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.

Guatemala ranking in the Global Innovation Index 2023

> Guatemala ranks **122nd**
  among the 132 economies
  featured in the GII 2023.

> Guatemala ranks **33rd**
  among the 33 upper-middle-income group economies.

> Guatemala ranks **19th**
  among the 19 economies in Latin America and the Caribbean.

**Guatemala GII Ranking (2020-2023)**

The table shows the rankings of Guatemala 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 Guatemala in the GII 2023 is between ranks 110 and 122.

<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>106th</td>
<td>110th</td>
<td>96th</td>
</tr>
<tr>
<td>2021</td>
<td>101st</td>
<td>112nd</td>
<td>83rd</td>
</tr>
<tr>
<td>2022</td>
<td>110th</td>
<td>117th</td>
<td>96th</td>
</tr>
<tr>
<td>2023</td>
<td>122nd</td>
<td>121st</td>
<td>115th</td>
</tr>
</tbody>
</table>

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

This year Guatemala ranks 121st in innovation inputs. This position is lower than last year.

Guatemala ranks 115th 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, Guatemala’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.

Guatemala produces more innovation outputs relative to its level of innovation investments.
→ Overview of Guatemala’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 Guatemala are those that rank above the GII (shown in blue) and the weakest are those that rank below.

**Highest rankings**

Guatemala ranks highest in Business sophistication (93rd), Knowledge and technology outputs (99th), Market sophistication (112nd), Infrastructure (118th), Creative outputs (119th), Institutions (120th) and Human capital and research (122nd).

**Lowest rankings**

Guatemala ranks lowest in Human capital and research, GII Index (122nd), Institutions (120th) and Creative outputs (119th).

The full WIPO Intellectual Property Statistics profile for Guatemala can be found on this link.
Benchmark of Guatemala against other country groupings for each of the seven areas of the GII Index

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

### Knowledge and technology outputs

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>GII I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper middle income</td>
<td></td>
<td>22.36</td>
</tr>
<tr>
<td>LCN</td>
<td></td>
<td>17.14</td>
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<tr>
<td>Guatemala</td>
<td></td>
<td>13.71</td>
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### Creative outputs

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>GII I</td>
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<td></td>
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<tr>
<td>Upper middle income</td>
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<td>23.16</td>
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<td>LCN</td>
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<td>18.91</td>
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<td>Guatemala</td>
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### Business sophistication

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Score</th>
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<tbody>
<tr>
<td>GII I</td>
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<td></td>
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<tr>
<td>Upper middle income</td>
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<td>29.27</td>
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<tr>
<td>LCN</td>
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<td>26.15</td>
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<td>Guatemala</td>
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<td>22.88</td>
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### Market sophistication

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
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<tr>
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### Human capital and research

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Score</th>
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<tr>
<td>GII I</td>
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<tr>
<td>Upper middle income</td>
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<td>LCN</td>
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<td>Guatemala</td>
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### Infrastructure

<table>
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<tr>
<td>GII I</td>
<td></td>
<td></td>
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<tr>
<td>Upper middle income</td>
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<td>40.40</td>
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<tr>
<td>LCN</td>
<td></td>
<td>35.88</td>
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<tr>
<td>Guatemala</td>
<td></td>
<td>20.66</td>
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</table>

### Institutions

<table>
<thead>
<tr>
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<th>Score</th>
</tr>
</thead>
<tbody>
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<td></td>
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<tr>
<td>Upper middle income</td>
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<td>LCN</td>
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<td>41.12</td>
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<tr>
<td>Guatemala</td>
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<td>31.28</td>
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</table>
## Innovation strengths and weaknesses in Guatemala

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

> Guatemala’s main innovation strengths are **Firms offering formal training, %** (rank 12), **Intellectual property payments, % total trade** (rank 22) and **Pupil-teacher ratio, secondary** (rank 26).

