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 ranks 98th among the 132 economies featured in the GII 2023.

> Paraguay ranks 31st among the 33 upper-middle-income group economies.

> Paraguay ranks 14th among the 19 economies in Latin America and the Caribbean.

> 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.

<table>
<thead>
<tr>
<th>Year</th>
<th>GII Position</th>
<th>Innovation Inputs</th>
<th>Innovation Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>97th</td>
<td>98th</td>
<td>92nd</td>
</tr>
<tr>
<td>2021</td>
<td>88th</td>
<td>90th</td>
<td>87th</td>
</tr>
<tr>
<td>2022</td>
<td>91st</td>
<td>94th</td>
<td>84th</td>
</tr>
<tr>
<td>2023</td>
<td>98th</td>
<td>101st</td>
<td>92nd</td>
</tr>
</tbody>
</table>

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.
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

→GDP per capita, PPP logarithmic scale (thousands of $)
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**

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

The charts shows 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**
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).

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengths</td>
<td>Weaknesses</td>
</tr>
<tr>
<td>Rank</td>
<td>Code</td>
</tr>
<tr>
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<td>------</td>
</tr>
<tr>
<td>6</td>
<td>7.1.2</td>
</tr>
<tr>
<td>8</td>
<td>5.3.2</td>
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<tr>
<td>73</td>
<td>4.1.2</td>
</tr>
<tr>
<td>75</td>
<td>7.3.2</td>
</tr>
</tbody>
</table>
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.

2.1.2 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.

2.1.3 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.
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.
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

<table>
<thead>
<tr>
<th>Rank</th>
<th>University</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001-1200</td>
<td>UNIVERSIDAD NACIONAL DE ASUNCIÓN</td>
<td>9.20</td>
</tr>
</tbody>
</table>


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=x" or a range "x-y".
Global Innovation Index 2023

Paraguay

Output rank: 92
Input rank: 101
Income: Lower middle (LCN)
Region: 6.8
Population (mn): 6,108.3
GDP, PPP($bn): 14,628.4
GDP per capita, PPP($): 2,371

Business sophistication: 23.3

- Knowledge workers: 29.7
- Knowledge-intensive employment, %: 20.6
- Firms offering formal training, %: 64.6

Human capital and research: 10.1

- Education: 19.2
- Expenditure on education, % GDP: 3.5
- Government funding, public, secondary, % GDP/cap: 12.6
- School life expectancy, years: 12.1
- PISA scales in reading, maths and science: 8.8
- Pupil-teacher ratio, secondary: 12.6
- Tertiary education: 11.6
- Enrollment, % gross: 4.2
- Graduates in science and engineering, %: 4.3
- Tertiary inbound mobility, %: 2.7
- Research and development (R&D): 1.0
- Researchers, FTE/mn pop.: 0.9
- Spending on R&D, % GDP: 0.2
- Global corporate R&D investors, top 3, mn US$: 0.0
- University ranking, top 3*: 0.0

Infrastructure: 35.4

- Information and communication technologies (ICTs): 57.9
- Internet access: 65.4
- ICT use*: 59.6
- Government’s online service*: 56.4
- E-participation*: 50.0
- General infrastructure: 25.2
- Electricity output, GWh/mn pop.: 5,254
- Logistics performance*: 27.3
- Rail network, km: 6,049
- Grass capital formation, % GDP: 24.2
- Ecological sustainability: 23.2
- GDP/unit of energy use: 12.3
- Environmental performance*: 37.3
- ISO 14001 environment/ mn PPP$ GDP: 0.4

Market sophistication: 31.6

- Credit: 12.5
- Finance for startups and scaleups*: 7.5
- Domestic credit to private sector, % GDP: 50.0
- Loans from microfinance institutions, %: 15.9
- Investment: 12.5
- Market capitalization, % GDP: 12.5
- Venture capital (VC) investors, deals/ mn PPP$ GDP: 4.2
- VC recipients, deals/ mn PPP$ GDP: 4.2
- Receivables, % GDP: 4.2
- Trade, diversification, and market scale: 50.6
- Applied tariffs, weighted avg., %: 4.0
- Domestic industry diversification: 7.5
- Domestic market scale, bn PPP$: 10.8

Knowledge and technology outputs: 12.3

- Knowledge creation: 3.0
- Patents by origin/ mn PPP$ GDP: 0.2
- Patent families/ mn PPP$ GDP: 0.1
- Utility models by origin/ mn PPP$ GDP: 0.1
- Scientific and technical articles/ mn PPP$ GDP: 0.1
- Citable documents H-index: 3.8
- Knowledge impact: 16.0
- Labor productivity growth, %: 1.0
- Unemployment, % GDP: 0.0
- Software spending, % GDP: 0.0
- High-tech manufacturing, %: 15.0
- Knowledge diffusion: 17.8
- Intellectual property receipts, % total trade: 18.4
- Production and export complexity: 45.0
- High-tech exports, % total trade: 0.8
- ICT services exports, % total trade: 0.1
- ISD 9001 quality/ mn PPP$ GDP: 4.2

