

# Global Innovation Index 2023

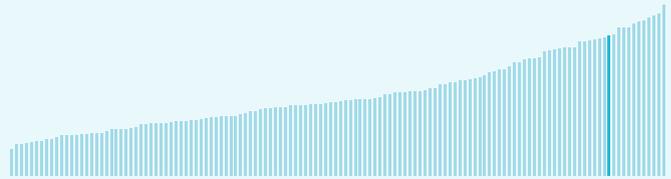


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

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

## China ranking in the Global Innovation Index 2023

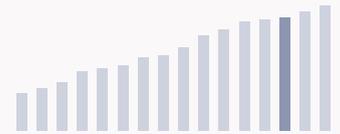
> China ranks **12th** among the 132 economies featured in the GII 2023.



> China ranks **1st** among the 33 upper-middle-income group economies.



> China ranks **3rd** among the 16 economies in South East Asia, East Asia, and Oceania.



### > China GII Ranking (2020-2023)

The table shows the rankings of China 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 China in the GII 2023 is between ranks 11 and 14.

	GII Position	Innovation Inputs	Innovation Outputs
2020	14th	26th	6th
2021	12th	25th	7th
2022	11th	21st	8th
2023	12th	25th	8th

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

This year China ranks 25th in innovation inputs. This position is lower than last year.

China ranks 8th in innovation outputs. This position is the same as last year.

# Global Innovation Index 2023



## → Expected vs. observed innovation performance

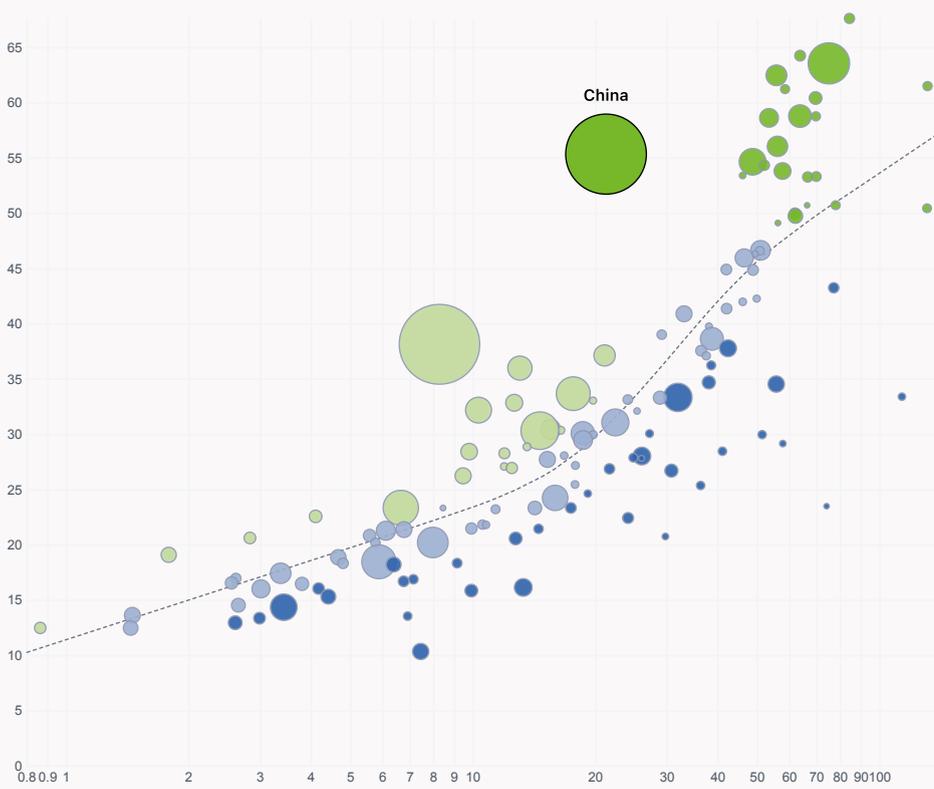
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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



> China 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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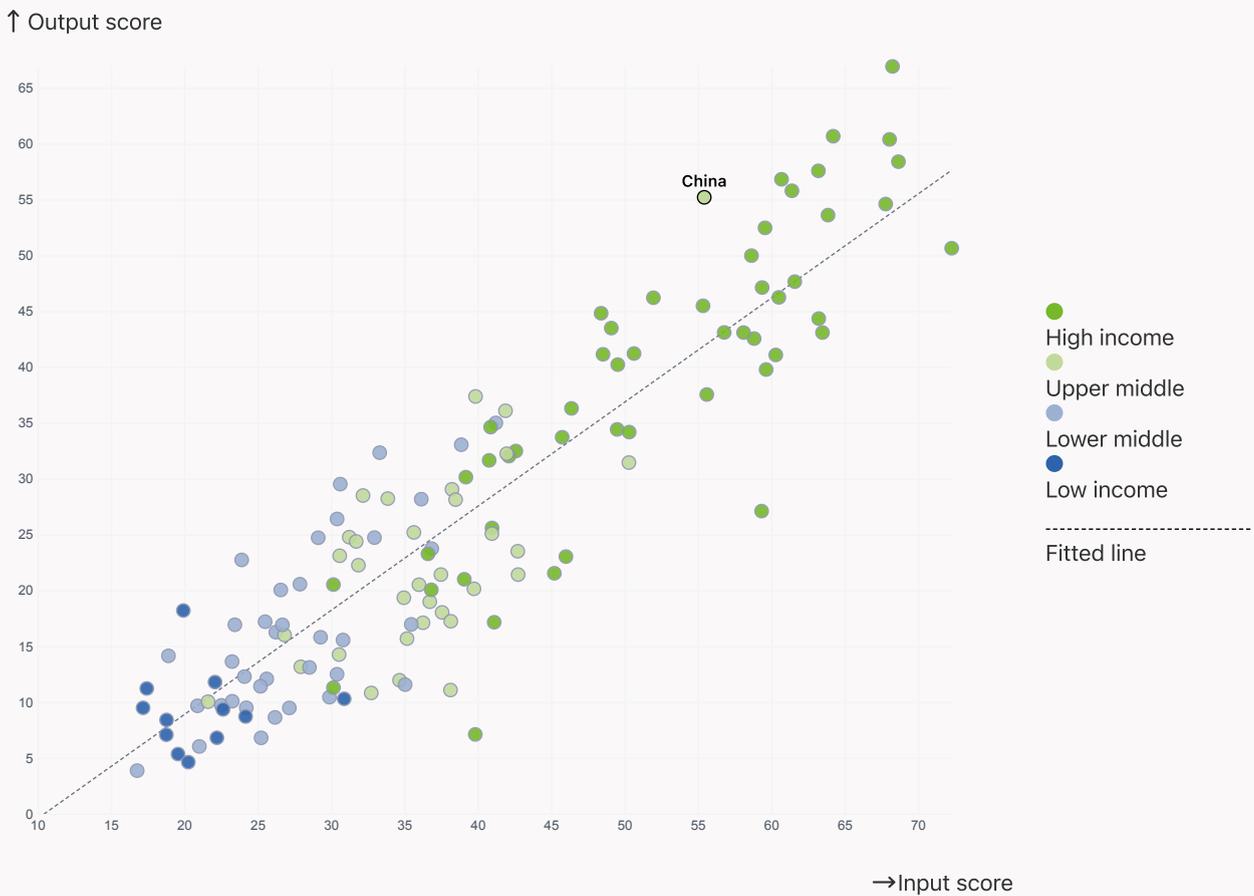
## → Effectively translating innovation investments into innovation outputs

