

Global Innovation Index 2023

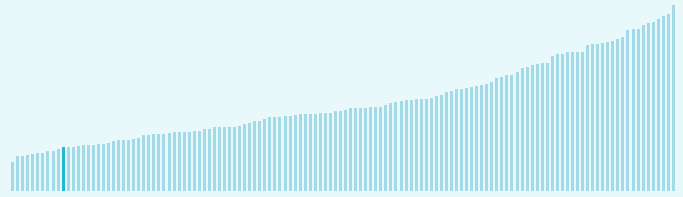


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

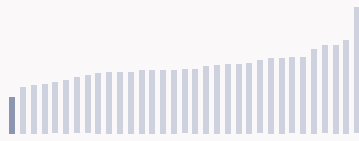
Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation.**

Guatemala ranking in the Global Innovation Index 2023

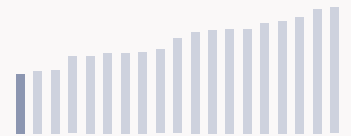
> Guatemala ranks **122nd** among the 132 economies featured in the GII 2023.



> 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.

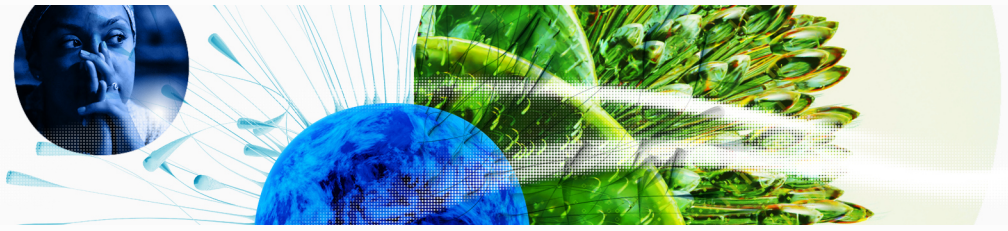
	GII Position	Innovation Inputs	Innovation Outputs
2020	106th	110th	96th
2021	101st	112nd	83rd
2022	110th	117th	96th
2023	122nd	121st	115th

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.

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→ Expected vs. observed innovation performance

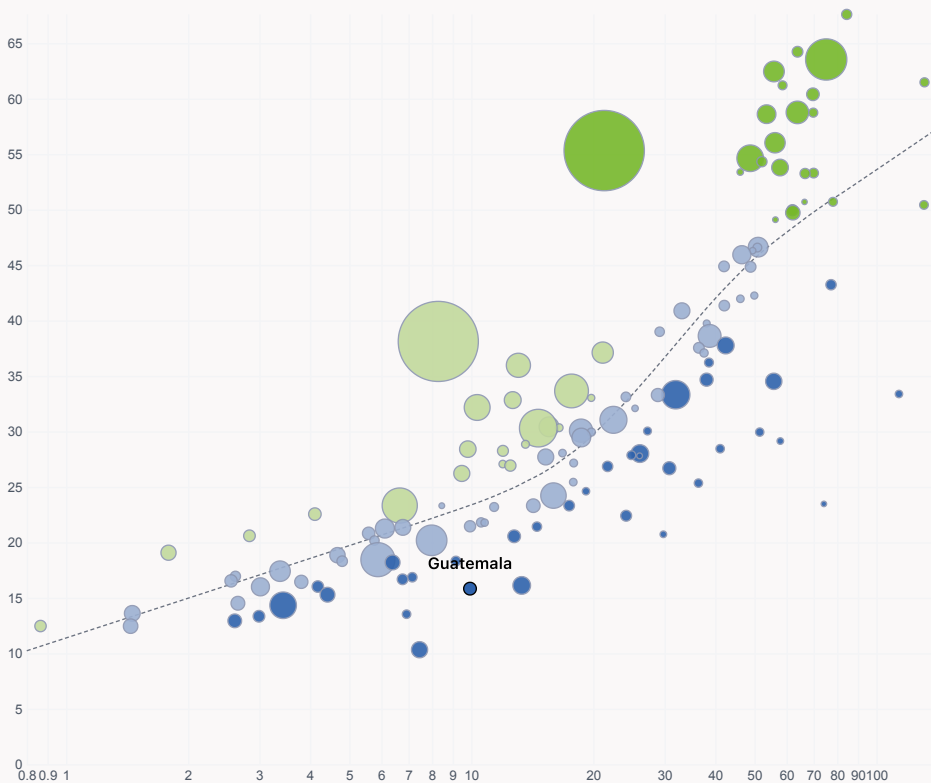
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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

