BRAZIL

54th Brazil ranks 54th among the 132 economies featured in the GII 2022.

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.

The following table shows the rankings of Brazil over the past three years, noting that 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 2022 is between ranks 50 and 55.

Rankings for Brazil (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	62	59	64
2021	57	56	59
2022	54	58	53

- Brazil performs better in innovation outputs than innovation inputs in 2022.
- This year Brazil ranks 58th in innovation inputs, lower than last year but higher than 2020.
- As for innovation outputs, Brazil ranks 53rd. This position is higher than both 2021 and 2020.

9th Brazil ranks 9th among the 36 upper-middle-income group economies.

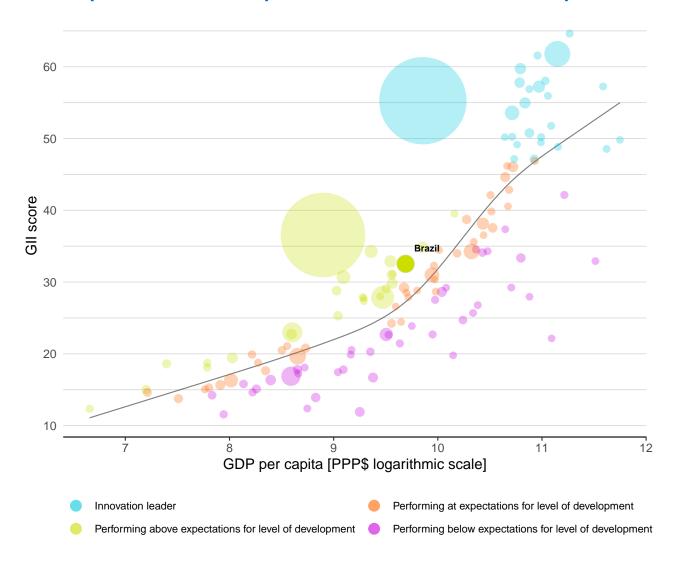
2nd Brazil ranks 2nd among the 18 economies in Latin America and the Caribbean.

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's performance is above expectations for its level of development.

The positive relationship between innovation and development

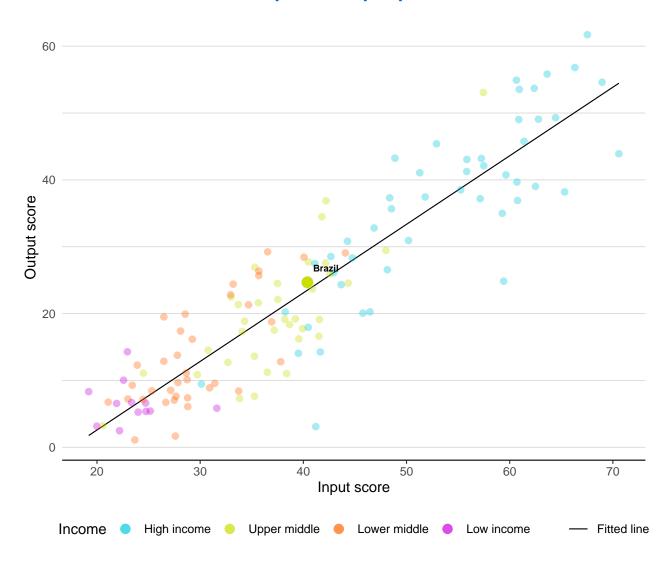


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

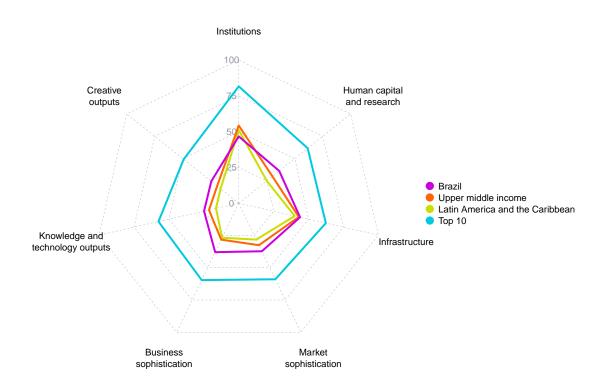
Brazil produces more innovation outputs relative to its level of innovation investments.