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td><strong>Rank</strong></td>
<td><strong>Code</strong></td>
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<tr>
<td>12</td>
<td>5.1.2</td>
</tr>
<tr>
<td>22</td>
<td>5.3.1</td>
</tr>
<tr>
<td>26</td>
<td>2.1.5</td>
</tr>
<tr>
<td>29</td>
<td>5.3.2</td>
</tr>
<tr>
<td>40</td>
<td>6.3.4</td>
</tr>
<tr>
<td>46</td>
<td>6.2.1</td>
</tr>
<tr>
<td>51</td>
<td>4.3.1</td>
</tr>
<tr>
<td>58</td>
<td>7.3.1</td>
</tr>
<tr>
<td>59</td>
<td>5.3.3</td>
</tr>
<tr>
<td>59</td>
<td>6.3.1</td>
</tr>
</tbody>
</table>
→ Guatemala’s innovation system

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

> Innovation inputs in Guatemala

2.1.1 Expenditure on education, % GDP was equal to 3.11% GDP in 2021, down by 0.19 percentage points from the year prior – and equivalent to an indicator rank of 105.

2.2.2 Graduates in science and engineering, % was equal to 9.77% of total tertiary graduates in 2015, down by 1.28 percentage points from the year prior – and equivalent to an indicator rank of 109.

2.3.1 Researchers, FTE/mn pop. was equal to 13.92 FTE/mn pop. in 2021, down by 16.3% from the year prior – and equivalent to an indicator rank of 106.

2.3.2 Gross expenditure on R&D, % GDP was equal to 0.059% GDP in 2021, up by 0.0097 percentage points from the year prior – and equivalent to an indicator rank of 110.

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 6.67 in 2021, up by 4.71% from the year prior – and equivalent to an indicator rank of 107.
4.1.1 Finance for startups and scaleups
was equal to an average perception score of
2.89 in 2022, equivalent to an indicator rank
of 82.

5.1.1 Knowledge-intensive employment, %
was equal to 9.32% in 2019, up by 0.83
percentage points from the year prior – and
equivalent to an indicator rank of 109.
Innovation outputs in Guatemala

6.1.1 Patents by origin
was equal to 0.009 Thousands in 2021, up by 28.57% from the year prior – and equivalent to an indicator rank of 121.

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 0.016% GDP in 2022, down by 0.00013 percentage points from the year prior – and equivalent to an indicator rank of 125.

6.1.5 Citable documents H-index
was equal to an index value of 119 in 2022, up by 8.18% from the year prior – and equivalent to an indicator rank of 112.

6.3.1 Intellectual property receipts, % total trade
was equal to 0.079% total trade in 2021, down by 0.021 percentage points from the year prior – and equivalent to an indicator rank of 59.

6.3.2 Production and export complexity
was equal to a score of −0.34 in 2020, down by 6.37% from the year prior – and equivalent to an indicator rank of 81.
6.3.3 High-tech exports
was equal to 332,468,059 USD in 2021, up by 10.81% from the year prior – and equivalent to an indicator rank of 67.

7.2.1 Cultural and creative services exports
was equal to 18,586,000 USD in 2021, up by 26.55% from the year prior – and equivalent to an indicator rank of 89.

7.3.4 Mobile app creation/bn PPP$ GDP
was equal to 2,057.96 Apps/bn PPP$ GDP in 2022, up by 9.67% from the year prior – and equivalent to an indicator rank of 111.
## Global Innovation Index 2023

### Guatemala

<table>
<thead>
<tr>
<th>Output rank</th>
<th>Input rank</th>
<th>Income (Region)</th>
<th>LCN*</th>
<th>Population (mn)</th>
<th>GDP, PPP$ (bn)</th>
<th>GDP per capita, PPP$</th>
</tr>
</thead>
<tbody>
<tr>
<td>115</td>
<td>121</td>
<td>Upper middle</td>
<td>17.8</td>
<td>185.8</td>
<td>9,931.4</td>
<td></td>
</tr>
</tbody>
</table>

### Institutions

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>31.3 120</th>
</tr>
</thead>
</table>

