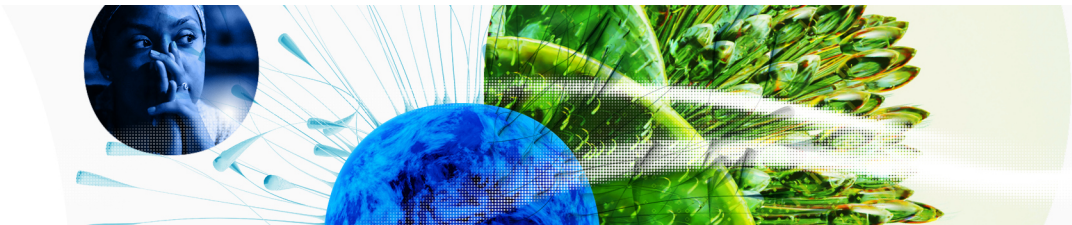
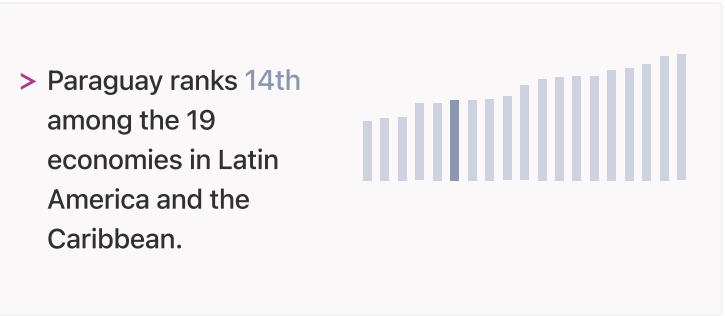
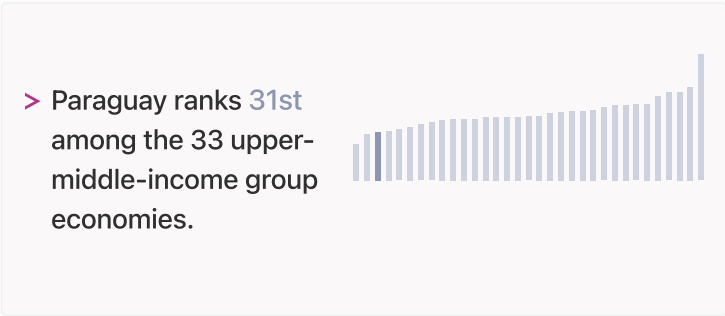
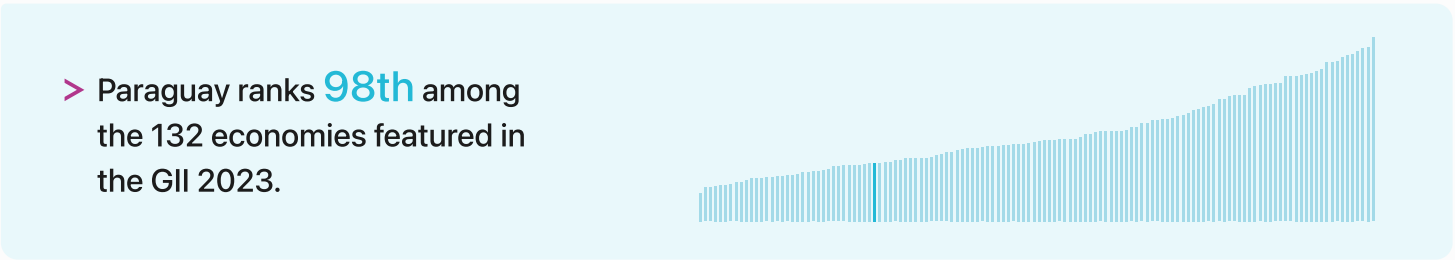


Global Innovation Index 2023



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**.

Paraguay ranking in the Global Innovation Index 2023



> **Paraguay GII Ranking (2020-2023)**

The table shows the rankings of Paraguay 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 Paraguay in the GII 2023 is between ranks 91 and 102.

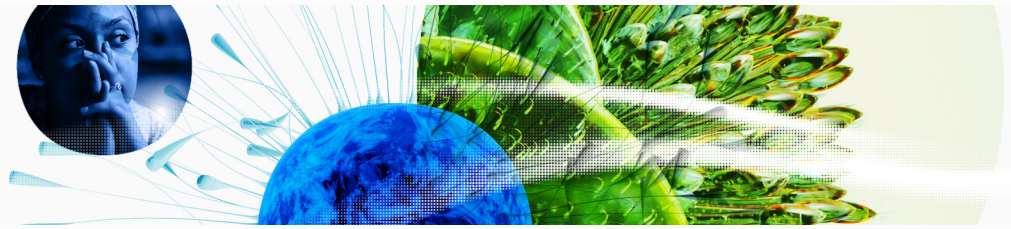
	GII Position	Innovation Inputs	Innovation Outputs
2020	97th	98th	92nd
2021	88th	90th	87th
2022	91st	94th	84th
2023	98th	101st	92nd

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

This year Paraguay ranks 101st in innovation inputs. This position is lower than last year.

Paraguay ranks 92nd in innovation outputs. This position is lower than last year.

