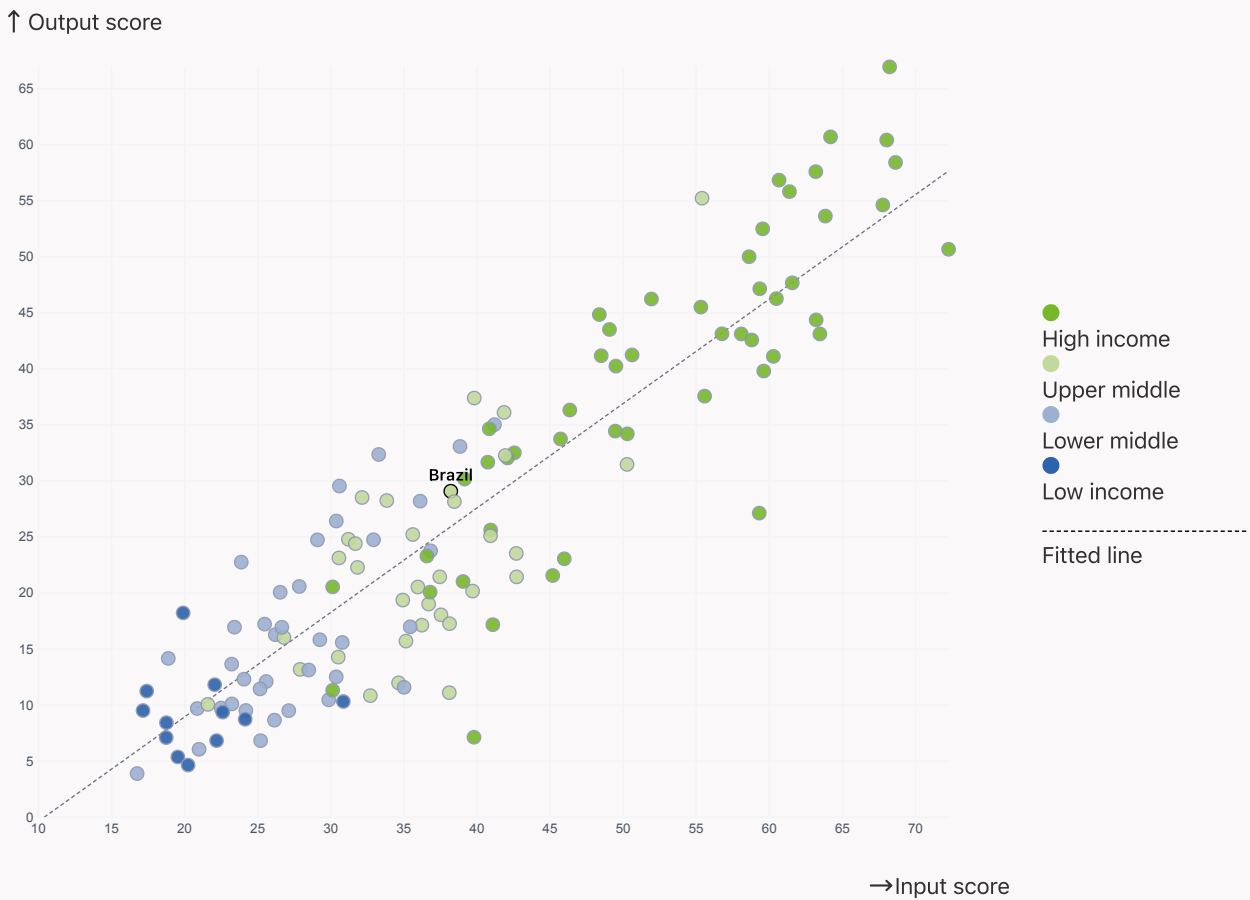
→ Effectively translating innovation investments into innovation outputs

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.

