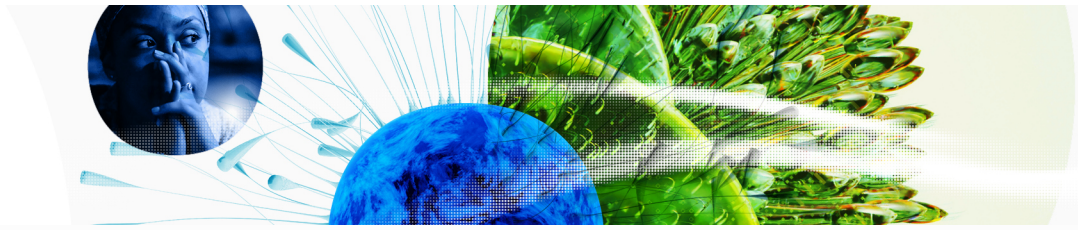
Global Innovation Index 2023



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.

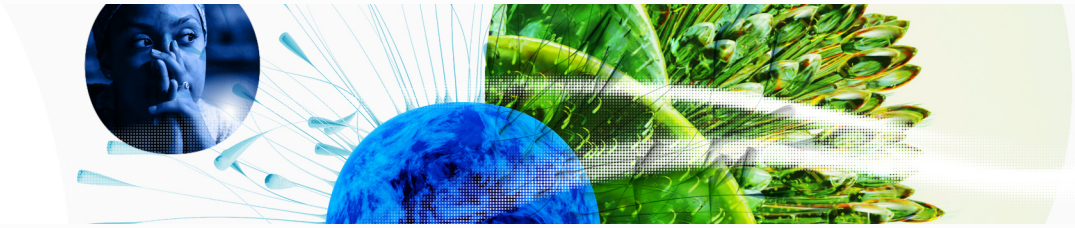
	GII Position	Innovation Inputs	Innovation Outputs
2020	106th	110th	96th
2021	101st	112nd	83rd
2022	110th	117th	96th
2023	122nd	121st	115th

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.