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.



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

### > Relationship between innovation inputs and outputs

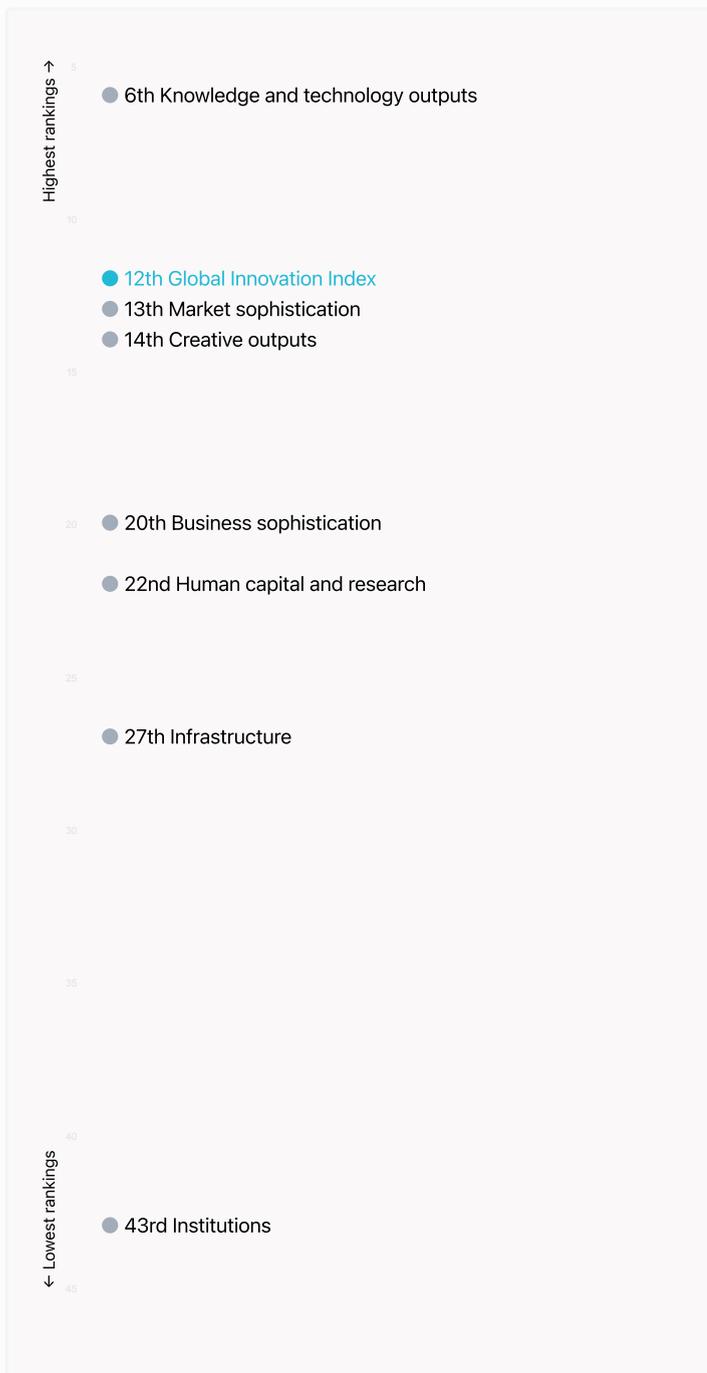


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## → Overview of China's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for China are those that rank above the GII (shown in blue) and the weakest are those that rank below.



### > Highest rankings



China ranks highest in Knowledge and technology outputs (6th).

### > Lowest rankings



China ranks lowest in Institutions (43rd), Infrastructure (27th) and Human capital and research (22nd).

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

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

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

### > Upper-Middle-Income economies

China performs above the upper-middle-income group average in all the pillars.

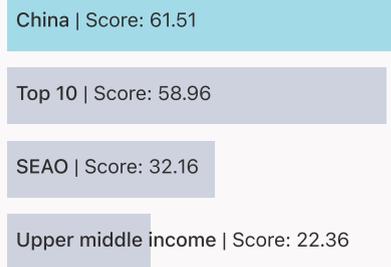


### > South East Asia, East Asia, And Oceania

China performs above the regional average in Knowledge and technology outputs, Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.

