

Global Innovation Index 2023

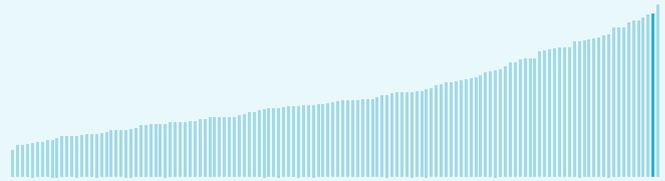


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

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

Sweden ranking in the Global Innovation Index 2023

> Sweden ranks **2nd** among the 132 economies featured in the GII 2023.



> Sweden ranks **2nd** among the 50 high-income group economies.



> Sweden ranks **2nd** among the 39 economies in Europe.



> Sweden GII Ranking (2020-2023)

The table shows the rankings of Sweden 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 Sweden in the GII 2023 is between ranks 2 and 3.

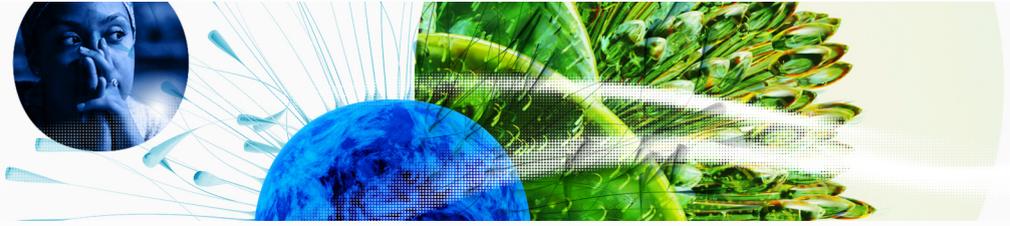
	GII Position	Innovation Inputs	Innovation Outputs
2020	2nd	3rd	2nd
2021	2nd	2nd	2nd
2022	3rd	4th	2nd
2023	2nd	4th	3rd

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

This year Sweden ranks **4th** in innovation inputs. This position is the same as last year.

Sweden ranks **3rd** in innovation outputs. This position is lower than last year.

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→ Expected vs. observed innovation performance

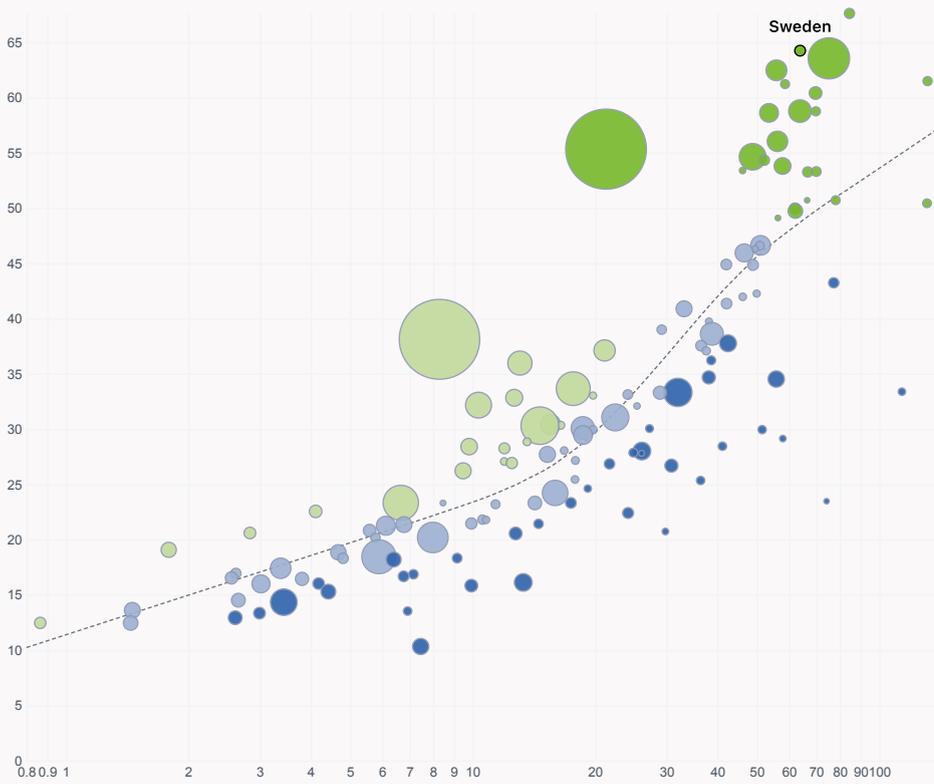
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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



> Sweden is an innovation leader, ranking in the top 25 of the GII.

> Innovation overperformers relative to their economic development

↑ GII Score



- Innovation leader
- Performing above expectations for level of development
- Performing at expectations for level of development
- Performing below expectations for level of development

Size legend (Population)