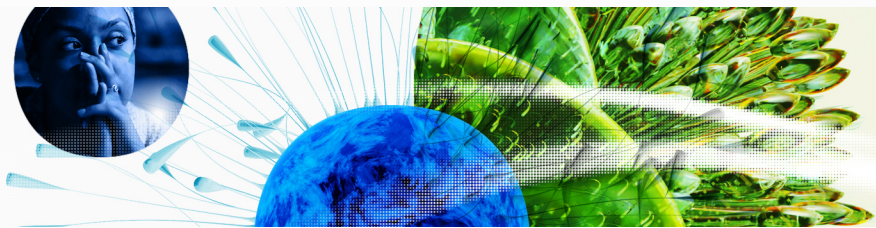


> Brazil produces more innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

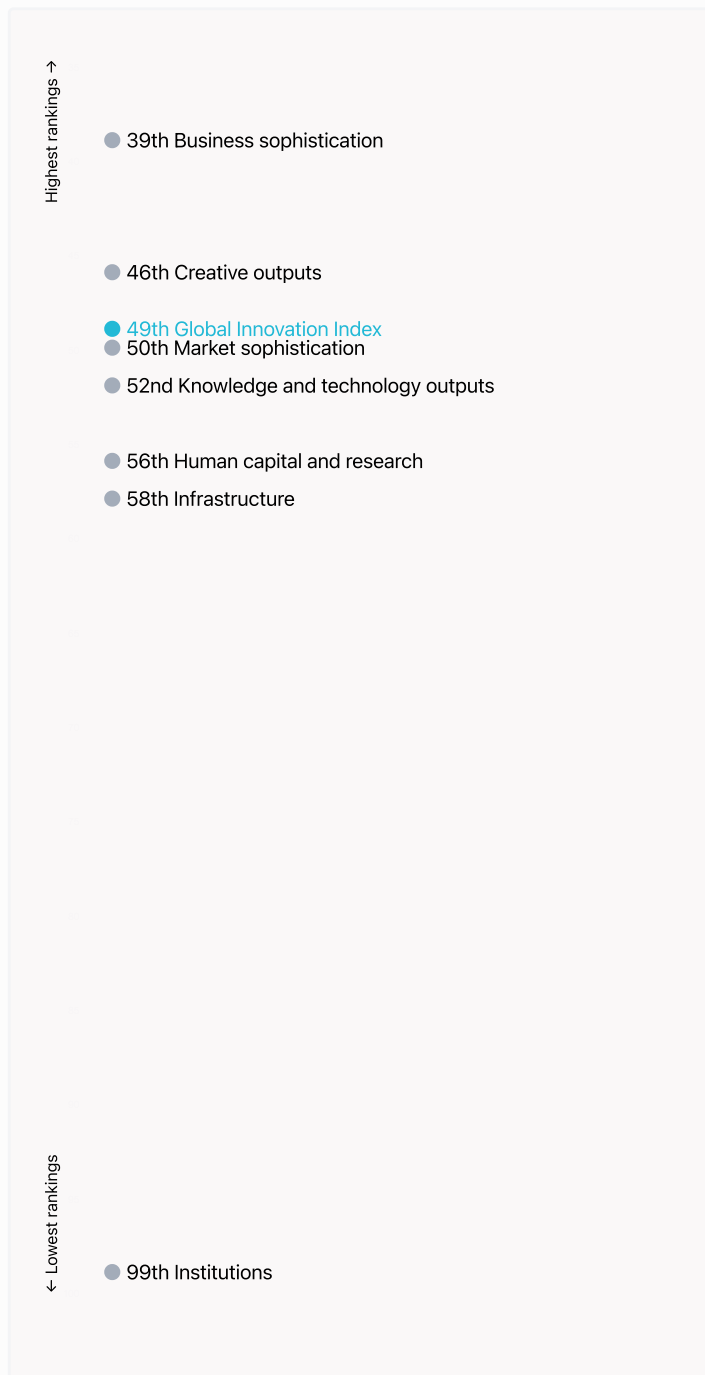


Global Innovation Index 2023



→ Overview of Brazil'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 Brazil are those that rank above the GII (shown in blue) and the weakest are those that rank below.



> Highest rankings

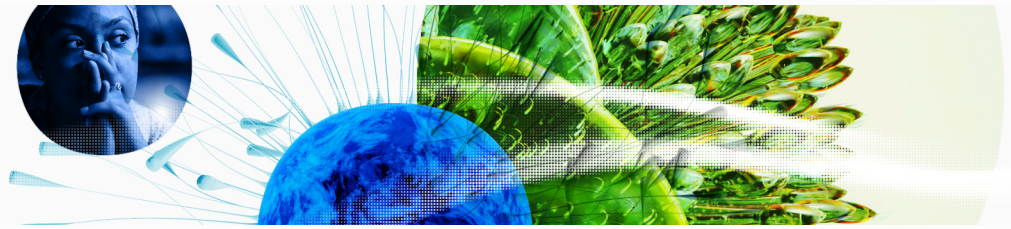
Brazil ranks highest in Business sophistication (39th) and Creative outputs (46th).

> Lowest rankings

Brazil ranks lowest in Institutions (99th), Infrastructure (58th) and Human capital and research (56th).

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

Global Innovation Index 2023



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

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

> Upper-Middle-Income economies

Brazil performs above the upper-middle-income group average in Knowledge and technology outputs, Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.

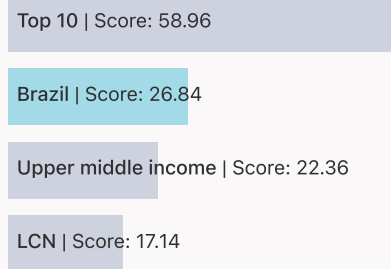


> Latin America And The Caribbean

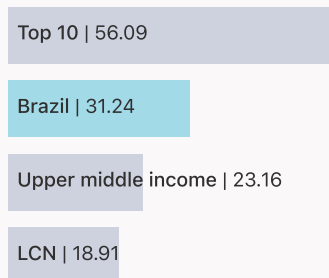
Brazil performs above the regional average in Knowledge and technology outputs, Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.



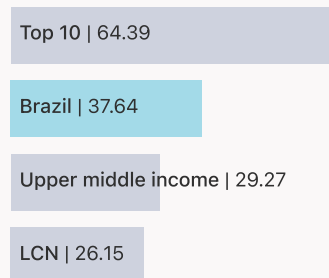
Knowledge and technology outputs



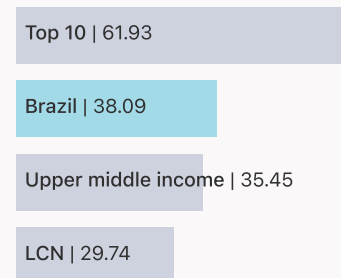
Creative outputs



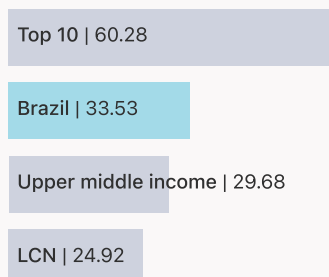
Business sophistication



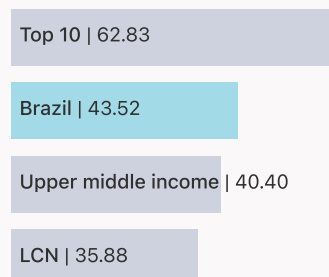
Market sophistication



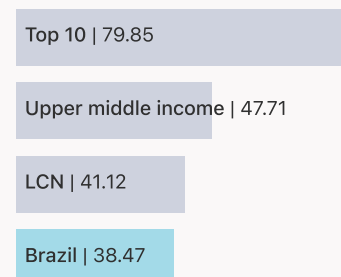
Human capital and research



Infrastructure



Institutions





→ Innovation strengths and weaknesses in Brazil

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



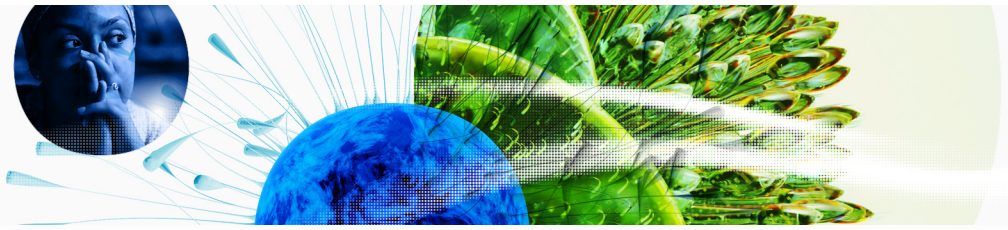
> Brazil's main innovation strengths are **Domestic market scale, bn PPP\$ (rank 8)**, **E-participation (rank 11)** and **Trademarks by origin/bn PPP\$ GDP (rank 13)**.

