

GLOBAL INNOVATION INDEX 2018

Brazil

64th Brazil is ranked 64th in the GII 2018, moving up 5 positions from the previous year.

The GII indicators are grouped into innovation inputs and outputs. The following table reflects Brazil's rankings over time¹.

Brazil's ranking over time

	GII	Input	Output	Efficiency
2018	64	58	70	85
2017	69	60	80	99
2016	69	58	79	100

- As many middle-income economies, Brazil performs much better in innovation inputs than outputs. Brazil shows rather stable ranking in innovation inputs, holding the 58th – 60th position over the last three years.
- This year Brazil notably improves its rank in innovation outputs, moving to the 70th spot (up 10).
- Brazil's Innovation Efficiency Ratio also shows a positive trend over the last three years, moving from the 100th position in 2016 to the 85th spot this year. In spite of such improvement, Brazil's efficiency of translating innovation inputs into outputs is still rather low. This is influenced by higher ranking in innovation inputs (58th) compared to outputs (70th).

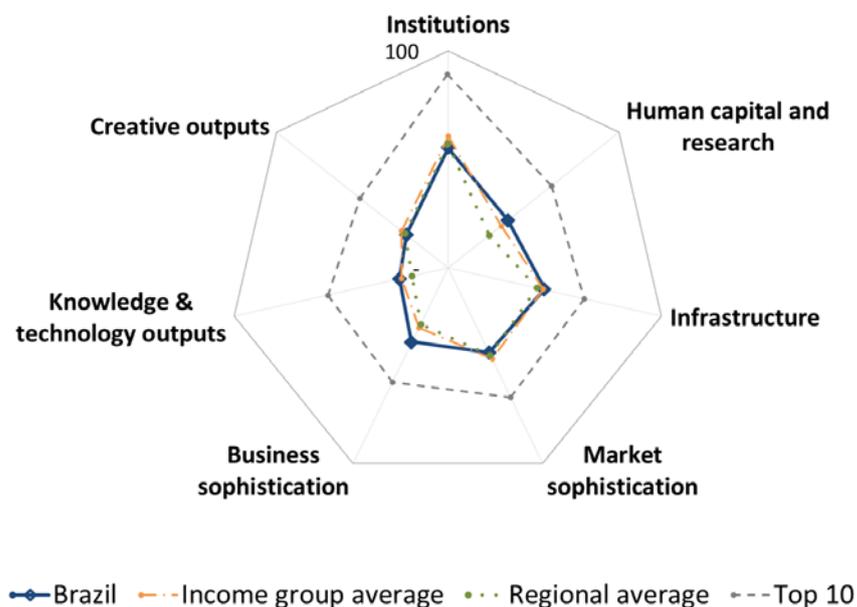
15th Brazil is ranked 15th among the 34 upper-middle-income countries in the GII 2018.

6th Brazil is ranked 6th among the 18 countries in Latin America and the Caribbean.

¹ Note that year-on-year comparisons of the GII ranks are imperfect and influenced by changes in the GII model and data availability.

Benchmarking Brazil to other upper-middle-income countries and the Latin America and the Caribbean region

Brazil's scores by area



Upper-middle-income countries

Brazil has high scores in 4 out of 7 GII areas – **Human Capital & Research, Infrastructure, Business Sophistication, and Knowledge & Technology Outputs**, in which it scores above the average of the upper-middle-income group.

Top scores in the areas *Education, Information & Communication Technologies (ICTs), Knowledge workers, and Knowledge impact*, are behind these high rankings.

Latin America and the Caribbean region

Compared to other countries in the Latin America and the Caribbean region, Brazil performs above average in the same 4 GII areas: **Human Capital & Research, Infrastructure, Business Sophistication, and Knowledge & Technology Outputs**.

Brazil's innovation profile

Strengths

- Most of Brazil's strengths are accrued in **Human Capital & Research** (52nd), where it has strong performance in the area *Research and development (R&D)* (28th) and four indicators: *Expenditure on education* (23rd), *R&D expenditures* (27th), *Global R&D companies expenditures* (22nd), and *Quality of universities* (27th).
- Several other strengths are found in **Business Sophistication** (38th) where Brazil shows strong performance in the area *Knowledge absorption* (31st) and indicators *R&D financed by business* (28th), *Intellectual property payments* (10th), and *High-tech imports* (23rd).
- On the innovation input side, two other strong ranks are in **Market Sophistication** (82nd), and in particular in the area *Trade, competition & market scale* (32nd) and in the indicator *Domestic market scale* (8th).
- On the innovation output side, only two strengths are found in **Knowledge & Technology Outputs** (64th): *Quality of scientific publications* (23rd) and *High-tech exports* (35th).