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

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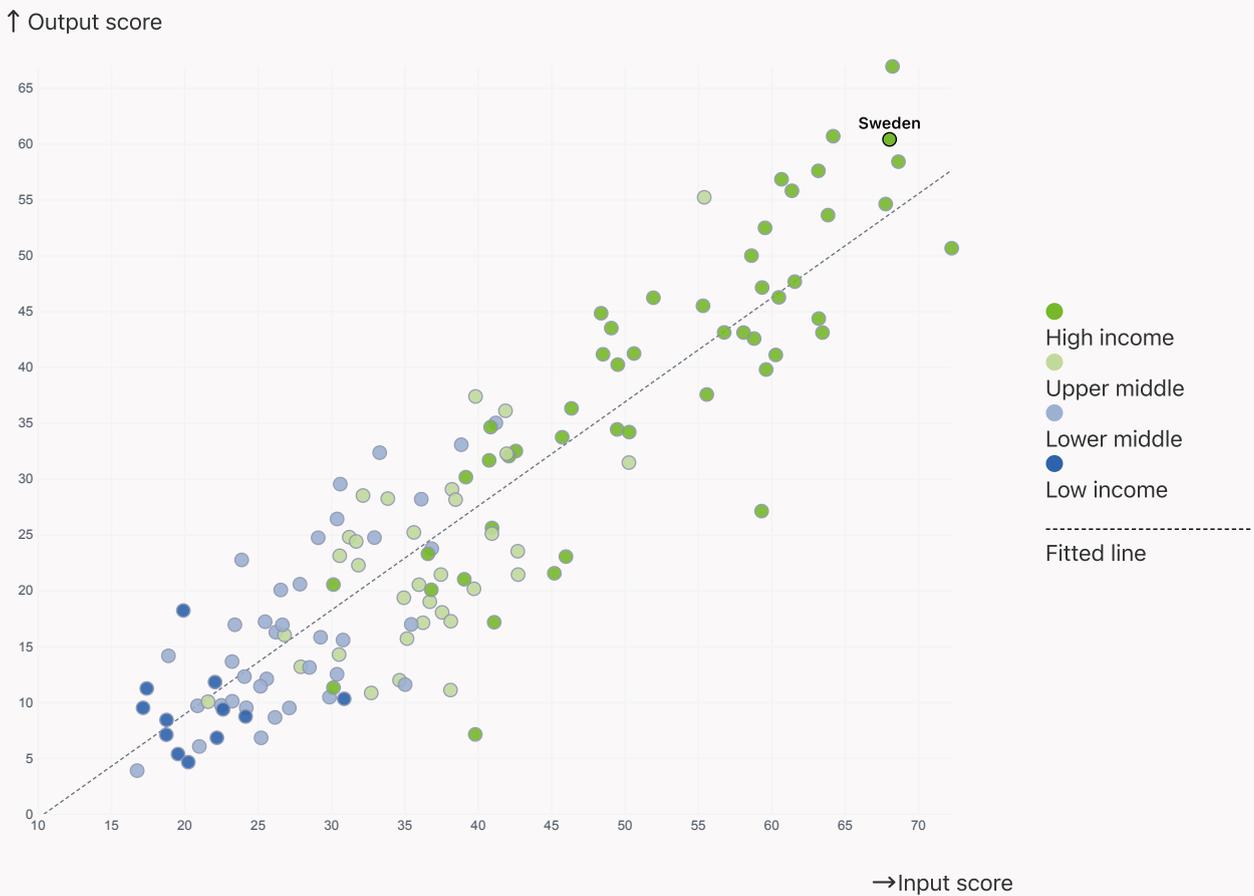
→ Effectively translating innovation investments into innovation outputs

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.



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

> Relationship between innovation inputs and outputs



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→ Overview of Sweden'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 Sweden are those that rank above the GII (shown in blue) and the weakest are those that rank below.



* Infrastructure

** Human capital and research, Knowledge and technology outputs

> Highest rankings



Sweden ranks highest in Business sophistication (1st) and Infrastructure (2nd).

> Lowest rankings



Sweden ranks lowest in Institutions (18th), Market sophistication (10th) and Creative outputs (8th).



The full WIPO Intellectual Property Statistics profile for Sweden can be found on [this link](#).

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

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

> High-Income economies

Sweden performs above the high-income group average in all the pillars.

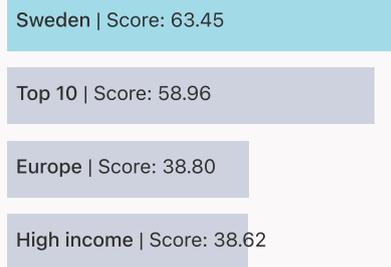


> Europe

Sweden performs above the regional average in all the pillars.



Knowledge and technology outputs



Creative outputs



Business sophistication



Market sophistication



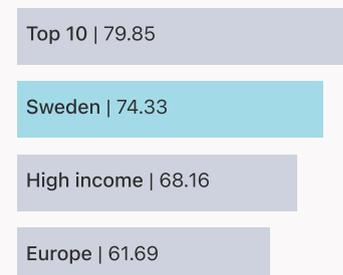
Human capital and research



Infrastructure



Institutions





→ Innovation strengths and weaknesses in Sweden

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



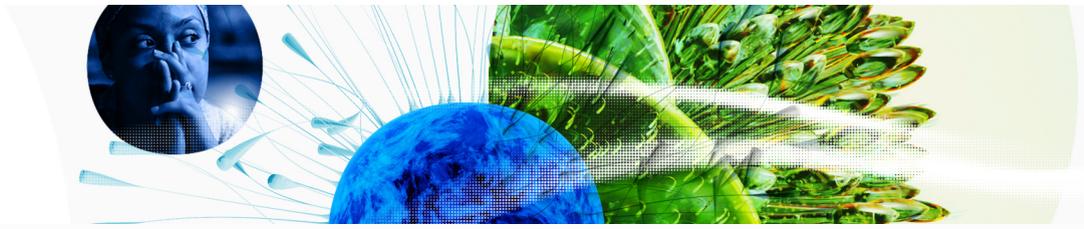
> Sweden's main innovation strengths are **Patent families/bn PPP\$ GDP (rank 1)**, **PCT patents by origin/bn PPP\$ GDP (rank 1)** and **Researchers, FTE/mn pop. (rank 1)**.