Innovation input to output performance



BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND LATIN AMERICA AND THE CARIBBEAN

The seven GII pillar scores for Brazil



Upper-middle-income group economies

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

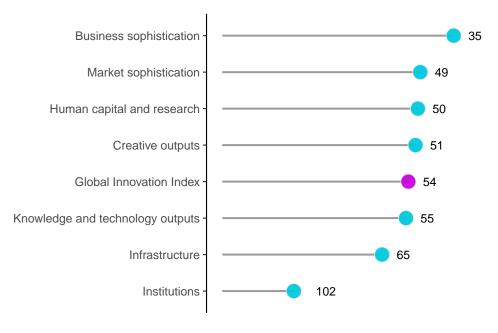
Latin America and the Caribbean

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

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Brazil performs best in Business sophistication and its weakest performance is in Institutions.

The seven GII pillar ranks for Brazil



Note: The highest possible ranking in each pillar is 1.

The full WIPO Intellectual Property Statistics profile for Brazil can be found at:

https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=BR.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the indicator strengths and weaknesses of Brazil in the GII 2022.

Strengths and weaknesses for Brazil

Strengths				Weaknesses	
Code	Indicator name	Rank	Code	Indicator name	Rank
2.1.1	Expenditure on education, % GDP	20	1.3.1	Policies for doing business	103
3.1.3	Government's online service	20	1.3.2	Entrepreneurship policies and culture	66
3.1.4	E-participation	18	2.1.4	PISA scales in reading, maths and science	68
4.3.3	Domestic market scale, bn PPP\$	8	2.2.2	Graduates in science and engineering, %	82
5.3.1	Intellectual property payments, % total trade	14	2.2.3	Tertiary inbound mobility, %	105
5.3.2	High-tech imports, % total trade	19	3.2.3	Gross capital formation, % GDP	108
5.3.3	ICT services imports, % total trade	25	4.1.3	Loans from microfinance institutions, % GDP	57
6.1.5	Citable documents H-index	23	4.3.1	Applied tariff rate, weighted avg., %	107
7.1.1	Intangible asset intensity, top 15, %	17	7.2.2	National feature films/mn pop. 15-69	56
7.1.2	Trademarks by origin/bn PPP\$ GDP	19	7.2.4	Printing and other media, % manufacturing	83

Brazil

Output rank

Input rank

Income

Region

Population (mn)

GDP, PPP\$ (bn)