Weaknesses

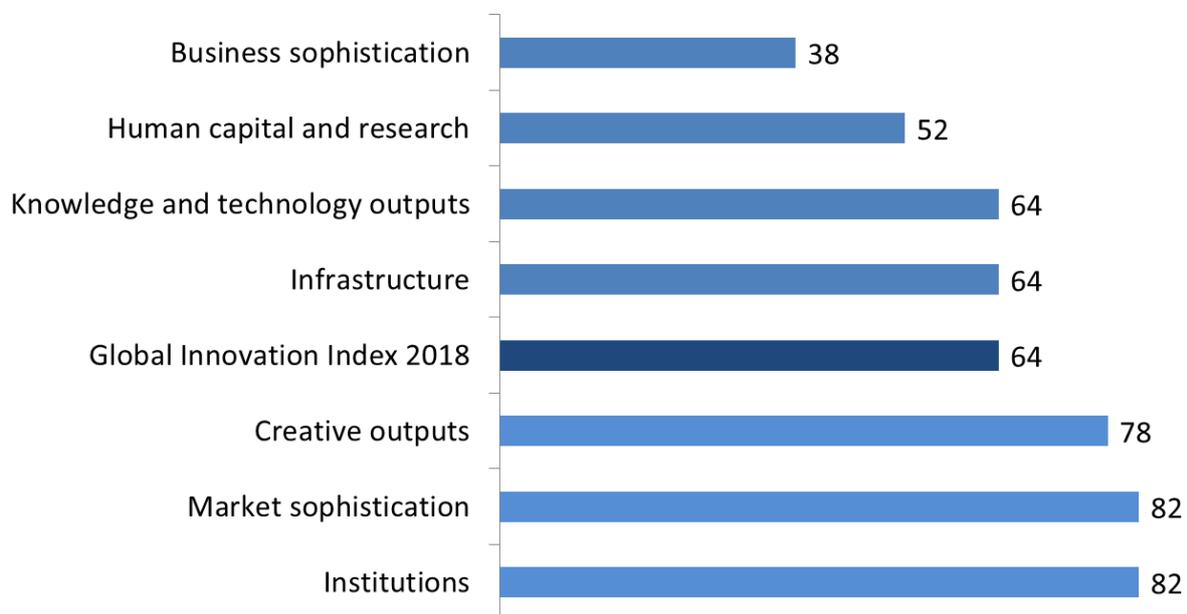
- Brazil has relative weaknesses in **Institutions** (82nd), and in particular in the area *Business environment* (110th) and in the indicator *Ease of starting a business* (123rd).
- In **Human Capital & Research** (52nd) it performs relatively weakly in indicators *PISA results* (64th), *Graduates in science & engineering* (79th), and *Tertiary inbound mobility* (100th).
- In **Market Sophistication** (82nd), Brazil performs weakly in the area *Credit* (104th) and in the indicator *Applied tariff rate* (106th).
- Other relative weaknesses on the innovation input side are found in **Infrastructure** (64th) in indicator *Gross capital formation* (104th). The indicator *Joint venture-strategic alliance deals* (93rd) is highlighted as the only weakness in **Business Sophistication** (38th).
- On the **innovation output** side, Brazil exhibits relative weaknesses in **Knowledge & Technology Outputs** (64th), where it performs weakly in indicators *Productivity growth* (101st) and *New businesses* (98th). In **Creative Outputs** (78th), a weakness is found in the indicator *Printing & other media* (78th).

The following figure presents a summary of Brazil's ranks in the 7 GII areas, as well as the overall rank in the GII 2018.