Strengths

Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
1	5.2.5	Patent families/bn PPP\$ GDP	63	6.2.1	Labor productivity growth, %
1	6.1.2	PCT patents by origin/bn PPP\$ GDP	56	1.2.3	Cost of redundancy dismissal
1	2.3.1	Researchers, FTE/mn pop.	56	2.1.5	Pupil-teacher ratio, secondary
3	5.1.1	Knowledge-intensive employment, %	54	3.3.1	GDP/unit of energy use
4	7.2.1	Cultural and creative services exports, % total trade	54	5.3.2	High-tech imports, % total trade
4	5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	53	6.3.5	ISO 9001 quality/bn PPP\$ GDP
4	2.3.2	Gross expenditure on R&D, % GDP	52	7.1.2	Trademarks by origin/bn PPP\$ GDP
4	2.1.3	School life expectancy, years	43	1.3.2	Entrepreneurship policies and culture
5	7.1.3	Global brand value, top 5,000	35	2.2.3	Tertiary inbound mobility, %
5	3.3.2	Environmental performance	20	4.3.1	Applied tariff rate, weighted avg., %
5	2.1.1	Expenditure on education, % GDP			
5	5.1.5	Females employed w/advanced degrees, %			

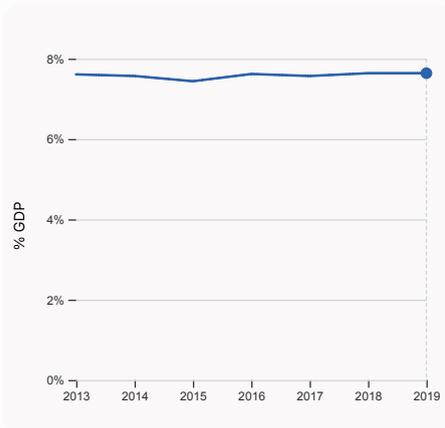
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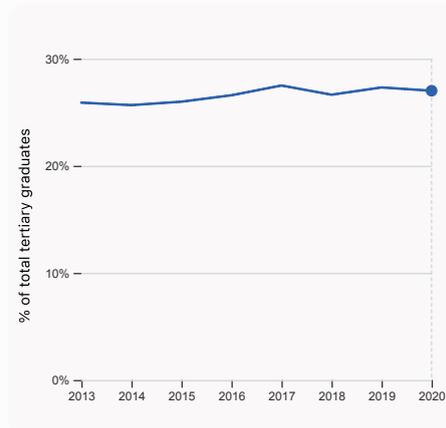
→ Sweden's innovation system

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

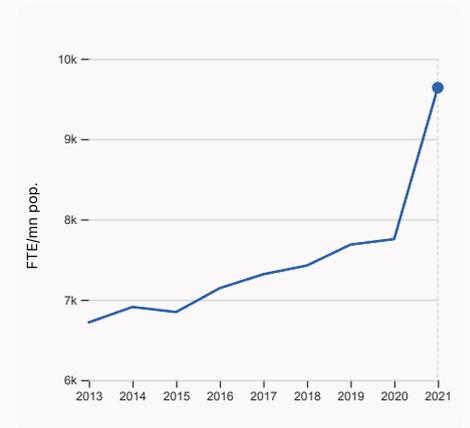
> Innovation inputs in Sweden



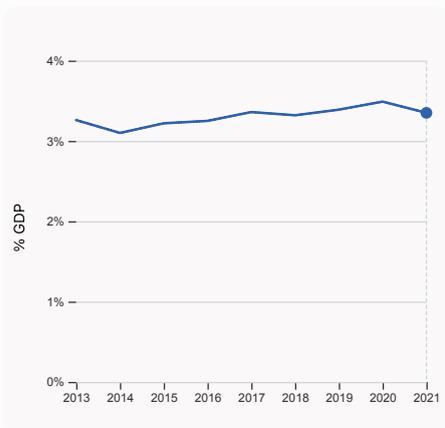
2.1.1 Expenditure on education, % GDP was equal to 7.64% GDP in 2019, with no change from the year prior – and equivalent to an indicator rank of 5.



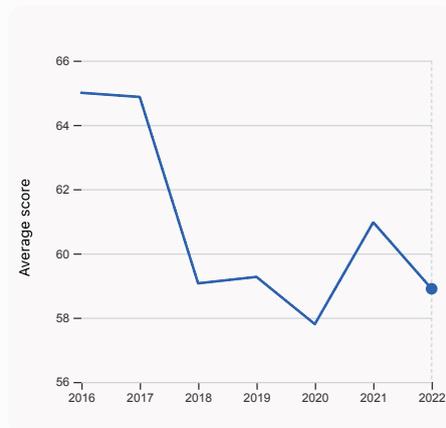
2.2.2 Graduates in science and engineering, % was equal to 27.01% of total tertiary graduates in 2020, down by 0.31 percentage points from the year prior – and equivalent to an indicator rank of 33.



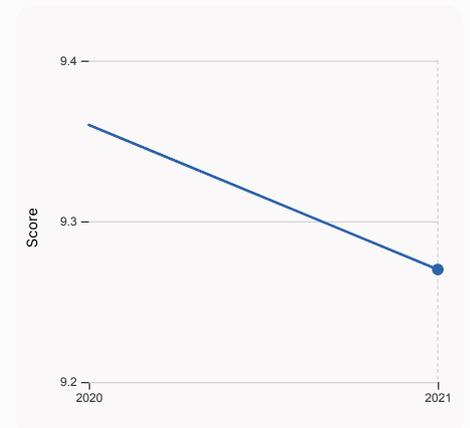
2.3.1 Researchers, FTE/mn pop. was equal to 9,640.25 FTE/mn pop. in 2021, up by 24.31% from the year prior – and equivalent to an indicator rank of 1.



2.3.2 Gross expenditure on R&D, % GDP was equal to 3.35% GDP in 2021, down by 0.14 percentage points from the year prior – and equivalent to an indicator rank of 4.

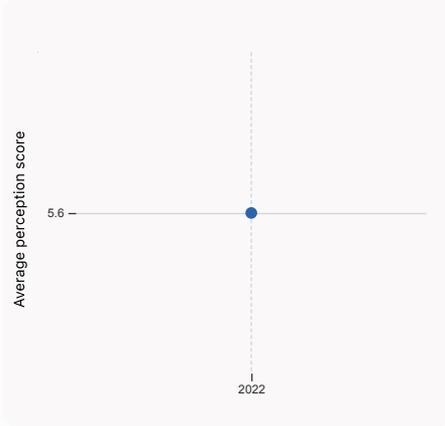


2.3.4 QS university ranking, top 3 was equal to an average score of 58.9 for the top 3 universities in 2022, down by 3.4% from the year prior – and equivalent to an indicator rank of 15.

