



## PARAGUAY

**91st**

Paraguay ranks 91st 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 Paraguay 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 Paraguay in the GII 2022 is between ranks 87 and 92.

### Rankings for Paraguay (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	97	98	92
2021	88	90	87
2022	91	94	84

- Paraguay performs better in innovation outputs than innovation inputs in 2022.
- This year Paraguay ranks 94th in innovation inputs, lower than last year but higher than 2020.
- As for innovation outputs, Paraguay ranks 84th. This position is higher than both 2021 and 2020.

**31st**

Paraguay ranks 31st among the 36 upper-middle-income group economies.

**12th**

Paraguay ranks 12th among the 18 economies in Latin America and the Caribbean.

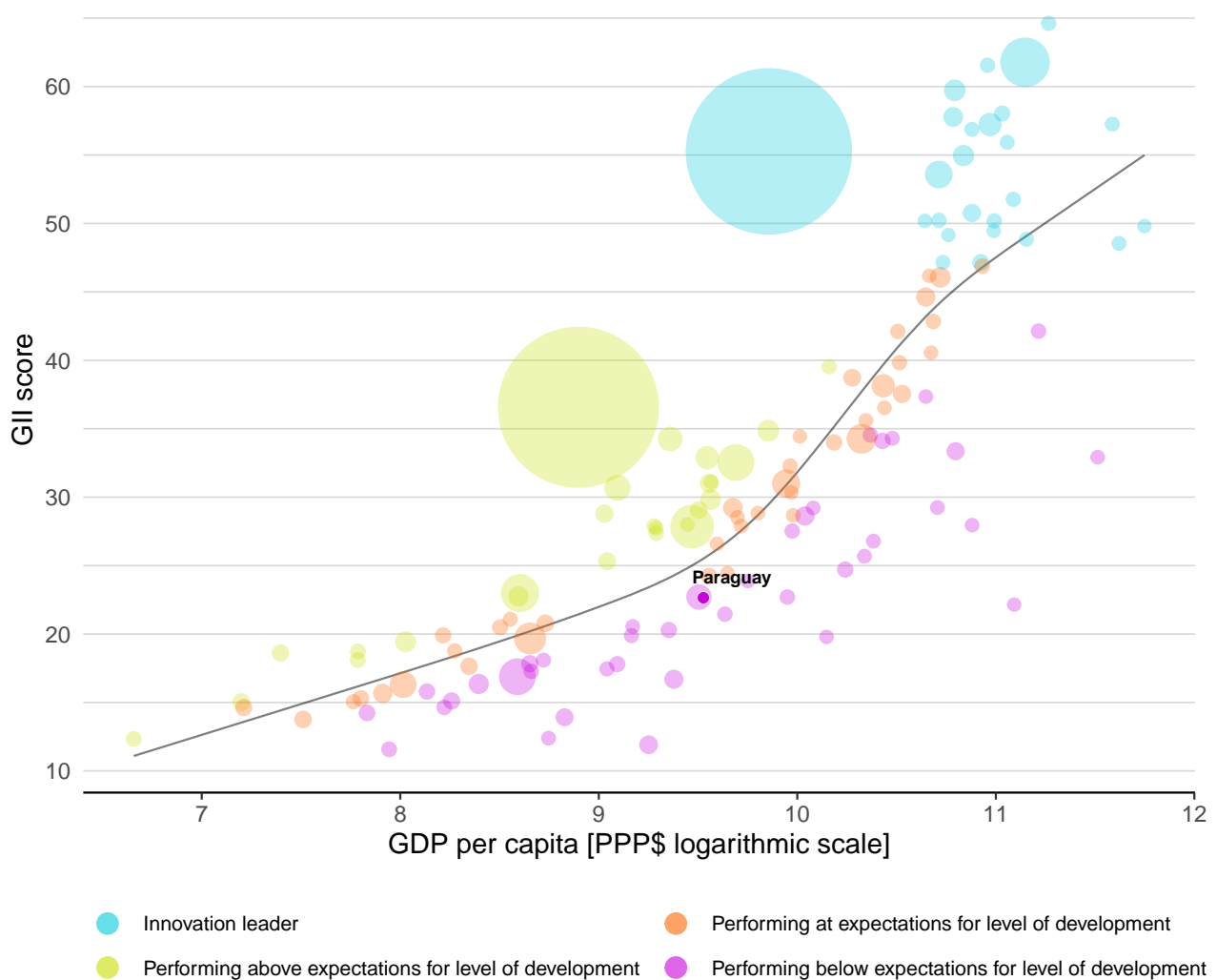


## EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Paraguay's performance is below expectations for its level of development.