Global Innovation Index 2023

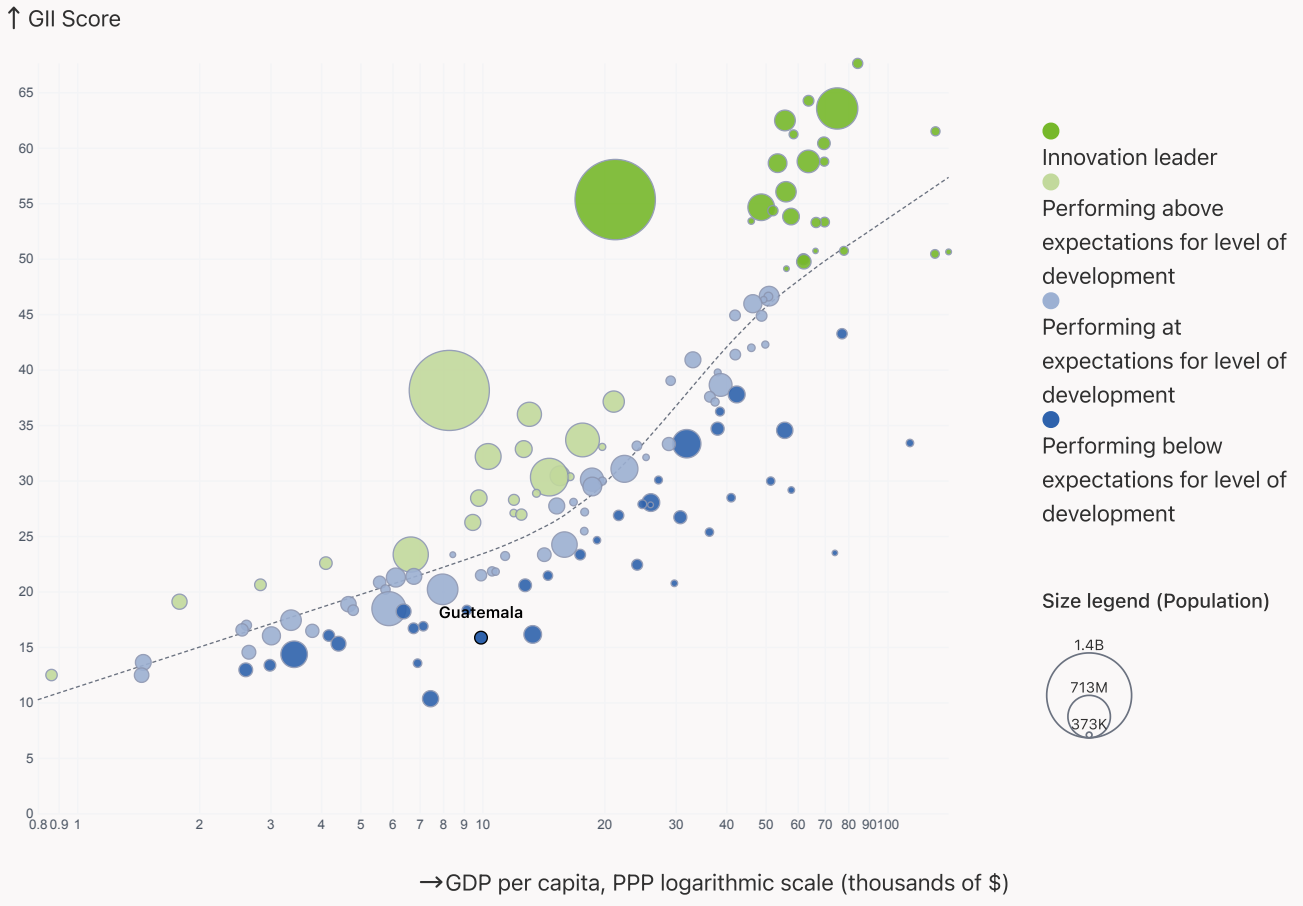


→ Expected vs. observed innovation performance

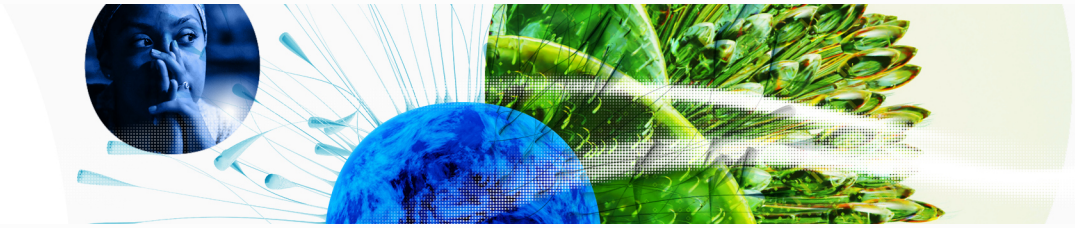
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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

> Relative to GDP, Guatemala's performance is below expectations for its level of development.

> Innovation overperformers relative to their economic development



Global Innovation Index 2023

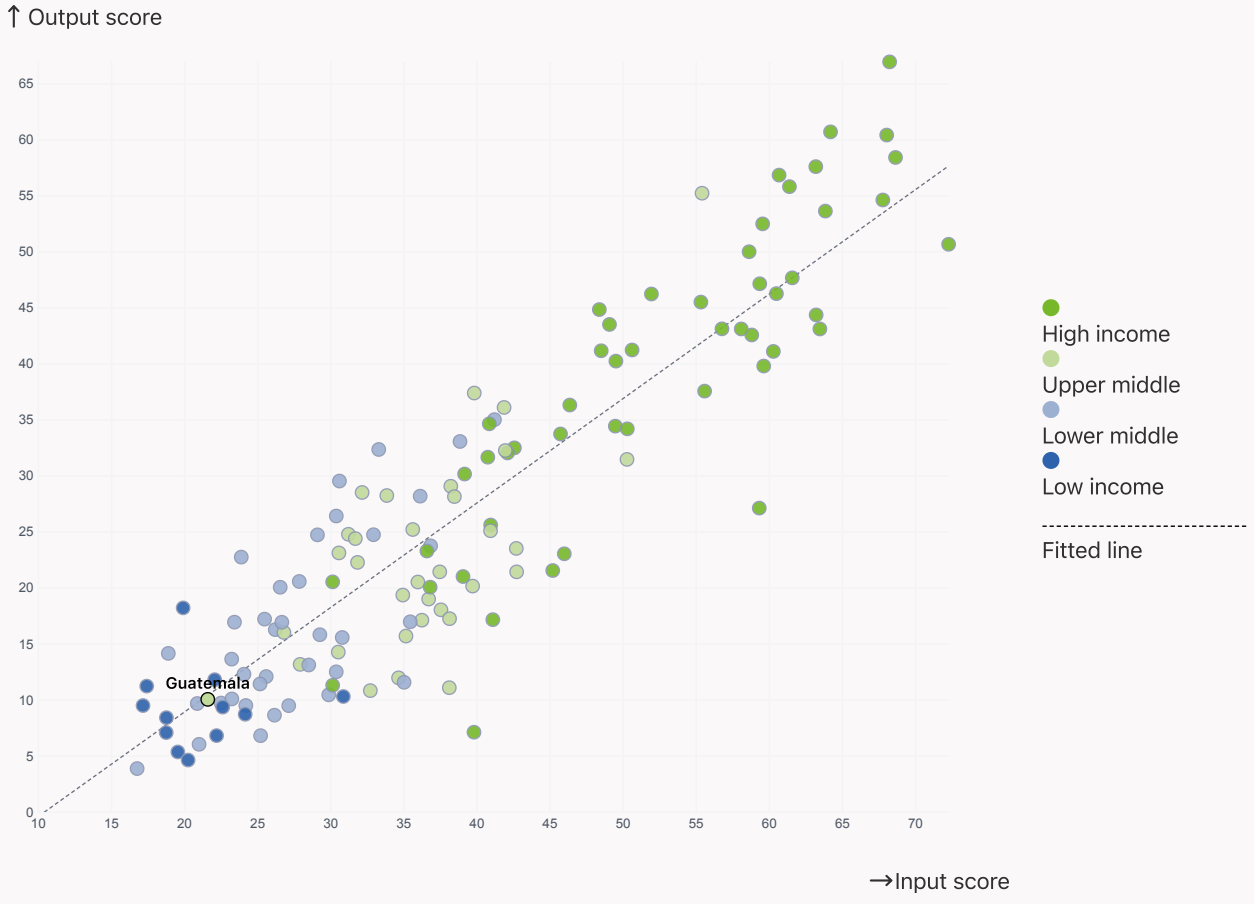


→ Effectively translating innovation investments into innovation outputs

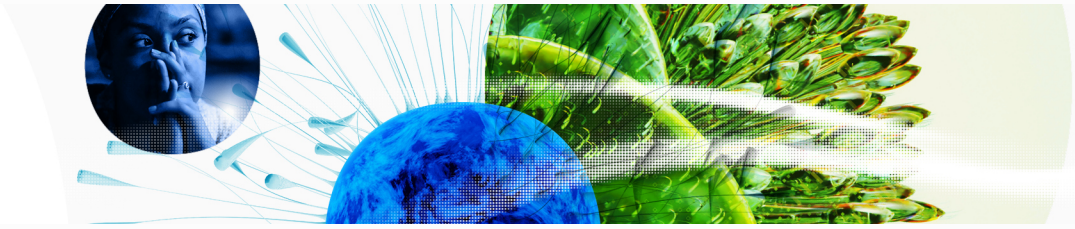
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