54

GDP per capita, PPP\$

	53	58	Upper middle	LC	:N	2	14.0	3,437.6	1	6,169	
				Score/ Value	Rank					Score/ Value	Rank
血	Institutio	ns		46.7	102 🔾	2	Business so	phistication		37.9	35
1.2.1 1.2.2 1.2.3 1.3.1	Regulatory of Regulatory of Rule of law* Cost of redur Business en Policies for d	operational stability* effectiveness* environment uality* ndancy dismissal		52.8 65.5 40.1 63.2 40.9 41.5 15.4 24.1 35.4 12.8	91 74 94 70 84 71 62 121 ○ ♦ 103 ○ 66 ○ ♦	5.1.3 5.1.4 5.1.5 5.2 5.2.1 5.2.2 5.2.3 5.2.4	Firms offering GERD performed GERD financed Females emplo Innovation lini University-indu State of cluster GERD financed Joint venture/s	ensive employment, % formal training, % ed by business, % GDP by business, % byed w/advanced degrees, % kages ustry R&D collaboration [†] development and depth [†] by abroad, % GDP strategic alliance deals/bn PPP\$ G	Ø DP	45.9 24.5 n/a n/a 43.5 14.4 24.7 40.4 49.8 n/a 0.0	[40] 59 n/a n/a 37 53 58 78 51 n/a 86
20	Human ca	pital and resear	ch	36.2	50	5.2.5 5.3	Patent families Knowledge ab			0.1 43.3	53 30
2.1.3 2.1.4	Government School life ex PISA scales in	on education, % GDP funding/pupil, secon pectancy, years n reading, maths and r ratio, secondary		51.4 6.1 21.4 15.6 400.0 16.3	67 20 ● 43 44 68 ○ 79	5.3.1 5.3.2 5.3.3 5.3.4 5.3.5	Intellectual pro High-tech impo ICT services im FDI net inflows Research talen	perty payments, % total trade orts, % total trade ports, % total trade , % GDP t, % in businesses	0	1.9 13.2 2.6 3.5 26.6	14 ● 4 19 ● 25 ● 4 37 48
2.2 2.2.1	Tertiary edu Tertiary enro	cation Iment, % gross		22.2 55.1	86 58	_	The state of the s	and technology outputs		24.8	55
2.2.3 2.3.1 2.3.2 2.3.3	Research an Researchers, Gross expend Global corpo	science and enginee und mobility, % d development (R&D FTE/mn pop. diture on R&D, % GDP rate R&D investors, to y ranking, top 3*)) 	0.2 35.0 887.7	82 ○ 105 ○ ◇ 33 ◆ 53 34 ◆ 32 ◆ 30 ◆	6.1.3 6.1.4 6.1.5 6.2 6.2.1	PCT patents by Utility models k Scientific and to Citable docume Knowledge im Labor producti	in/bn PPP\$ GDP origin/bn PPP\$ GDP by origin/bn PPP\$ GDP echnical articles/bn PPP\$ GDP ents H-index pact vity growth, %		20.0 1.7 0.2 0.8 18.9 38.6 30.8 0.8	48 43 54 26 51 23 •
A	Infrastruc	ture		43.9	65		New businesse Software spend			2.7 0.3	48 40
3.1.2 3.1.3 3.1.4 3.2 3.2.1 3.2.2	ICT access* ICT use* Government E-participatio General infr Electricity ou Logistics per	astructure tput, GWh/mn pop.	technologies (ICTs)	80.4 81.4 62.9 87.1 90.5 26.0 2,922.5 43.7 17.3	45 81 63 20 • ◆ 18 • ◆ 75 64 55	6.2.5 6.3 6.3.1 6.3.2 6.3.3 6.3.4	High-tech man Knowledge dif Intellectual pro Production and High-tech expo	fusion sperty receipts, % total trade desport complexity orts, % total trade ports, % total trade		5.7 37.5 23.7 0.3 44.0 2.6 1.1	50 32 64 36 53 53 85
3.3	Ecological su			25.3	71 67	7.1	Intangible ass			41.8	33
3.3.2 3.3.3	ISO 14001 e	al performance* nvironmental certific	cates/bn PPP\$ GDP	10.2 43.6 1.0	67 60 69		Trademarks by Global brand va	et intensity, top 15, % origin/bn PPP\$ GDP alue, top 5,000, % GDP gns by origin/bn PPP\$ GDP		72.1 82.7 34.7 1.4	17 ● 19 ● 41 58
iii	Market so	phistication		37.2	49	7.2 7.2.1	Creative goods	s and services eative services exports, % total trad	۵	6.8 0.5	93 51
	Domestic cre Loans from n	tartups and scaleups edit to private sector, i nicrofinance institution	% GDP	22.1 40.7 70.2 0.0	82 38 48 57 ○	7.2.2 7.2.3 7.2.4	National featur Entertainment Printing and ot	eather services exports, % total tradi- er films/mn pop. 15–69 and media market/th pop. 15–69 her media, % manufacturing exports, % total trade		1.1 6.0 0.5 0.2	56 O 44 83 O 83
4.2.2 4.2.3	Venture capi Venture capi	alization, % GDP tal investors, deals/bi tal recipients, deals/b tal received, value, %	n PPP\$ GDP	17.2 59.8 0.0 0.0 0.0	38 32 53 44 22	7.3.3	Country-code 1 GitHub commit	ity rel domains (TLDs)/th pop. 15–69 FLDs/th pop. 15–69 t pushes received/mn pop. 15–69 ation/bn PPP\$ GDP		7.6 1.6 8.9 8.3 11.5	51 85 42 47 34
4.3.2	Applied tarif	sification, and marke f rate, weighted avg., lustry diversification irket scale, bn PPP\$		72.4 8.4 94.2 3,437.6	18 • ◆ 107 ○ ◇ 27 8 • ◆		and the same				

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/global_innovation_index/en/2022. 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.