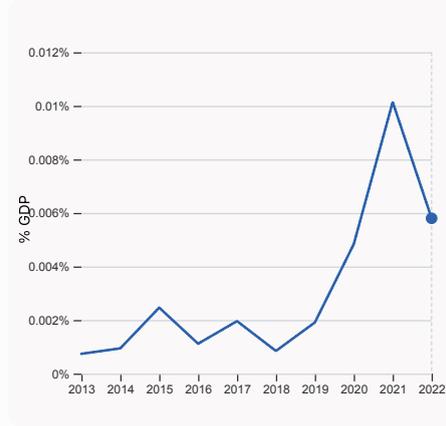


3.1.1 ICT access was equal to a score of 9.27 in 2021, down by 0.96% from the year prior – and equivalent to an indicator rank of 27.

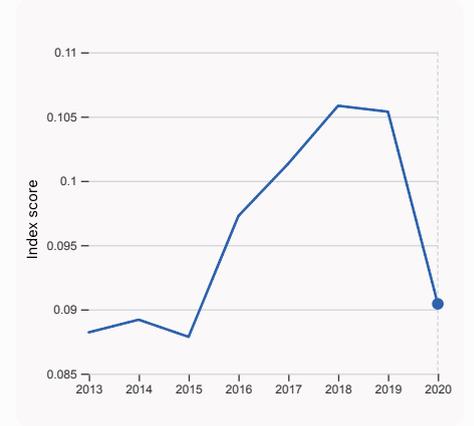
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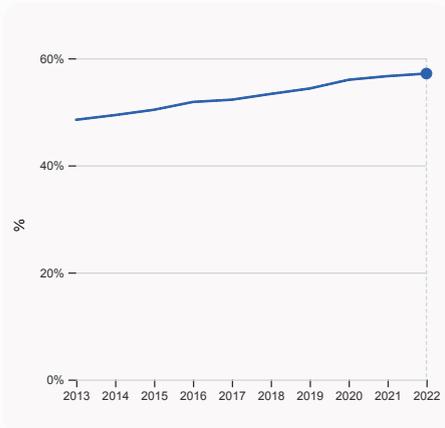
4.1.1 Finance for startups and scaleups was equal to an average perception score of 5.6 in 2022, equivalent to an indicator rank of 15.



4.2.4 VC received, value, % GDP was equal to 0.0058% GDP in 2022, down by 0.0043 percentage points from the year prior – and equivalent to an indicator rank of 7.



4.3.2 Domestic industry diversification was equal to an index score of 0.09 in 2020, down by 14.19% from the year prior – and equivalent to an indicator rank of 8.

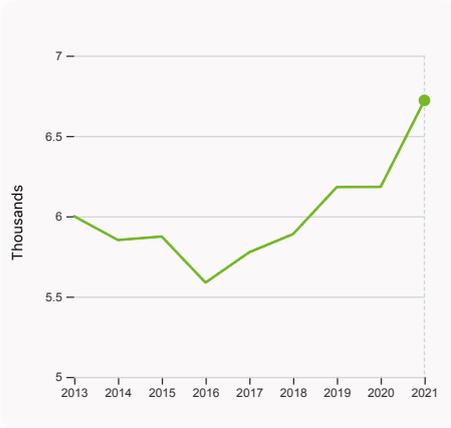


5.1.1 Knowledge-intensive employment, % was equal to 57.14% in 2022, up by 0.48 percentage points from the year prior – and equivalent to an indicator rank of 3.

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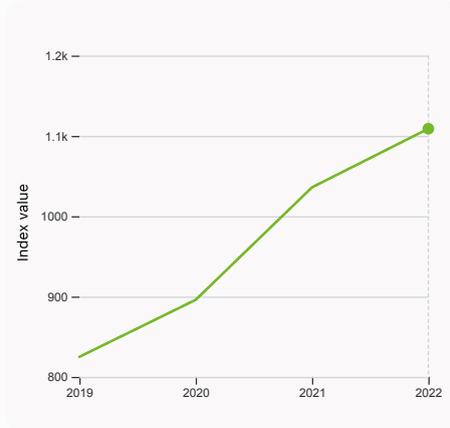


> Innovation outputs in Sweden



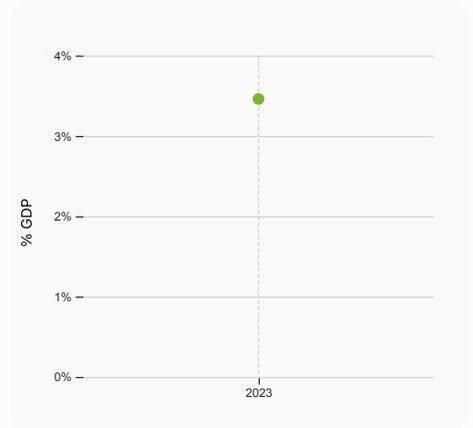
6.1.1 Patents by origin

was equal to 6.72 Thousands in 2021, up by 8.7% from the year prior – and equivalent to an indicator rank of 8.



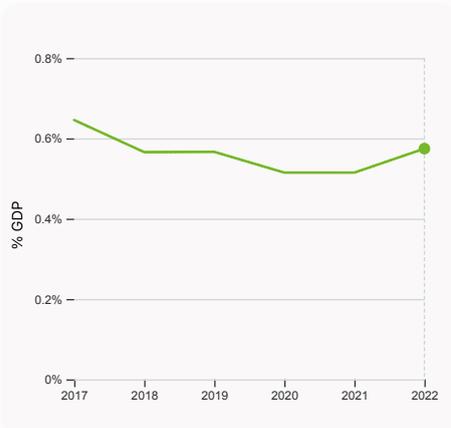
6.1.5 Citable documents H-index

was equal to an index value of 1,109 in 2022, up by 7.046% from the year prior – and equivalent to an indicator rank of 13.