### The positive relationship between innovation and development

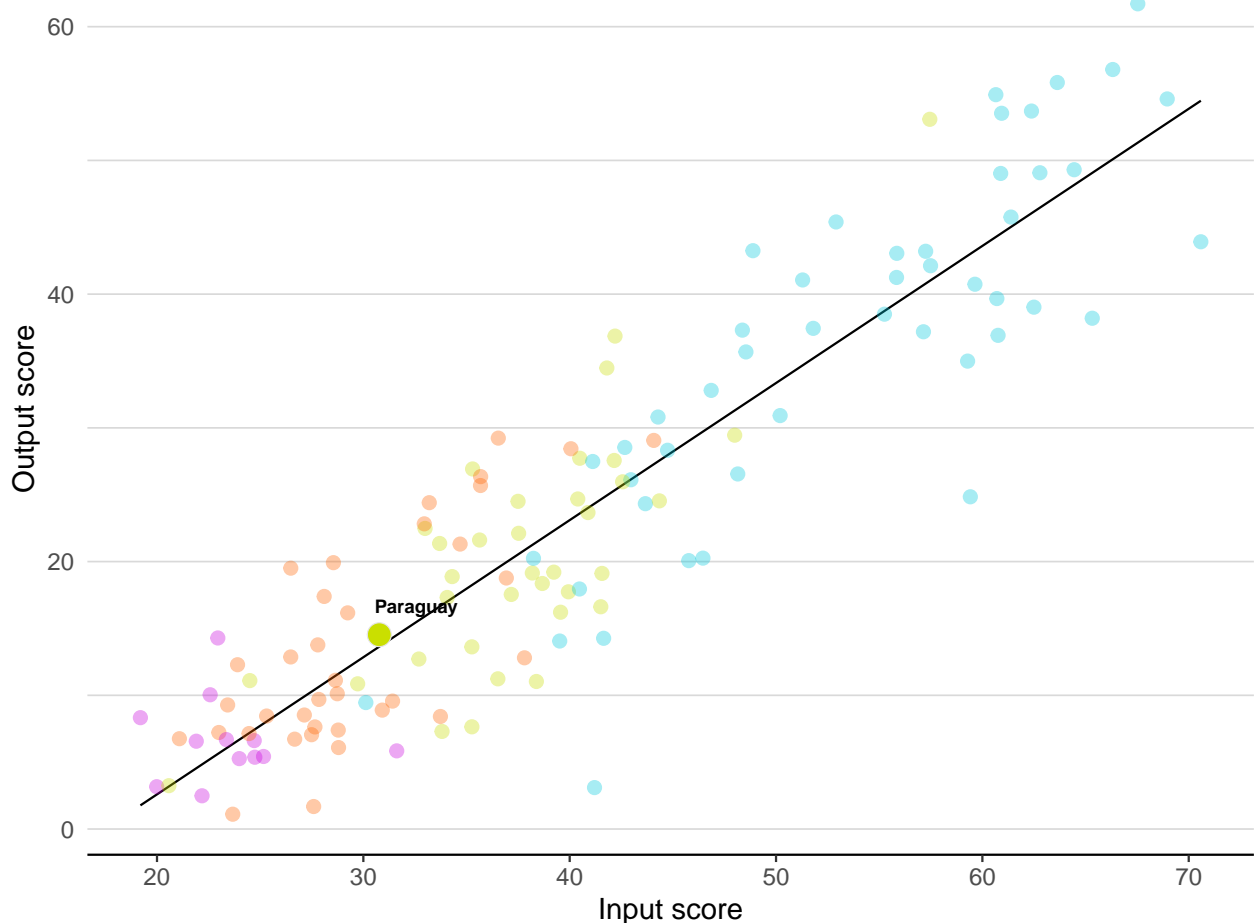


## EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

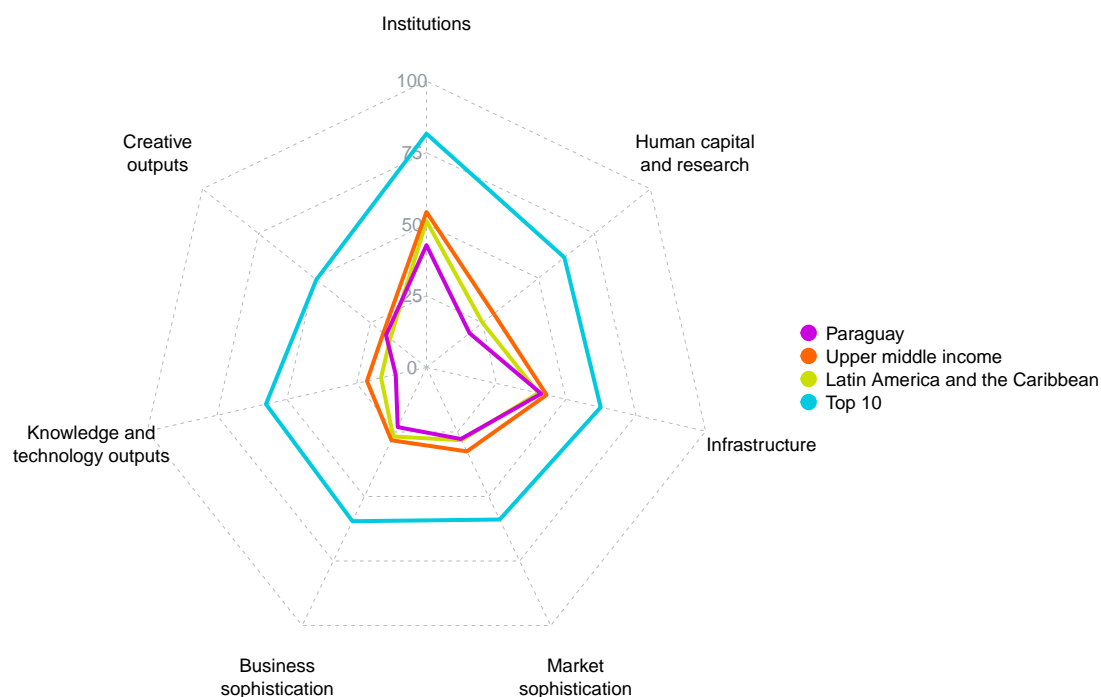
### Innovation input to output performance



Income    High income    Upper middle    Lower middle    Low income    — Fitted line

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

### The seven GII pillar scores for Paraguay



### Upper-middle-income group economies

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

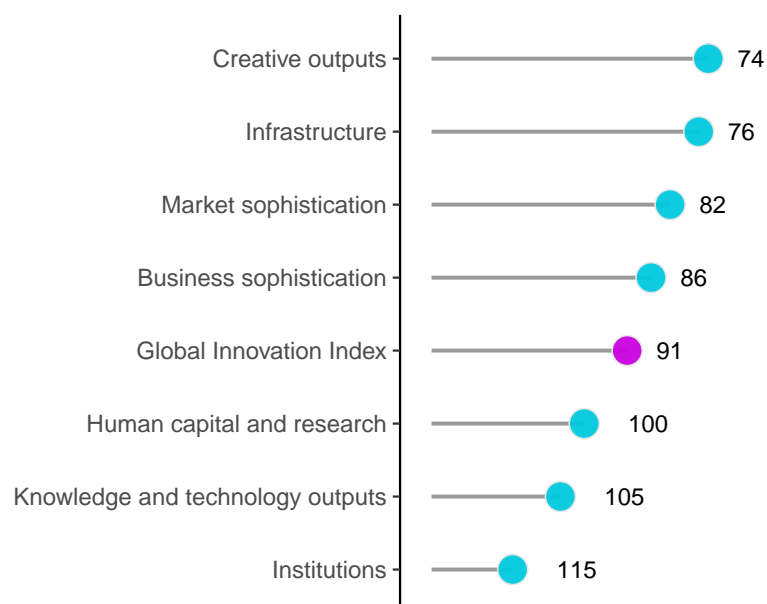
### Latin America and the Caribbean

Paraguay performs above the regional average in two pillars, namely: Infrastructure; and, Creative outputs.

## OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Paraguay performs best in Creative outputs and its weakest performance is in Institutions.

### The seven GII pillar ranks for Paraguay



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

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

[https://www.wipo.int/ipstats/en/statistics/country\\_profile/profile.jsp?code=PY](https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=PY).