Global Innovation Index 2023



→ Expected vs. observed innovation performance

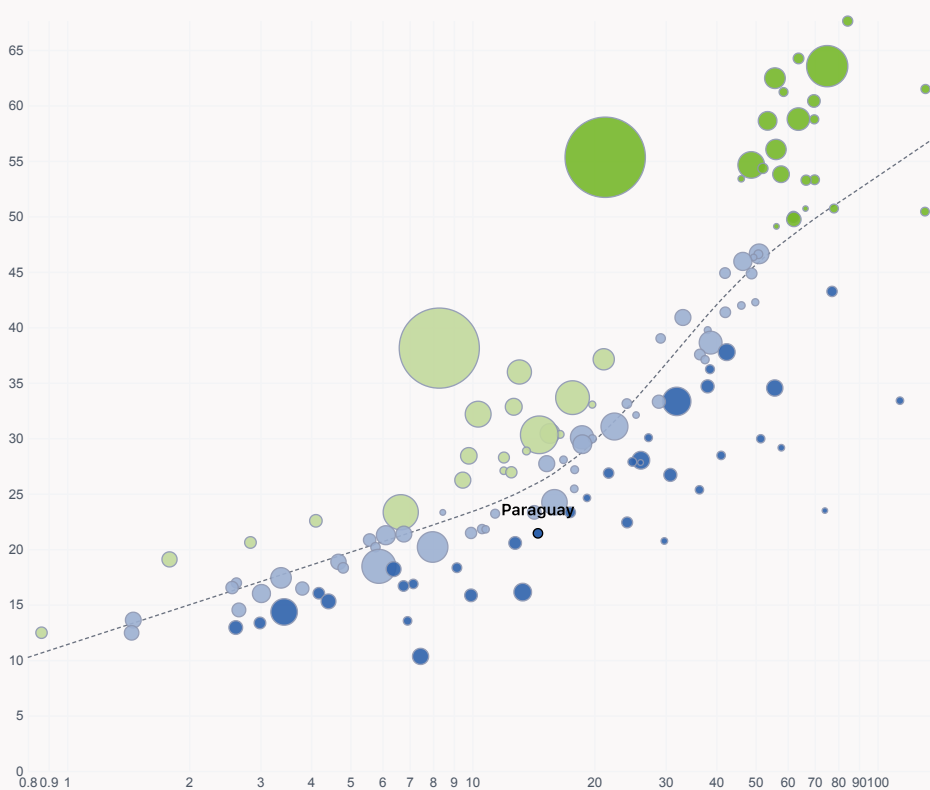
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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



> Relative to GDP, Paraguay's performance is below 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



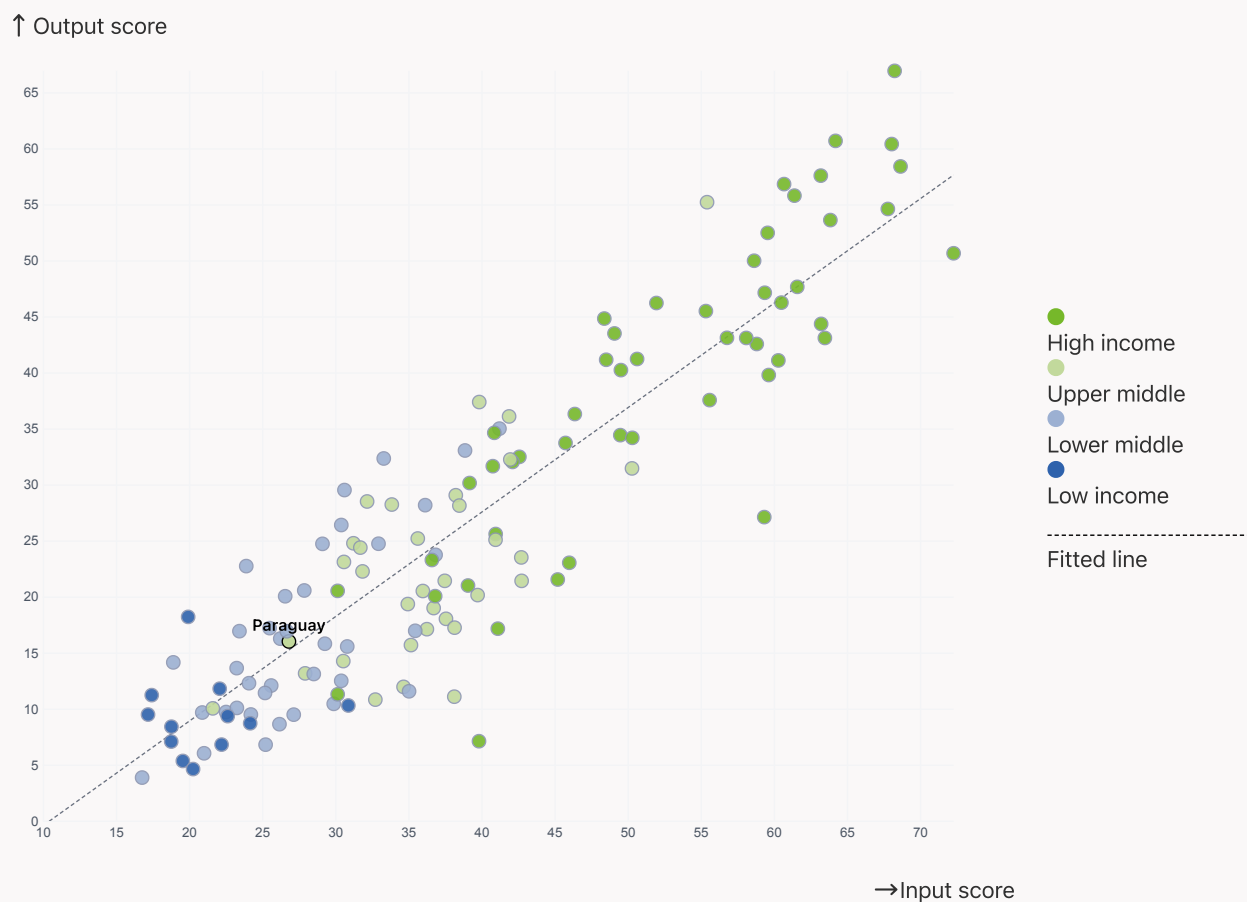
→ Effectively translating innovation investments into innovation outputs

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.



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

> Relationship between innovation inputs and outputs



Global Innovation Index 2023



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

Highest rankings →

- 76th Creative outputs
- 79th Market sophistication
- 83rd Infrastructure
- 87th Business sophistication
- 98th Global Innovation Index
- 109th Knowledge and technology outputs
- 112nd Institutions

← Lowest rankings

- 129th Human capital and research

> Highest rankings



Paraguay ranks highest in Creative outputs (76th), Market sophistication (79th), Infrastructure (83rd) and Business sophistication (87th).

> Lowest rankings

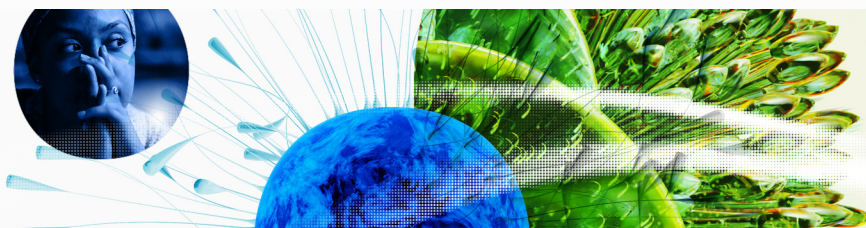


Paraguay ranks lowest in Human capital and research (129th), Institutions (112nd) and Knowledge and technology outputs (109th).