Brazil's rank in the GII 2018 and the 7 GII areas

Rank 1 is the highest possible in each pillar

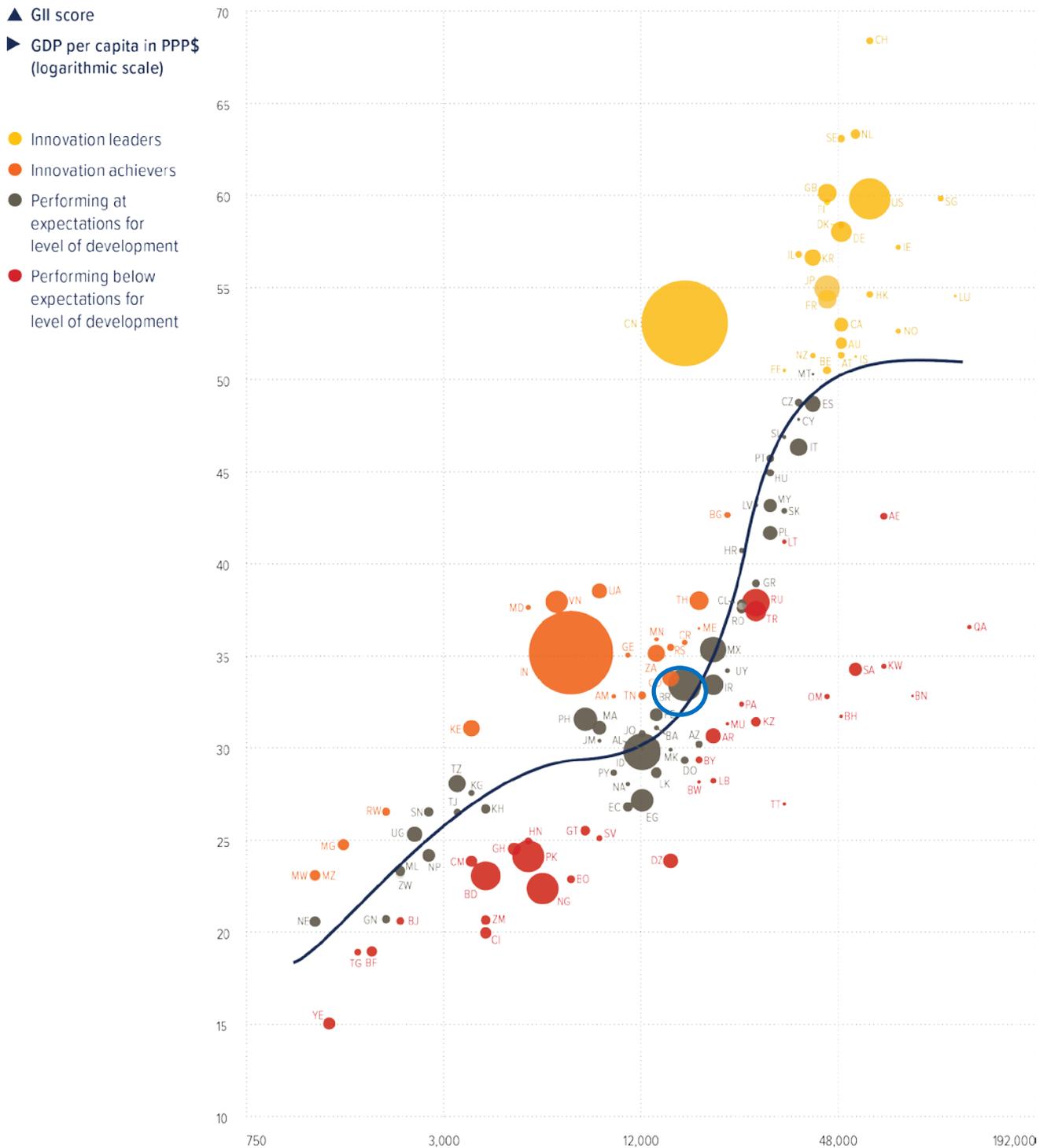
Total number of countries: 126



Expected vs. Observed Innovation Performance

The GII bubble chart shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The depicted trendline gives an indication of the expected innovation performance at different levels of income. Countries located above the trendline are performing better than what would be expected based on their income level. Countries below the line are Innovation Under-performers relative to GDP.

Relative to GDP, Brazil performs at its expected level of development.



Missing and Outdated Data

More and better data improves the ability of a country to understand its strengths and weaknesses and give policymakers greater capacity to plan and adapt public policies accordingly. The GII 2018 covers 126 countries that complied with the minimum indicator coverage of 35 indicators in the Innovation Input Sub-Index (66%) and 18 indicators in the Innovation Output Sub-Index (66%).

