Global Innovation Index 2021

BRAZIL

57th Brazil ranks 57th among the 132 economies featured in the GII 2021.

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 2021 is between ranks 53 and 59.

Rankings for Brazil (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	57	56	59
2020	62	59	64
2019	66	60	67

- Brazil performs better in innovation inputs than innovation outputs in 2021.
- This year Brazil ranks 56th in innovation inputs, higher than both 2020 and 2019.
- As for innovation outputs, Brazil ranks 59th. This position is higher than both 2020 and 2019.

11th Brazil ranks 11th among the 34 upper middle-income group economies.

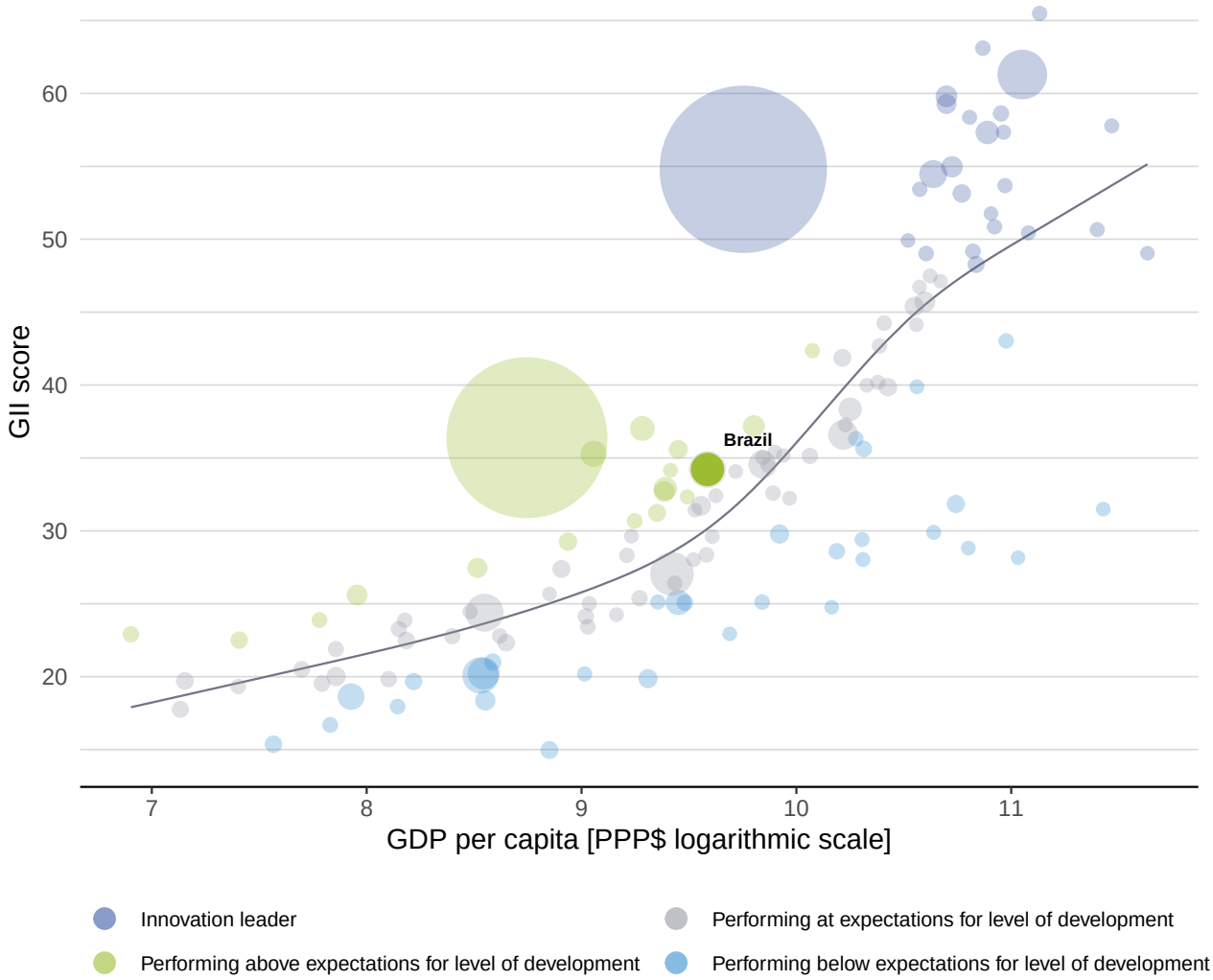
4th Brazil ranks 4th among the 18 economies in Latin America and the Caribbean.