↑ **GII Score**



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

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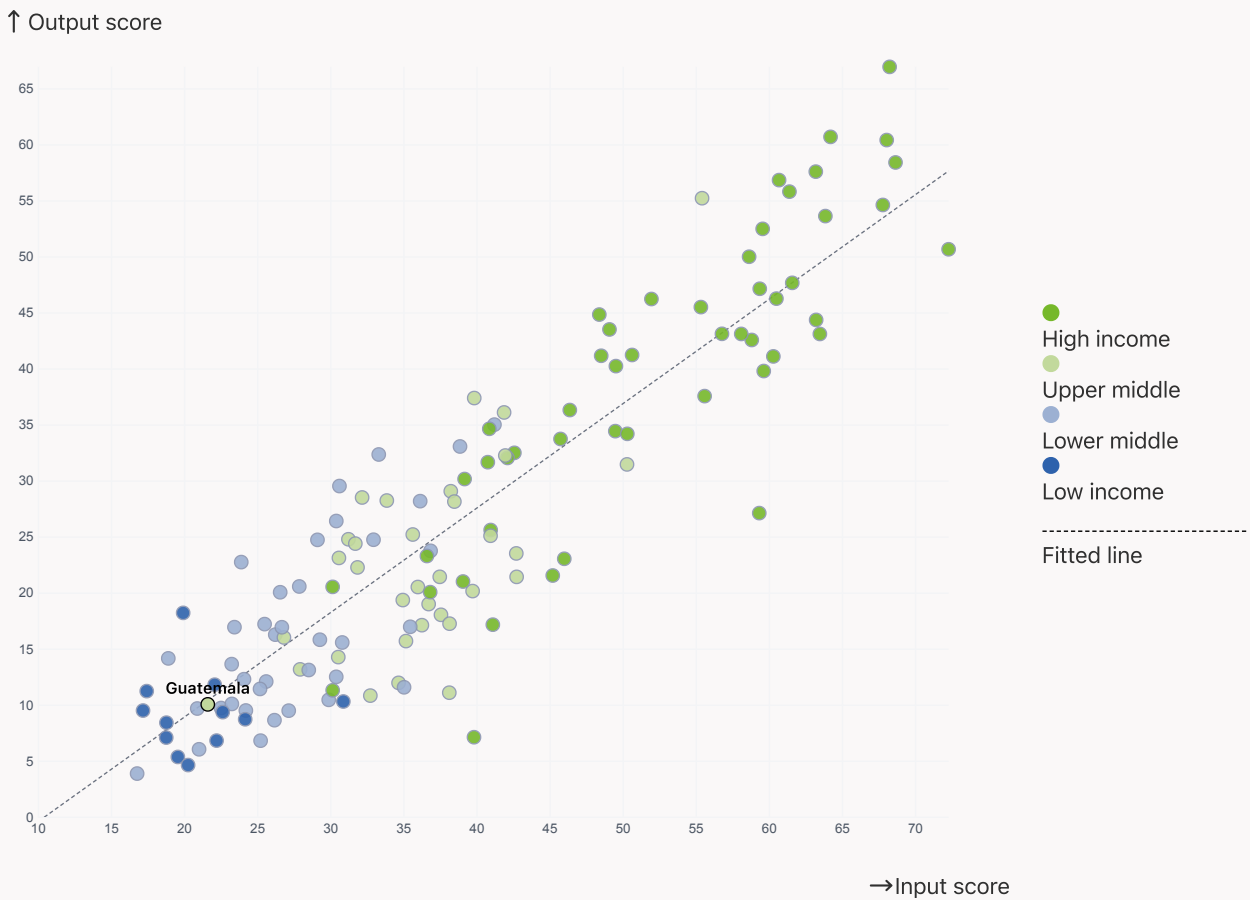
→ Effectively translating innovation investments into innovation outputs

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.

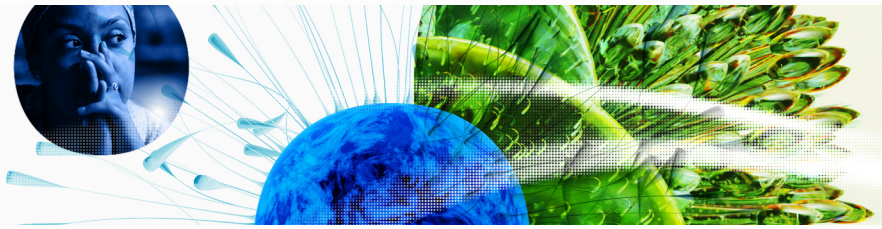


> Guatemala produces less innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