1.1 Institutional environment

- 1.1.1 Operational stability for businesses
- 1.1.2 Government effectiveness
- 1.2 Regulatory environment
- 1.2.1 Regulatory quality
- 1.2.2 Rule of law
- 1.2.3 Cost of redundancy dismissal

1.3 Business environment

- 1.3.1 Policies for doing business
- 1.3.2 Entrepreneurship policies and culture

### Business sophistication

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>22.9 93</th>
</tr>
</thead>
</table>

5.1 Knowledge workers

- 5.1.1 Knowledge-intensive employment, %
- 5.1.2 Firms offering formal training, %
- 5.1.3 GERD performed by business, % GDP
- 5.1.4 GERD financed by business, %
- 5.1.5 Females employed w/advanced degrees, %

5.2 Innovation linkages

- 5.2.1 University-industry R&D collaboration
- 5.2.2 State of cluster development
- 5.2.3 GERD financed by abroad, % GDP
- 5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP
- 5.2.5 Patents families/bn PPP$ GDP

### Human capital and research

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>13.2 122</th>
</tr>
</thead>
</table>

2.1 Education

- 2.1.1 Education on expenditure on education, % GDP
- 2.1.2 Government funding/pupil, secondary, % GDP/cap
- 2.1.3 School life expectancy
- 2.1.4 PI SA scales in reading, maths and science
- 2.1.5 Pupil-teacher ratio, secondary

2.2 Tertiary education

- 2.2.1 Tertiary enrollment, %
- 2.2.2 Graduates in science and engineering, %
- 2.2.3 Tertiary in-mobility, %

2.3 Research and development (R&D)

- 2.3.1 Researchers, FTE/mm pop.
- 2.3.2 Gross expenditure on R&D, % GDP
- 2.3.3 Global corporate R&D investors, top 3, mn US$
- 2.3.4 QS university ranking, top 3

### Infrastructure

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>20.7 118</th>
</tr>
</thead>
</table>

3.1 Information and communication technologies (ICTs)

- 3.1.1 ICT access
- 3.1.2 ICT use
- 3.1.3 Government’s online service
- 3.1.4 E-participation

3.2 General infrastructure

- 3.2.1 Electricity output, GWh/mm pop.
- 3.2.2 Logistics performance
- 3.2.3 Grass formation, % GDP

3.3 Ecological sustainability

- 3.3.1 GDP/unit of energy use
- 3.3.2 Environmental performance
- 3.3.3 ISO 14001 environment/bn PPP$ GDP

### Market sophistication

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>20.1 112</th>
</tr>
</thead>
</table>

4.1 Credit

- 4.1.1 Finance for startups and scaleups
- 4.1.2 Domestic credit to private sector, % GDP
- 4.1.3 Loans from microfinance institutions, % GDP

4.2 Investment

- 4.2.1 Market capitalization, % GDP
- 4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP
- 4.2.3 VC recipients, deals/bn PPP$ GDP
- 4.2.4 VC received, value, % GDP

4.3 Trade, diversification, and market scale

- 4.3.1 Applied tariff rate, weighted avg, %
- 4.3.2 Domestic industry diversification
- 4.3.3 Domestic market share, bn PPP$ GDP

### Knowledge and technology outputs

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>13.7 99</th>
</tr>
</thead>
</table>

6.1 Knowledge creation

- 6.1.1 Patents by origin/bn PPP$ GDP
- 6.1.2 PCT patents by origin/bn PPP$ GDP

6.2 Knowledge diffusion

- 6.2.1 Knowledge diffusion
- 6.2.2 Unicorns valuation, % GDP
- 6.2.3 Software spending, % GDP
- 6.2.4 High-tech manufacturing, % GDP

6.3 Knowledge use

- 6.3.1 Intellectual property receipts, % total trade
- 6.3.2 Production and export complexity
- 6.3.3 High-tech exports, % total trade
- 6.3.4 ICT services exports, % total trade
- 6.3.5 ISIC 9001 quality/bn PPP$ GDP

### Creative outputs

<table>
<thead>
<tr>
<th>Score / Value Rank</th>
<th>6.3 119</th>
</tr>
</thead>
</table>