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

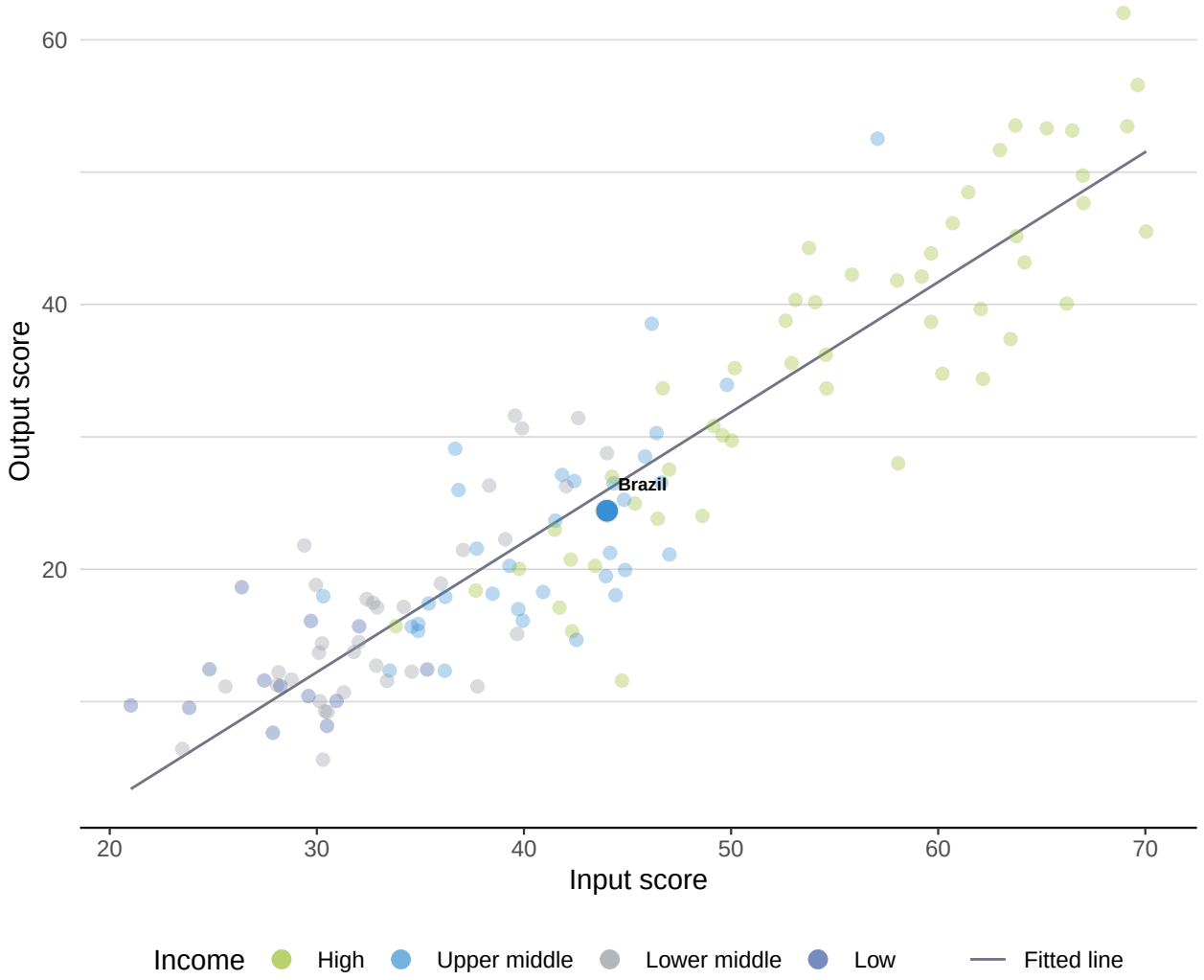


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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 less 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 four pillars, namely: Human capital and research; Infrastructure; Business sophistication; and, Knowledge and technology outputs.