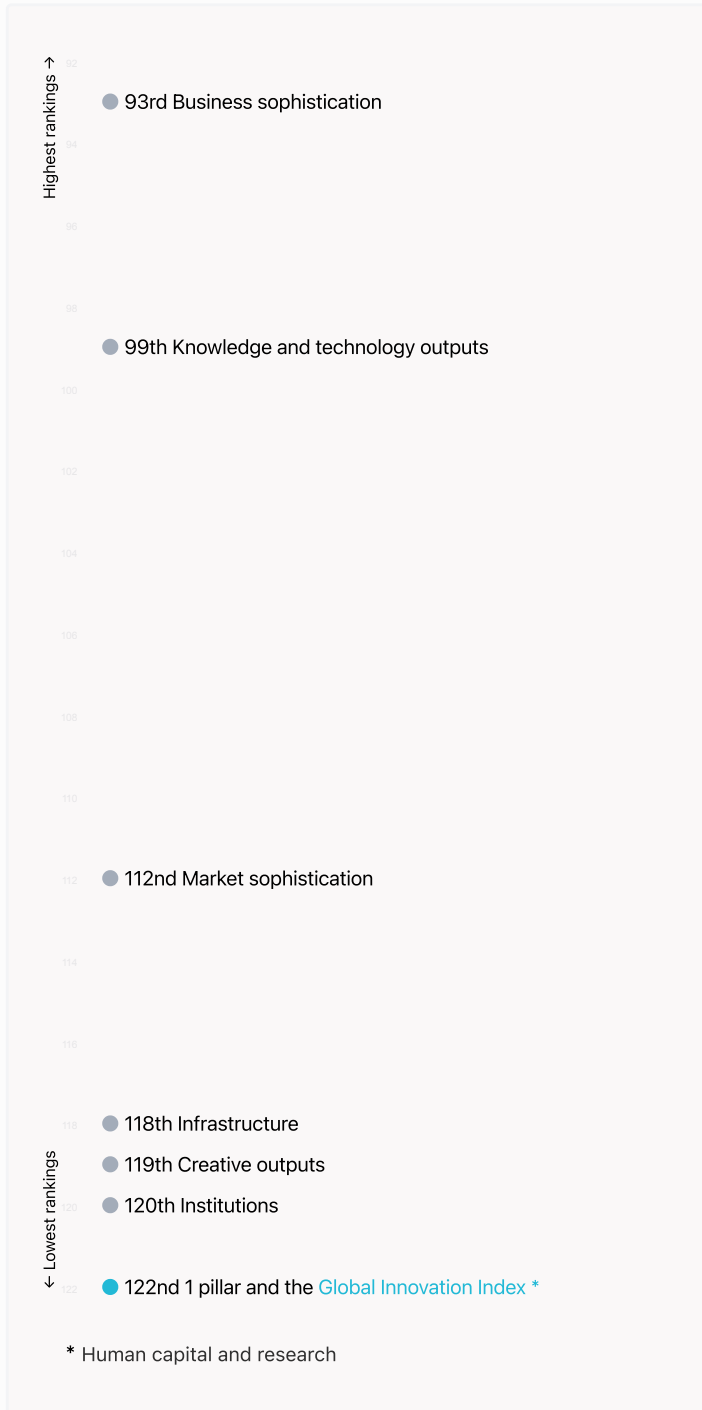


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→ Overview of Guatemala's rankings in the seven areas of the GII in 2023

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](#).

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→ 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.

> Upper-Middle-Income economies

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



> Latin America And The Caribbean

Guatemala performs below the regional average in all the pillars.



Knowledge and technology outputs

Top 10 | Score: 58.96

Upper middle income | Score: 22.36

LCN | Score: 17.14

Guatemala | Score: 13.71

Creative outputs

Top 10 | 56.09

Upper middle income | 23.16

LCN | 18.91

Guatemala | 6.33

Business sophistication

Top 10 | 64.39

Upper middle income | 29.27

LCN | 26.15

Guatemala | 22.88

Market sophistication

Top 10 | 61.93

Upper middle income | 35.45

LCN | 29.74

Guatemala | 20.13

Human capital and research

Top 10 | 60.28

Upper middle income | 29.68

LCN | 24.92

Guatemala | 13.21

Infrastructure

Top 10 | 62.83

Upper middle income | 40.40

LCN | 35.88

Guatemala | 20.66

Institutions

Top 10 | 79.85

Upper middle income | 47.71

LCN | 41.12

Guatemala | 31.28



→ Innovation strengths and weaknesses in Guatemala

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



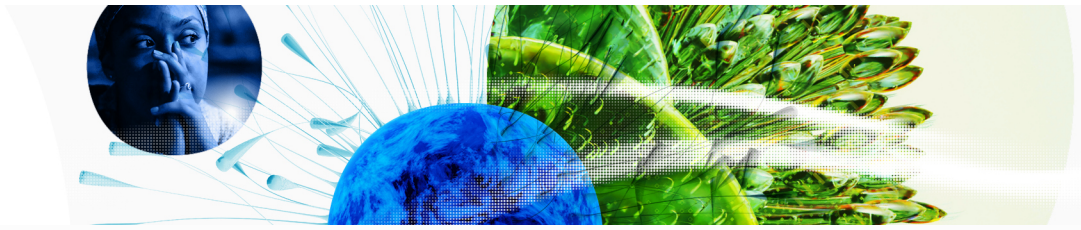
> Guatemala's main innovation strengths are **Firms offering formal training, % (rank 12)**, **Intellectual property payments, % total trade (rank 22)** and **Pupil-teacher ratio, secondary (rank 26)**.

Strengths

Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
12	5.1.2	Firms offering formal training, %	129	6.1.4	Scientific and technical articles/bn PPP\$ GDP
22	5.3.1	Intellectual property payments, % total trade	123	3.2.3	Gross capital formation, % GDP
26	2.1.5	Pupil-teacher ratio, secondary	110	2.3.2	Gross expenditure on R&D, % GDP
29	5.3.2	High-tech imports, % total trade	106	2.3.1	Researchers, FTE/mn pop.
40	6.3.4	ICT services exports, % total trade	100	2.1.2	Government funding/pupil, secondary, % GDP/cap
46	6.2.1	Labor productivity growth, %	95	5.2.5	Patent families/bn PPP\$ GDP
51	4.3.1	Applied tariff rate, weighted avg., %	90	5.1.3	GERD performed by business, % GDP
58	7.3.1	Generic top-level domains (TLDs)/th pop. 15-69	71	2.3.4	QS university ranking, top 3
59	5.3.3	ICT services imports, % total trade	48	6.2.2	Unicorn valuation, % GDP
59	6.3.1	Intellectual property receipts, % total trade	40	2.3.3	Global corporate R&D investors, top 3, mn US\$

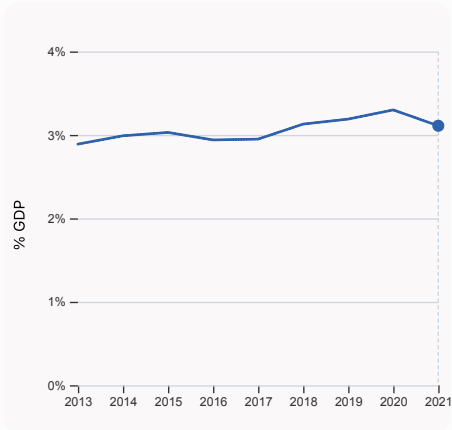
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→ Guatemala's innovation system