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

> Relationship between innovation inputs and outputs

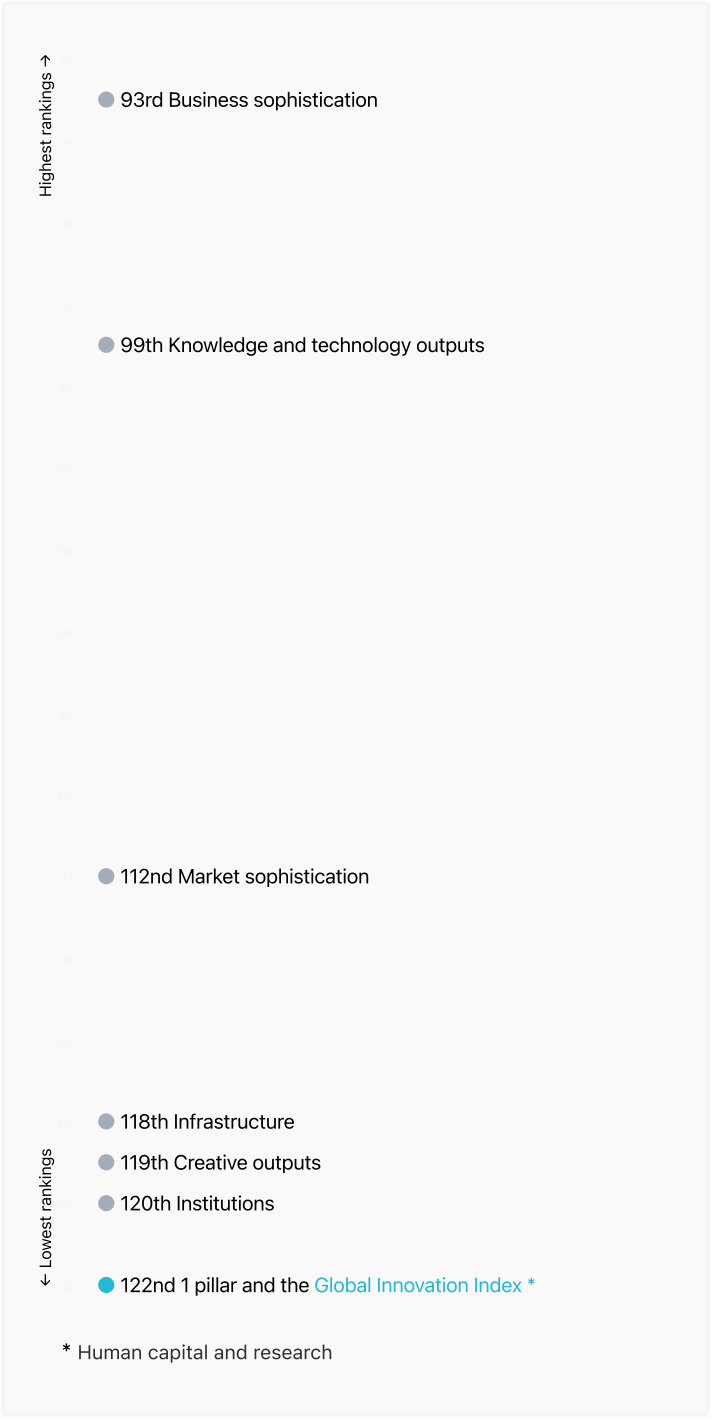


Global Innovation Index 2023



→ 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

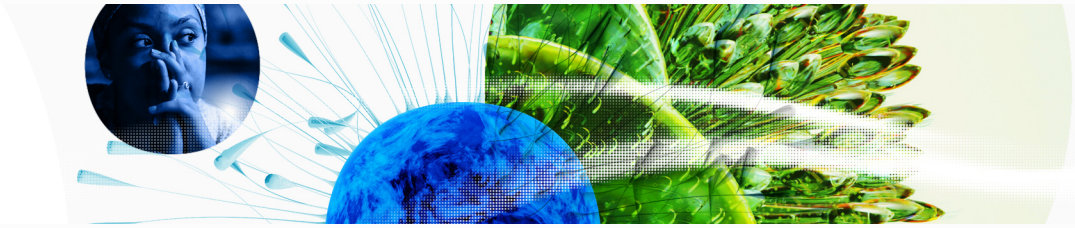
Guatemala ranks highest in Business sophistication (93rd), Knowledge and technology outputs (99th), Market sophistication (112nd), Infrastructure (118th), Creative outputs (119th), Institutions (120th) and Human capital and research (122nd).

> 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.

Global Innovation Index 2023



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

The charts shows 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

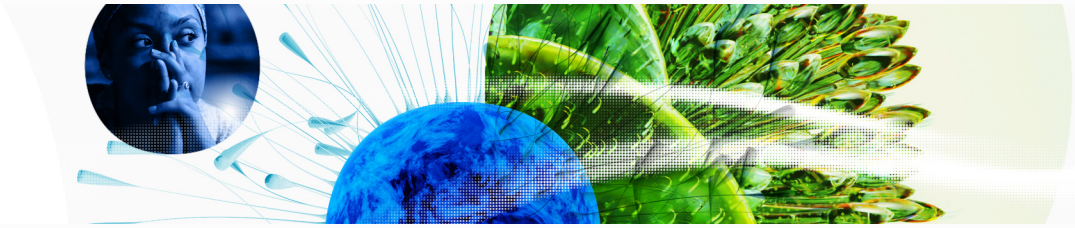
Infrastructure

- 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

Global Innovation Index 2023



→ 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).