Strengths

Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
8	4.3.3	Domestic market scale, bn PPP\$	107	4.3.1	Applied tariff rate, weighted avg., %
11	3.1.4	E-participation	107	2.2.3	Tertiary inbound mobility, %
13	7.1.2	Trademarks by origin/bn PPP\$ GDP	104	3.2.3	Gross capital formation, % GDP
14	3.1.3	Government's online service	103	1.3.1	Policies for doing business
17	5.3.1	Intellectual property payments, % total trade	100	6.2.1	Labor productivity growth, %
19	2.1.1	Expenditure on education, % GDP	90	2.2.2	Graduates in science and engineering, %
19	5.3.2	High-tech imports, % total trade	79	1.3.2	Entrepreneurship policies and culture
22	6.2.2	Unicorn valuation, % GDP	68	2.1.4	PISA scales in reading, maths and science
23	6.1.5	Citable documents H-index	63	7.2.2	National feature films/mn pop. 15-69
30	2.3.4	QS university ranking, top 3	55	4.1.3	Loans from microfinance institutions, % GDP

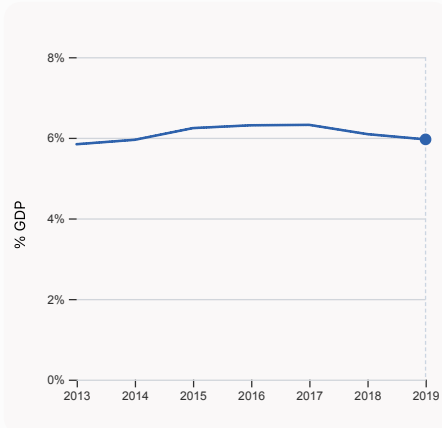
Global Innovation Index 2023



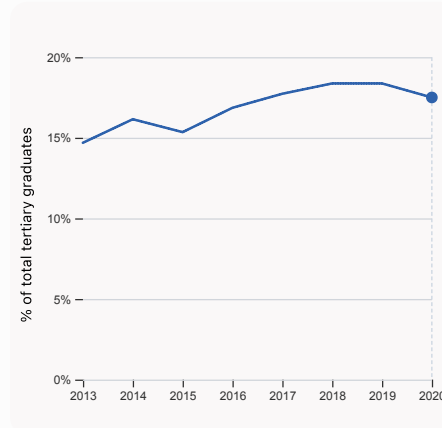
→ Brazil's innovation system

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

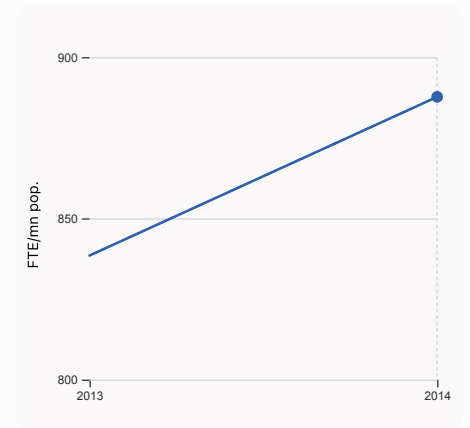
> Innovation inputs in Brazil



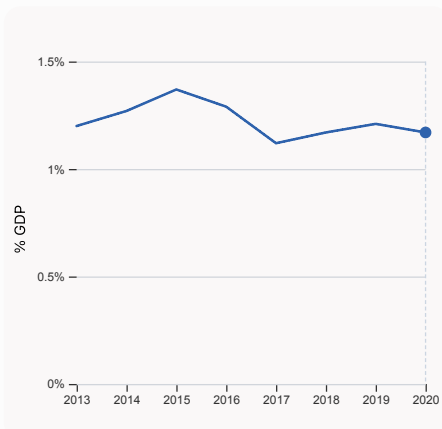
2.1.1 Expenditure on education, % GDP
was equal to 5.96% GDP in 2019, down by 0.13 percentage points from the year prior – and equivalent to an indicator rank of 19.



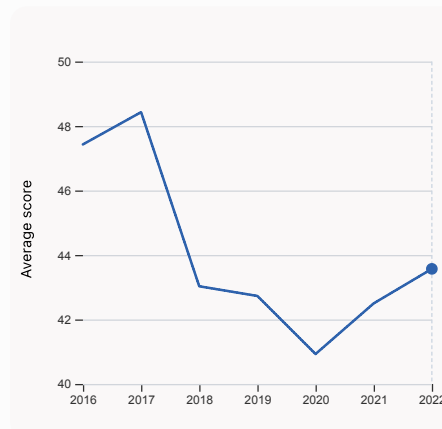
2.2.2 Graduates in science and engineering, %
was equal to 17.5% of total tertiary graduates in 2020, down by 0.87 percentage points from the year prior – and equivalent to an indicator rank of 90.



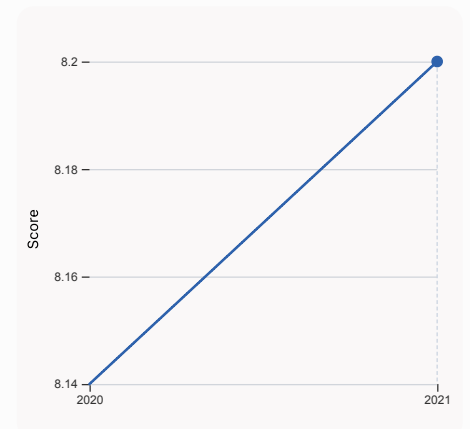
2.3.1 Researchers, FTE/mn pop.
was equal to 887.68 FTE/mn pop. in 2014, up by 5.87% from the year prior – and equivalent to an indicator rank of 54.