The following tables show data for Brazil that is not available or that is outdated.

Missing Data

Code	Indicator	Country Year	Model Year	Source
5.1.3	GERD performed by business, % GDP	n/a	2016	UNESCO Institute for Statistics
5.2.3	GERD financed by abroad, %	n/a	2015	UNESCO Institute for Statistics

Outdated Data

Code	Indicator	Country Year	Model Year	Source
2.1.3	School life expectancy, years	2015	2016	UNESCO Institute for Statistics
2.1.5	Pupil-teacher ratio, secondary	2015	2016	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2015	2016	UNESCO Institute for Statistics
2.2.2	Graduates in science & engineering, %	2015	2016	UNESCO Institute for Statistics
2.2.3	Tertiary inbound mobility, %	2015	2016	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2014	2016	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2015	2016	UNESCO Institute for Statistics
5.1.2	Firms offering formal training, % firms	2009	2013	World Bank, Enterprise Surveys
5.3.5	Research talent, % in business enterprise	2014	2016	UNESCO Institute for Statistics

Output rank	Input rank	Income	Region	Efficiency ratio	Population (mn)	GDP, PPP\$	GDP per capita, PPP\$	GII 2017 rank
70	58	Upper-middle	LCN	85	209.3	3,219.1	15,602.5	69

	Score/Value	Rank
Institutions	55.3	82
1.1 Political environment.....	45.3	81
1.1.1 Political stability & safety*.....	54.3	89
1.1.2 Government effectiveness*.....	40.8	81
1.2 Regulatory environment.....	64.4	70
1.2.1 Regulatory quality*.....	38.8	83
1.2.2 Rule of law*.....	41.7	67
1.2.3 Cost of redundancy dismissal, salary weeks.....	15.4	59
1.3 Business environment.....	56.3	110 ○◇
1.3.1 Ease of starting a business*.....	65.1	123 ○◇
1.3.2 Ease of resolving insolvency*.....	47.5	73
Human capital & research	34.9	52
2.1 Education.....	47.7	64
2.1.1 Expenditure on education, % GDP.....	5.9	23 ●
2.1.2 Government funding/pupil, secondary, % GDP/cap.....	21.6	46
2.1.3 School life expectancy, years ^②	15.4	42
2.1.4 PISA scales in reading, maths & science.....	395.0	64 ○
2.1.5 Pupil-teacher ratio, secondary ^②	16.5	74
2.2 Tertiary education.....	18.5	98 ◇
2.2.1 Tertiary enrolment, % gross ^②	50.6	52
2.2.2 Graduates in science & engineering, % ^②	15.3	79 ○◇
2.2.3 Tertiary inbound mobility, % ^②	0.2	100 ○◇
2.3 Research & development (R&D).....	38.6	28 ●◆
2.3.1 Researchers, FTE/mn pop. ^②	900.3	52
2.3.2 Gross expenditure on R&D, % GDP ^②	1.3	27 ●◆
2.3.3 Global R&D companies, top 3, mn US\$.....	65.3	22 ●◆
2.3.4 QS university ranking, average score top 3*.....	48.4	27 ●◆
Infrastructure	45.1	64
3.1 Information & communication technologies (ICTs).....	66.4	46
3.1.1 ICT access*.....	62.5	69
3.1.2 ICT use*.....	56.9	52
3.1.3 Government's online service*.....	73.2	37
3.1.4 E-participation*.....	72.9	37
3.2 General infrastructure.....	31.0	91
3.2.1 Electricity output, kWh/cap.....	2,798.4	64
3.2.2 Logistics performance*.....	47.4	54
3.2.3 Gross capital formation, % GDP.....	17.6	104 ○
3.3 Ecological sustainability.....	37.9	62
3.3.1 GDP/unit of energy use.....	9.9	51
3.3.2 Environmental performance*.....	60.7	62
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP.....	1.0	65
Market sophistication	43.4	82
4.1 Credit.....	24.3	104 ○
4.1.1 Ease of getting credit*.....	45.0	88
4.1.2 Domestic credit to private sector, % GDP.....	62.2	53
4.1.3 Microfinance gross loans, % GDP.....	0.1	51
4.2 Investment.....	36.0	87
4.2.1 Ease of protecting minority investors*.....	63.3	42
4.2.2 Market capitalization, % GDP.....	34.6	43
4.2.3 Venture capital deals/bn PPP\$ GDP.....	0.0	61
4.3 Trade, competition, & market scale.....	69.9	32 ●
4.3.1 Applied tariff rate, weighted mean, %.....	8.0	106 ○◇
4.3.2 Intensity of local competition [†]	71.3	50
4.3.3 Domestic market scale, bn PPP\$.....	3,219.1	8 ●◆