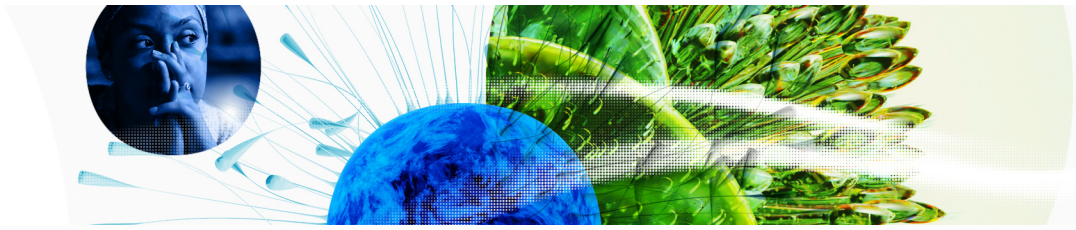
Strengths

Rank	Code	Indicator name
12	5.1.2	Firms offering formal training, %
22	5.3.1	Intellectual property payments, % total trade
26	2.1.5	Pupil-teacher ratio, secondary
29	5.3.2	High-tech imports, % total trade
40	6.3.4	ICT services exports, % total trade
46	6.2.1	Labor productivity growth, %
51	4.3.1	Applied tariff rate, weighted avg., %
58	7.3.1	Generic top-level domains (TLDs)/th pop. 15-69
59	5.3.3	ICT services imports, % total trade
59	6.3.1	Intellectual property receipts, % total trade

Weaknesses

Rank	Code	Indicator name
129	6.1.4	Scientific and technical articles/bn PPP$ GDP
123	3.2.3	Gross capital formation, % GDP
110	2.3.2	Gross expenditure on R&D, % GDP
106	2.3.1	Researchers, FTE/mn pop.
100	2.1.2	Government funding/pupil, secondary, % GDP/cap
95	5.2.5	Patent families/bn PPP$ GDP
90	5.1.3	GERD performed by business, % GDP
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$

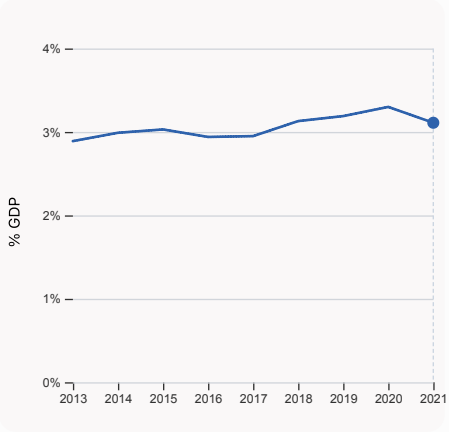
Global Innovation Index 2023



→ Guatemala's innovation system

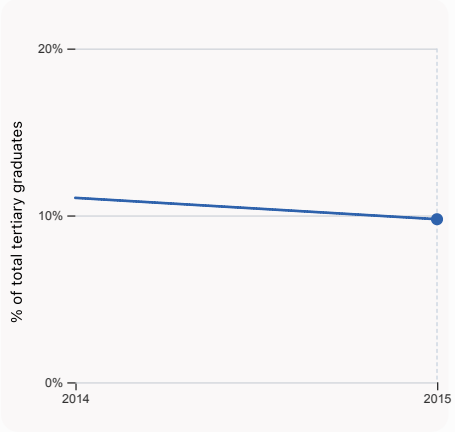
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Guatemala



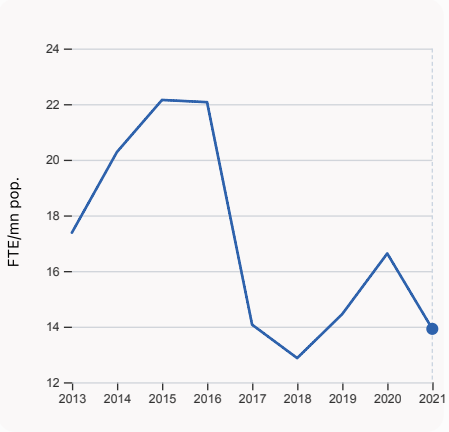
2.1.1 Expenditure on education, % GDP

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.



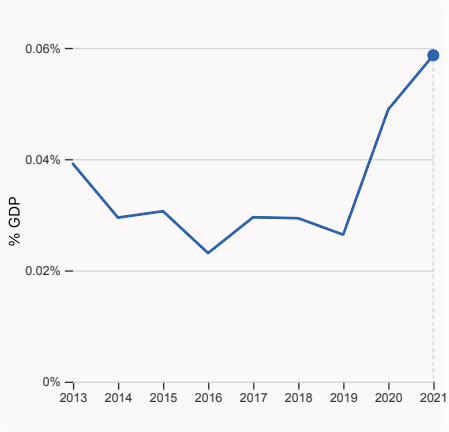
2.2.2 Graduates in science and engineering, %

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.



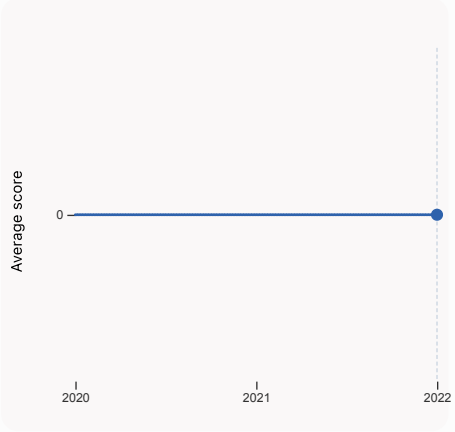
2.3.1 Researchers, FTE/mn pop.

