Global Innovation Index 2021

CHINA

12th China ranks 12th among the 132 economies featured in the GII 2021.

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.

The following table shows the rankings of China over the past three years, noting that 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 2021 is between ranks 11 and 14.

Rankings for China (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	12	25	7
2020	14	26	6
2019	14	26	5

- China performs better in innovation outputs than innovation inputs in 2021.
- This year China ranks 25th in innovation inputs, higher than both 2020 and 2019.
- As for innovation outputs, China ranks 7th. This position is lower than both 2020 and 2019.

1st China ranks 1st among the 34 upper middle-income group economies.

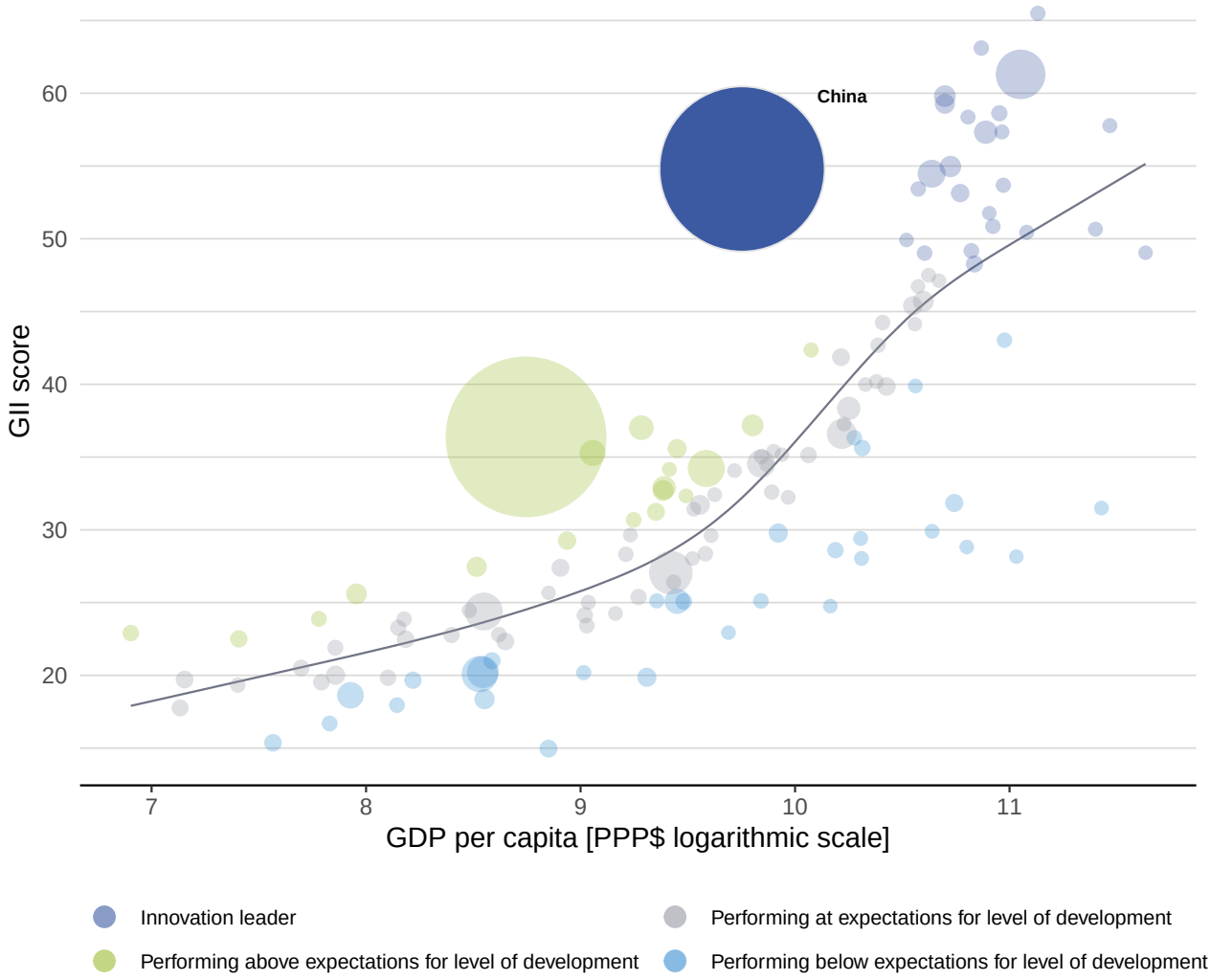
3rd China ranks 3rd among the 17 economies in South East Asia, East Asia, and Oceania.