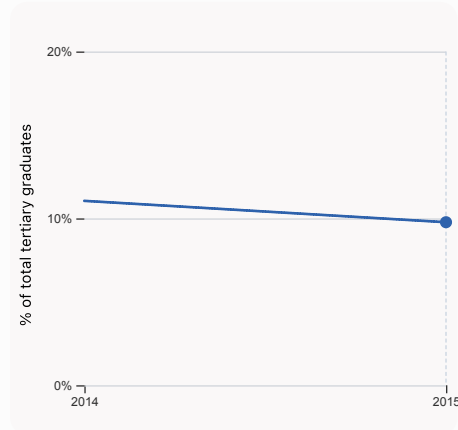
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Guatemala



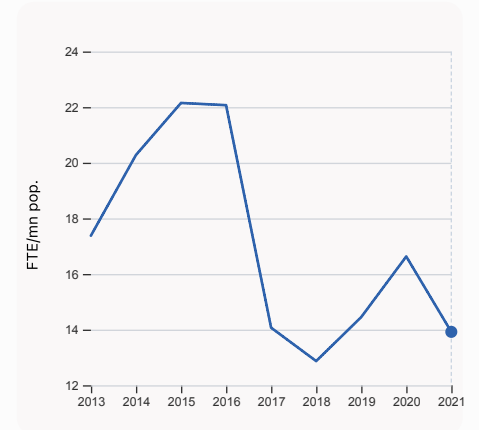
2.1.1 Expenditure on education, % GDP

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.



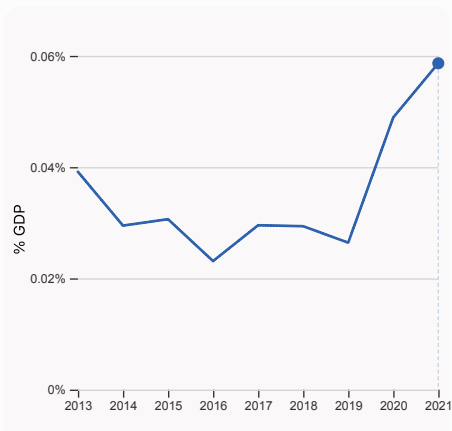
2.2.2 Graduates in science and engineering, %

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.



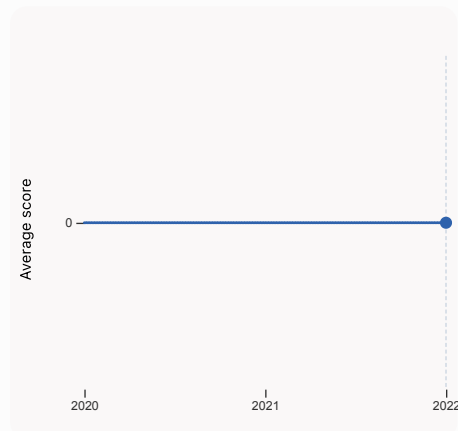
2.3.1 Researchers, FTE/mn pop.

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.



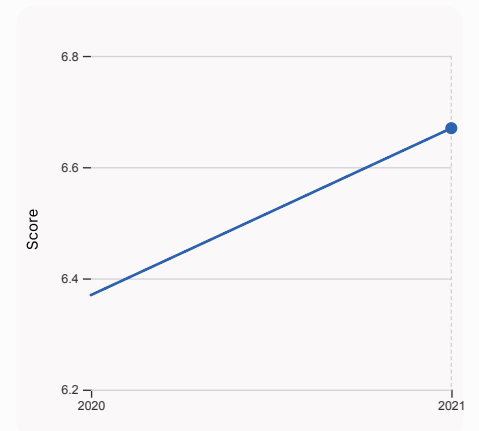
2.3.2 Gross expenditure on R&D, % GDP

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

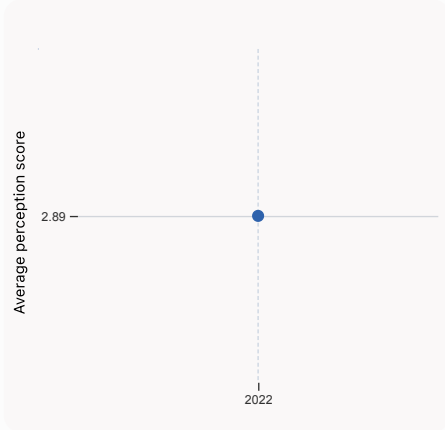
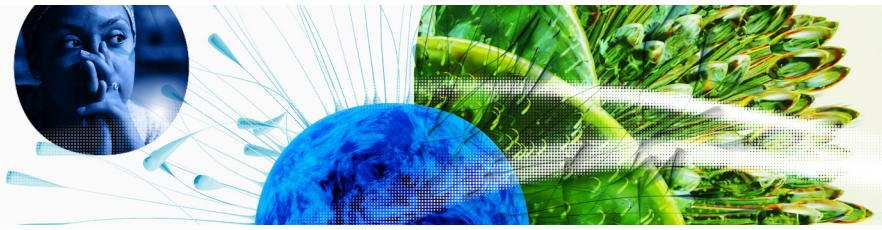
was equal to an average score of 0 for the top 3 universities in 2022, equivalent to an indicator rank of 71.