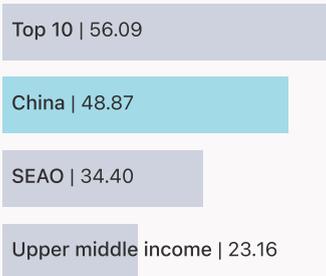


### Knowledge and technology outputs

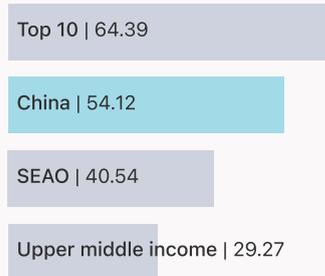


\* South East Asia, East Asia, and Oceania

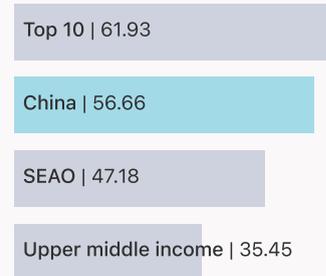
### Creative outputs



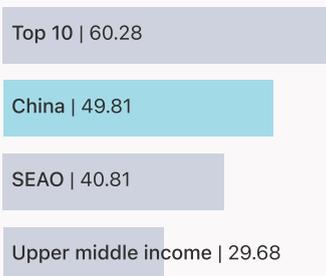
### Business sophistication



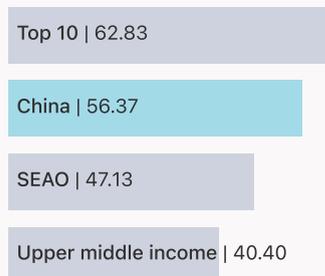
### Market sophistication



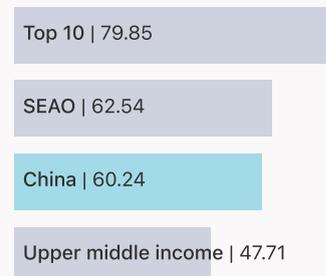
### Human capital and research



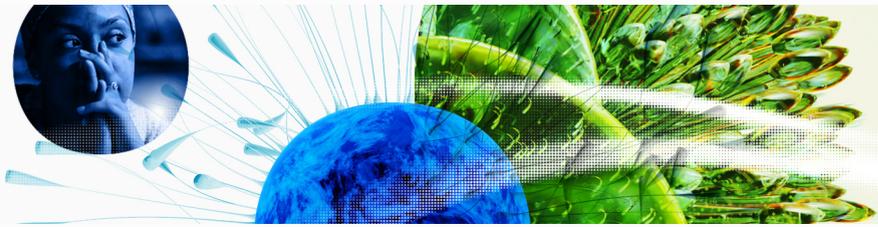
### Infrastructure



### Institutions



# Global Innovation Index 2023



## → Innovation strengths and weaknesses in China

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



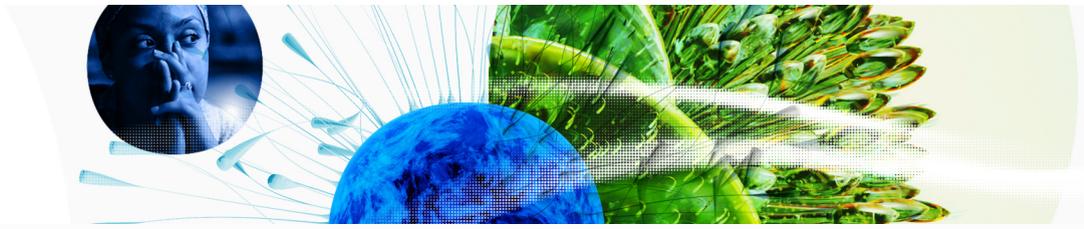
> China's main innovation strengths are **Creative goods exports, % total trade (rank 1)**, **Domestic market scale, bn PPP\$ (rank 1)** and **Labor productivity growth, % (rank 1)**.

### Strengths

### Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
1	7.2.4	Creative goods exports, % total trade	118	3.3.2	Environmental performance
1	4.3.3	Domestic market scale, bn PPP\$	111	1.2.3	Cost of redundancy dismissal
1	6.2.1	Labor productivity growth, %	107	7.3.3	GitHub commits/mn pop. 15-69
1	2.1.4	PISA scales in reading, maths and science	101	2.2.3	Tertiary inbound mobility, %
1	7.1.2	Trademarks by origin/bn PPP\$ GDP	100	3.3.1	GDP/unit of energy use
1	6.1.3	Utility models by origin/bn PPP\$ GDP	89	1.2.1	Regulatory quality
2	3.2.3	Gross capital formation, % GDP	88	2.1.1	Expenditure on education, % GDP
2	4.3.2	Domestic industry diversification	82	5.3.4	FDI net inflows, % GDP
2	7.1.4	Industrial designs by origin/bn PPP\$ GDP	76	5.2.3	GERD financed by abroad, % GDP
2	6.1.1	Patents by origin/bn PPP\$ GDP	69	7.2.2	National feature films/mn pop. 15-69
2	2.3.3	Global corporate R&D investors, top 3, mn US\$			
2	5.2.2	State of cluster development			
3	5.1.4	GERD financed by business, %			
3	2.3.4	QS university ranking, top 3			

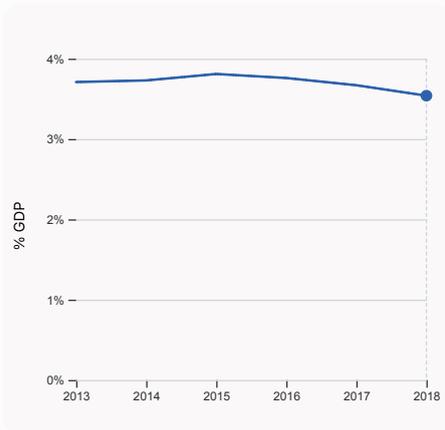
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## → China's innovation system

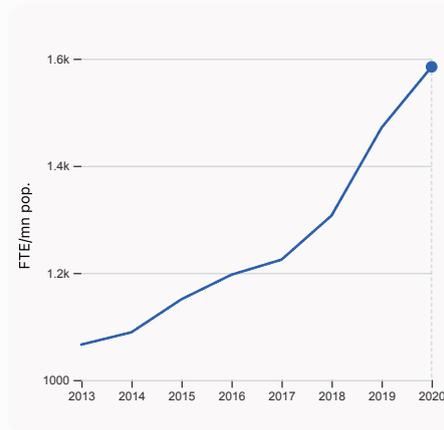
As far as practicable, the plots below present unscaled indicator data.