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

Global Innovation Index 2023



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

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

> Upper-Middle-Income economies

Paraguay performs below the upper-middle-income group average in all the pillars.



> Latin America And The Caribbean

Paraguay performs below the regional average in Knowledge and technology outputs, Business sophistication, Human capital and research, Infrastructure, Institutions.



Knowledge and technology outputs

Top 10 | Score: 58.96

Upper middle income | Score: 22.36

LCN | Score: 17.14

Paraguay | Score: 12.26

Creative outputs

Top 10 | 56.09

Upper middle income | 23.16

Paraguay | 19.72

LCN | 18.91

Business sophistication

Top 10 | 64.39

Upper middle income | 29.27

LCN | 26.15

Paraguay | 23.27

Market sophistication

Top 10 | 61.93

Upper middle income | 35.45

Paraguay | 31.56

LCN | 29.74

Human capital and research

Top 10 | 60.28

Upper middle income | 29.68

LCN | 24.92

Paraguay | 10.08

Infrastructure

Top 10 | 62.83

Upper middle income | 40.40

LCN | 35.88

Paraguay | 35.42

Institutions

Top 10 | 79.85

Upper middle income | 47.71

LCN | 41.12

Paraguay | 33.86

Global Innovation Index 2023



→ Innovation strengths and weaknesses in Paraguay

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



> Paraguay's main innovation strengths are **Trademarks by origin/bn PPP\$ GDP** (rank 6), **High-tech imports, % total trade** (rank 8) and **Firms offering formal training, %** (rank 23).

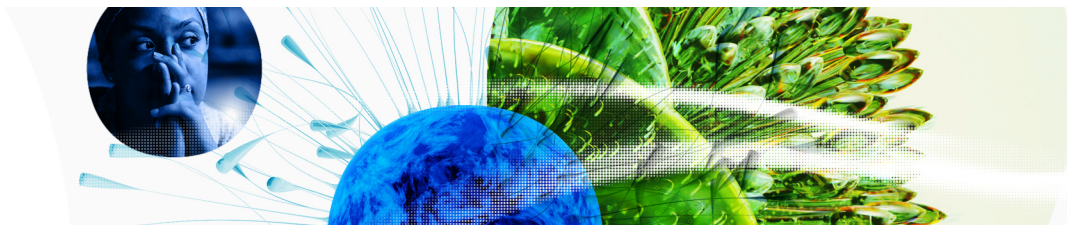
Strengths

Rank	Code	Indicator name
6	7.1.2	Trademarks by origin/bn PPP\$ GDP
8	5.3.2	High-tech imports, % total trade
23	5.1.2	Firms offering formal training, %
39	3.2.1	Electricity output, GWh/mn pop.
43	3.3.1	GDP/unit of energy use
61	6.3.5	ISO 9001 quality/bn PPP\$ GDP
62	3.2.3	Gross capital formation, % GDP
69	3.3.2	Environmental performance
73	4.1.2	Domestic credit to private sector, % GDP
75	7.3.2	Country-code TLDs/th pop. 15-69

Weaknesses

Rank	Code	Indicator name
132	5.3.3	ICT services imports, % total trade
127	6.3.4	ICT services exports, % total trade
125	5.2.1	University-industry R&D collaboration
107	7.2.1	Cultural and creative services exports, % total trade
96	5.1.4	GERD financed by business, %
84	4.1.1	Finance for startups and scaleups
74	7.1.3	Global brand value, top 5,000
71	2.3.4	QS university ranking, top 3
48	6.2.2	Unicorn valuation, % GDP
40	2.3.3	Global corporate R&D investors, top 3, mn US\$

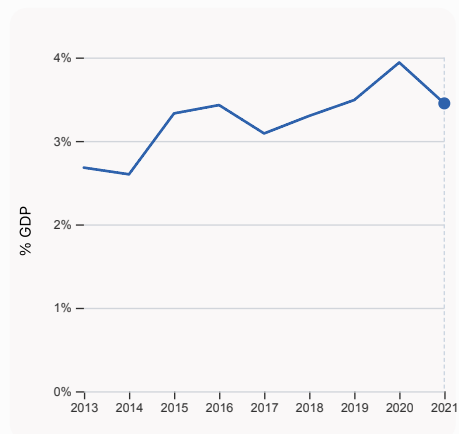
Global Innovation Index 2023



→ Paraguay's innovation system

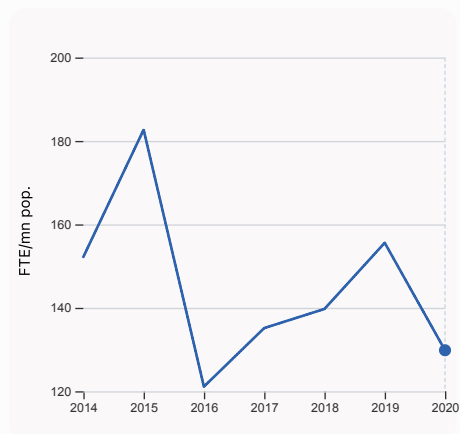
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Paraguay



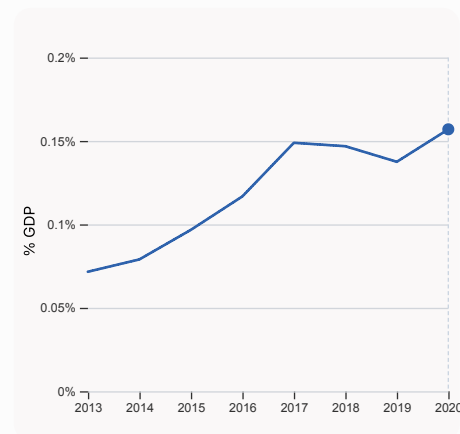
2.1.1 Expenditure on education, % GDP

was equal to 3.45% GDP in 2021, down by 0.49 percentage points from the year prior – and equivalent to an indicator rank of 94.