7.1 Intangible assets

- 7.1.1 Intangible asset intensity, % GDP
- 7.1.2 Trademarks by origin/bn PPP$ GDP
- 7.1.3 Global brand value, top 5,000
- 7.1.4 Industrial designs by origin/bn PPP$ GDP

7.2 Creative goods and services

- 7.2.1 Cultural and creative services exports, % total trade
- 7.2.2 National feature films/mm pop. 15-69
- 7.2.3 Entertainment and media market/th pop. 15-69
- 7.2.4 Creative goods exports, % total trade

### Economic and technological indicators

**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 Guatemala.

> Guatemala has missing data for twelve indicators and outdated data for eleven indicators.

### Missing data for Guatemala

<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>2.1.4</td>
<td>PISA scales in reading, maths and science</td>
<td>n/a</td>
<td>2018</td>
<td>OECD, PISA</td>
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<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>
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<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>
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<tr>
<td>4.2.3</td>
<td>VC recipients, deals/bn PPP$/ GDP</td>
<td>n/a</td>
<td>2022</td>
<td>Refinitiv; International Monetary Fund</td>
</tr>
<tr>
<td>4.2.4</td>
<td>VC received, value, % GDP</td>
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<td>2022</td>
<td>Refinitiv; International Monetary Fund</td>
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<tr>
<td>4.3.2</td>
<td>Domestic industry diversification</td>
<td>n/a</td>
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<td>United Nations Industrial Development Organization</td>
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<td>6.2.4</td>
<td>High-tech manufacturing, %</td>
<td>n/a</td>
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<tr>
<td>7.1.1</td>
<td>Intangible asset intensity, top 15, %</td>
<td>n/a</td>
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<td>Brand Finance</td>
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<td>7.1.2</td>
<td>Trademarks by origin/bn PPP$/ GDP</td>
<td>n/a</td>
<td>2021</td>
<td>World Intellectual Property Organization; International Monetary Fund</td>
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<tr>
<td>7.1.3</td>
<td>Global brand value, top 5,000</td>
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<td>2023</td>
<td>Brand Finance; International Monetary Fund</td>
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<tr>
<td>7.2.2</td>
<td>National feature films/mn pop. 15-69</td>
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<td>7.2.3</td>
<td>Entertainment and media market/t h pop. 15-69</td>
<td>n/a</td>
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### Outdated data for Guatemala

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<td>2.1.3</td>
<td>School life expectancy, years</td>
<td>2019</td>
<td>2020</td>
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<td>2.2.1</td>
<td>Tertiary enrolment, % gross</td>
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<td>2020</td>
<td>UNESCO Institute for Statistics</td>
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<tr>
<td>Code</td>
<td>Indicator name</td>
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<td>2.2.2</td>
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<td>2020</td>
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<tr>
<td>2.2.3</td>
<td>Tertiary inbound mobility, %</td>
<td>2019</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
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<tr>
<td>5.1.1</td>
<td>Knowledge-intensive employment, %</td>
<td>2019</td>
<td>2022</td>
<td>International Labour Organization</td>
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<tr>
<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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<tr>
<td>5.1.3</td>
<td>GERD performed by business, % GDP</td>
<td>2019</td>
<td>2021</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD; RICYT</td>
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<tr>
<td>5.1.4</td>
<td>GERD financed by business, %</td>
<td>2019</td>
<td>2020</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD; RICYT</td>
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<td>5.1.5</td>
<td>Females employed w/advanced degrees, %</td>
<td>2019</td>
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<td>International Labour Organization</td>
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<tr>
<td>5.2.3</td>
<td>GERD financed by abroad, % GDP</td>
<td>2019</td>
<td>2020</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD; RICYT</td>
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<tr>
<td>5.3.5</td>
<td>Research talent, % in businesses</td>
<td>2019</td>
<td>2021</td>
<td>UNESCO Institute for Statistics; Eurostat; OECD; RICYT</td>
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</table>
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.