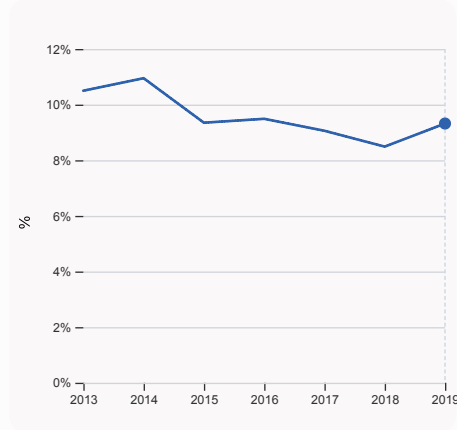
3.1.1 ICT access

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.

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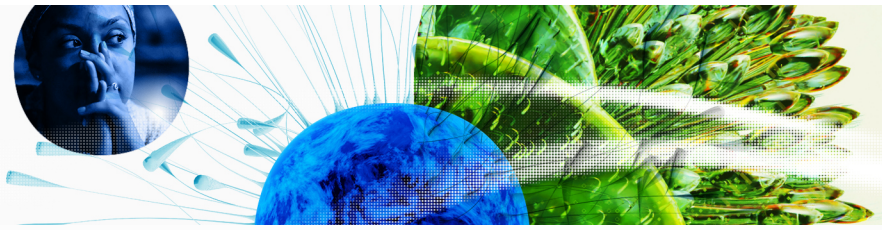


4.1.1 Finance for startups and scaleups was equal to an average perception score of 2.89 in 2022, equivalent to an indicator rank of 82.

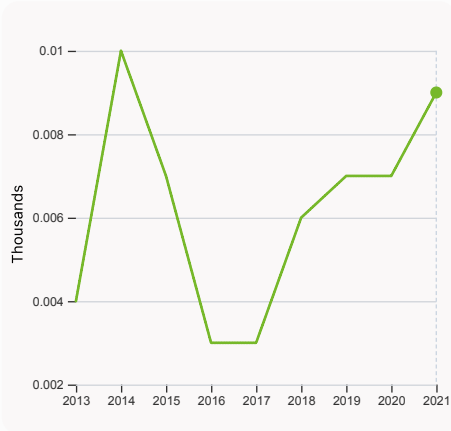


5.1.1 Knowledge-intensive employment, % was equal to 9.32% in 2019, up by 0.83 percentage points from the year prior – and equivalent to an indicator rank of 109.

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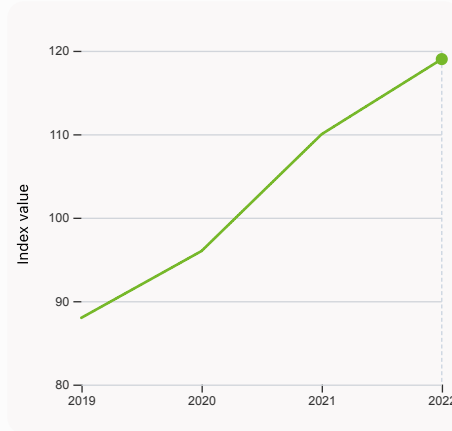


> Innovation outputs in Guatemala



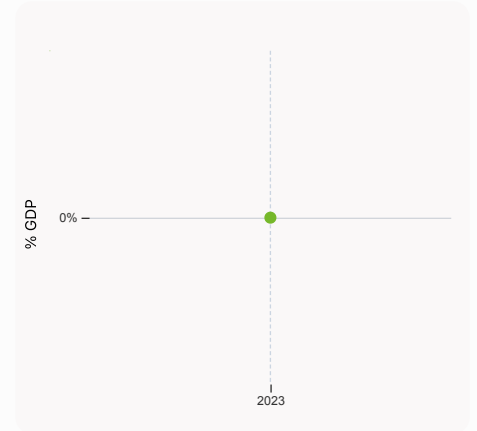
6.1.1 Patents by origin

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



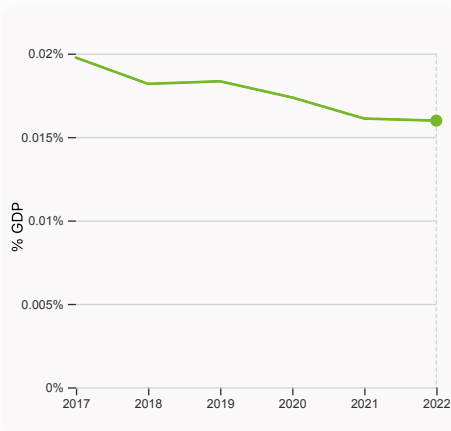
6.1.5 Citable documents H-index

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.



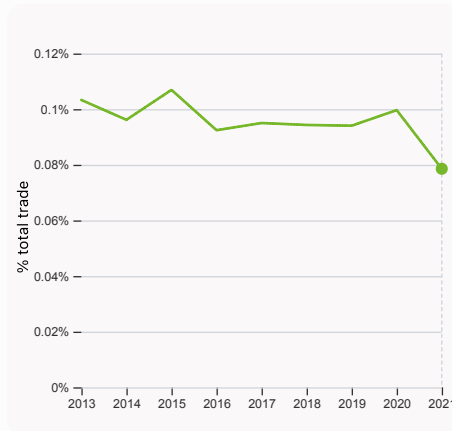
6.2.2 Unicorn valuation, % GDP

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.