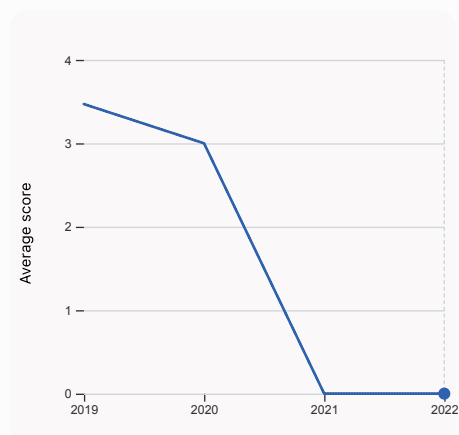
2.3.1 Researchers, FTE/mn pop.

was equal to 129.83 FTE/mn pop. in 2020, down by 16.55% from the year prior – and equivalent to an indicator rank of 87.



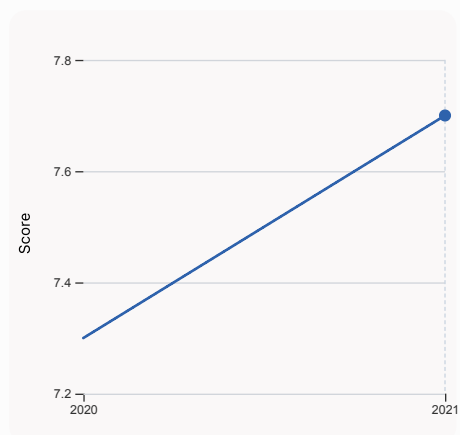
2.3.2 Gross expenditure on R&D, % GDP

was equal to 0.157% GDP in 2020, up by 0.019 percentage points from the year prior – and equivalent to an indicator rank of 96.



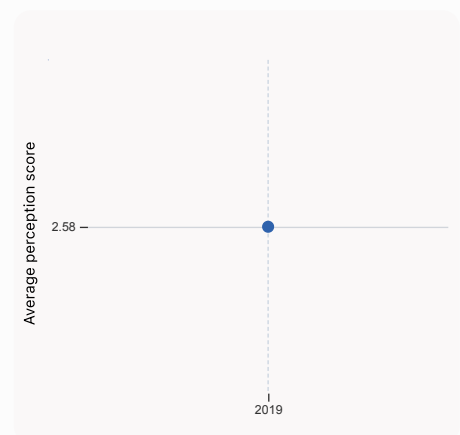
2.3.4 QS university ranking, top 3

was equal to an average score of 0 for the top 3 universities in 2022, equivalent to an indicator rank of 71.



3.1.1 ICT access

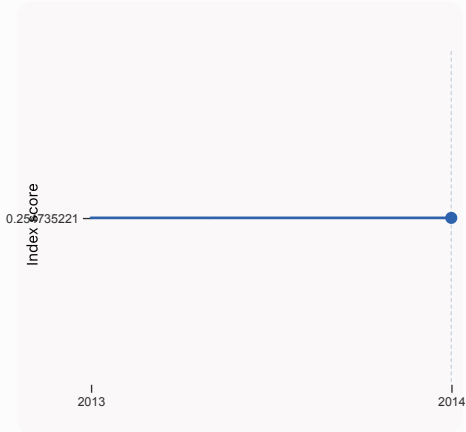
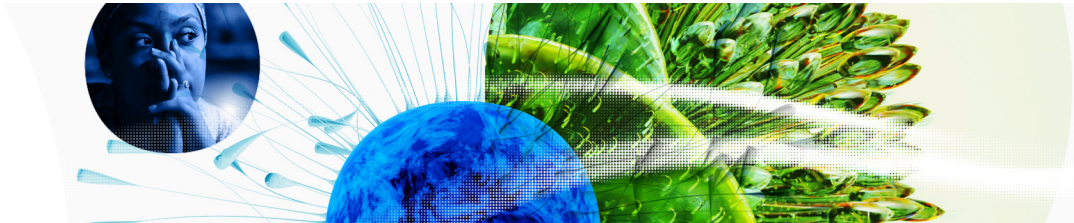
was equal to a score of 7.7 in 2021, up by 5.48% from the year prior – and equivalent to an indicator rank of 93.



4.1.1 Finance for startups and scaleups

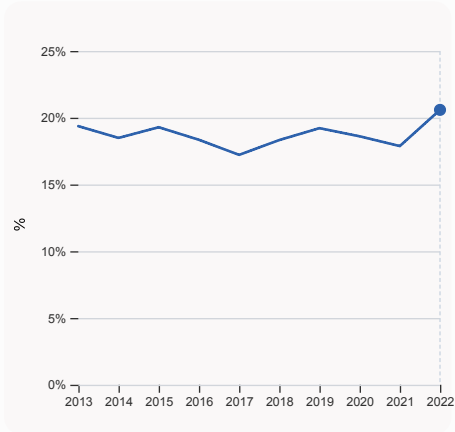
was equal to an average perception score of 2.58 in 2019, equivalent to an indicator rank of 84.

Global Innovation Index 2023



4.3.2 Domestic industry diversification

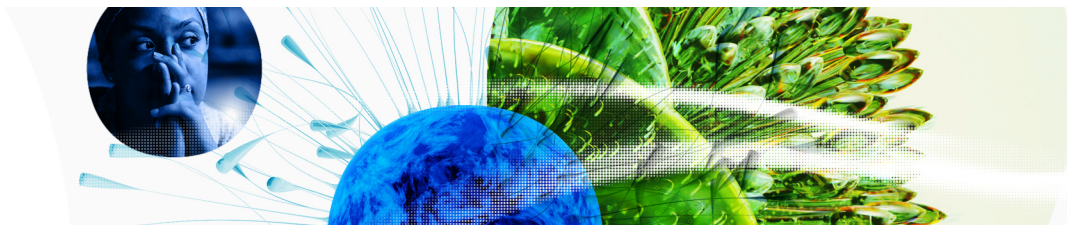
was equal to an index score of 0.255 in 2014, with no change from the year prior – and equivalent to an indicator rank of 86.



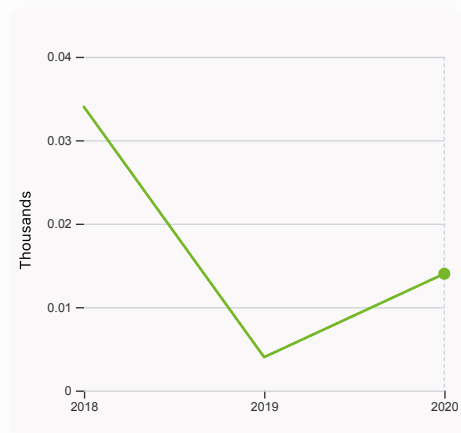
5.1.1 Knowledge-intensive employment, %

was equal to 20.59% in 2022, up by 2.71 percentage points from the year prior – and equivalent to an indicator rank of 74.