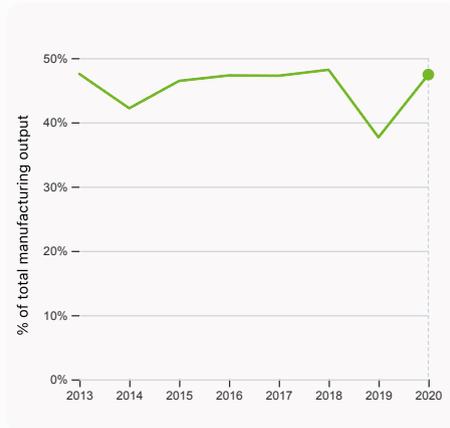
6.2.2 Unicorn valuation, % GDP

was equal to 3.46 % GDP in 2023 – and equivalent to an indicator rank of 13.



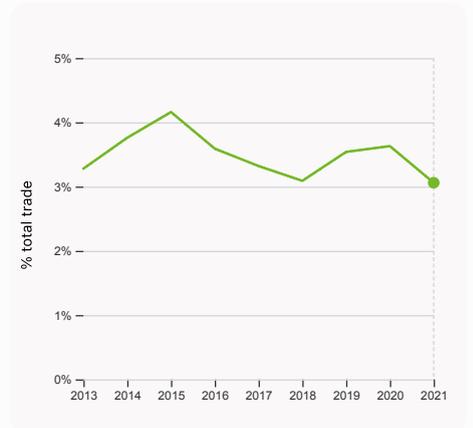
6.2.3 Software spending, % GDP

was equal to 0.575% GDP in 2022, up by 0.06 percentage points from the year prior – and equivalent to an indicator rank of 19.



6.2.4 High-tech manufacturing, %

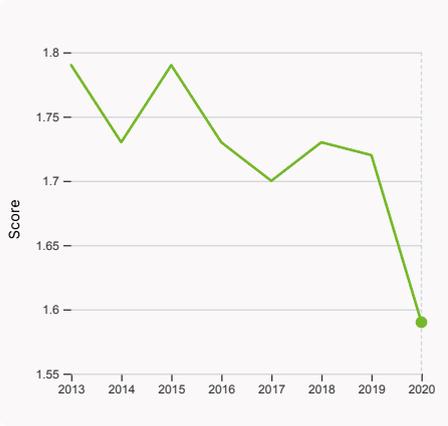
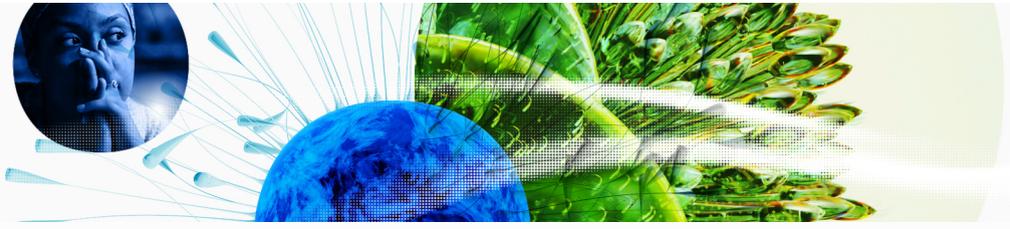
was equal to 47.43% of total manufacturing output in 2020, up by 9.76 percentage points from the year prior – and equivalent to an indicator rank of 14.



6.3.1 Intellectual property receipts, % total trade

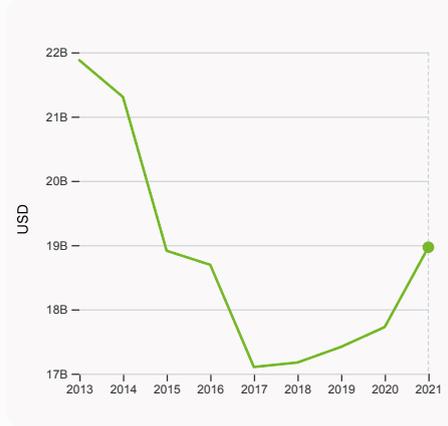
was equal to 3.06% total trade in 2021, down by 0.57 percentage points from the year prior – and equivalent to an indicator rank of 7.

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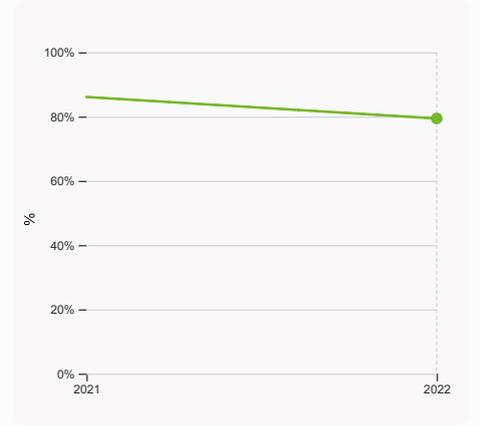
6.3.2 Production and export complexity

was equal to a score of 1.59 in 2020, down by 7.56% from the year prior – and equivalent to an indicator rank of 8.



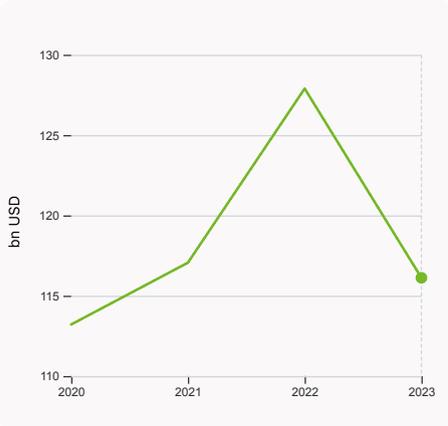
6.3.3 High-tech exports

was equal to 18,966,628,284 USD in 2021, up by 7.0052% from the year prior – and equivalent to an indicator rank of 27.