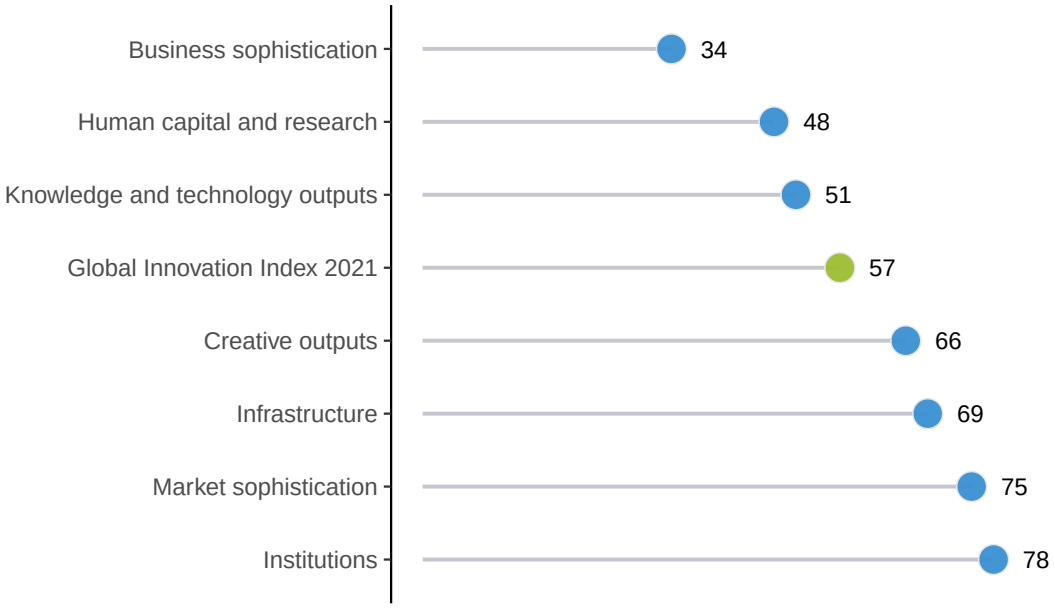
Latin America and the Caribbean

Brazil performs above the regional average in all GII pillars.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 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 one.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Brazil in the GII 2021.

Strengths and weaknesses for Brazil

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
2.1.1	Expenditure on education, % GDP	11	1.3.1	Ease of starting a business	106
2.3.3	Global corporate R&D investors, top 3, mn US$	26	2.1.4	PISA scales in reading, maths and science	68
3.1.3	Government's online service	20	2.2.2	Graduates in science and engineering, %	83
3.1.4	E-participation	18	2.2.3	Tertiary inbound mobility, %	104
4.3	Trade, diversification, and market scale	26	3.2	General infrastructure	107
4.3.3	Domestic market scale, bn PPP$	8	3.2.3	Gross capital formation, % GDP	116
5.3	Knowledge absorption	28	4.1	Credit	103
5.3.1	Intellectual property payments, % total trade	14	4.1.1	Ease of getting credit	94
5.3.2	High-tech imports, % total trade	28	4.2	Investment	99
5.3.3	ICT services imports, % total trade	30	4.3.1	Applied tariff rate, weighted avg., %	102
6.1.5	Citable documents H-index	24	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	89
7.1.1	Trademarks by origin/bn PPP$ GDP	27	7.2	Creative goods and services	94
			7.2.2	National feature films/mn pop. 15–69	84
			7.2.4	Printing and other media, % manufacturing	86

Brazil

GII 2021 rank **57**

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$	GII 2020 rank
59	56	Upper middle	LCN	212.6	3,078.9	14,563	62