### > Innovation inputs in China



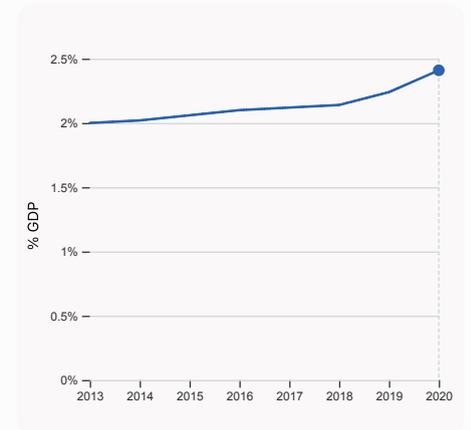
#### 2.1.1 Expenditure on education, % GDP

was equal to 3.54% GDP in 2018, down by 0.13 percentage points from the year prior – and equivalent to an indicator rank of 88.



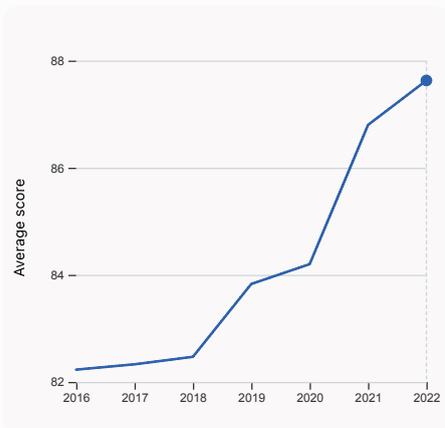
#### 2.3.1 Researchers, FTE/mn pop.

was equal to 1,584.87 FTE/mn pop. in 2020, up by 7.72% from the year prior – and equivalent to an indicator rank of 48.



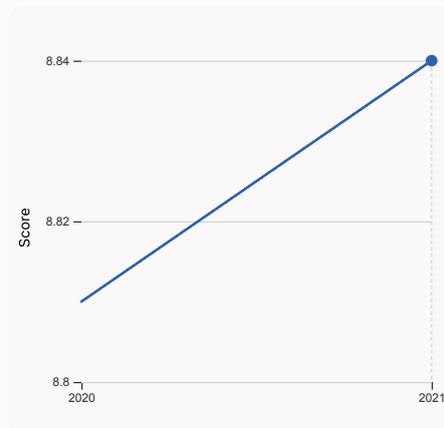
#### 2.3.2 Gross expenditure on R&D, % GDP

was equal to 2.41% GDP in 2020, up by 0.17 percentage points from the year prior – and equivalent to an indicator rank of 14.



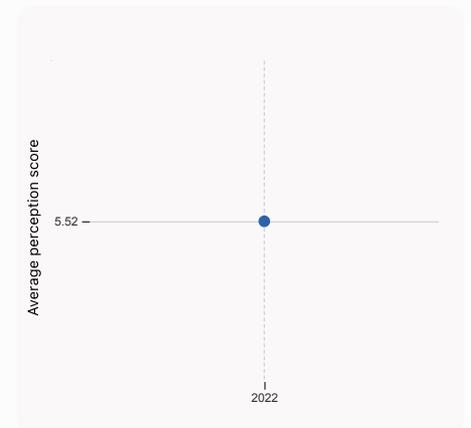
#### 2.3.4 QS university ranking, top 3

was equal to an average score of 87.63 for the top 3 universities in 2022, up by 0.96% from the year prior – and equivalent to an indicator rank of 3.



#### 3.1.1 ICT access

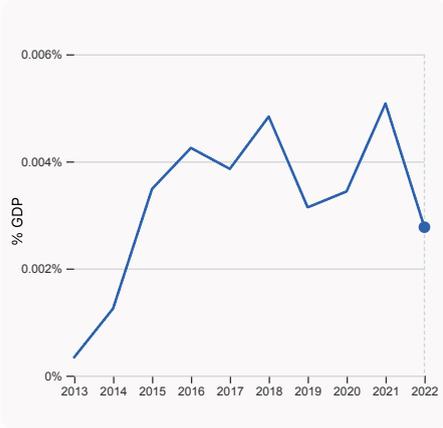
was equal to a score of 8.84 in 2021, up by 0.34% from the year prior – and equivalent to an indicator rank of 64.



#### 4.1.1 Finance for startups and scaleups

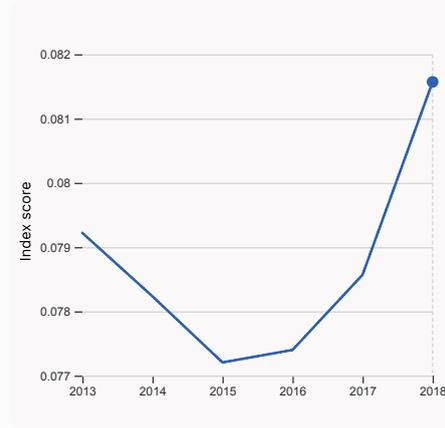
was equal to an average perception score of 5.52 in 2022, equivalent to an indicator rank of 16.

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## 4.2.4 VC received, value, % GDP

was equal to 0.00277% GDP in 2022, down by 0.0023 percentage points from the year prior – and equivalent to an indicator rank of 18.



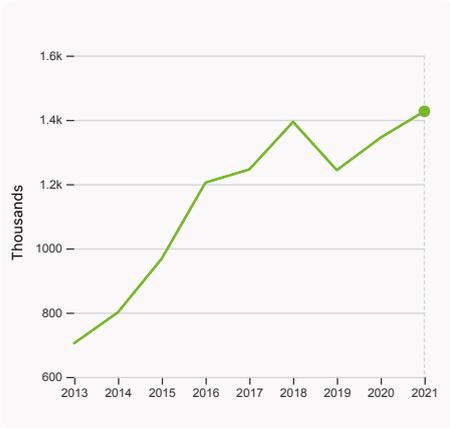
## 4.3.2 Domestic industry diversification

was equal to an index score of 0.082 in 2018, up by 3.82% from the year prior – and equivalent to an indicator rank of 2.