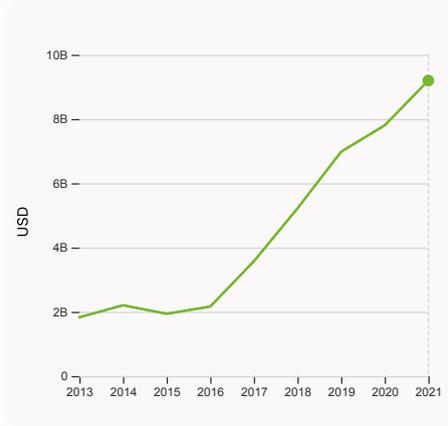
7.1.1 Intangible asset intensity, top 15, %

was equal to 79.41% in 2022, down by 6.69 percentage points from the year prior – and equivalent to an indicator rank of 7.



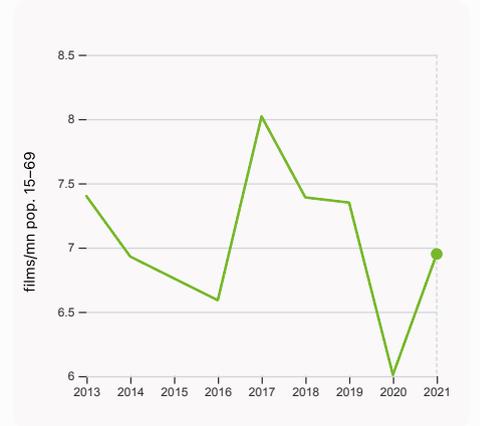
7.1.3 Global brand value, top 5,000

was equal to 116.119 bn USD in 2023, down by 9.21% from the year prior – and equivalent to an indicator rank of 5.



7.2.1 Cultural and creative services exports

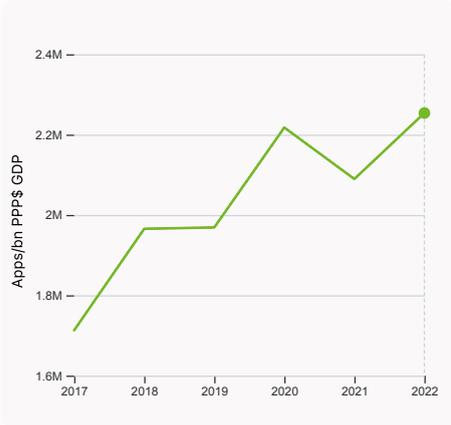
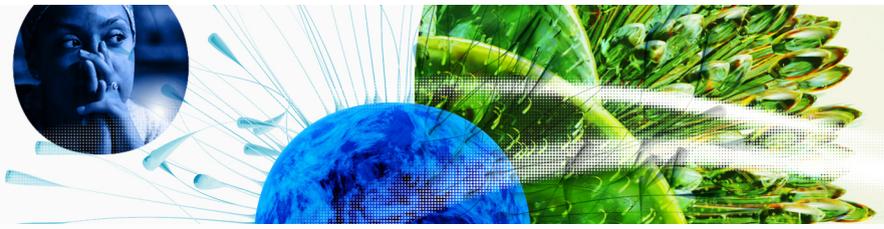
was equal to 9,198,252,000 USD in 2021, up by 17.85% from the year prior – and equivalent to an indicator rank of 4.



7.2.2 National feature films/mn pop. 15-69

was equal to 6.95 films/mn pop. 15-69 in 2021, up by 15.64% from the year prior – and equivalent to an indicator rank of 12.

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7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 2,253,905.44 Apps/bn PPP\$ GDP in 2022, up by 7.86% from the year prior – and equivalent to an indicator rank of 10.

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→ Sweden's innovation top performers

> 2.3.3 Global corporate R&D investors from Sweden

Rank	Firm	Industry	R&D	R&D Growth	R&D Intensity
			[mn EUR]	[%]	[%]
47	ERICSSON	Technology Hardware & Equipment	4,046	6	18
104	VOLVO	Industrial Engineering	1,802	14	5
135	GEELY SWEDEN HOLDINGS	Construction & Materials	1,390	-3	n/a
325	HEXAGON	Industrial Engineering	566	10	13

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2022-eu-industrial-rd-investment-scoreboard>).

Note: European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually.

> 2.3.4 QS university ranking of Sweden's top universities

Rank	University	Score
89	KTH, ROYAL INSTITUTE OF TECHNOLOGY	62.10
95	LUND UNIVERSITY	60.10
125	CHALMERS UNIVERSITY OF TECHNOLOGY	54.50

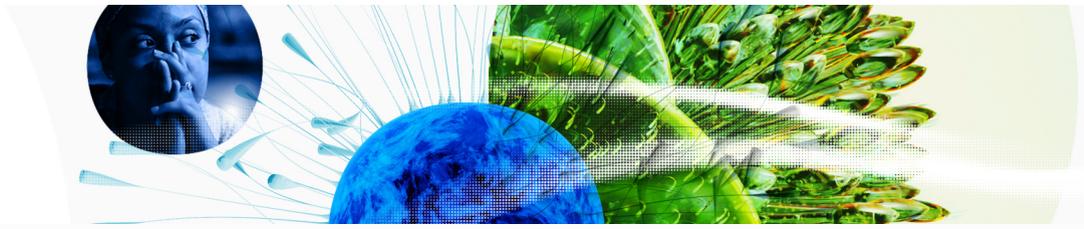
Source: QS Quacquarelli Symonds Ltd (<https://www.topuniversities.com/university-rankings/world-university-rankings/2023>).

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=" or a range "x-y".