	Score/Value	Rank
Business sophistication	38.3	38 ◆
5.1 Knowledge workers.....	45.9	43
5.1.1 Knowledge-intensive employment, %.....	23.9	63
5.1.2 Firms offering formal training, % firms ^②	42.2	29
5.1.3 GERD performed by business, % GDP.....	n/a	n/a
5.1.4 GERD financed by business, %.....	47.5	28 ●
5.1.5 Females employed w/advanced degrees, %.....	11.9	55
5.2 Innovation linkages.....	29.9	59
5.2.1 University/industry research collaboration [†]	40.3	67
5.2.2 State of cluster development [†]	52.2	40
5.2.3 GERD financed by abroad, %.....	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP.....	0.0	93 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP.....	0.1	61
5.3 Knowledge absorption.....	39.1	31 ●◆
5.3.1 Intellectual property payments, % total trade.....	2.5	10 ●◆
5.3.2 High-tech net imports, % total trade.....	11.7	23 ●
5.3.3 ICT services imports, % total trade.....	1.6	39
5.3.4 FDI net inflows, % GDP.....	4.2	38
5.3.5 Research talent, % in business enterprise ^②	26.1	46
Knowledge & technology outputs	22.8	64
6.1 Knowledge creation.....	17.5	52
6.1.1 Patents by origin/bn PPP\$ GDP.....	1.7	52
6.1.2 PCT patents by origin/bn PPP\$ GDP.....	0.2	51
6.1.3 Utility models by origin/bn PPP\$ GDP.....	0.9	29
6.1.4 Scientific & technical articles/bn PPP\$ GDP.....	9.8	54
6.1.5 Citable documents H index.....	36.2	23 ●◆
6.2 Knowledge impact.....	31.5	84
6.2.1 Growth rate of PPP\$ GDP/worker, %.....	(1.8)	101 ○
6.2.2 New businesses/th pop. 15-64.....	0.1	98 ○
6.2.3 Computer software spending, % GDP.....	0.2	69
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP.....	6.7	50
6.2.5 High- & medium-high-tech manufactures, %.....	0.3	30
6.3 Knowledge diffusion.....	19.5	67
6.3.1 Intellectual property receipts, % total trade.....	0.3	32 ◆
6.3.2 High-tech net exports, % total trade.....	5.0	35 ●
6.3.3 ICT services exports, % total trade.....	0.9	87
6.3.4 FDI net outflows, % GDP.....	0.8	55
Creative outputs	24.2	78
7.1 Intangible assets.....	38.5	77
7.1.1 Trademarks by origin/bn PPP\$ GDP.....	43.9	60
7.1.2 Industrial designs by origin/bn PPP\$ GDP.....	1.1	67
7.1.3 ICTs & business model creation [†]	60.6	60
7.1.4 ICTs & organizational model creation [†]	51.2	74
7.2 Creative goods & services.....	10.0	92
7.2.1 Cultural & creative services exports, % total trade.....	0.2	43
7.2.2 National feature films/mn pop. 15-69.....	0.9	82
7.2.3 Entertainment & Media market/th pop. 15-69.....	7.6	39
7.2.4 Printing & other media, % manufacturing.....	0.6	78 ○
7.2.5 Creative goods exports, % total trade.....	0.3	66
7.3 Online creativity.....	9.6	57
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69.....	1.5	86
7.3.2 Country-code TLDs/th pop. 15-69.....	7.3	43
7.3.3 Wikipedia edits/mn pop. 15-69.....	6.3	71
7.3.4 Mobile app creation/bn PPP\$ GDP.....	25.5	39

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question.

② indicates that the country's data are older than the base year; see Appendix II for details, including the year of the data, at <http://globalinnovationindex.org>.

Square brackets indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level; see page 75 of this appendix for details.