Global Innovation Index 2023

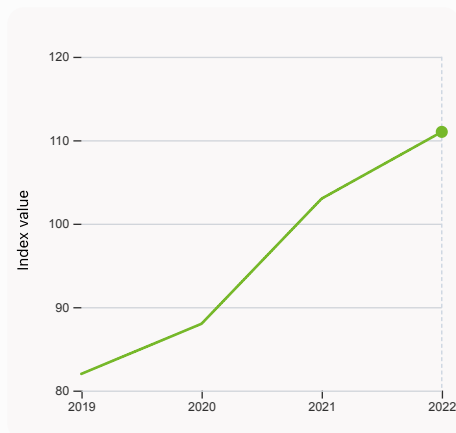


> Innovation outputs in Paraguay



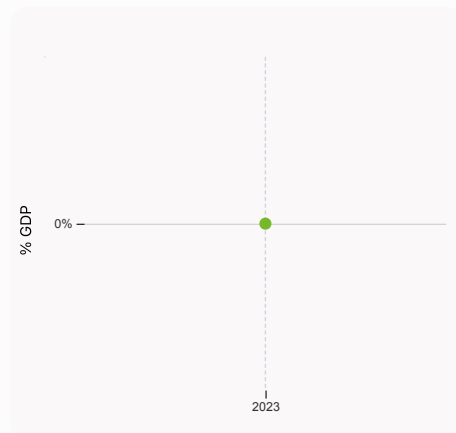
6.1.1 Patents by origin

was equal to 0.014 Thousands in 2020, up by 250% from the year prior – and equivalent to an indicator rank of 105.



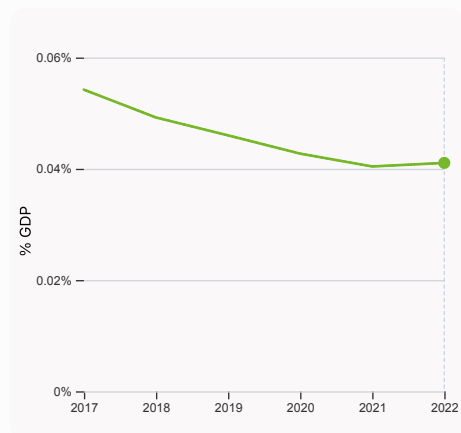
6.1.5 Citable documents H-index

was equal to an index value of 111 in 2022, up by 7.77% from the year prior – and equivalent to an indicator rank of 118.



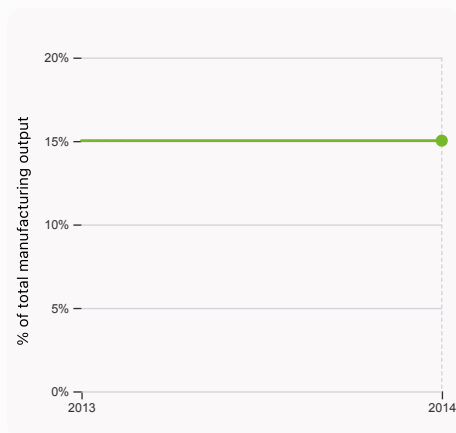
6.2.2 Unicorn valuation, % GDP

was equal to 0 % GDP in 2023 – and equivalent to an indicator rank of 48.



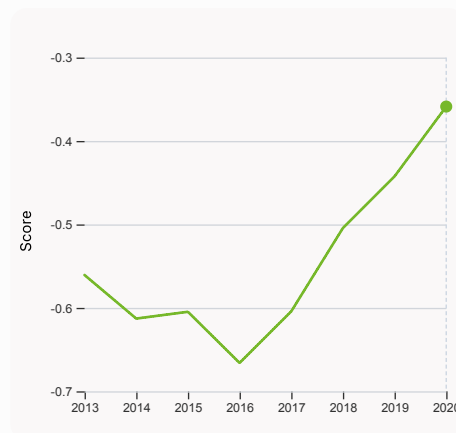
6.2.3 Software spending, % GDP

was equal to 0.041% GDP in 2022, up by 0.00064 percentage points from the year prior – and equivalent to an indicator rank of 110.



6.2.4 High-tech manufacturing, %

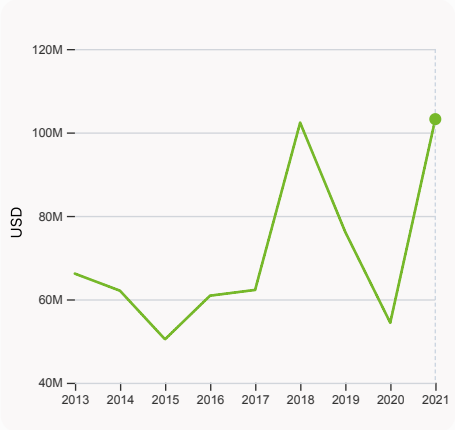
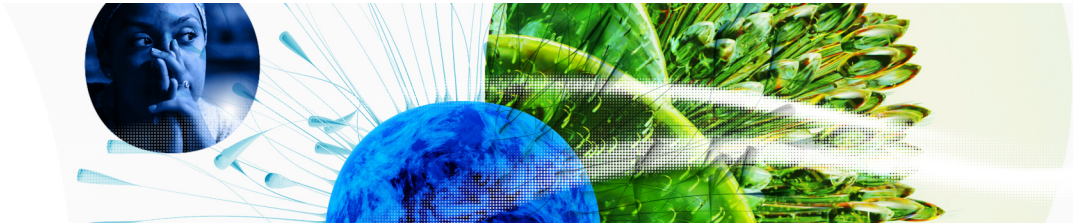
was equal to 15.02% of total manufacturing output in 2014, up by with no change from the year prior – and equivalent to an indicator rank of 77.