		Score/ Value	Rank	
Institutions		**60.6**	**78**	
1.1	**Political environment**	**53.0**	**85**	
1.1.1	Political and operational stability*	66.1	74	
1.1.2	Government effectiveness*	46.5	86	
1.2	**Regulatory environment**	**62.8**	**74**	
1.2.1	Regulatory quality*	38.9	82	
1.2.2	Rule of law*	42.0	72	
1.2.3	Cost of redundancy dismissal	15.4	60	
1.3	**Business environment**	**65.9**	**80**	
1.3.1	Ease of starting a business*	81.3	106 ○	
1.3.2	Ease of resolving insolvency*	50.4	69	
Human capital and research		**37.5**	**48**	
2.1	**Education**	**55.4**	**48**	
2.1.1	Expenditure on education, % GDP	6.3	11 ● ◆	
2.1.2	Government funding/pupil, secondary, % GDP/cap	21.8	35	
2.1.3	School life expectancy, years	15.7	42	
2.1.4	PISA scales in reading, maths and science	400.0	68 ○	
2.1.5	Pupil-teacher ratio, secondary	16.6	81	
2.2	**Tertiary education**	**25.1**	**85**	
2.2.1	Tertiary enrolment, % gross	53.3	58	
2.2.2	Graduates in science and engineering, %	18.4	83 ○	
2.2.3	Tertiary inbound mobility, %	0.2	104 ○ ◇	
2.3	**Research and development (R&D)**	**31.9**	**36** ◆	
2.3.1	Researchers, FTE/mn pop.	887.7	53	
2.3.2	Gross expenditure on R&D, % GDP	1.2	34 ◆	
2.3.3	Global corporate R&D investors, top 3, mn US$	52.7	26 ● ◆	
2.3.4	QS university ranking, top 3*	40.9	31 ◆	
Infrastructure		**41.2**	**69**	
3.1	**Information and communication technologies (ICTs)**	**74.5**	**49**	
3.1.1	ICT access*	58.9	77	
3.1.2	ICT use*	61.5	60	
3.1.3	Government's online service*	87.1	20 ● ◆	
3.1.4	E-participation*	90.5	18 ● ◆	
3.2	**General infrastructure**	**20.5**	**107** ○	
3.2.1	Electricity output, GWh/mn pop.	2,967.7	67	
3.2.2	Logistics performance*	43.6	55	
3.2.3	Gross capital formation, % GDP	14.7	116 ○ ◇	
3.3	**Ecological sustainability**	**28.6**	**64**	
3.3.1	GDP/unit of energy use	11.1	56	
3.3.2	Environmental performance*	51.2	53	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.9	68	
Market sophistication		**44.9**	**75**	
4.1	**Credit**	**30.5**	**103** ○ ◇	
4.1.1	Ease of getting credit*	50.0	94 ○ ◇	
4.1.2	Domestic credit to private sector, % GDP	63.7	53	
4.1.3	Microfinance gross loans, % GDP	0.1	58	
4.2	**Investment**	**23.2**	**99** ○	
4.2.1	Ease of protecting minority investors*	62.0	60	
4.2.2	Market capitalization, % GDP	53.1	33	
4.2.3	Venture capital investors, deals/bn PPP$ GDP	0.0	57	
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	0.0	55	
4.3	**Trade, diversification, and market scale**	**80.8**	**26** ●	
4.3.1	Applied tariff rate, weighted avg., %	8.0	102 ○	
4.3.2	Domestic industry diversification	94.8	28	
4.3.3	Domestic market scale, bn PPP$	3,078.9	8 ● ◆	

		Score/ Value	Rank	
Business sophistication		**36.0**	**34**	◆
5.1	**Knowledge workers**	**46.1**	**[30]**	
5.1.1	Knowledge-intensive employment, %	25.2	58	
5.1.2	Firms offering formal training, %	n/a	n/a	
5.1.3	GERD performed by business, % GDP	n/a	n/a	
5.1.4	GERD financed by business, %	43.5	35	
5.1.5	Females employed w/advanced degrees, %	15.3	46	
5.2	**Innovation linkages**	**21.4**	**61**	
5.2.1	University-industry R&D collaboration†	39.0	81	
5.2.2	State of cluster development and depth†	49.4	49	
5.2.3	GERD financed by abroad, % GDP	n/a	n/a	
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	89 ○	
5.2.5	Patent families/bn PPP$ GDP	0.1	56	
5.3	**Knowledge absorption**	**40.4**	**28** ● ◆	
5.3.1	Intellectual property payments, % total trade	2.1	14 ● ◆	
5.3.2	High-tech imports, % total trade	10.5	28 ●	
5.3.3	ICT services imports, % total trade	2.2	30 ● ◆	
5.3.4	FDI net inflows, % GDP	3.7	34	
5.3.5	Research talent, % in businesses	26.6	46	
Knowledge and technology outputs		**25.3**	**51**	
6.1	**Knowledge creation**	**23.0**	**46**	
6.1.1	Patents by origin/bn PPP$ GDP	1.7	41	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.2	47	
6.1.3	Utility models by origin/bn PPP$ GDP	0.9	26	
6.1.4	Scientific and technical articles/bn PPP$ GDP	18.8	47	
6.1.5	Citable documents H-index	37.6	24 ● ◆	
6.2	**Knowledge impact**	**35.5**	**40**	
6.2.1	Labor productivity growth, %	1.3	35	
6.2.2	New businesses/th pop. 15–64	1.3	76	
6.2.3	Software spending, % GDP	0.3	29	◆
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	5.6	54	
6.2.5	High-tech manufacturing, %	36.3	32	
6.3	**Knowledge diffusion**	**17.4**	**62**	
6.3.1	Intellectual property receipts, % total trade	0.3	33	◆
6.3.2	Production and export complexity	48.8	49	
6.3.3	High-tech exports, % total trade	3.7	44	
6.3.4	ICT services exports, % total trade	1.0	82	
Creative outputs		**23.5**	**66**	
7.1	**Intangible assets**	**35.3**	**51**	
7.1.1	Trademarks by origin/bn PPP$ GDP	67.9	27 ●	
7.1.2	Global brand value, top 5,000, % GDP	36.1	41	
7.1.3	Industrial designs by origin/bn PPP$ GDP	1.3	59	
7.1.4	ICTs and organizational model creation†	52.6	69	
7.2	**Creative goods and services**	**6.8**	**94** ○	
7.2.1	Cultural and creative services exports, % total trade	0.5	48	
7.2.2	National feature films/mn pop. 15–69	1.1	84 ○	
7.2.3	Entertainment and media market/th pop. 15–69	7.8	40	
7.2.4	Printing and other media, % manufacturing	0.5	86 ○	
7.2.5	Creative goods exports, % total trade	0.3	70	
7.3	**Online creativity**	**16.7**	**69**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.6	87	
7.3.2	Country-code TLDs/th pop. 15–69	8.6	42	
7.3.3	Wikipedia edits/mn pop. 15–69	42.8	81	
7.3.4	Mobile app creation/bn PPP$ GDP	15.0	37	