6.3.1 Intellectual property receipts, % total trade

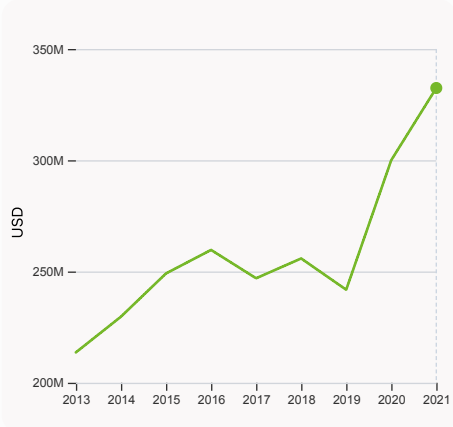
was equal to 0.079% total trade in 2021, down by 0.021 percentage points from the year prior – and equivalent to an indicator rank of 59.



6.3.2 Production and export complexity

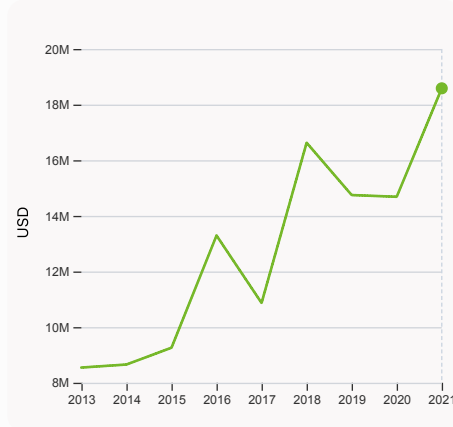
was equal to a score of -0.34 in 2020, down by 6.37% from the year prior – and equivalent to an indicator rank of 81.

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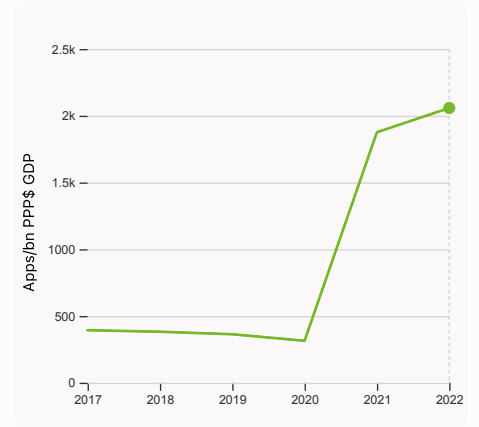
6.3.3 High-tech exports

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

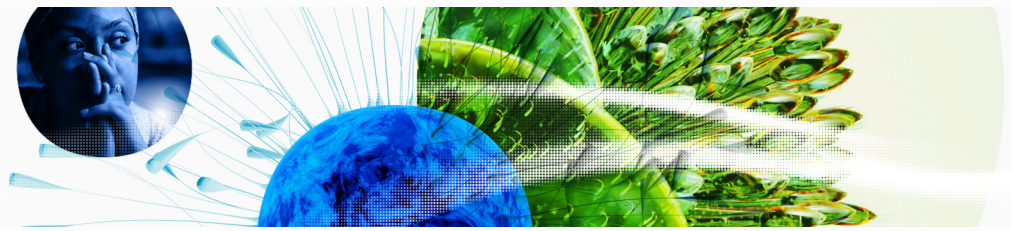
was equal to 18,586,000 USD in 2021, up by 26.55% from the year prior – and equivalent to an indicator rank of 89.



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.