## INNOVATION STRENGTHS AND WEAKNESSES

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



### Strengths and weaknesses for Paraguay

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
3.1.3	Government's online service	65	2.3.3	Global corporate R&D investors, top 3, mn USD	38
3.1.4	E-participation	57	2.3.4	QS university ranking, top 3	72
3.2.1	Electricity output, GWh/mn pop.	29	4.1.1	Finance for startups and scaleups	73
3.3.1	GDP/unit of energy use	50	5.1.3	GERD performed by business, % GDP	93
5.1.2	Firms offering formal training, %	23	5.1.4	GERD financed by business, %	98
5.2.5	Patent families/bn PPP\$ GDP	47	5.3.3	ICT services imports, % total trade	132
5.3.2	High-tech imports, % total trade	10	6.1.4	Scientific and technical articles/bn PPP\$ GDP	125
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	54	6.2.2	New businesses/th pop. 15–64	121
7.1.2	Trademarks by origin/bn PPP\$ GDP	5	6.3.4	ICT services exports, % total trade	128
7.1.3	Global brand value, top 5,000, % GDP	54	7.2.1	Cultural and creative services exports, % total trade	110

## Paraguay

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Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
84	94	Upper middle	LCN	7.2	100.9	13,724

	Score/Value	Rank		Score/Value	Rank
 <b>Institutions</b>	42.7	115	 <b>Business sophistication</b>	23.1	86
<b>1.1 Political environment</b>	51.7	95	<b>5.1 Knowledge workers</b>	22.5	88
1.1.1 Political and operational stability*	63.6	81	5.1.1 Knowledge-intensive employment, %	17.9	84
1.1.2 Government effectiveness*	39.7	96	5.1.2 Firms offering formal training, %	46.4	23 ●
<b>1.2 Regulatory environment</b>	47.6	112	5.1.3 GERD performed by business, % GDP	0.0	93 ○ ◇
1.2.1 Regulatory quality*	39.9	87	5.1.4 GERD financed by business, %	0.2	98 ○ ◇
1.2.2 Rule of law*	35.3	88	5.1.5 Females employed w/advanced degrees, %	9.5	76
1.2.3 Cost of redundancy dismissal	29.4	118	<b>5.2 Innovation linkages</b>	19.1	100
<b>1.3 Business environment</b>	28.8	114	5.2.1 University-industry R&D collaboration†	26.8	122
1.3.1 Policies for doing business†	46.2	78	5.2.2 State of cluster development and depth†	40.5	102
1.3.2 Entrepreneurship policies and culture*	11.4	67	5.2.3 GERD financed by abroad, % GDP	0.0	63
			5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	n/a	n/a
			5.2.5 Patent families/bn PPP\$ GDP	0.2	47 ●
<b>Human capital and research</b>	19.2	[100]	<b>5.3 Knowledge absorption</b>	27.9	76
<b>2.1 Education</b>	37.8	[105]	5.3.1 Intellectual property payments, % total trade	0.1	97
2.1.1 Expenditure on education, % GDP	3.3	100	5.3.2 High-tech imports, % total trade	19.4	10 ● ◆
2.1.2 Government funding/pupil, secondary, % GDP/cap	15.0	82	5.3.3 ICT services imports, % total trade	0.0	132 ○ ◇
2.1.3 School life expectancy, years	n/a	n/a	5.3.4 FDI net inflows, % GDP	1.4	88
2.1.4 PISA scales in reading, maths and science	n/a	n/a	5.3.5 Research talent, % in businesses	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	18.4	89	<b>Knowledge and technology outputs</b>	11.0	105
<b>2.2 Tertiary education</b>	n/a	[n/a]	<b>6.1 Knowledge creation</b>	2.1	122
2.2.1 Tertiary enrolment, % gross	n/a	n/a	6.1.1 Patents by origin/bn PPP\$ GDP	0.2	104