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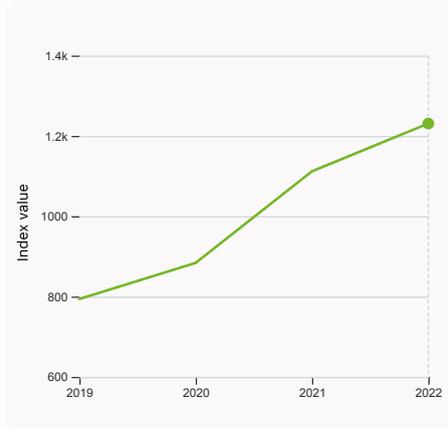


## > Innovation outputs in China



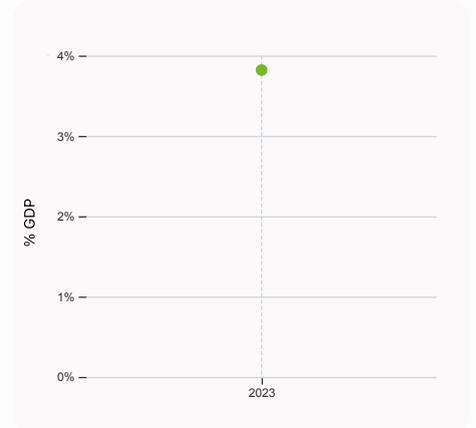
**6.1.1 Patents by origin**

was equal to 1,426.64 Thousands in 2021, up by 6.085% from the year prior – and equivalent to an indicator rank of 2.



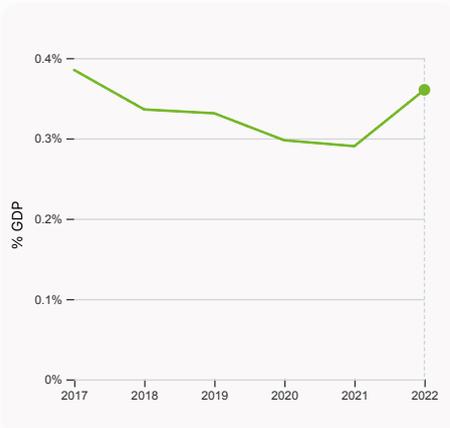
**6.1.5 Citable documents H-index**

was equal to an index value of 1,231 in 2022, up by 10.7% from the year prior – and equivalent to an indicator rank of 11.



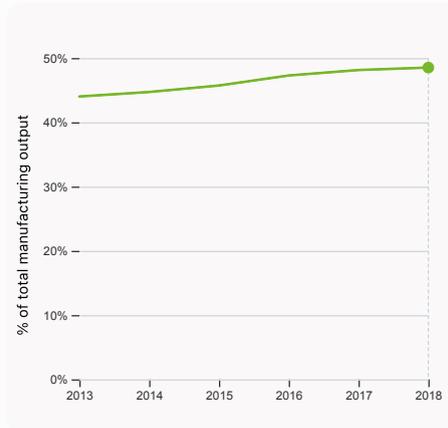
**6.2.2 Unicorn valuation, % GDP**

was equal to 3.82 % GDP in 2023 – and equivalent to an indicator rank of 12.



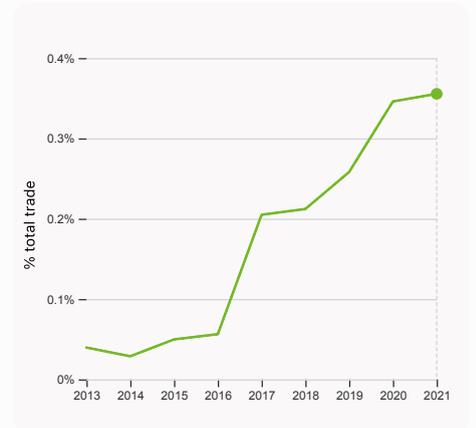
**6.2.3 Software spending, % GDP**

was equal to 0.36% GDP in 2022, up by 0.07 percentage points from the year prior – and equivalent to an indicator rank of 27.



**6.2.4 High-tech manufacturing, %**

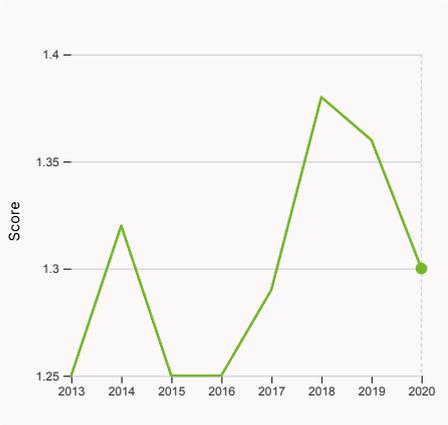
was equal to 48.52% of total manufacturing output in 2018, up by 0.38 percentage points from the year prior – and equivalent to an indicator rank of 13.



**6.3.1 Intellectual property receipts, % total trade**

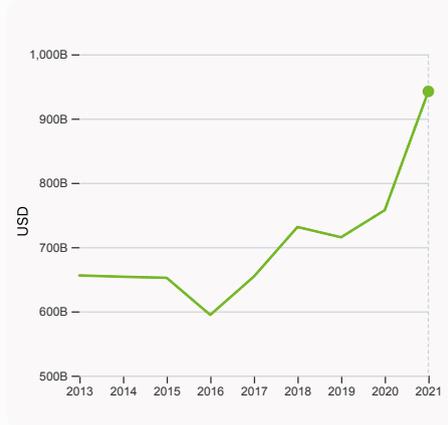
was equal to 0.356% total trade in 2021, up by 0.0095 percentage points from the year prior – and equivalent to an indicator rank of 33.