2.3.2 Gross expenditure on R&D, % GDP
was equal to 1.17% GDP in 2020, down by 0.04 percentage points from the year prior – and equivalent to an indicator rank of 34.

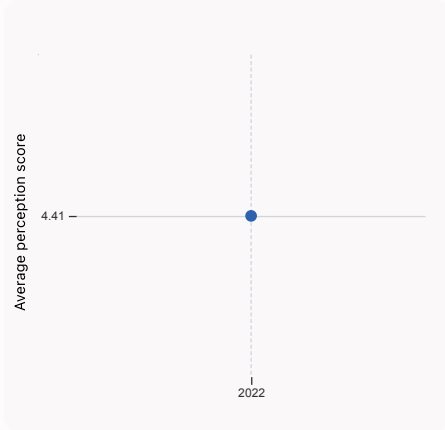
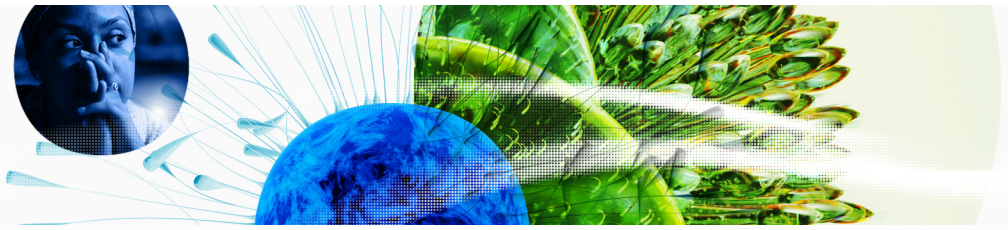


2.3.4 QS university ranking, top 3
was equal to an average score of 43.57 for the top 3 universities in 2022, up by 2.52% from the year prior – and equivalent to an indicator rank of 30.

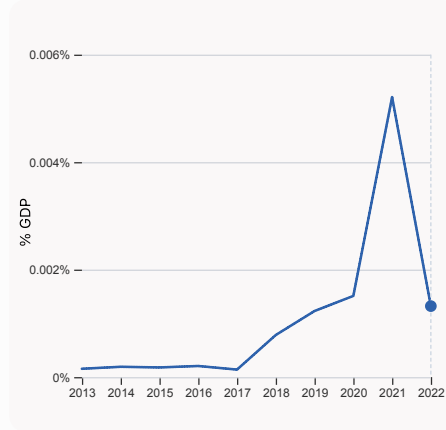


3.1.1 ICT access
was equal to a score of 8.2 in 2021, up by 0.74% from the year prior – and equivalent to an indicator rank of 84.

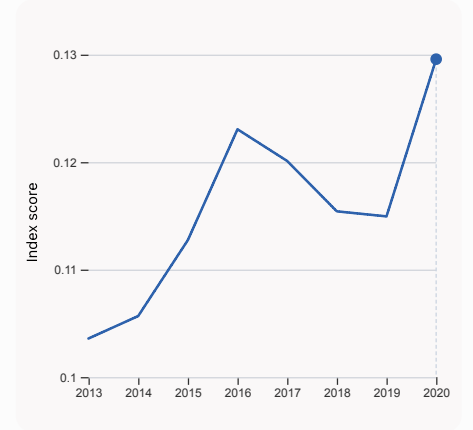
Global Innovation Index 2023



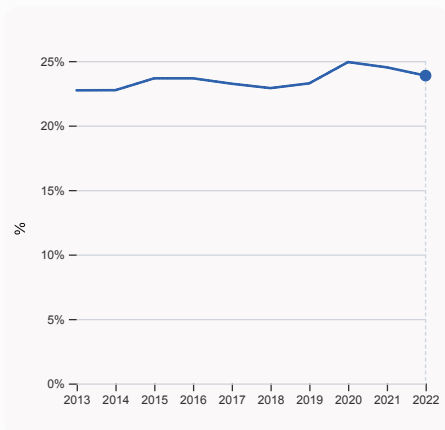
4.1.1 Finance for startups and scaleups was equal to an average perception score of 4.41 in 2022, equivalent to an indicator rank of 51.



4.2.4 VC received, value, % GDP was equal to 0.00132% GDP in 2022, down by 0.0039 percentage points from the year prior – and equivalent to an indicator rank of 27.

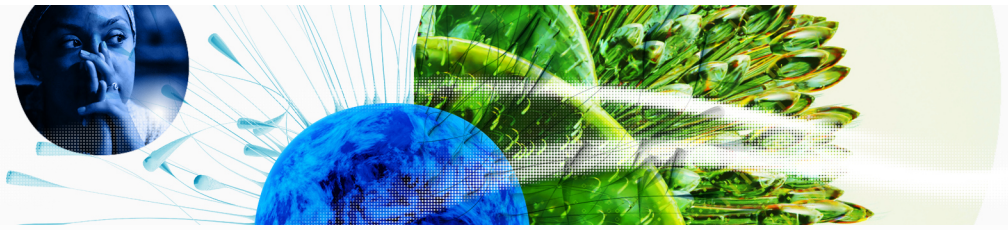


4.3.2 Domestic industry diversification was equal to an index score of 0.13 in 2020, up by 12.72% from the year prior – and equivalent to an indicator rank of 39.

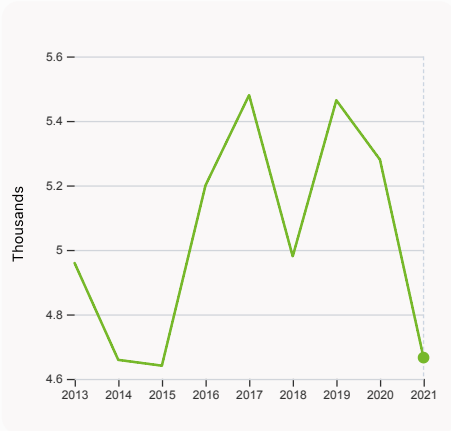


5.1.1 Knowledge-intensive employment, % was equal to 23.87% in 2022, down by 0.64 percentage points from the year prior – and equivalent to an indicator rank of 60.