2.2.2 Graduates in science and engineering, %	n/a	n/a	6.1.2 PCT patents by origin/bn PPP\$ GDP	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a	6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	63
<b>2.3 Research and development (R&amp;D)</b>	0.7	101	6.1.4 Scientific and technical articles/bn PPP\$ GDP	2.4	125 ○ ◇
2.3.1 Researchers, FTE/mn pop.	155.6	85	6.1.5 Citable documents H-index	3.2	116
2.3.2 Gross expenditure on R&D, % GDP	0.1	99	<b>6.2 Knowledge impact</b>	16.9	100
2.3.3 Global corporate R&D investors, top 3, mn USD	0.0	38 ○ ◇	6.2.1 Labor productivity growth, %	4.0	75
2.3.4 QS university ranking, top 3*	0.0	72 ○ ◇	6.2.2 New businesses/th pop. 15–64	0.0	121 ○
			6.2.3 Software spending, % GDP	0.1	102
<b>Infrastructure</b>	41.1	76	6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.2	54 ●
<b>3.1 Information and communication technologies (ICTs)</b>	67.1	84	6.2.5 High-tech manufacturing, %	n/a	n/a
3.1.1 ICT access*	73.0	92	<b>6.3 Knowledge diffusion</b>	14.0	92
3.1.2 ICT use*	49.8	94	6.3.1 Intellectual property receipts, % total trade	n/a	n/a
3.1.3 Government's online service*	70.6	65 ●	6.3.2 Production and export complexity	31.1	83
3.1.4 E-participation*	75.0	57 ●	6.3.3 High-tech exports, % total trade	0.5	89
<b>3.2 General infrastructure</b>	31.0	62 ●	6.3.4 ICT services exports, % total trade	0.1	128 ○
3.2.1 Electricity output, GWh/mn pop.	6,617.1	29 ● ◆	<b>Creative outputs</b>	18.1	74
3.2.2 Logistics performance*	34.0	73	<b>7.1 Intangible assets</b>	35.3	49 ●
3.2.3 Gross capital formation, % GDP	20.8	88	7.1.1 Intangible asset intensity, top 15, %	n/a	n/a
<b>3.3 Ecological sustainability</b>	25.2	73	7.1.2 Trademarks by origin/bn PPP\$ GDP	131.5	5 ● ◆
3.3.1 GDP/unit of energy use	12.1	50 ●	7.1.3 Global brand value, top 5,000, % GDP	13.1	54 ●
3.3.2 Environmental performance*	40.9	68	7.1.4 Industrial designs by origin/bn PPP\$ GDP	0.3	95
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.4	92	<b>7.2 Creative goods and services</b>	0.6	[127]
<b>Market sophistication</b>	27.7	82	7.2.1 Cultural and creative services exports, % total trade	0.0	110 ○
<b>4.1 Credit</b>	17.5	93	7.2.2 National feature films/mn pop. 15–69	n/a	n/a
4.1.1 Finance for startups and scaleups*	17.6	73 ○ ◇	7.2.3 Entertainment and media market/th pop. 15–69	n/a	n/a
4.1.2 Domestic credit to private sector, % GDP	49.7	72	7.2.4 Printing and other media, % manufacturing	n/a	n/a
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	7.2.5 Creative goods exports, % total trade	0.1	101
<b>4.2 Investment</b>	n/a	[n/a]	<b>7.3 Online creativity</b>	1.1	98
4.2.1 Market capitalization, % GDP	n/a	n/a	7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.6	84
4.2.2 Venture capital investors, deals/bn PPP\$ GDP	n/a	n/a	7.3.2 Country-code TLDs/th pop. 15–69	1.5	75
4.2.3 Venture capital recipients, deals/bn PPP\$ GDP	n/a	n/a	7.3.3 GitHub commit pushes received/mn pop. 15–69	1.3	94
4.2.4 Venture capital received, value, % GDP	n/a	n/a	7.3.4 Mobile app creation/bn PPP\$ GDP	0.1	98
<b>4.3 Trade, diversification, and market scale</b>	37.9	104			
4.3.1 Applied tariff rate, weighted avg., %	4.0	84			
4.3.2 Domestic industry diversification	n/a	n/a			
4.3.3 Domestic market scale, bn PPP\$	100.9	87			

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](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 Paraguay.