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.



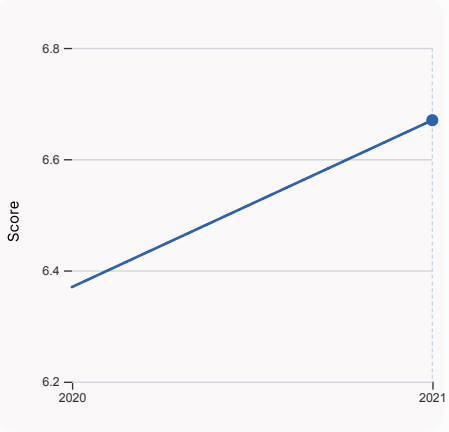
2.3.2 Gross expenditure on R&D, % GDP

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

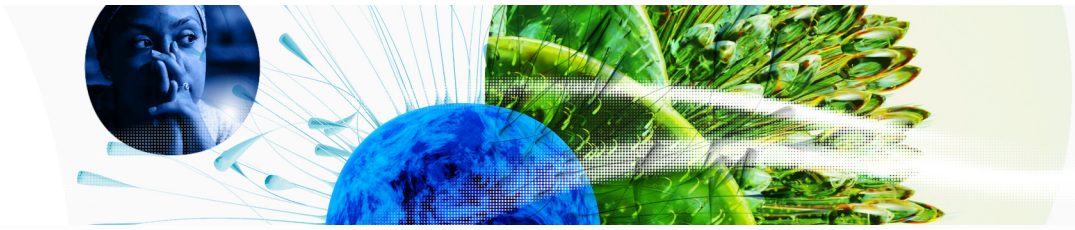
was equal to an average score of 0 for the top 3 universities in 2022, equivalent to an indicator rank of 71.

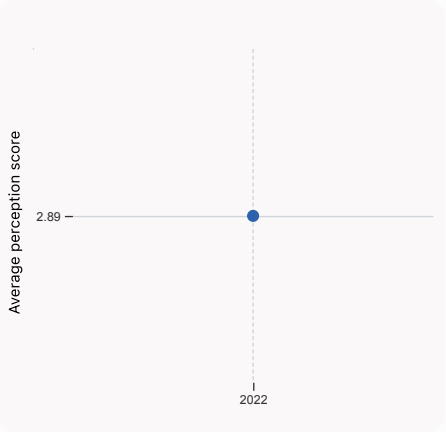


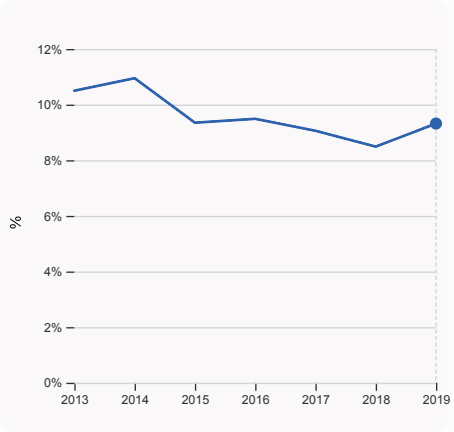
3.1.1 ICT access

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.

Global Innovation Index 2023







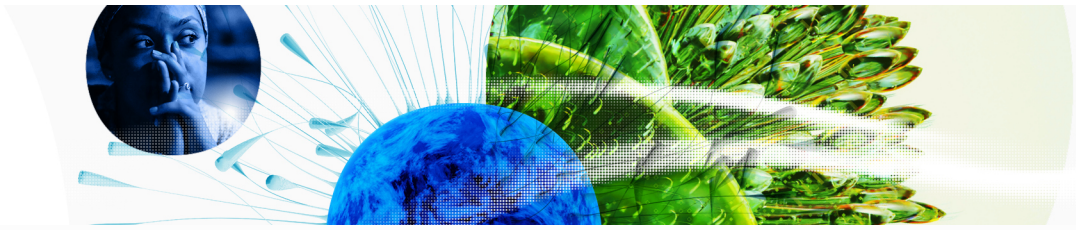
4.1.1 Finance for startups and scaleups

was equal to an average perception score of 2.89 in 2022, equivalent to an indicator rank of 82.

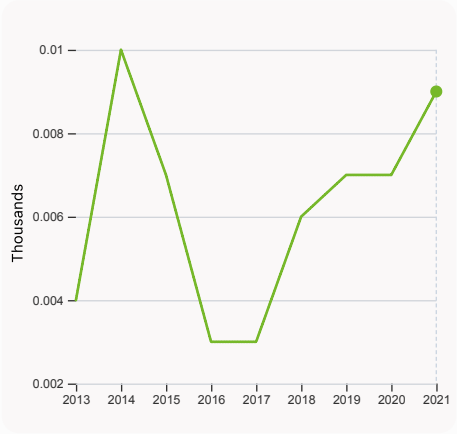
5.1.1 Knowledge-intensive employment, %

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.