Global Innovation Index 2023

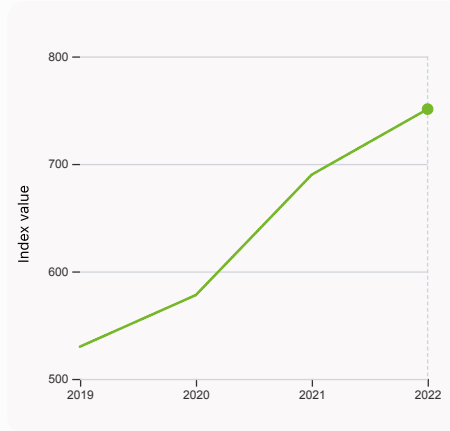


> Innovation outputs in Brazil



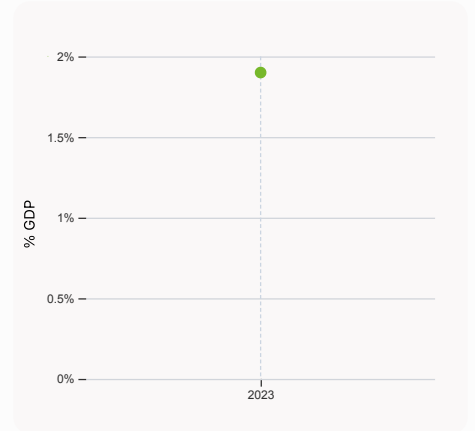
6.1.1 Patents by origin

was equal to 4.67 Thousands in 2021, down by 11.63% from the year prior – and equivalent to an indicator rank of 49.



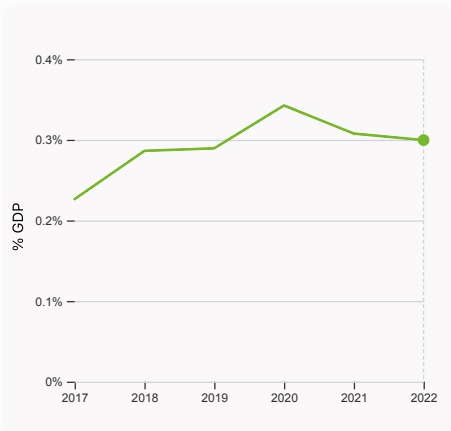
6.1.5 Citable documents H-index

was equal to an index value of 751 in 2022, up by 8.84% from the year prior – and equivalent to an indicator rank of 23.



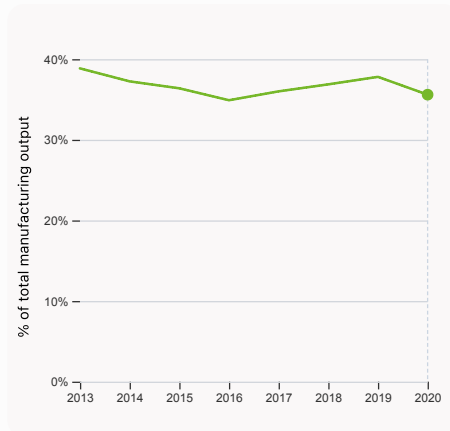
6.2.2 Unicorn valuation, % GDP

was equal to 1.9 % GDP in 2023 – and equivalent to an indicator rank of 22.



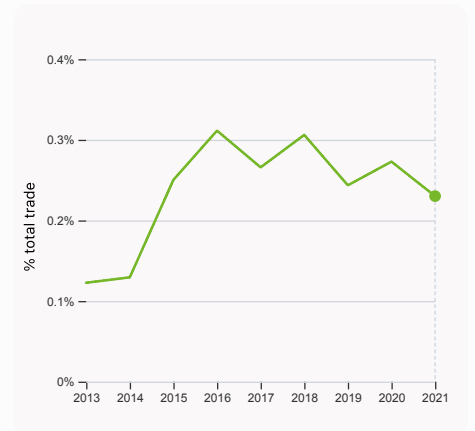
6.2.3 Software spending, % GDP

was equal to 0.3% GDP in 2022, down by 0.0081 percentage points from the year prior – and equivalent to an indicator rank of 44.



6.2.4 High-tech manufacturing, %

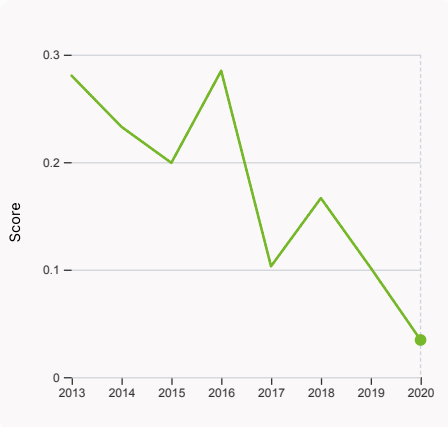
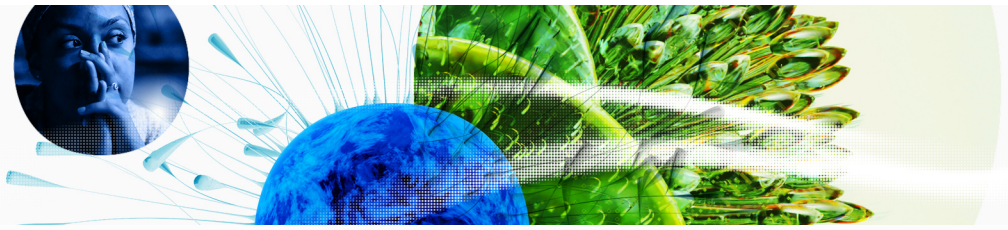
was equal to 35.6% of total manufacturing output in 2020, down by 2.21 percentage points from the year prior – and equivalent to an indicator rank of 33.



6.3.1 Intellectual property receipts, % total trade

was equal to 0.23% total trade in 2021, down by 0.043 percentage points from the year prior – and equivalent to an indicator rank of 41.