### Missing data for Paraguay

Code	Indicator name	Economy year	Model year	Source
2.1.3	School life expectancy, years	n/a	2019	UNESCO Institute for Statistics
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
2.2.1	Tertiary enrolment, % gross	n/a	2019	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	n/a	2020	UNESCO Institute for Statistics
2.2.3	Tertiary inbound mobility, %	n/a	2019	UNESCO Institute for Statistics
4.1.3	Loans from microfinance institutions, % GDP	n/a	2020	International Monetary Fund, Financial Access Survey (FAS)
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges
4.2.2	Venture capital investors, deals/bn PPP\$ GDP	n/a	2021	Refinitiv
4.2.3	Venture capital recipients, deals/bn PPP\$ GDP	n/a	2021	Refinitiv
4.2.4	Venture capital received, value, % GDP	n/a	2021	Refinitiv
4.3.2	Domestic industry diversification	n/a	2019	United Nations Industrial Development Organization
5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	n/a	2021	Refinitiv
5.3.5	Research talent, % in businesses	n/a	2020	UNESCO Institute for Statistics
6.1.2	PCT patents by origin/bn PPP\$ GDP	n/a	2021	World Intellectual Property Organization
6.2.5	High-tech manufacturing, %	n/a	2019	United Nations Industrial Development Organization
6.3.1	Intellectual property receipts, % total trade	n/a	2020	World Trade Organization and United Nations Conference on Trade and Development
7.1.1	Intangible asset intensity, top 15, %	n/a	2021	Brand Finance
7.2.2	National feature films/mn pop. 15–69	n/a	2019	OMDIA
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2021	PwC, GEMO
7.2.4	Printing and other media, % manufacturing	n/a	2019	United Nations Industrial Development Organization

### Outdated data for Paraguay

Code	Indicator name	Economy year	Model year	Source
1.3.2	Entrepreneurship policies and culture	2019	2021	Global Entrepreneurship Monitor

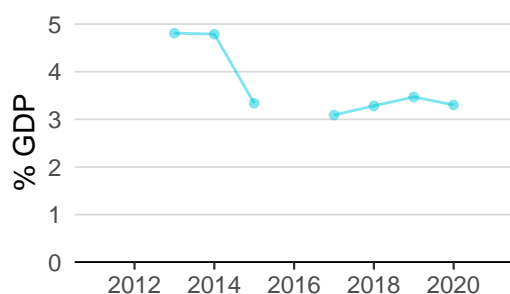


Code	Indicator name	Economy year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2012	2019	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2019	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2019	2020	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups	2019	2021	Global Entrepreneurship Monitor
5.1.2	Firms offering formal training, %	2017	2019	World Bank Enterprise Surveys
5.1.3	GERD performed by business, % GDP	2011	2020	UNESCO Institute for Statistics
5.1.5	Females employed w/advanced degrees, %	2017	2021	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2018	2019	UNESCO Institute for Statistics

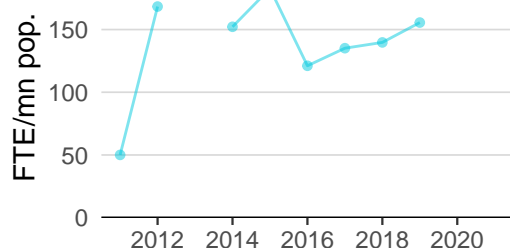
## PARAGUAY'S INNOVATION SYSTEM

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

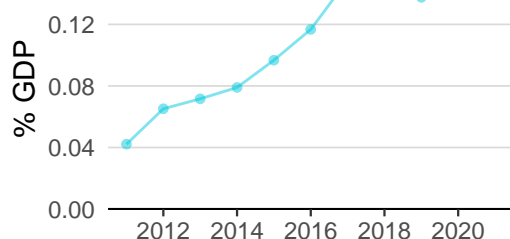
### Innovation inputs



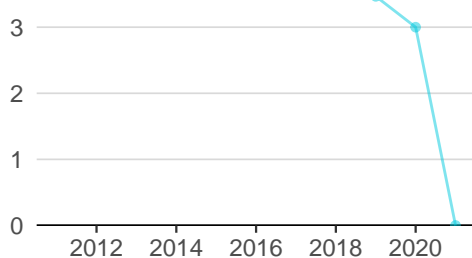
**2.1.1 Expenditure on education** was equal to 3.3% GDP in 2020—down by 5 percentage points from the year prior—and equivalent to an indicator rank of 100.



**2.3.1 Researchers** was equal to 155.6 FTE/mn pop. in 2019—up by 11 percentage points from the year prior—and equivalent to an indicator rank of 85.



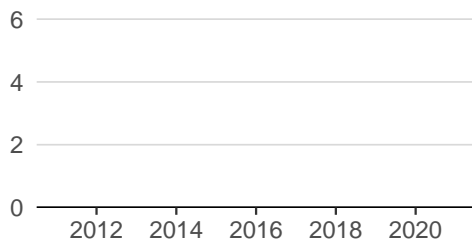
**2.3.2 Gross expenditure on R&D** was equal to 0.1% GDP in 2019—down by 6 percentage points from the year prior—and equivalent to an indicator rank of 99.