6.3.2 Production and export complexity

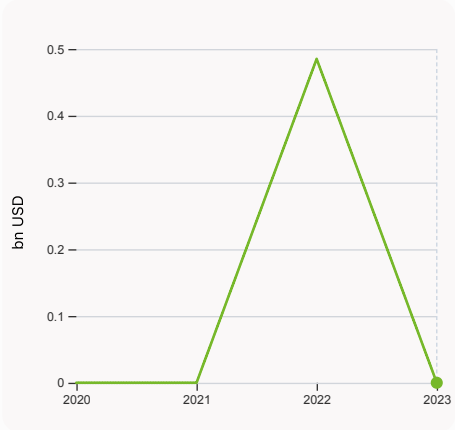
was equal to a score of -0.359 in 2020, up by 18.9% from the year prior – and equivalent to an indicator rank of 83.

Global Innovation Index 2023



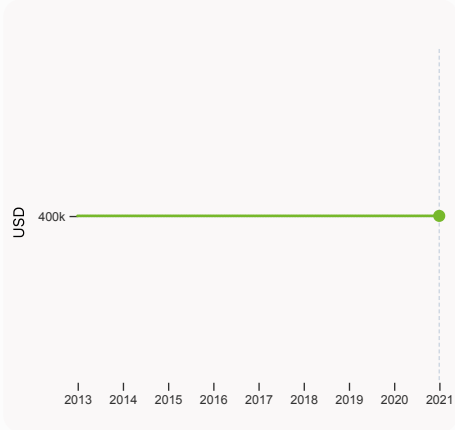
6.3.3 High-tech exports

was equal to 103,189,076 USD in 2021, up by 89.69% from the year prior – and equivalent to an indicator rank of 77.



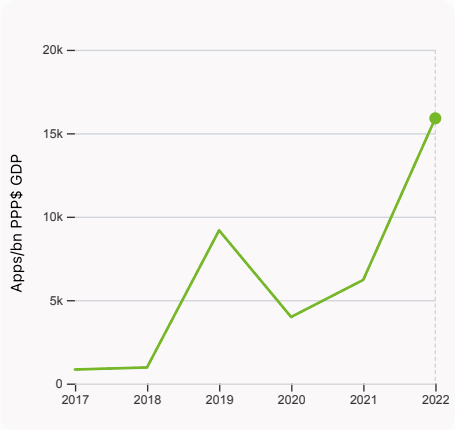
7.1.3 Global brand value, top 5,000

was equal to 0 bn USD in 2023, down by 100% from the year prior – and equivalent to an indicator rank of 74.



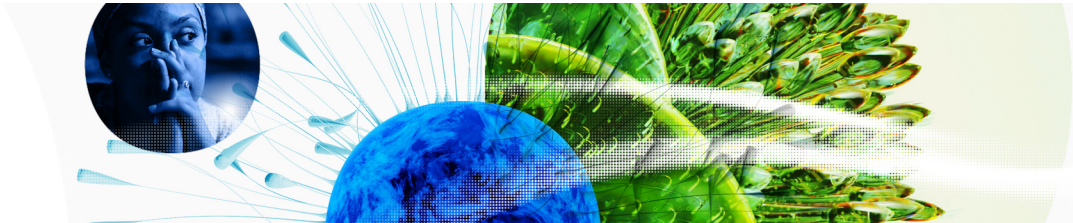
7.2.1 Cultural and creative services exports

was equal to 400,000 USD in 2021, up by with no change from the year prior – and equivalent to an indicator rank of 107.



7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 15,893.62 Apps/bn PPP\$ GDP in 2022, up by 155.97% from the year prior – and equivalent to an indicator rank of 100.



→ Paraguay's innovation top performers

> 2.3.4 QS university ranking of Paraguay’s top universities

Rank	University	Score
1001-1200	UNIVERSIDAD NACIONAL DE ASUNCION	9.20

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".