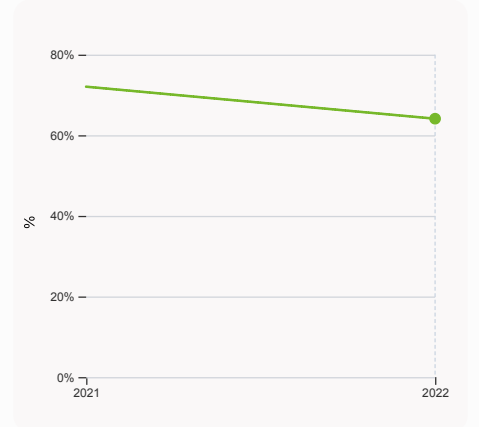
Global Innovation Index 2023



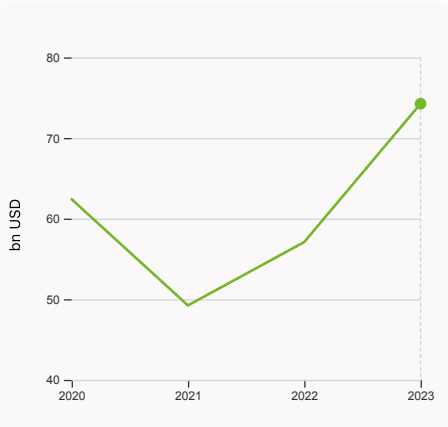
6.3.2 Production and export complexity was equal to a score of 0.035 in 2020, down by 65.99% from the year prior – and equivalent to an indicator rank of 59.



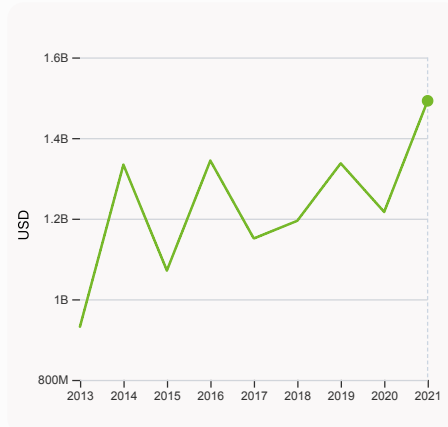
6.3.3 High-tech exports was equal to 6,350,114,828 USD in 2021, up by 6.82% from the year prior – and equivalent to an indicator rank of 58.



7.1.1 Intangible asset intensity, top 15, % was equal to 64.11% in 2022, down by 7.94 percentage points from the year prior – and equivalent to an indicator rank of 30.



7.1.3 Global brand value, top 5,000 was equal to 74.262 bn USD in 2023, up by 30.06% from the year prior – and equivalent to an indicator rank of 39.

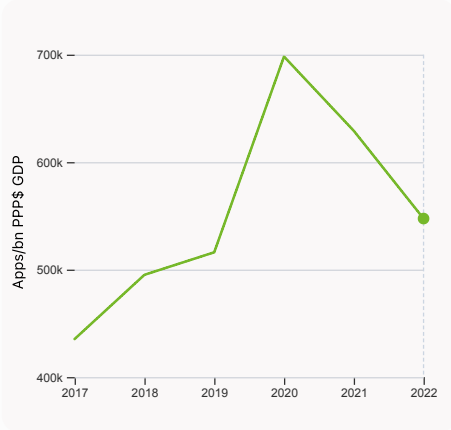
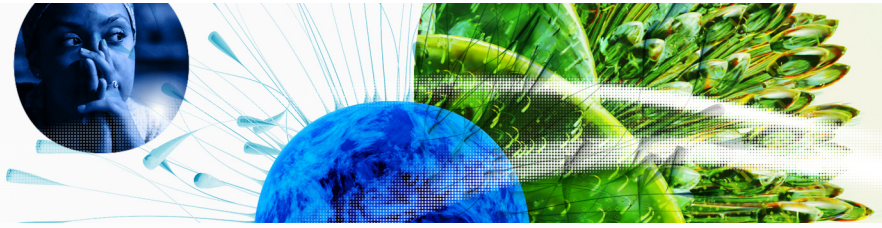


7.2.1 Cultural and creative services exports was equal to 1,492,300,000 USD in 2021, up by 22.65% from the year prior – and equivalent to an indicator rank of 53.



7.2.2 National feature films/mn pop. 15-69 was equal to 0.819 films/mn pop. 15-69 in 2021, up by 117.2% from the year prior – and equivalent to an indicator rank of 63.

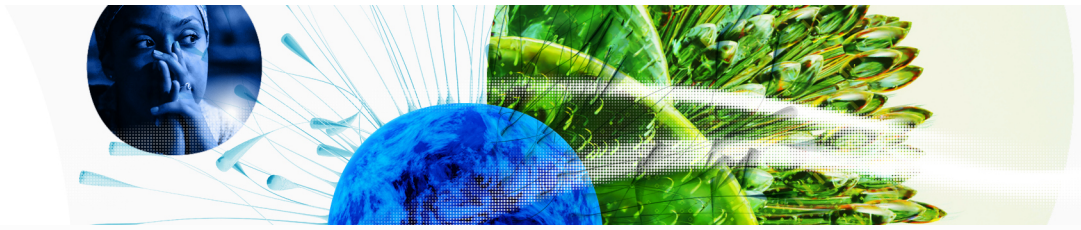
Global Innovation Index 2023



7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 547,505.07 Apps/bn PPP\$ GDP in 2022, down by 12.98% from the year prior – and equivalent to an indicator rank of 40.