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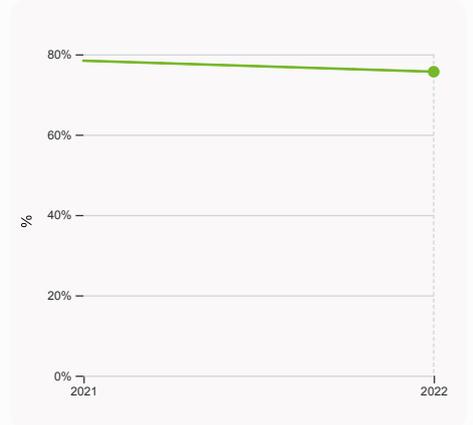
## 6.3.2 Production and export complexity

was equal to a score of 1.3 in 2020, down by 4.41% from the year prior – and equivalent to an indicator rank of 17.



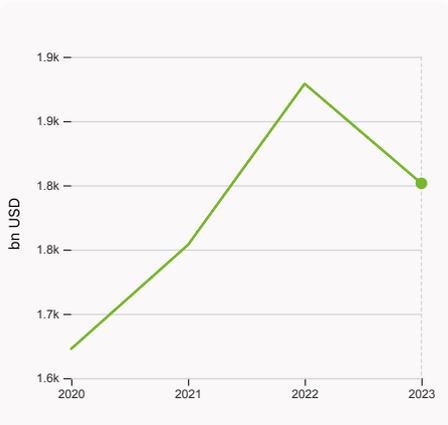
## 6.3.3 High-tech exports

was equal to 942,314,811,992 USD in 2021, up by 24.4% from the year prior – and equivalent to an indicator rank of 5.



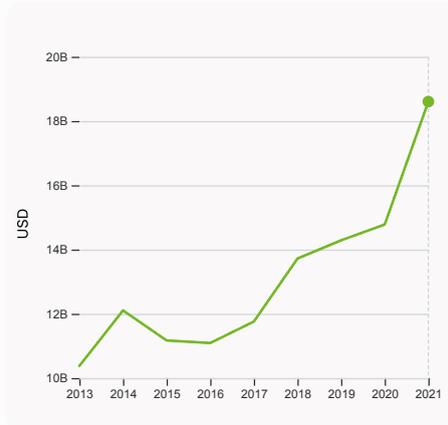
## 7.1.1 Intangible asset intensity, top 15, %

was equal to 75.67% in 2022, down by 2.74 percentage points from the year prior – and equivalent to an indicator rank of 11.



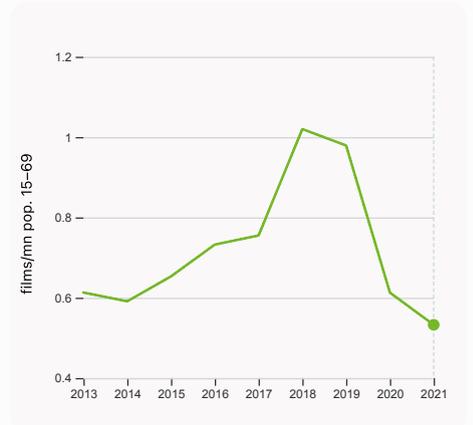
## 7.1.3 Global brand value, top 5,000

was equal to 1,801.504 bn USD in 2023, down by 4.13% from the year prior – and equivalent to an indicator rank of 20.



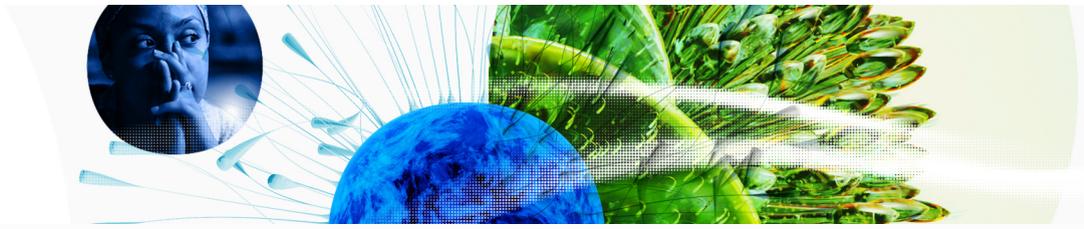
## 7.2.1 Cultural and creative services exports

was equal to 18,604,942,000 USD in 2021, up by 25.87% from the year prior – and equivalent to an indicator rank of 51.



## 7.2.2 National feature films/mn pop. 15-69

was equal to 0.533 films/mn pop. 15-69 in 2021, down by 13.076% from the year prior – and equivalent to an indicator rank of 69.



## → China's innovation top performers

### > 2.3.3 Global corporate R&D investors from China

Rank	Firm	Industry	R&D	R&D Growth	R&D Intensity
			[mn EUR]	[%]	[%]
4	HUAWEI INVESTMENT & HOLDING	Technology Hardware & Equipment	19,534	1	16
17	ALIBABA GROUP HOLDING	Software & Computer Services	7,687	-3	7
18	TENCENT	Software & Computer Services	7,190	33	9
34	CHINA STATE CONSTRUCTION ENGINEERING	Construction & Materials	5,509	35	2

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 China's top universities

Rank	University	Score
12	PEKING UNIVERSITY	91.30
14	TSINGHUA UNIVERSITY	90.10
34	FUDAN UNIVERSITY	81.50

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 China

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	BYTEDANCE	Artificial intelligence	Beijing	225
2	SHEIN	E-commerce & direct-to-consumer	Shenzhen	100
3	XIAOHONGSHU	E-commerce & direct-to-consumer	Shanghai	20

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 China

Rank	Firm	Intensity, %
1	TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD	69.40
2	KWEICHOW MOUTAI CO LTD	85.87
3	TENCENT HOLDINGS LTD	60.09

Source: Brand Finance (<https://brandirectory.com/reports/gif-2022>).

Note: Brand Finance only provides within economy ranks.

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

Rank	Brand	Industry	Brand Value, mn USD
1	ICBC	Banking	69,545.3
2	TIKTOK/DOUYIN	Media	65,696.1
3	CHINA CONSTRUCTION BANK	Banking	62,681.1

Source: Brand Finance (<https://brandirectory.com>).

Note: Rank corresponds to within economy ranks.