Global Innovation Index 2023

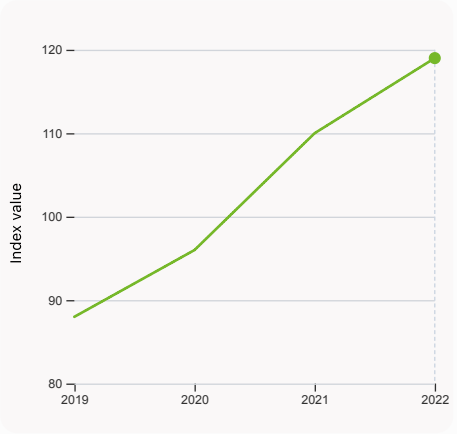


> Innovation outputs in Guatemala



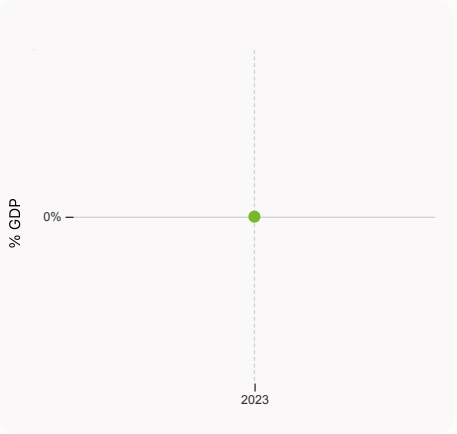
6.1.1 Patents by origin

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



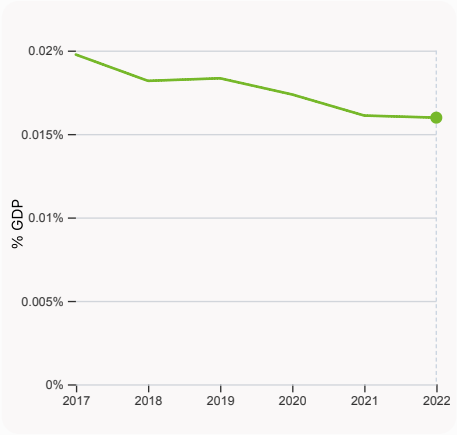
6.1.5 Citable documents H-index

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.



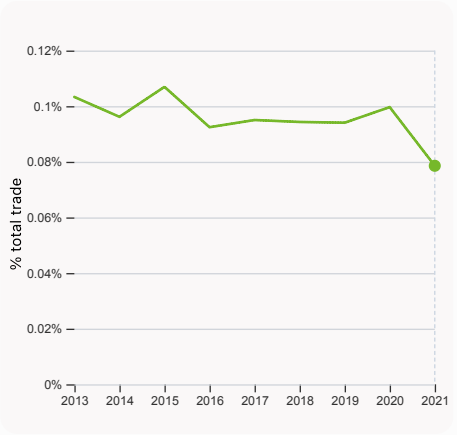
6.2.2 Unicorn valuation, % GDP

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.



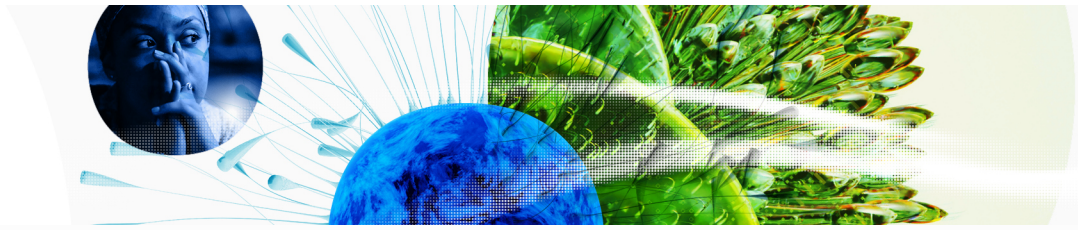
6.3.1 Intellectual property receipts, % total trade

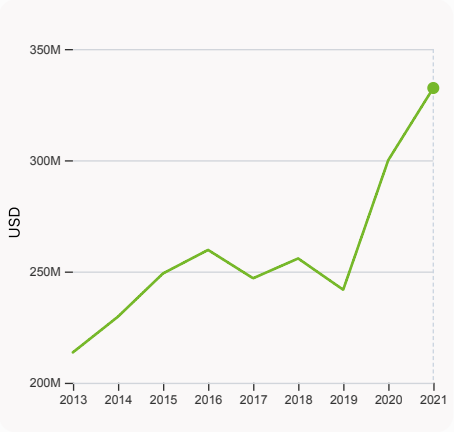
was equal to 0.079% total trade in 2021, down by 0.021 percentage points from the year prior – and equivalent to an indicator rank of 59.

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.