Global Innovation Index 2023



→ Brazil's innovation top performers

> 2.3.3 Global corporate R&D investors from Brazil

Rank	Firm	Industry	R&D	R&D Growth	R&D Intensity
			[mn EUR]	[%]	[%]
1019	EMBRAER	Aerospace & Defence	152	56	4
1156	PETROBRAS	Oil & Gas Producers	131	20	0
1465	TOTVS	Software & Computer Services	96	35	19
1588	WEG	Industrial Engineering	87	17	2

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 Brazil's top universities

Rank	University	Score
115	UNIVERSIDADE DE SAO PAULO	56.10
210	UNIVERSIDADE ESTADUAL DE CAMPINAS (UNICAMP)	42.50
333	UNIVERSIDADE FEDERAL DO RIO DE JANEIRO	32.10

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 Brazil

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	QUINTOANDAR	E-commerce & direct-to-consumer	Campinas	5
2	C6 BANK	Fintech	Sao Paulo	5
3	CREDITAS	Fintech	Sao Paulo	5

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 Brazil

Rank	Firm	Intensity, %
1	VALE SA	52.97
2	WEG SA	92.93
3	B3 SA - BRASIL BOLSA BALCAO	95.08

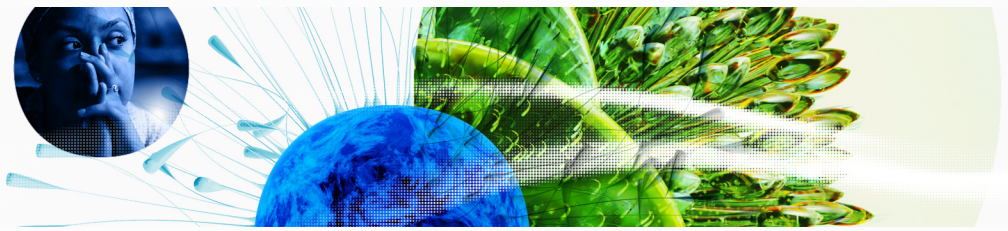
Source: Brand Finance (<https://brandirectory.com/reports/gift-2022>).
Note: Brand Finance only provides within economy ranks.

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

Rank	Brand	Industry	Brand Value, mn USD
1	ITAU	Banking	8,716.5
2	BRADESCO	Banking	5,091.8
3	BANCO DO BRASIL	Banking	4,903.6

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

Global Innovation Index 2023



GII 2023 rank

49

Brazil

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
49	59	Upper middle	LCN	215.3	3,782.8	17,683.8
		Score / Value Rank		Score / Value Rank		
Institutions		38.5	99	Business sophistication		37.6 39
1.1 Institutional environment		34.9	91	5.1 Knowledge workers		44.9 41
1.1.1 Operational stability for businesses*		45.8	79	5.1.1 Knowledge-intensive employment, %		23.9 60
1.1.2 Government effectiveness*		24.0	98	5.1.2 Firms offering formal training, %		n/a n/a
1.2 Regulatory environment		60.3	70	5.1.3 GERD performed by business, % GDP		n/a n/a
1.2.1 Regulatory quality*		39.2	79	5.1.4 GERD financed by business, %		43.2 39
1.2.2 Rule of law*		31.5	81	5.1.5 Females employed w/advanced degrees, %		14.5 52
1.2.3 Cost of redundancy dismissal		15.4	62	5.2 Innovation linkages		23.3 60
1.3 Business environment		20.2	118 ◇	5.2.1 University-industry R&D collaboration†		38.2 78
1.3.1 Policies for doing business†		31.7	103 ○	5.2.2 State of cluster development†		47.5 50
1.3.2 Entrepreneurship policies and culture†		8.7	79 ○ ◇	5.2.3 GERD financed by abroad, % GDP		n/a n/a
Human capital and research		33.5	56	5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP		0.0 77
2.1 Education		50.0	68	5.2.5 Patent families/bn PPP\$ GDP		0.1 53
2.1.1 Expenditure on education, % GDP		6.0	19 ●	5.3 Knowledge absorption		44.7 32
2.1.2 Government funding/pupil, secondary, % GDP/cap		21.4	44	5.3.1 Intellectual property payments, % total trade		1.8 17 ●
2.1.3 School life expectancy, years		15.1	49	5.3.2 High-tech imports, % total trade		13.5 19 ●
2.1.4 PISA scales in reading, maths and science		400.0	68 ○	5.3.3 ICT services imports, % total trade		2.1 34
2.1.5 Pupil-teacher ratio, secondary		16.3	84	5.3.4 FDI net inflows, % GDP		3.1 45
2.2 Tertiary education		19.8	90	5.3.5 Research talent, % in businesses		26.1 50
2.2.1 Tertiary enrolment, % gross		54.6	63	Knowledge and technology outputs		26.8 52
2.2.2 Graduates in science and engineering, %		17.5	90 ○	6.1 Knowledge creation		21.2 53
2.2.3 Tertiary inbound mobility, %		0.2	107 ○ ◇	6.1.1 Patents by origin/bn PPP\$ GDP		1.4 49
2.3 Research and development (R&D)		30.8	35	6.1.2 PCT patents by origin/bn PPP\$ GDP		0.1 51
2.3.1 Researchers, FTE/mn pop.		887.7	54	6.1.3 Utility models by origin/bn PPP\$ GDP		0.7 26
2.3.2 Gross expenditure on R&D, % GDP		1.2	34	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\$		48.9	34	6.1.5 Citable documents H-index		39.4 23 ●
2.3.4 QS university ranking, top 3*		44.1	30 ●	6.2 Knowledge impact		37.4 37
Infrastructure		43.5	58	6.2.1 Labor productivity growth, %		-0.1 100 ○
3.1 Information and communication technologies (ICTs)		81.0	36	6.2.2 Unicorn valuation, % GDP		1.9 22 ●
3.1.1 ICT access*		72.9	84	6.2.3 Software spending, % GDP		0.3 44
3.1.2 ICT use*		73.1	66	6.2.4 High-tech manufacturing, %		35.6 33
3.1.3 Government's online service*		88.5	14 ●	6.3 Knowledge diffusion		22.0 67
3.1.4 E-participation*		89.5	11 ●	6.3.1 Intellectual property receipts, % total trade		0.2 41
3.2 General infrastructure		25.6	70	6.3.2 Production and export complexity		53.2 59
3.2.1 Electricity output, GWh/mn pop.		3,065.9	66	6.3.3 High-tech exports, % total trade		2.1 58
3.2.2 Logistics performance*		50.0	50	6.3.4 ICT services exports, % total trade		1.1 86
3.2.3 Gross capital formation, % GDP		18.8	104 ○	6.3.5 ISO 9001 quality/bn PPP\$ GDP		4.8 56
3.3 Ecological sustainability		23.9	65	Creative outputs		31.2 46
3.3.1 GDP/unit of energy use		10.2	63	7.1 Intangible assets		47.4 31
3.3.2 Environmental performance*		41.9	60	7.1.1 Intangible asset intensity, top 15, %		64.1 30
3.3.3 ISO 14001 environment/bn PPP\$ GDP		0.9	69	7.1.2 Trademarks by origin/bn PPP\$ GDP		100.9 13 ●
Market sophistication		38.1	50	7.1.3 Global brand value, top 5,000		3.6 39
4.1 Credit		24.1	80	7.1.4 Industrial designs by origin/bn PPP\$ GDP		1.3 60
4.1.1 Finance for startups and scaleups†		46.6	51	7.2 Creative goods and services		5.6 85
4.1.2 Domestic credit to private sector, % GDP		70.0	52	7.2.1 Cultural and creative services exports, % total trade		0.5 53
4.1.3 Loans from microfinance institutions, % GDP		0.0	55 ○	7.2.2 National feature films/mn pop. 15-69		0.8 63 ○
4.2 Investment		16.9	44	7.2.3 Entertainment and media market/th pop. 15-69		5.4 41
4.2.1 Market capitalization, % GDP		59.8	30	7.2.4 Creative goods exports, % total trade		0.2 80
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP		0.1	53	7.3 Online creativity		24.6 52
4.2.3 VC recipients, deals/bn PPP\$ GDP		0.0	46	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69		1.8 89
4.2.4 VC received, value, % GDP		0.0	27	7.3.2 Country-code TLDs/th pop. 15-69		9.3 42
4.3 Trade, diversification, and market scale		73.3	18	7.3.3 GitHub commits/mn pop. 15-69		14.1 49
4.3.1 Applied tariff rate, weighted avg., %		8.4	107 ○ ◇	7.3.4 Mobile app creation/bn PPP\$ GDP		73.2 40
4.3.2 Domestic industry diversification		93.1	39			
4.3.3 Domestic market scale, bn PPP\$		3,782.8	8 ●			