Global Innovation Index 2023



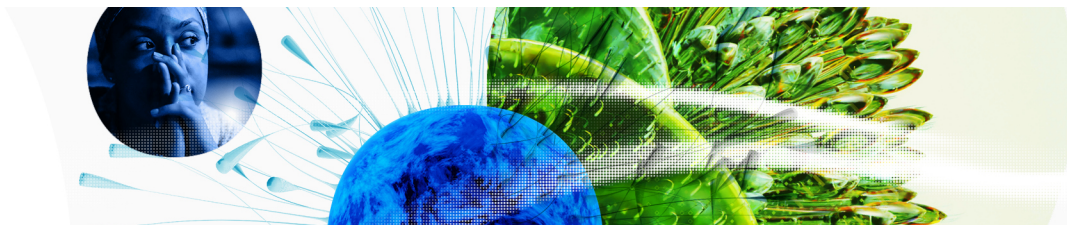
GII 2023 rank

Paraguay

98

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
92	101	Upper middle	LCN	6.8	108.3	14,528.4
Score / Value Rank						
Institutions				Business sophistication		
33.9 112				23.3 87		
1.1 Institutional environment				5.1 Knowledge workers		
32.0 97				29.7 71		
1.1.1 Operational stability for businesses*				20.6 74		
44.4 82				5.1.1 Knowledge-intensive employment, %		
1.1.2 Government effectiveness*				46.4 23		
19.5 107				5.1.2 Firms offering formal training, %		
1.2 Regulatory environment				n/a n/a		
43.8 114				5.1.3 GERD performed by business, % GDP		
1.2.1 Regulatory quality*				0.2 96		
36.7 83				5.1.4 GERD financed by business, %		
1.2.2 Rule of law*				9.5 78		
23.4 96				5.2 Innovation linkages		
29.4 117				9.2 120		
1.3 Business environment				5.2.1 University-industry R&D collaboration†		
25.8 108				11.6 125		
1.3.1 Policies for doing business†				22.2 108		
37.4 94				5.2.2 State of cluster development†		
1.3.2 Entrepreneurship policies and culture†				0.0 65		
14.1 74				5.2.3 GERD financed by abroad, % GDP		
Human capital and research				n/a n/a		
10.1 129				5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP		
2.1 Education				0.0 88		
19.2 127				31.0 76		
2.1.1 Expenditure on education, % GDP				0.1 97		
3.5 94				5.3 Knowledge absorption		
12.6 85				5.3.1 Intellectual property payments, % total trade		
2.1.2 Government funding/pupil, secondary, % GDP/cap				19.4 8		
n/a n/a				5.3.2 High-tech imports, % total trade		
2.1.3 School life expectancy, years				0.0 132		
n/a n/a				5.3.3 ICT services imports, % total trade		
2.1.4 PISA scales in reading, maths and science				0.6 110		
n/a n/a				5.3.4 FDI net inflows, % GDP		
2.1.5 Pupil-teacher ratio, secondary				n/a n/a		
2.2 Tertiary education				Knowledge and technology outputs		
n/a n/a				12.3 109		
2.2.1 Tertiary enrolment, % gross				6.1 Knowledge creation		
n/a n/a				3.0 121		
2.2.2 Graduates in science and engineering, %				6.1.1 Patents by origin/bn PPP\$ GDP		
n/a n/a				0.2 105		
2.2.3 Tertiary inbound mobility, %				6.1.2 PCT patents by origin/bn PPP\$ GDP		
2.3 Research and development (R&D)				n/a n/a		
1.0 100				6.1.3 Utility models by origin/bn PPP\$ GDP		
2.3.1 Researchers, FTE/mn pop.				0.1 60		
129.8 87				6.1.4 Scientific and technical articles/bn PPP\$ GDP		
2.3.2 Gross expenditure on R&D, % GDP				n/a n/a		
0.2 96				6.1.5 Citable documents H-index		
2.3.3 Global corporate R&D investors, top 3, mn US\$				3.8 118		
0.0 40				6.2 Knowledge impact		
2.3.4 QS university ranking, top 3*				16.0 121		
0.0 71				6.2.1 Labor productivity growth, %		
Infrastructure				-0.1 103		
35.4 83				6.2.2 Unicorn valuation, % GDP		
3.1 Information and communication technologies (ICTs)				0.0 48		
57.9 86				0.0 110		
3.1.1 ICT access*				6.2.3 Software spending, % GDP		
65.4 93				0.0 77		
3.1.2 ICT use*				6.2.4 High-tech manufacturing, %		
59.6 93				15.0 77		
3.1.3 Government's online service*				6.3 Knowledge diffusion		
56.4 84				17.8 83		
3.1.4 E-participation*				6.3.1 Intellectual property receipts, % total trade		
3.2 General infrastructure				n/a n/a		
25.2 73				6.3.2 Production and export complexity		
3.2.1 Electricity output, GWh/mn pop.				45.0 83		
5,524.9 39				0.8 77		
3.2.2 Logistics performance*				6.3.3 High-tech exports, % total trade		
27.3 76				0.1 127		
3.2.3 Gross capital formation, % GDP				6.3.4 ICT services exports, % total trade		
24.2 62				4.2 61		
3.3 Ecological sustainability				Creative outputs		
23.2 69				19.7 76		
3.3.1 GDP/unit of energy use				7.1 Intangible assets		
12.3 43				32.0 64		
3.3.2 Environmental performance*				7.1.1 Intangible asset intensity, top 15, %		
37.3 69				n/a n/a		
3.3.3 ISO 14001 environment/bn PPP\$ GDP				7.1.2 Trademarks by origin/bn PPP\$ GDP		
0.4 92				131.9 6		
Market sophistication				7.1.3 Global brand value, top 5,000		
31.6 79				0.0 74		
4.1 Credit				0.3 96		
12.5 108				7.2 Creative goods and services		
4.1.1 Finance for startups and scaleups†				0.6 119		
7.5 84				7.2.1 Cultural and creative services exports, % total trade		
4.1.2 Domestic credit to private sector, % GDP				0.0 107		
50.0 73				7.2.2 National feature films/mn pop. 15-69		
n/a n/a				n/a n/a		
4.1.3 Loans from microfinance institutions, % GDP				7.2.3 Entertainment and media market/th pop. 15-69		
4.2 Investment				n/a n/a		
n/a n/a				7.2.4 Creative goods exports, % total trade		
4.2.1 Market capitalization, % GDP				0.1 95		
n/a n/a				7.3 Online creativity		
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP				14.3 102		
n/a n/a				7.3.1 Generic top-level domains (TLDs)/th pop. 15-69		
4.2.3 VC recipients, deals/bn PPP\$ GDP				1.9 86		
n/a n/a				7.3.2 Country-code TLDs/th pop. 15-69		
4.2.4 VC received, value, % GDP				1.7 75		
n/a n/a				7.3.3 GitHub commits/mn pop. 15-69		
4.3 Trade, diversification, and market scale				2.4 96		
50.6 84				7.3.4 Mobile app creation/bn PPP\$ GDP		
4.3.1 Applied tariff rate, weighted avg., %				51.3 100		
4.0 84						
4.3.2 Domestic industry diversification						
75.7 86						
4.3.3 Domestic market scale, bn PPP\$						
108.3 86						

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 Paraguay.

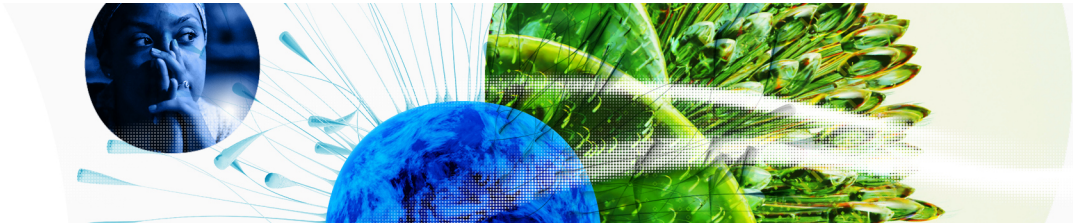


> Paraguay has missing data for nineteen indicators and outdated data for twelve indicators.