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GII 2023 rank

# 12

## China

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
8	25	Upper middle	SEAO	1425.9	30,074.4	21,290.9
Score / Value Rank				Score / Value Rank		
<b>Institutions</b> 60.2 43 ◆				<b>Business sophistication</b> 54.1 20 ◆		
<b>1.1 Institutional environment</b> 56.4 44 ◆				<b>5.1 Knowledge workers</b> 66.1 [12]		
1.1.1 Operational stability for businesses* 52.8 65				5.1.1 Knowledge-intensive employment, % n/a n/a		
1.1.2 Government effectiveness* 60.0 37 ◆				5.1.2 Firms offering formal training, % n/a n/a		
<b>1.2 Regulatory environment</b> 49.5 100 ○				5.1.3 GERD performed by business, % GDP 1.8 13 ◆		
1.2.1 Regulatory quality* 34.0 89 ○				5.1.4 GERD financed by business, % 77.5 3 ◆◆		
1.2.2 Rule of law* 40.8 62				5.1.5 Females employed w/advanced degrees, % n/a n/a		
1.2.3 Cost of redundancy dismissal 27.4 111 ○◇				<b>5.2 Innovation linkages</b> 43.8 27 ◆		
<b>1.3 Business environment</b> 74.9 14 ◆				5.2.1 University-industry R&D collaboration+ 86.8 6 ◆		
1.3.1 Policies for doing business* 74.4 21 ◆				5.2.2 State of cluster development+ 91.4 2 ◆◆		
1.3.2 Entrepreneurship policies and culture* 75.4 10 ◆				5.2.3 GERD financed by abroad, % GDP 0.0 76 ○		
<b>Human capital and research</b> 49.8 22 ◆				5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP 0.0 70		
<b>2.1 Education</b> 68.5 [11]				5.2.5 Patent families/bn PPP\$ GDP 1.7 23 ◆		
2.1.1 Expenditure on education, % GDP 3.5 88 ○				<b>5.3 Knowledge absorption</b> 52.5 14 ◆		
2.1.2 Government funding/pupil, secondary, % GDP/cap n/a n/a				5.3.1 Intellectual property payments, % total trade 1.4 24		
2.1.3 School life expectancy, years n/a n/a				5.3.2 High-tech imports, % total trade 22.6 6 ◆		
2.1.4 PISA scales in reading, maths and science 579.0 1 ◆◆				5.3.3 ICT services imports, % total trade 1.2 76		
2.1.5 Pupil-teacher ratio, secondary 13.3 62				5.3.4 FDI net inflows, % GDP 1.6 82 ○		
<b>2.2 Tertiary education</b> 20.6 88 ○				5.3.5 Research talent, % in businesses 58.5 17 ◆		
2.2.1 Tertiary enrolment, % gross 63.6 50				<b>Knowledge and technology outputs</b> 61.5 6 ◆		
2.2.2 Graduates in science and engineering, % n/a n/a				<b>6.1 Knowledge creation</b> 71.9 3 ◆◆		
2.2.3 Tertiary inbound mobility, % 0.4 101 ○◇				6.1.1 Patents by origin/bn PPP\$ GDP 52.4 2 ◆◆		
<b>2.3 Research and development (R&amp;D)</b> 60.3 15 ◆				6.1.2 PCT patents by origin/bn PPP\$ GDP 2.3 14 ◆		
2.3.1 Researchers, FTE/mn pop. 1,584.9 48				6.1.3 Utility models by origin/bn PPP\$ GDP 104.6 1 ◆◆		
2.3.2 Gross expenditure on R&D, % GDP 2.4 14 ◆				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\$ 92.9 2 ◆◆				6.1.5 Citable documents H-index 66.1 11 ◆		
2.3.4 QS university ranking, top 3* 88.8 3 ◆◆				<b>6.2 Knowledge impact</b> 65.5 3 ◆◆		
<b>Infrastructure</b> 56.4 27 ◆				6.2.1 Labor productivity growth, % 6.0 1 ◆◆		
<b>3.1 Information and communication technologies (ICTs)</b> 86.0 18 ◆				6.2.2 Unicorn valuation, % GDP 3.8 12 ◆		
3.1.1 ICT access* 82.7 64				6.2.3 Software spending, % GDP 0.4 27 ◆		
3.1.2 ICT use* 87.7 26 ◆				6.2.4 High-tech manufacturing, % 48.5 13 ◆		
3.1.3 Government's online service* 87.6 15 ◆				<b>6.3 Knowledge diffusion</b> 47.2 20 ◆		
3.1.4 E-participation* 86.0 13 ◆				6.3.1 Intellectual property receipts, % total trade 0.3 33 ◆		
<b>3.2 General infrastructure</b> 52.4 13 ◆				6.3.2 Production and export complexity 79.8 17 ◆		
3.2.1 Electricity output, GWh/mn pop. 6,019.0 32 ◆				6.3.3 High-tech exports, % total trade 28.0 5 ◆		
3.2.2 Logistics performance* 72.7 18 ◆				6.3.4 ICT services exports, % total trade 2.3 52		
3.2.3 Gross capital formation, % GDP 44.8 2 ◆◆				6.3.5 ISO 9001 quality/bn PPP\$ GDP 15.7 19		
<b>3.3 Ecological sustainability</b> 30.7 50				<b>Creative outputs</b> 48.9 14 ◆		
3.3.1 GDP/unit of energy use 6.8 100 ○◇				<b>7.1 Intangible assets</b> 80.5 1 ◆◆		
3.3.2 Environmental performance* 16.1 118 ○◇				7.1.1 Intangible asset intensity, top 15, % 75.7 11		
3.3.3 ISO 14001 environment/bn PPP\$ GDP 8.0 10 ◆				7.1.2 Trademarks by origin/bn PPP\$ GDP 337.9 1 ◆◆		
<b>Market sophistication</b> 56.7 13 ◆				7.1.3 Global brand value, top 5,000 9.4 20 ◆		
<b>4.1 Credit</b> 50.0 28 ◆				7.1.4 Industrial designs by origin/bn PPP\$ GDP 28.9 2 ◆◆		
4.1.1 Finance for startups and scaleups+ 70.5 16 ◆				<b>7.2 Creative goods and services</b> 31.4 28 ◆		
4.1.2 Domestic credit to private sector, % GDP 182.9 4 ◆				7.2.1 Cultural and creative services exports, % total trade 0.6 51		
4.1.3 Loans from microfinance institutions, % GDP 0.8 32				7.2.2 National feature films/mn pop. 15-69 0.5 69 ○		
<b>4.2 Investment</b> 25.3 27				7.2.3 Entertainment and media market/th pop. 15-69 11.1 32 ◆		
4.2.1 Market capitalization, % GDP 62.8 28				7.2.4 Creative goods exports, % total trade 11.3 1 ◆◆		
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP 0.1 36				<b>7.3 Online creativity</b> 3.1 123 ○◇		
4.2.3 VC recipients, deals/bn PPP\$ GDP 0.1 27 ◆				7.3.1 Generic top-level domains (TLDs)/th pop. 15-69 2.8 74		
4.2.4 VC received, value, % GDP 0.0 18 ◆				7.3.2 Country-code TLDs/th pop. 15-69 5.0 56		
<b>4.3 Trade, diversification, and market scale</b> 94.6 3 ◆◆				7.3.3 GitHub commits/mn pop. 15-69 1.4 107 ○		
4.3.1 Applied tariff rate, weighted avg., % 2.5 66				7.3.4 Mobile app creation/bn PPP\$ GDP n/a n/a		
4.3.2 Domestic industry diversification 99.8 2 ◆◆						
4.3.3 Domestic market scale, bn PPP\$ 30,074.4 1 ◆◆						