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 Brazil.



> Brazil has missing data for three indicators and outdated data for four indicators.

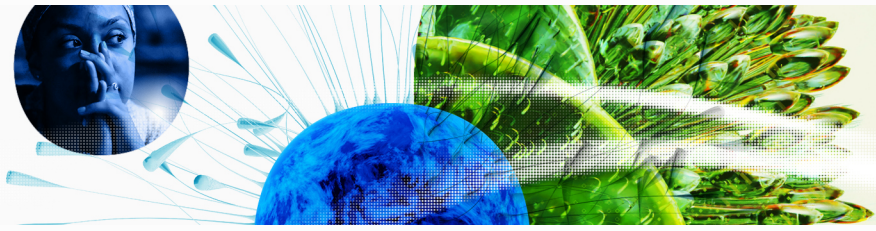
> Missing data for Brazil

Code	Indicator name	Economy Year	Model Year	Source
5.1.2	Firms offering formal training, %	n/a	2019	World Bank Enterprise Surveys
5.1.3	GERD performed by business, % GDP	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.3	GERD financed by abroad, % GDP	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT

> Outdated data for Brazil

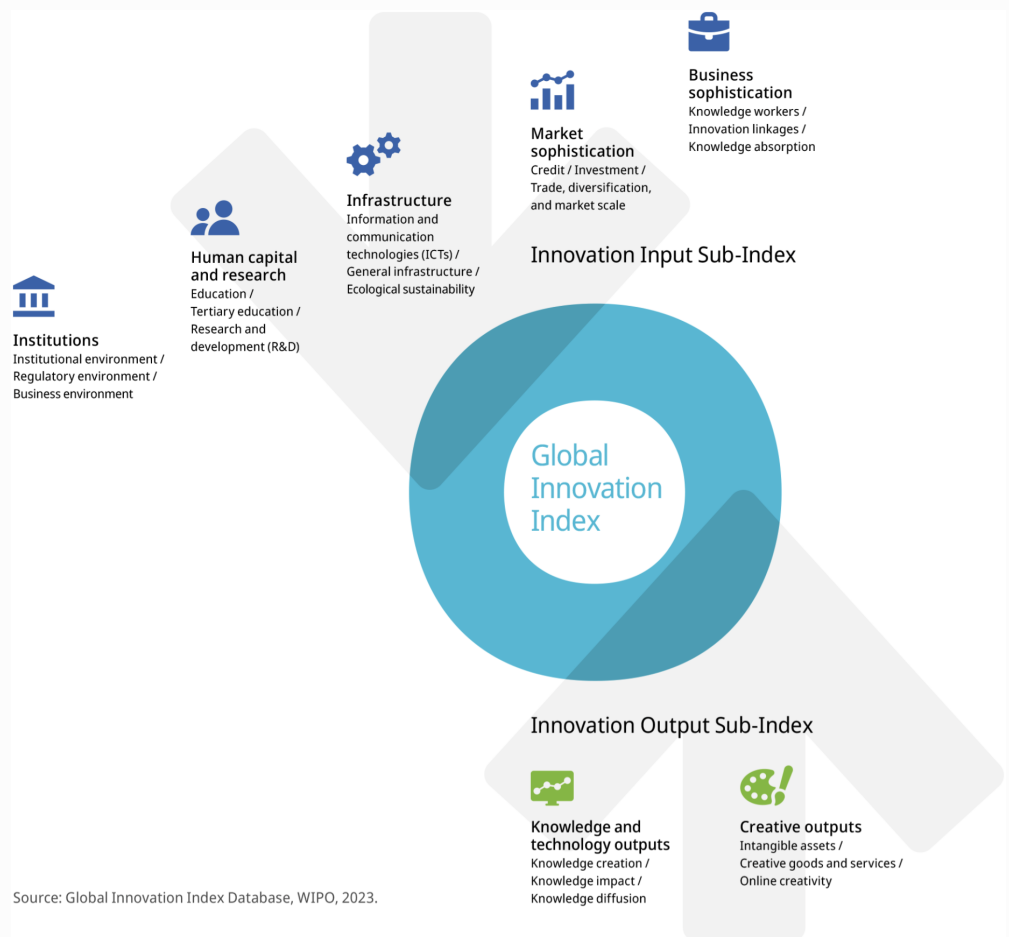
Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2019	2021	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2014	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	2014	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT

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.