> Missing data for Paraguay

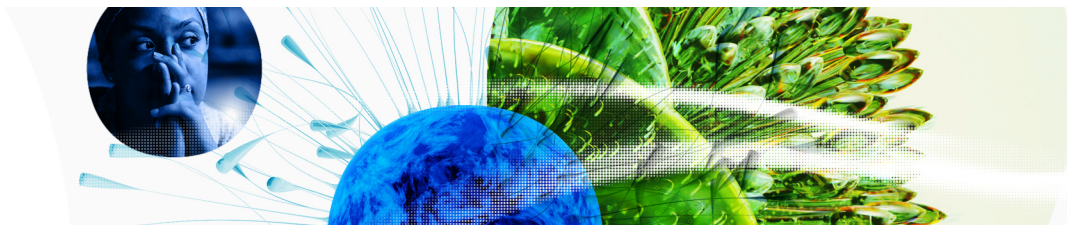
Code	Indicator name	Economy Year	Model Year	Source
2.1.3	School life expectancy, years	n/a	2020	UNESCO Institute for Statistics
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
2.1.5	Pupil-teacher ratio, secondary	n/a	2020	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	n/a	2020	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD
2.2.3	Tertiary inbound mobility, %	n/a	2020	UNESCO Institute for Statistics
4.1.3	Loans from microfinance institutions, % GDP	n/a	2021	International Monetary Fund, Financial Access Survey (FAS)
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges; World Bank
4.2.2	Venture capital (VC) investors, deals/bn PPP\$ GDP	n/a	2022	Refinitiv; International Monetary Fund
4.2.3	VC recipients, deals/bn PPP\$ GDP	n/a	2022	Refinitiv; International Monetary Fund
4.2.4	VC received, value, % GDP	n/a	2022	Refinitiv; International Monetary Fund
5.1.3	GERD performed by business, % GDP	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	n/a	2022	Refinitiv; International Monetary Fund
5.3.5	Research talent, % in businesses	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.1.2	PCT patents by origin/bn PPP\$ GDP	n/a	2022	World Intellectual Property Organization; International Monetary Fund
6.3.1	Intellectual property receipts, % total trade	n/a	2021	World Trade Organization and United Nations Conference on Trade and Development
7.1.1	Intangible asset intensity, top 15, %	n/a	2022	Brand Finance

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Code	Indicator name	Economy Year	Model Year	Source
7.2.2	National feature films/mn pop. 15-69	n/a	2021	OMDIA; United Nations, World Population Prospects
7.2.3	Entertainment and media market/th pop. 15-69	n/a	2022	PwC, GEMO; United Nations, World Population Prospects; International Monetary Fund

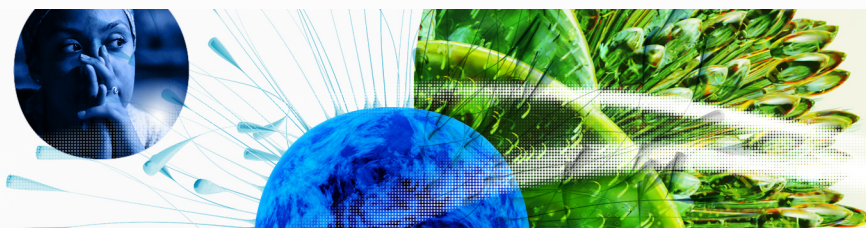
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> Outdated data for Paraguay

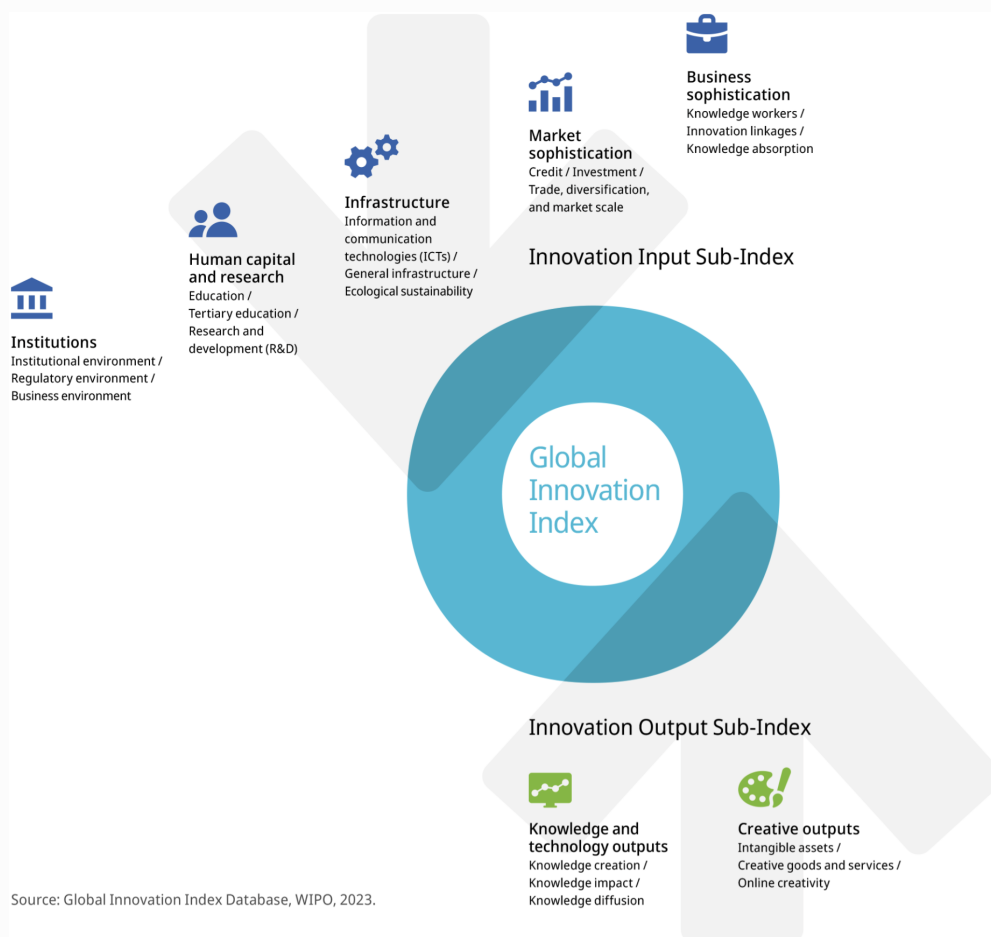
Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	2019	2022	Global Entrepreneurship Monitor
2.3.1	Researchers, FTE/mn pop.	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
4.1.1	Finance for startups and scaleups	2019	2022	Global Entrepreneurship Monitor
4.3.2	Domestic industry diversification	2014	2020	United Nations Industrial Development Organization
5.1.2	Firms offering formal training, %	2017	2019	World Bank Enterprise Surveys
5.1.5	Females employed w/advanced degrees, %	2017	2022	International Labour Organization
6.1.1	Patents by origin/bn PPP\$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
6.1.3	Utility models by origin/bn PPP\$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
6.2.4	High-tech manufacturing, %	2014	2020	United Nations Industrial Development Organization
7.1.2	Trademarks by origin/bn PPP\$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
7.1.4	Industrial designs by origin/bn PPP\$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund

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→ 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.