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GII 2023 rank

122

Guatemala

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
115	121	Upper middle	LCN	17.8	185.8	9,931.4
Score / Value Rank				Score / Value Rank		
Institutions 31.3 120				Business sophistication 22.9 93		
1.1 Institutional environment 26.7 108				5.1 Knowledge workers 21.1 95		
1.1.1 Operational stability for businesses* 37.5 103				5.1.1 Knowledge-intensive employment, % 9.3 109		
1.1.2 Government effectiveness* 16.0 115				5.1.2 Firms offering formal training, % 55.7 12		
1.2 Regulatory environment 41.6 117				5.1.3 GERD performed by business, % GDP 0.0 90		
1.2.1 Regulatory quality* 33.9 90				5.1.4 GERD financed by business, % 11.1 74		
1.2.2 Rule of law* 7.7 124				5.1.5 Females employed w/advanced degrees, % 2.7 105		
1.2.3 Cost of redundancy dismissal 27.0 108				5.2 Innovation linkages 14.4 98		
1.3 Business environment 25.5 109				5.2.1 University-industry R&D collaboration+ 33.9 87		
1.3.1 Policies for doing business+ 36.2 98				5.2.2 State of cluster development+ 37.0 83		
1.3.2 Entrepreneurship policies and culture+ 14.7 72				5.2.3 GERD financed by abroad, % GDP 0.0 94		
Human capital and research 13.2 122				5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP 0.0 122		
2.1 Education 34.4 112				5.2.5 Patent families/bn PPP\$ GDP 0.0 95		
2.1.1 Expenditure on education, % GDP 3.1 105				5.3 Knowledge absorption 33.1 68		
2.1.2 Government funding/pupil, secondary, % GDP/cap 5.4 100				5.3.1 Intellectual property payments, % total trade 1.5 22		
2.1.3 School life expectancy, years 10.6 102				5.3.2 High-tech imports, % total trade 10.8 29		
2.1.4 PISA scales in reading, maths and science n/a n/a				5.3.3 ICT services imports, % total trade 1.5 59		
2.1.5 Pupil-teacher ratio, secondary 9.6 26				5.3.4 FDI net inflows, % GDP 2.3 68		
2.2 Tertiary education 5.0 122				5.3.5 Research talent, % in businesses 3.5 73		
2.2.1 Tertiary enrolment, % gross 22.1 98				Knowledge and technology outputs 13.7 99		
2.2.2 Graduates in science and engineering, % 9.8 109				6.1 Knowledge creation 1.5 127		
2.2.3 Tertiary inbound mobility, % 0.2 108				6.1.1 Patents by origin/bn PPP\$ GDP 0.1 121		
2.3 Research and development (R&D) 0.2 115				6.1.2 PCT patents by origin/bn PPP\$ GDP 0.0 97		
2.3.1 Researchers, FTE/mn pop. 13.9 106				6.1.3 Utility models by origin/bn PPP\$ GDP 0.0 70		
2.3.2 Gross expenditure on R&D, % GDP 0.1 110				6.1.4 Scientific and technical articles/bn PPP\$ GDP n/a n/a		
2.3.3 Global corporate R&D investors, top 3, mn US\$ 0.0 40				6.1.5 Citable documents H-index 4.2 112		
2.3.4 QS university ranking, top 3* 0.0 71				6.2 Knowledge impact 19.9 104		
Infrastructure 20.7 118				6.2.1 Labor productivity growth, % 1.5 46		
3.1 Information and communication technologies (ICTs) 38.5 110				6.2.2 Unicorn valuation, % GDP 0.0 48		
3.1.1 ICT access* 49.8 107				6.2.3 Software spending, % GDP 0.0 125		
3.1.2 ICT use* 23.6 122				6.2.4 High-tech manufacturing, % n/a n/a		
3.1.3 Government's online service* 49.3 92				6.3 Knowledge diffusion 19.8 76		
3.1.4 E-participation* 31.4 103				6.3.1 Intellectual property receipts, % total trade 0.1 59		
3.2 General infrastructure 10.4 122				6.3.2 Production and export complexity 45.4 81		
3.2.1 Electricity output, GWh/mn pop. 844.5 102				6.3.3 High-tech exports, % total trade 1.6 67		
3.2.2 Logistics performance* 22.7 82				6.3.4 ICT services exports, % total trade 3.1 40		
3.2.3 Gross capital formation, % GDP 14.4 123				6.3.5 ISO 9001 quality/bn PPP\$ GDP 1.3 100		
3.3 Ecological sustainability 13.1 114				Creative outputs 6.3 [119]		
3.3.1 GDP/unit of energy use 10.0 67				7.1 Intangible assets 5.3 [119]		
3.3.2 Environmental performance* 15.4 124				7.1.1 Intangible asset intensity, top 15, % n/a n/a		
3.3.3 ISO 14001 environment/bn PPP\$ GDP 0.2 112				7.1.2 Trademarks by origin/bn PPP\$ GDP n/a n/a		
Market sophistication 20.1 112				7.1.3 Global brand value, top 5,000 n/a n/a		
4.1 Credit 13.0 106				7.1.4 Industrial designs by origin/bn PPP\$ GDP 0.2 105		
4.1.1 Finance for startups and scaleups+ 14.0 82				7.2 Creative goods and services 2.5 [100]		
4.1.2 Domestic credit to private sector, % GDP 35.9 89				7.2.1 Cultural and creative services exports, % total trade 0.1 89		
4.1.3 Loans from microfinance institutions, % GDP n/a n/a				7.2.2 National feature films/mn pop. 15-69 n/a n/a		
4.2 Investment 0.6 [110]				7.2.3 Entertainment and media market/th pop. 15-69 n/a n/a		
4.2.1 Market capitalization, % GDP n/a n/a				7.2.4 Creative goods exports, % total trade 0.3 70		
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP 0.0 87				7.3 Online creativity 12.2 108		
4.2.3 VC recipients, deals/bn PPP\$ GDP n/a n/a				7.3.1 Generic top-level domains (TLDs)/th pop. 15-69 4.4 58		
4.2.4 VC received, value, % GDP n/a n/a				7.3.2 Country-code TLDs/th pop. 15-69 0.6 98		
4.3 Trade, diversification, and market scale 46.8 94				7.3.3 GitHub commits/mn pop. 15-69 2.0 99		
4.3.1 Applied tariff rate, weighted avg., % 1.6 51				7.3.4 Mobile app creation/bn PPP\$ GDP 41.8 111		
4.3.2 Domestic industry diversification n/a n/a						
4.3.3 Domestic market scale, bn PPP\$ 185.8 72						

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.