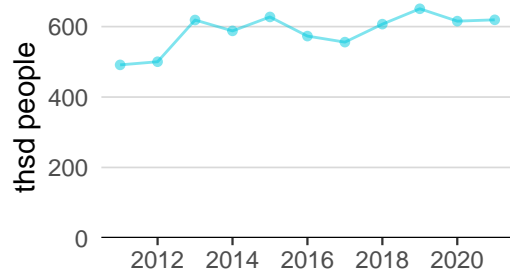
**2.3.4 QS university ranking** was equal to 0.0 in 2021—down by 100 percentage points from the year prior—and equivalent to an indicator rank of 72.



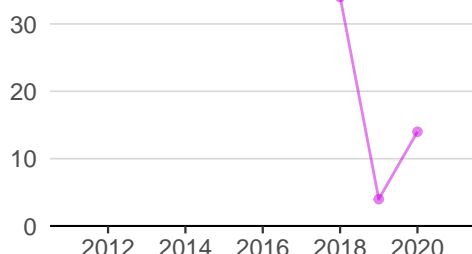
**3.1.1 ICT access** was equal to 7.3 in 2020 and equivalent to an indicator rank of 92.



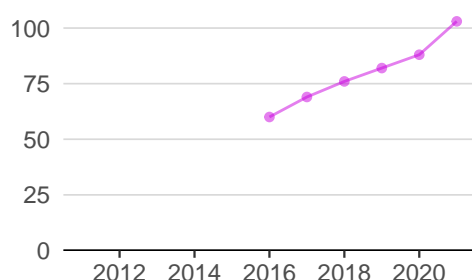
**5.1.1 Knowledge-intensive employment** was equal to 619.3 thsd people in 2021—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 84.



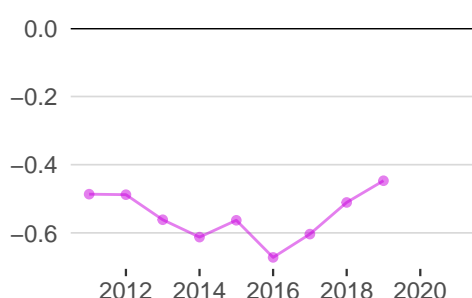
## Innovation outputs



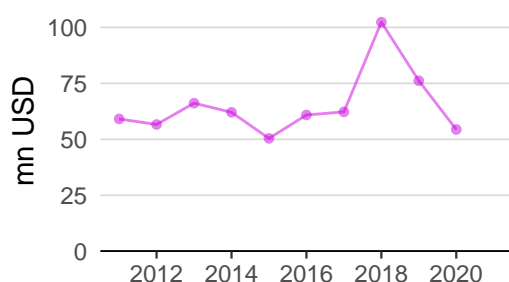
**6.1.1 Patents by origin** was equal to 14.0 in 2020—up by 250 percentage points from the year prior—and equivalent to an indicator rank of 104.



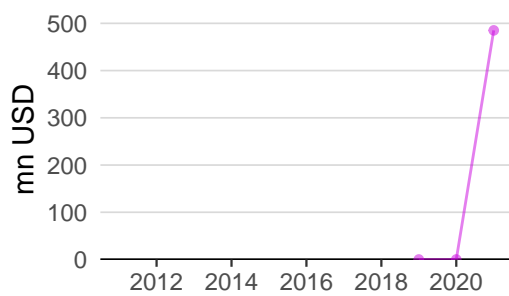
**6.1.5 Citable documents H-index** was equal to 103.0 in 2021—up by 17 percentage points from the year prior—and equivalent to an indicator rank of 116.



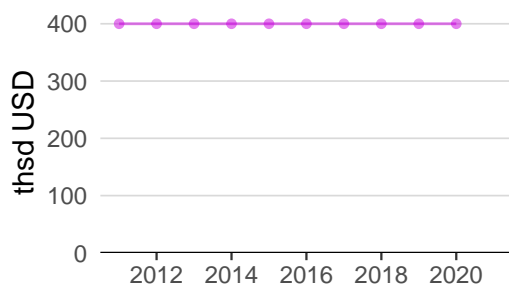
**6.3.2 Production and export complexity** was equal to -0.4 in 2019—up by 12 percentage points from the year prior—and equivalent to an indicator rank of 83.