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 China.



> China has missing data for seven indicators and outdated data for seven indicators.

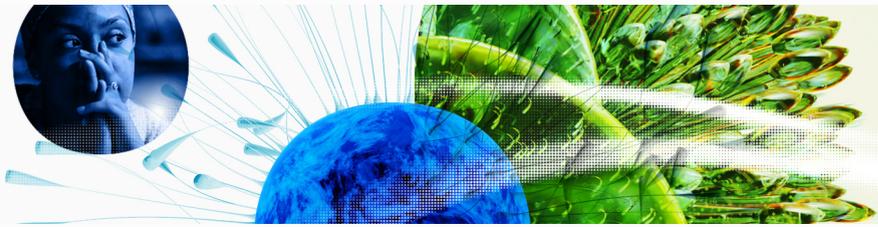
### > Missing data for China

Code	Indicator name	Economy Year	Model Year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2019	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	n/a	2020	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD
5.1.1	Knowledge-intensive employment, %	n/a	2022	International Labour Organization
5.1.2	Firms offering formal training, %	n/a	2019	World Bank Enterprise Surveys
5.1.5	Females employed w/advanced degrees, %	n/a	2022	International Labour Organization
7.3.4	Mobile app creation/bn PPP\$ GDP	n/a	2022	data.ia; International Monetary Fund

### > Outdated data for China

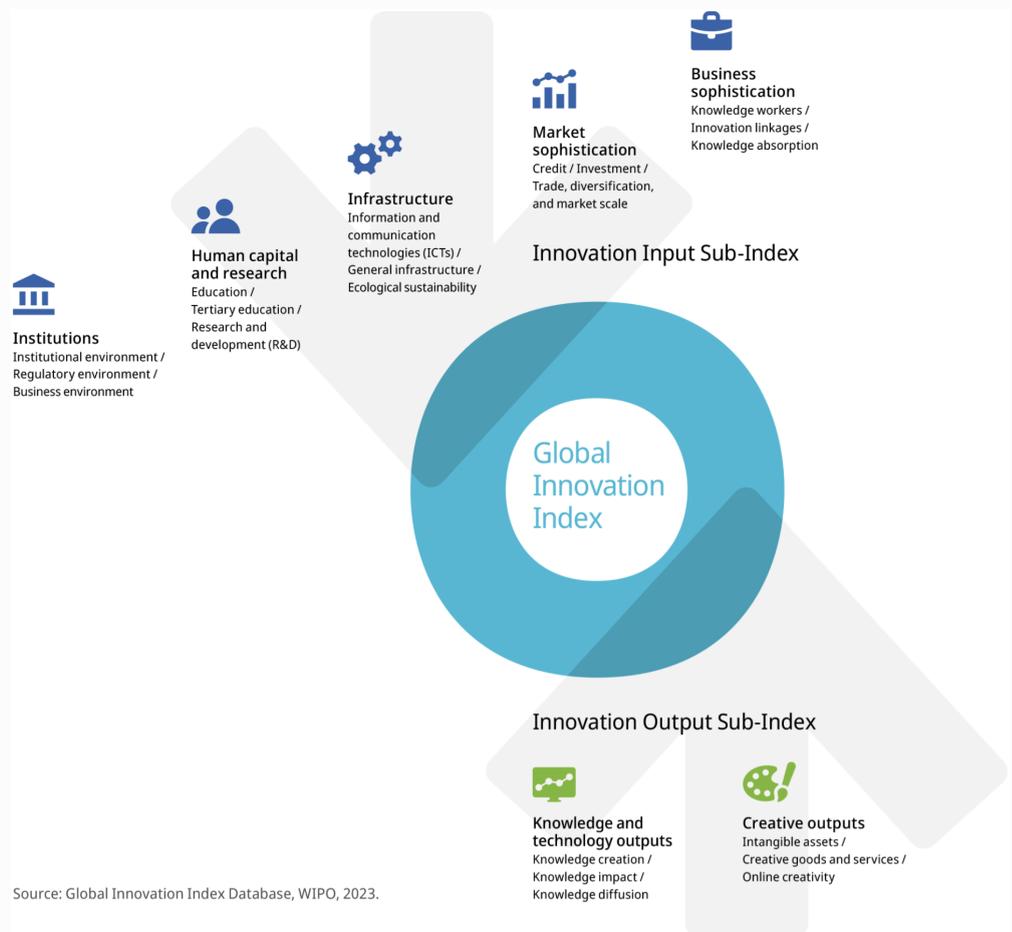
Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2018	2021	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
4.3.2	Domestic industry diversification	2018	2020	United Nations Industrial Development Organization
5.1.3	GERD performed by business, % GDP	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	2020	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.2.4	High-tech manufacturing, %	2018	2020	United Nations Industrial Development Organization

# 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.