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 Appendix IV 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.

DATA AVAILABILITY

The following tables list data 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
5.1.3	GERD performed by business, % GDP	n/a	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.2.3	GERD financed by abroad, % GDP	n/a	2018	UNESCO Institute for Statistics

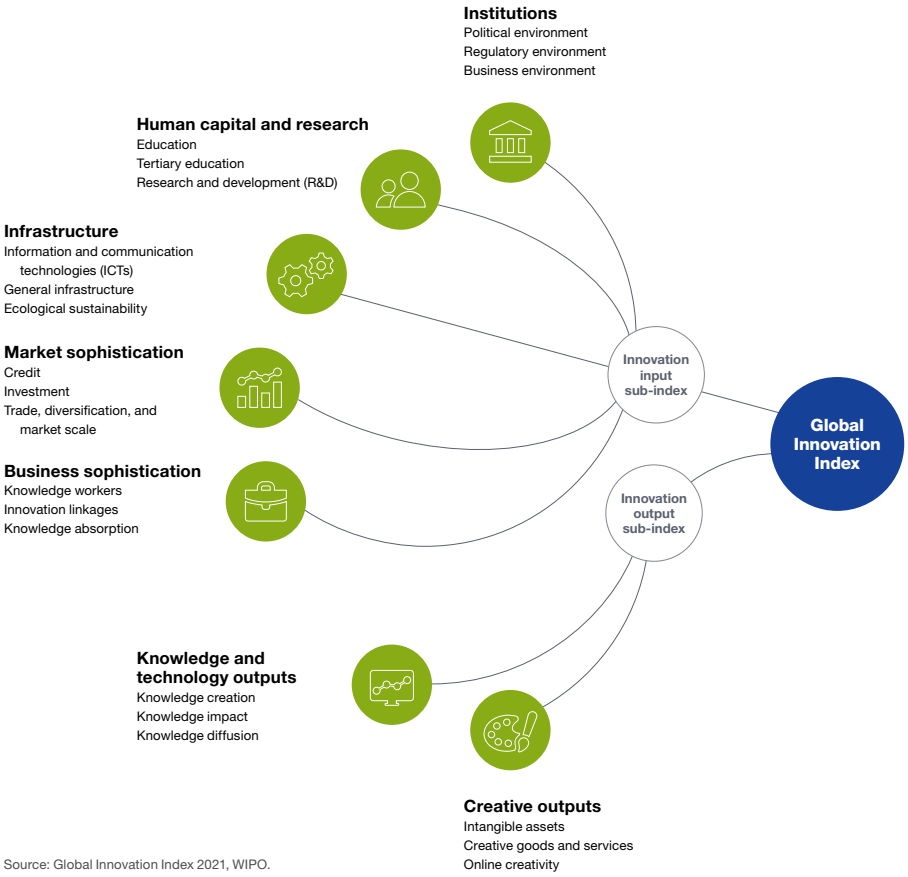
Outdated data for Brazil

Code	Indicator name	Economy year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2018	2019	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2014	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2018	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.3.5	Research talent, % in businesses	2014	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators

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 2021, WIPO.

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.