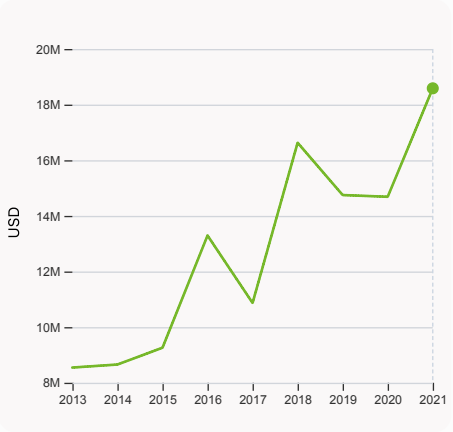
Global Innovation Index 2023





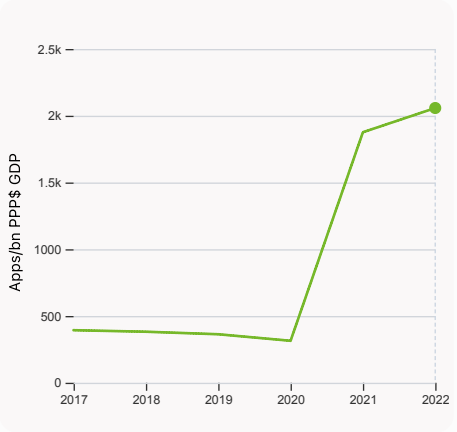
6.3.3 High-tech exports

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

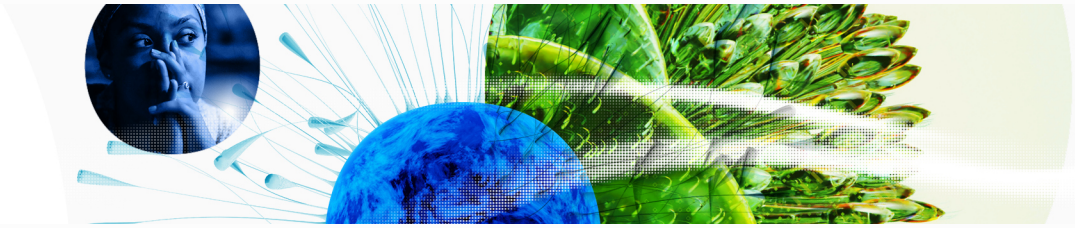
was equal to 18,586,000 USD in 2021, up by 26.55% from the year prior – and equivalent to an indicator rank of 89.



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

GII 2023 rank **122**

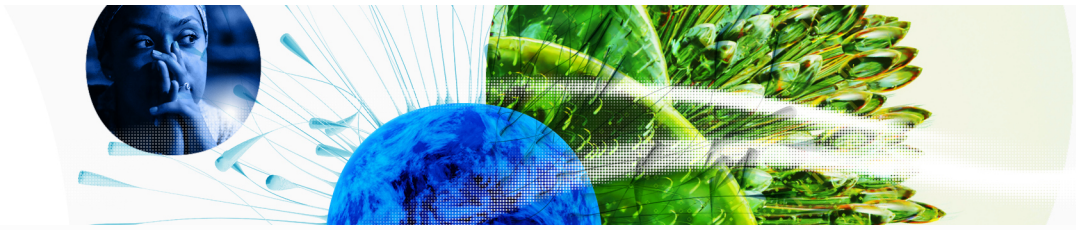
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
115	121	Upper middle	LCN	17.8	185.8	9,931.4

	Score / Value	Rank	
Institutions	**31.3**	**120**	◇
1.1 Institutional environment	**26.7**	**108**	◇
1.1.1 Operational stability for businesses*	37.5	103	
1.1.2 Government effectiveness*	16.0	115	◇
1.2 Regulatory environment	**41.6**	**117**	◇
1.2.1 Regulatory quality*	33.9	90	
1.2.2 Rule of law*	7.7	124	◇
1.2.3 Cost of redundancy dismissal	27.0	108	◇
1.3 Business environment	**25.5**	**109**	
1.3.1 Policies for doing business†	36.2	98	
1.3.2 Entrepreneurship policies and culture†	14.7	72	◇
Human capital and research	**13.2**	**122**	◇
2.1 Education	**34.4**	**112**	◇
2.1.1 Expenditure on education, % GDP	3.1	105	
2.1.2 Government funding/pupil, secondary, % GDP/cap	5.4	100 ○	◇
2.1.3 School life expectancy, years	10.6	102	◇
2.1.4 PISA scales in reading, maths and science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary	9.6	26 ●	
2.2 Tertiary education	**5.0**	**122**	◇
2.2.1 Tertiary enrolment, % gross	22.1	98	◇
2.2.2 Graduates in science and engineering, %	9.8	109	◇
2.2.3 Tertiary inbound mobility, %	0.2	108	◇
2.3 Research and development (R&D)	**0.2**	**115**	
2.3.1 Researchers, FTE/mn pop.	13.9	106 ○	◇
2.3.2 Gross expenditure on R&D, % GDP	0.1	110 ○	◇
2.3.3 Global corporate R&D investors, top 3, mn US$	0.0	40 ○	◇
2.3.4 QS university ranking, top 3*	0.0	71 ○	◇
Infrastructure	**20.7**	**118**	◇
3.1 Information and communication technologies (ICTs)	**38.5**	**110**	◇
3.1.1 ICT access*	49.8	107	◇
3.1.2 ICT use*	23.6	122	◇
3.1.3 Government's online service*	49.3	92	◇
3.1.4 E-participation*	31.4	103	◇
3.2 General infrastructure	**10.4**	**122**	◇
3.2.1 Electricity output, GWh/mn pop.	844.5	102	◇
3.2.2 Logistics performance*	22.7	82	
3.2.3 Gross capital formation, % GDP	14.4	123 ○	◇
3.3 Ecological sustainability	**13.1**	**114**	◇
3.3.1 GDP/unit of energy use	10.0	67	
3.3.2 Environmental performance*	15.4	124	◇
3.3.3 ISO 14001 environment/bn PPP$ GDP	0.2	112	
Market sophistication	**20.1**	**112**	◇
4.1 Credit	**13.0**	**106**	◇
4.1.1 Finance for startups and scaleups†	14.0	82	◇
4.1.2 Domestic credit to private sector, % GDP	35.9	89	
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	
4.2 Investment	**0.6**	**110**	
4.2.1 Market capitalization, % GDP	n/a	n/a	
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	0.0	87	
4.2.3 VC recipients, deals/bn PPP$ GDP	n/a	n/a	
4.2.4 VC received, value, % GDP	n/a	n/a	
4.3 Trade, diversification, and market scale	**46.8**	**94**	◇
4.3.1 Applied tariff rate, weighted avg., %	1.6	51 ●	
4.3.2 Domestic industry diversification	n/a	n/a	
4.3.3 Domestic market scale, bn PPP$	185.8	72	