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	2020	UNESCO Institute for Statistics
5.2.3	GERD financed by abroad, % GDP	n/a	2019	UNESCO Institute for Statistics

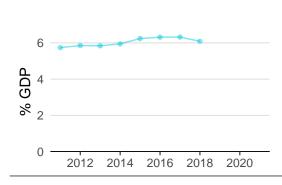
Outdated data for Brazil

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	2019	2020	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2014	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2019	2020	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	2018	2019	UNESCO Institute for Statistics
5.3.5	Research talent, % in businesses	2014	2020	UNESCO Institute for Statistics

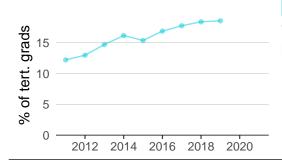
BRAZIL'S INNOVATION SYSTEM

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

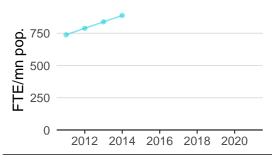
Innovation inputs



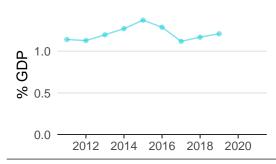
2.1.1 Expenditure on education was equal to 6.1% GDP in 2018–down by 4 percentage points from the year prior–and equivalent to an indicator rank of 20.



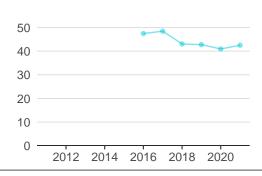
2.2.2 Graduates in science and engineering was equal to 18.5% of tert. grads in 2019—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 82.



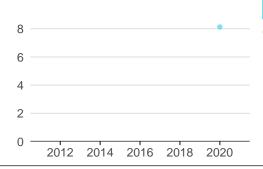
2.3.1 Researchers was equal to 887.7 FTE/mn pop. in 2014—up by 6 percentage points from the year prior—and equivalent to an indicator rank of 53.



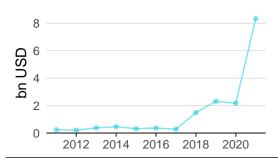
2.3.2 Gross expenditure on R&D was equal to 1.2% GDP in 2019–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 34.



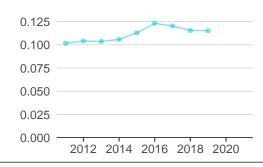
2.3.4 QS university ranking was equal to 42.5 in 2021—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 30.



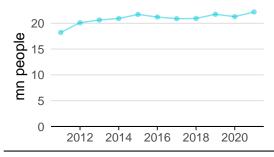
3.1.1 ICT access was equal to 8.1 in 2020 and equivalent to an indicator rank of 81.



4.2.4 Venture capital received was equal to 8.3 bn USD in 2021–up by 281 percentage points from the year prior–and equivalent to an indicator rank of 22.

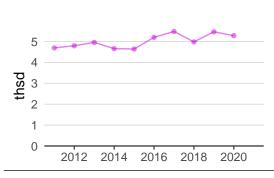


4.3.2 Domestic industry diversification was equal to 0.1 in 2019–effectively unchanged from the year prior–and equivalent to an indicator rank of 27.

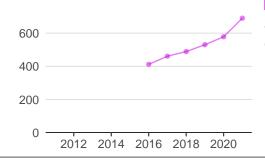


5.1.1 Knowledge-intensive employment was equal to 22.2 mn people in 2021—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 59.

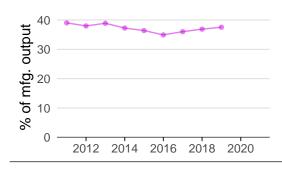
Innovation outputs



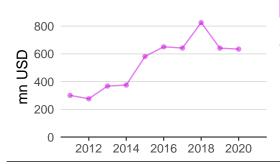
6.1.1 Patents by origin was equal to 5.3 thsd in 2020–down by 3 percentage points from the year prior–and equivalent to an indicator rank of 43.