**6.3.3 High-tech exports** was equal to 54.4 mn USD in 2020—down by 29 percentage points from the year prior—and equivalent to an indicator rank of 89.



**7.1.3 Global brand value** was equal to 485.1 mn USD in 2021—up by Inf percentage points from the year prior—and equivalent to an indicator rank of 54.



**7.2.1 Cultural and creative services exports** was equal to 400.0 thsd USD in 2020—effectively unchanged from the year prior—and equivalent to an indicator rank of 110.



## PARAGUAY'S INNOVATION TOP PERFORMERS

### 2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank
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No observations

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard>).

### 2.3.4 QS university ranking

University	Score	Rank
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No observations

Source: QS Quacquarelli Symonds Ltd (<https://www.topuniversities.com/university-rankings/world-university-rankings/2022>).

### 7.1.1 Intangible asset intensity, top 15

Firm	Rank
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No observations

Source: Brand Finance (<https://brandirectory.com/reports/gift-2021>).

### 7.1.3 Global brand value, top 5,000

Brand	Industry	Rank
PILSEN	Beers	1

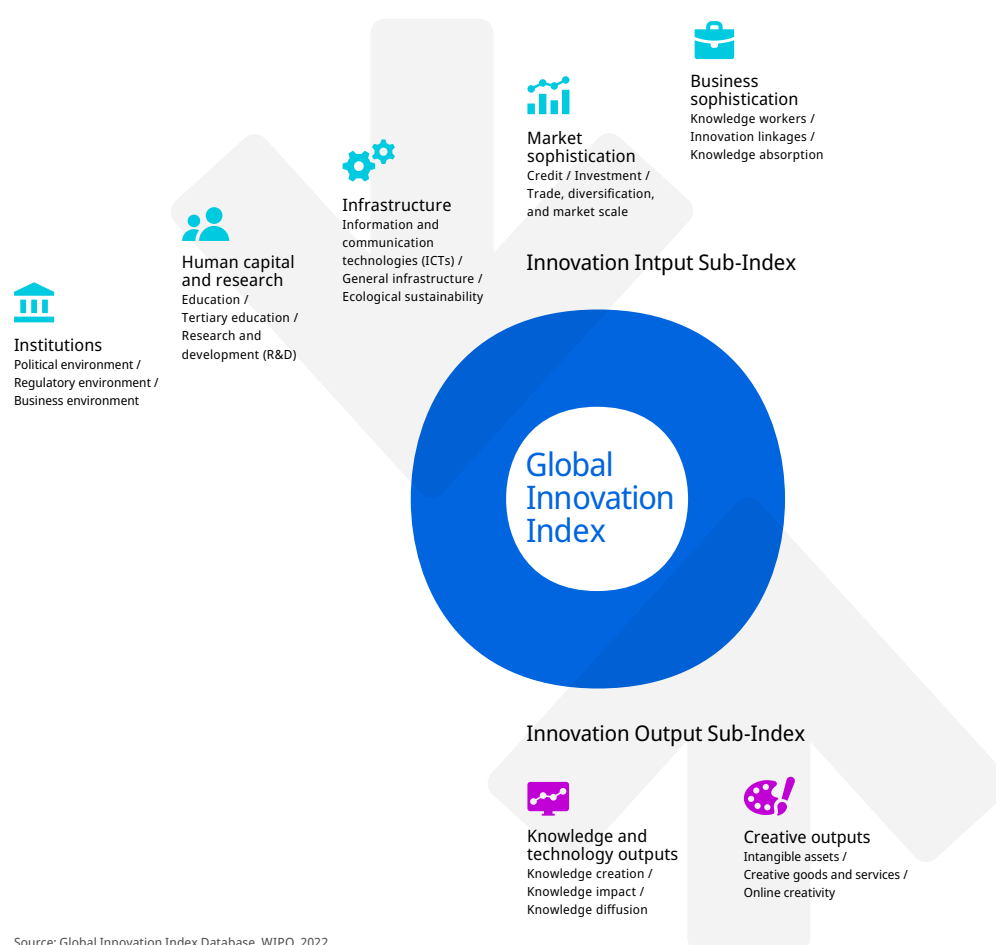
Source: Brand Finance (<https://brandirectory.com>).

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.