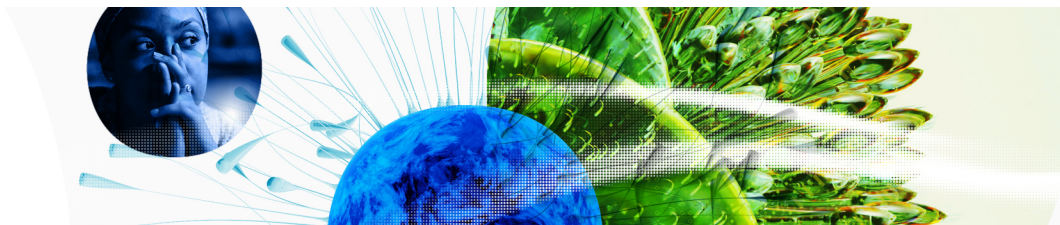
> Missing data for Guatemala

Code	Indicator name	Economy Year	Model Year	Source
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
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
4.2.3	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
4.3.2	Domestic industry diversification	n/a	2020	United Nations Industrial Development Organization
6.2.4	High-tech manufacturing, %	n/a	2020	United Nations Industrial Development Organization
7.1.1	Intangible asset intensity, top 15, %	n/a	2022	Brand Finance
7.1.2	Trademarks by origin/bn PPP\$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund
7.1.3	Global brand value, top 5,000	n/a	2023	Brand Finance; International Monetary Fund
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

> Outdated data for Guatemala

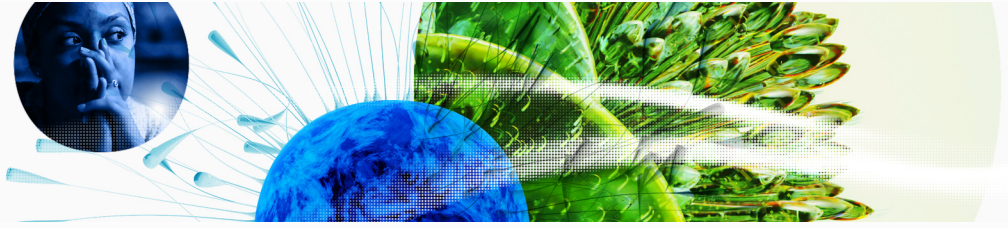
Code	Indicator name	Economy Year	Model Year	Source
2.1.3	School life expectancy, years	2019	2020	UNESCO Institute for Statistics

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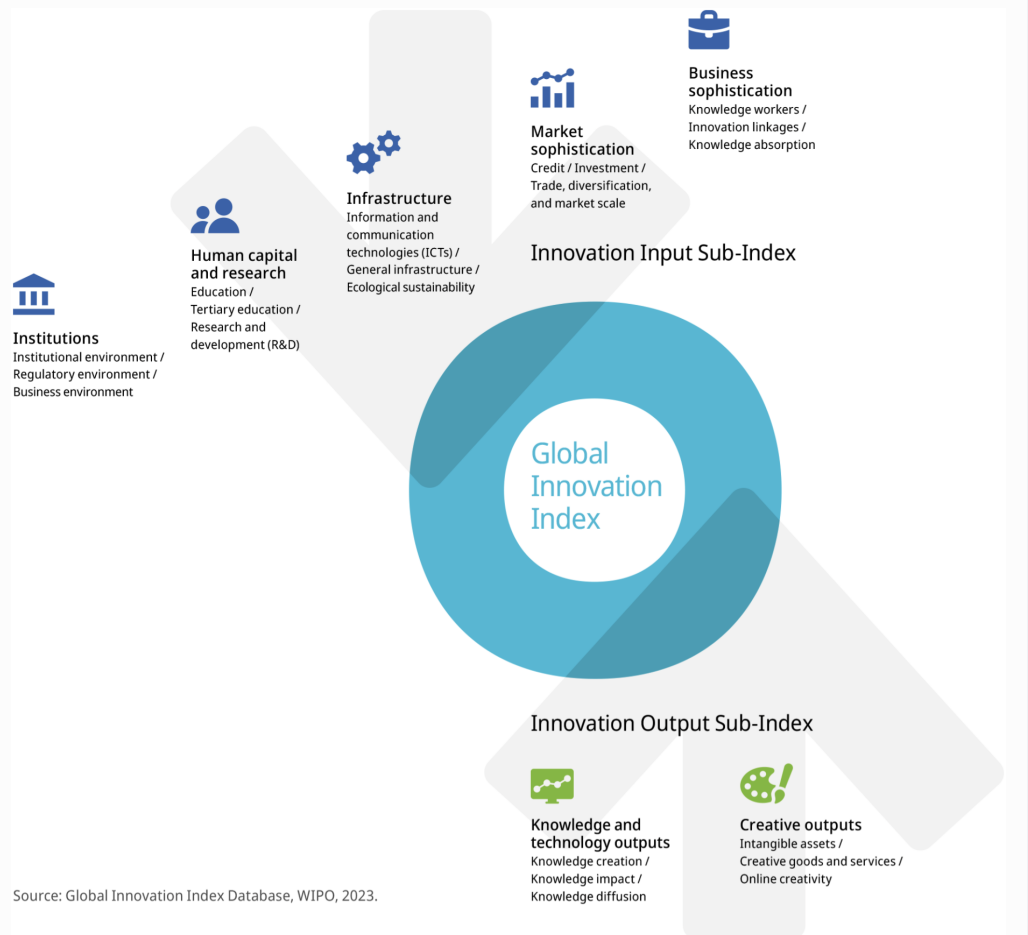
Code	Indicator name	Economy Year	Model Year	Source
2.2.1	Tertiary enrolment, % gross	2019	2020	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	2015	2020	UNESCO Institute for Statistics; Eurostat; OECD
2.2.3	Tertiary inbound mobility, %	2019	2020	UNESCO Institute for Statistics
5.1.1	Knowledge-intensive employment, %	2019	2022	International Labour Organization
5.1.2	Firms offering formal training, %	2017	2019	World Bank Enterprise Surveys
5.1.3	GERD performed by business, % GDP	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.4	GERD financed by business, %	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.5	Females employed w/advanced degrees, %	2019	2022	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT

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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.