> 6.2.2 Top Unicorn Companies in Sweden

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	NORTHVOLT	Other	Stockholm	9
2	KLARNA	Fintech	Stockholm	7
3	KRY	Health	Stockholm	2

Source: CBInsights, Tracker – The Complete List of Unicorn Companies: <https://www.cbinsights.com/research-unicorn-companies>



> 7.1.1 Top 15 intangible-asset intensive companies in Sweden

Rank	Firm	Intensity, %
1	ATLAS COPCO AB	92.52
2	HEXAGON AB	96.76
3	ASSA ABLOY AB	92.76

Source: Brand Finance (<https://brandirectory.com/reports/gifit-2022>).
Note: Brand Finance only provides within economy ranks.

> 7.1.3 Top 5,000 companies in Sweden with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	IKEA	Retail	15,928.8
2	H&M	Apparel	9,430.0
3	VOLVO	Automobiles	8,783.9

Source: Brand Finance (<https://brandirectory.com>).
Note: Rank corresponds to within economy ranks.

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GII 2023 rank

2

Sweden

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
3	4	High	EUR	10.5	684.5	63,877.4
Score / Value Rank				Score / Value Rank		
Institutions 74.3 18				Business sophistication 75.8 1 ●◆		
1.1 Institutional environment 80.1 10				5.1 Knowledge workers 77.7 1 ●◆		
1.1.1 Operational stability for businesses* 77.8 10				5.1.1 Knowledge-intensive employment, % 57.1 3 ●◆		
1.1.2 Government effectiveness* 82.4 8				5.1.2 Firms offering formal training, % 61.9 7		
1.2 Regulatory environment 88.1 14				5.1.3 GERD performed by business, % GDP 2.4 6		
1.2.1 Regulatory quality* 87.6 8				5.1.4 GERD financed by business, % ● 62.4 13		
1.2.2 Rule of law* 90.5 11				5.1.5 Females employed w/advanced degrees, % 28.7 5 ●◆		
1.2.3 Cost of redundancy dismissal 14.4 56 ○				5.2 Innovation linkages 77.0 2 ●◆		
1.3 Business environment 54.8 48 ○◇				5.2.1 University-industry R&D collaboration+ 82.1 11		
1.3.1 Policies for doing business+ 66.5 29				5.2.2 State of cluster development+ 78.5 13		
1.3.2 Entrepreneurship policies and culture+ 43.1 43 ○◇				5.2.3 GERD financed by abroad, % GDP ● 0.3 11		
Human capital and research 62.7 3 ●◆				5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP 0.2 4 ●◆		
2.1 Education 71.8 4 ●◆				5.2.5 Patent families/bn PPP\$ GDP 7.0 1 ●◆		
2.1.1 Expenditure on education, % GDP ● 7.6 5 ●◆				5.3 Knowledge absorption 72.7 2 ●◆		
2.1.2 Government funding/pupil, secondary, % GDP/cap 23.8 27				5.3.1 Intellectual property payments, % total trade 3.5 6 ◆		
2.1.3 School life expectancy, years 19.7 4 ●◆				5.3.2 High-tech imports, % total trade 8.8 54 ○		
2.1.4 PISA scales in reading, maths and science 502.5 14				5.3.3 ICT services imports, % total trade 4.5 6 ◆		
2.1.5 Pupil-teacher ratio, secondary 12.5 56 ○				5.3.4 FDI net inflows, % GDP 4.9 21		
2.2 Tertiary education 41.8 28				5.3.5 Research talent, % in businesses 77.6 4 ◆		
2.2.1 Tertiary enrolment, % gross 84.5 17				Knowledge and technology outputs 63.4 3 ●◆		
2.2.2 Graduates in science and engineering, % 27.0 33				6.1 Knowledge creation 74.3 2 ●◆		
2.2.3 Tertiary inbound mobility, % 7.0 35 ○				6.1.1 Patents by origin/bn PPP\$ GDP 10.8 8		
2.3 Research and development (R&D) 74.4 3 ●◆				6.1.2 PCT patents by origin/bn PPP\$ GDP 6.5 1 ●◆		
2.3.1 Researchers, FTE/mn pop. 9,640.3 1 ●◆				6.1.3 Utility models by origin/bn PPP\$ GDP n/a n/a		
2.3.2 Gross expenditure on R&D, % GDP 3.3 4 ●◆				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\$ 77.7 10				6.1.5 Citable documents H-index 59.3 13		
2.3.4 QS university ranking, top 3* 59.7 15				6.2 Knowledge impact 57.1 6		
Infrastructure 67.6 2 ●◆				6.2.1 Labor productivity growth, % 1.0 63 ○		
3.1 Information and communication technologies (ICTs) 86.7 16				6.2.2 Unicorn valuation, % GDP 3.5 13		
3.1.1 ICT access* 89.2 27				6.2.3 Software spending, % GDP 0.6 19		
3.1.2 ICT use* 96.5 6				6.2.4 High-tech manufacturing, % 47.4 14		
3.1.3 Government's online service* 89.0 13				6.3 Knowledge diffusion 58.9 8		
3.1.4 E-participation* 72.1 32				6.3.1 Intellectual property receipts, % total trade 3.4 7 ◆		
3.2 General infrastructure 64.8 3 ●◆				6.3.2 Production and export complexity 85.9 8		
3.2.1 Electricity output, GWh/mn pop. 16,179.7 7 ◆				6.3.3 High-tech exports, % total trade 6.8 27		
3.2.2 Logistics performance* 86.4 7				6.3.4 ICT services exports, % total trade 6.2 16		
3.2.3 Gross capital formation, % GDP 27.5 34				6.3.5 ISO 9001 quality/bn PPP\$ GDP 5.1 53 ○		
3.3 Ecological sustainability 51.4 21				Creative outputs 57.3 8		
3.3.1 GDP/unit of energy use 11.4 54 ○				7.1 Intangible assets 56.9 12		
3.3.2 Environmental performance* 91.2 5 ●◆				7.1.1 Intangible asset intensity, top 15, % 79.4 7		
3.3.3 ISO 14001 environment/bn PPP\$ GDP 4.6 22				7.1.2 Trademarks by origin/bn PPP\$ GDP 44.7 52 ○		
Market sophistication 59.9 10				7.1.3 Global brand value, top 5,000 17.8 5 ●◆		
4.1 Credit 62.2 16				7.1.4 Industrial designs by origin/bn PPP\$ GDP 3.3 30		
4.1.1 Finance for startups and scaleups+ 72.1 15				7.2 Creative goods and services 48.6 4 ●◆		
4.1.2 Domestic credit to private sector, % GDP 137.8 15				7.2.1 Cultural and creative services exports, % total trade 3.3 4 ●◆		
4.1.3 Loans from microfinance institutions, % GDP n/a n/a				7.2.2 National feature films/mn pop. 15-69 7.0 12		
4.2 Investment 49.6 12				7.2.3 Entertainment and media market/th pop. 15-69 61.5 10		
4.2.1 Market capitalization, % GDP n/a n/a				7.2.4 Creative goods exports, % total trade 1.8 29		
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP 0.4 15				7.3 Online creativity 66.7 11		
4.2.3 VC recipients, deals/bn PPP\$ GDP 0.2 11				7.3.1 Generic top-level domains (TLDs)/th pop. 15-69 47.6 17		
4.2.4 VC received, value, % GDP 0.0 7				7.3.2 Country-code TLDs/th pop. 15-69 61.8 14		
4.3 Trade, diversification, and market scale 67.9 22				7.3.3 GitHub commits/mn pop. 15-69 77.2 8		
4.3.1 Applied tariff rate, weighted avg., % 1.5 20 ○				7.3.4 Mobile app creation/bn PPP\$ GDP 80.3 10		
4.3.2 Domestic industry diversification 98.5 8						
4.3.3 Domestic market scale, bn PPP\$ 684.5 38						