Creative outputs: 19.7

- Intangible assets: 32.0
- Intangible asset intensity, top 5%, %: 15.9
- Trademarks by origin/ mn PPP$ GDP: 13.9
- Brand value, top 5,000: 0.0
- Industrial designs by origin/ mn PPP$ GDP: 0.3
- Creative goods and services: 6.6
- Cultural and creative services exports, % total trade: 0.0
- National feature films/ mn pop. 15-69: 0.0
- Entertainment and media market/ mn pop. 15-69: 0.0
- Creative goods exports, % total trade: 0.1
- Online creativity: 14.3
- Generic top-level domains (TLDs)/ mn pop. 15-69: 1.9
- Country-code TLDs/ mn pop. 15-69: 1.7
- GitHub commits/ mn pop. 15-69: 2.4
- Mobile app creation/ mn PPP$ GDP: 51.3

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Indicator name</th>
<th>Economy Year</th>
<th>Model Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.3</td>
<td>School life expectancy, years</td>
<td>n/a</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>2.1.4</td>
<td>PISA scales in reading, maths and science</td>
<td>n/a</td>
<td>2018</td>
<td>OECD, PISA</td>
</tr>
<tr>
<td>2.1.5</td>
<td>Pupil-teacher ratio, secondary</td>
<td>n/a</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>2.2.1</td>
<td>Tertiary enrolment, % gross</td>
<td>n/a</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>2.2.2</td>
<td>Graduates in science and engineering, %</td>
<td>n/a</td>
<td>2020</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD</td>
</tr>
<tr>
<td>2.2.3</td>
<td>Tertiary inbound mobility, %</td>
<td>n/a</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>4.1.3</td>
<td>Loans from microfinance institutions, % GDP</td>
<td>n/a</td>
<td>2021</td>
<td>International Monetary Fund, Financial Access Survey (FAS)</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Market capitalization, % GDP</td>
<td>n/a</td>
<td>2020</td>
<td>World Federation of Exchanges; World Bank</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Venture capital (VC) investors, deals/bn PPP$ GDP</td>
<td>n/a</td>
<td>2022</td>
<td>Refinitiv; International Monetary Fund</td>
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<tr>
<td>4.2.3</td>
<td>VC recipients, deals/bn PPP$ GDP</td>
<td>n/a</td>
<td>2022</td>
<td>Refinitiv; International Monetary Fund</td>
</tr>
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<td>4.2.4</td>
<td>VC received, value, % GDP</td>
<td>n/a</td>
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<td>Refinitiv; International Monetary Fund</td>
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<td>5.1.3</td>
<td>GERD performed by business, % GDP</td>
<td>n/a</td>
<td>2021</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD; RICYT</td>
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<tr>
<td>5.2.4</td>
<td>Joint venture/strategic alliance deals/bn PPP$ GDP</td>
<td>n/a</td>
<td>2022</td>
<td>Refinitiv; International Monetary Fund</td>
</tr>
<tr>
<td>5.3.5</td>
<td>Research talent, % in businesses</td>
<td>n/a</td>
<td>2021</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD; RICYT</td>
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<tr>
<td>6.1.2</td>
<td>PCT patents by origin/bn PPP$ GDP</td>
<td>n/a</td>
<td>2022</td>
<td>World Intellectual Property Organization; International Monetary Fund</td>
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<tr>
<td>6.3.1</td>
<td>Intellectual property receipts, % total trade</td>
<td>n/a</td>
<td>2021</td>
<td>World Trade Organization and United Nations Conference on Trade and Development</td>
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<tr>
<td>7.1.1</td>
<td>Intangible asset intensity, top 15, %</td>
<td>n/a</td>
<td>2022</td>
<td>Brand Finance</td>
</tr>
<tr>
<td>Code</td>
<td>Indicator name</td>
<td>Economy Year</td>
<td>Model Year</td>
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<tr>
<td>7.2.2</td>
<td>National feature films, mn pop. 15-69</td>
<td>2021</td>
<td>2021</td>
<td>OMDIA; United Nations, World Population Prospects</td>
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<tr>
<td>7.2.3</td>
<td>Entertainment and media market, th pop. 15-69</td>
<td>2022</td>
<td>2022</td>
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</table>
## Outdated data for Paraguay

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