	Score / Value	Rank	
Business sophistication	**22.9**	**93**	
5.1 Knowledge workers	**21.1**	**95**	◇
5.1.1 Knowledge-intensive employment, %	9.3	109	◇
5.1.2 Firms offering formal training, %	55.7	12 ●	
5.1.3 GERD performed by business, % GDP	0.0	90 ○	
5.1.4 GERD financed by business, %	11.1	74	
5.1.5 Females employed w/advanced degrees, %	2.7	105	◇
5.2 Innovation linkages	**14.4**	**98**	
5.2.1 University-industry R&D collaboration†	33.9	87	
5.2.2 State of cluster development†	37.0	83	
5.2.3 GERD financed by abroad, % GDP	0.0	94	
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	122	
5.2.5 Patent families/bn PPP$ GDP	0.0	95 ○	◇
5.3 Knowledge absorption	**33.1**	**68**	
5.3.1 Intellectual property payments, % total trade	1.5	22 ●	
5.3.2 High-tech imports, % total trade	10.8	29 ●	
5.3.3 ICT services imports, % total trade	1.5	59 ●	
5.3.4 FDI net inflows, % GDP	2.3	68	
5.3.5 Research talent, % in businesses	3.5	73	
Knowledge and technology outputs	**13.7**	**99**	
6.1 Knowledge creation	**1.5**	**127**	◇
6.1.1 Patents by origin/bn PPP$ GDP	0.1	121	
6.1.2 PCT patents by origin/bn PPP$ GDP	0.0	97	
6.1.3 Utility models by origin/bn PPP$ GDP	0.0	70	
6.1.4 Scientific and technical articles/bn PPP$ GDP	n/a	n/a	
6.1.5 Citable documents H-index	4.2	112	
6.2 Knowledge impact	**19.9**	**104**	
6.2.1 Labor productivity growth, %	1.5	46 ●	
6.2.2 Unicorn valuation, % GDP	0.0	48 ○	◇
6.2.3 Software spending, % GDP	0.0	125	◇
6.2.4 High-tech manufacturing, %	n/a	n/a	
6.3 Knowledge diffusion	**19.8**	**76**	
6.3.1 Intellectual property receipts, % total trade	0.1	59 ●	
6.3.2 Production and export complexity	45.4	81	
6.3.3 High-tech exports, % total trade	1.6	67	
6.3.4 ICT services exports, % total trade	3.1	40 ●	
6.3.5 ISO 9001 quality/bn PPP$ GDP	1.3	100	
Creative outputs	**6.3**	**119**	
7.1 Intangible assets	**5.3**	**119**	
7.1.1 Intangible asset intensity, top 15, %	n/a	n/a	
7.1.2 Trademarks by origin/bn PPP$ GDP	n/a	n/a	
7.1.3 Global brand value, top 5,000	n/a	n/a	
7.1.4 Industrial designs by origin/bn PPP$ GDP	0.2	105	
7.2 Creative goods and services	**2.5**	**100**	
7.2.1 Cultural and creative services exports, % total trade	0.1	89	
7.2.2 National feature films/mn pop. 15-69	n/a	n/a	
7.2.3 Entertainment and media market/th pop. 15-69	n/a	n/a	
7.2.4 Creative goods exports, % total trade	0.3	70	
7.3 Online creativity	**12.2**	**108**	◇
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	4.4	58 ●	
7.3.2 Country-code TLDs/th pop. 15-69	0.6	98	
7.3.3 GitHub commits/mn pop. 15-69	2.0	99	
7.3.4 Mobile app creation/bn PPP$ GDP	41.8	111	◇

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.

Global Innovation Index 2023



→ 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.

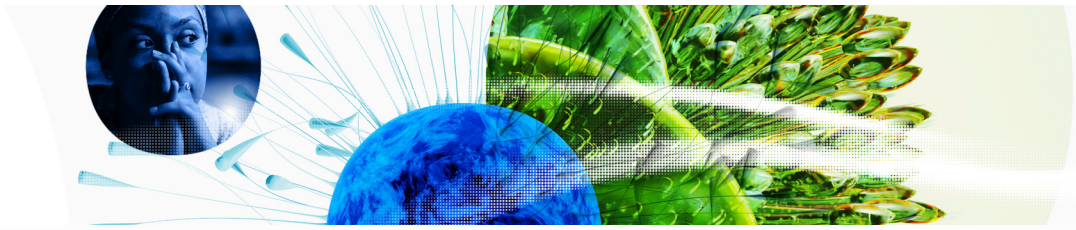
> Missing data for Guatemala

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

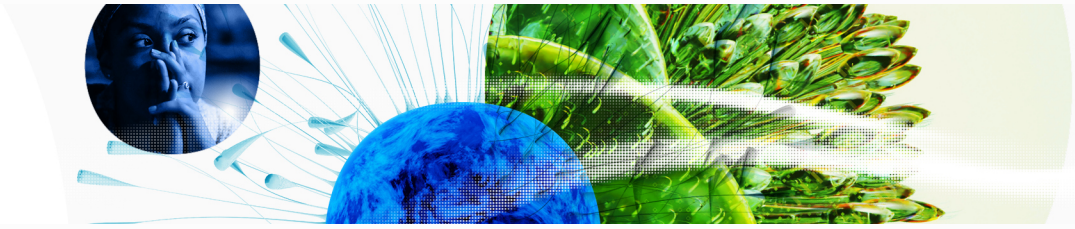
Code	Indicator name	Economy Year	Model Year	Source
2.1.3	School life expectancy, years	2019	2020	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2019	2020	UNESCO Institute for Statistics

Global Innovation Index 2023



Code	Indicator name	Economy Year	Model Year	Source
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

Global Innovation Index 2023



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.

Source: Global Innovation Index Database, WIPO, 2023.

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.