6.1.5 Citable documents H-index was equal to 690.0 in 2021—up by 19 percentage points from the year prior—and equivalent to an indicator rank of 23.



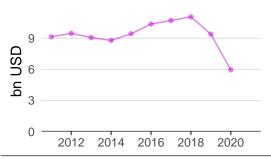
6.2.5 High-tech manufacturing was equal to 37.5% of mfg. output in 2019–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 32.



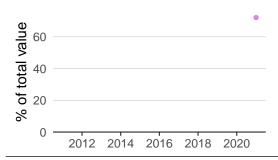
6.3.1 Intellectual property receipts was equal to 634.3 mn USD in 2020–down by 1 percentage point from the year prior–and equivalent to an indicator rank of 36.



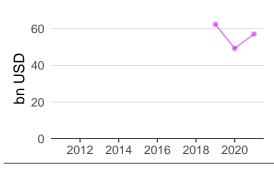
6.3.2 Production and export complexity was equal to 0.1 in 2019–down by 46 percentage points from the year prior–and equivalent to an indicator rank of 53.



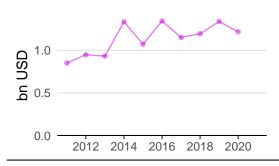
6.3.3 High-tech exports was equal to 5.9 bn USD in 2020—down by 37 percentage points from the year prior—and equivalent to an indicator rank of 53.



7.1.1 Intangible asset intensity was equal to 72.1% of total value in 2021 and equivalent to an indicator rank of 17.



7.1.3 Global brand value was equal to 57.1 bn USD in 2021—up by 16 percentage points from the year prior—and equivalent to an indicator rank of 41.



7.2.1 Cultural and creative services exports was equal to 1.2 bn USD in 2020–down by 9 percentage points from the year prior–and equivalent to an indicator rank of 51.



BRAZIL'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank
		[mn EUR]	[%]	[%]	
PETROBRAS	Oil & Gas Producers	100	-32.4	0.2	1,177
EMBRAER	Aerospace & Defence	90	-59.9	2.9	1,286
WEG	Industrial Engineering	74	38.3	2.7	1,485

European Commission's Joint Research Centre (https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard). European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually. Note:

2.3.4 QS university ranking

University	Score	Rank
UNIVERSIDADE DE SÃO PAULO	55.9	121=
UNIVERSIDADE ESTADUAL DE CAMPINAS	41.3	219
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO	30.3	369=

QS Quacquarelli Symonds Ltd (https://www.topuniversities.com/university-rankings/world-university-rankings/2022). 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". Note:

7.1.1 Intangible asset intensity, top 15

Firm	Rank
VALE	1
WEG	2
BANCO BRADESCO	3

Source: Brand Finance (https://brandirectory.com/reports/gift-2021). Note: Brand Finance only provides within economy ranks.

7.1.3 Global brand value, top 5,000

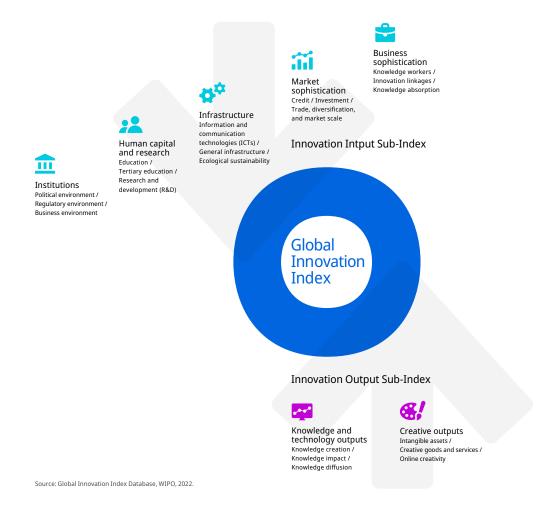
Brand	Industry	Rank
ITAÚ	Banking	1
BRADESCO	Banking	2
BANCO DO BRASIL	Banking	3

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

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.