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 Sweden.



> Sweden has missing data for three indicators and outdated data for three indicators.

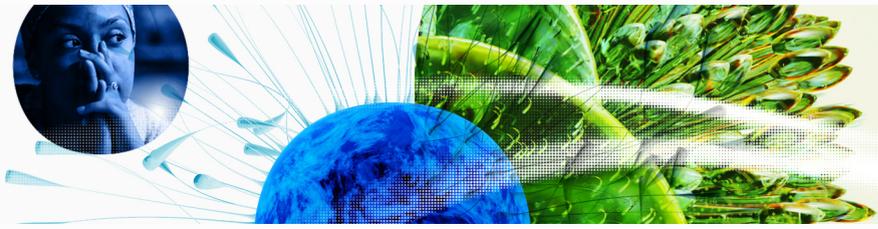
> Missing data for Sweden

Code	Indicator name	Economy Year	Model Year	Source
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
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund

> Outdated data for Sweden

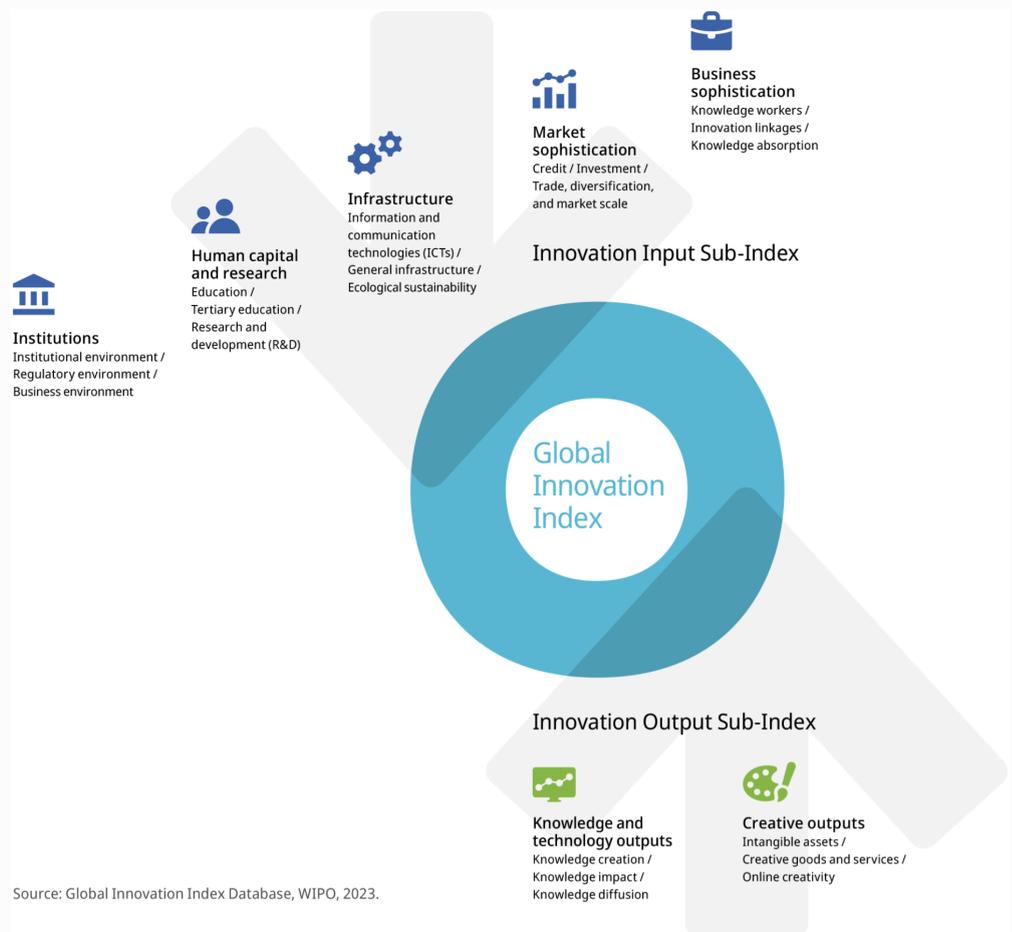
Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2019	2021	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.3	GERD financed by abroad, % GDP	2019	2020	UNESCO Institute for Statistics; 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.



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.