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, China's performance is above expectations for its level of development.

The positive relationship between innovation and development

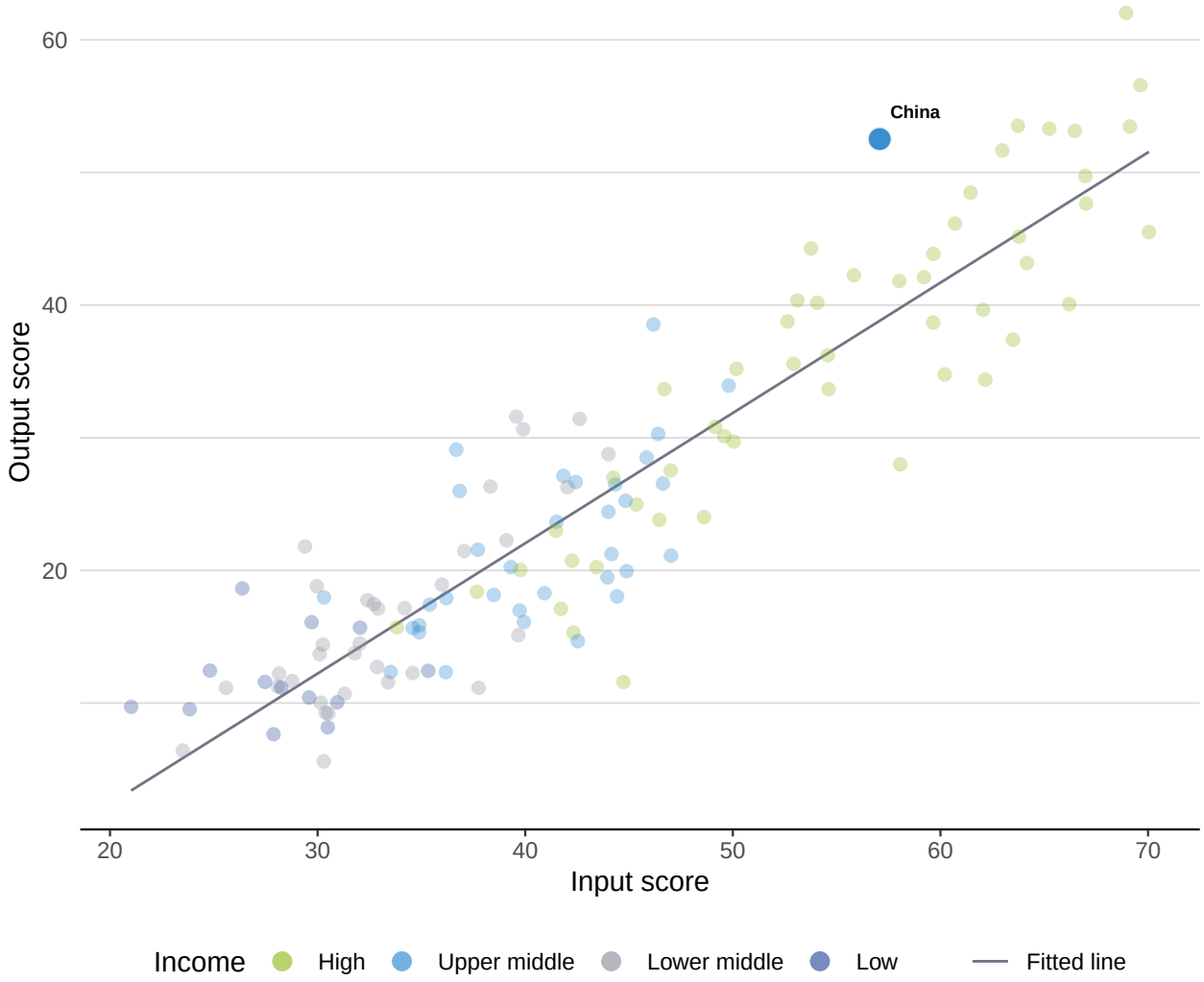


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

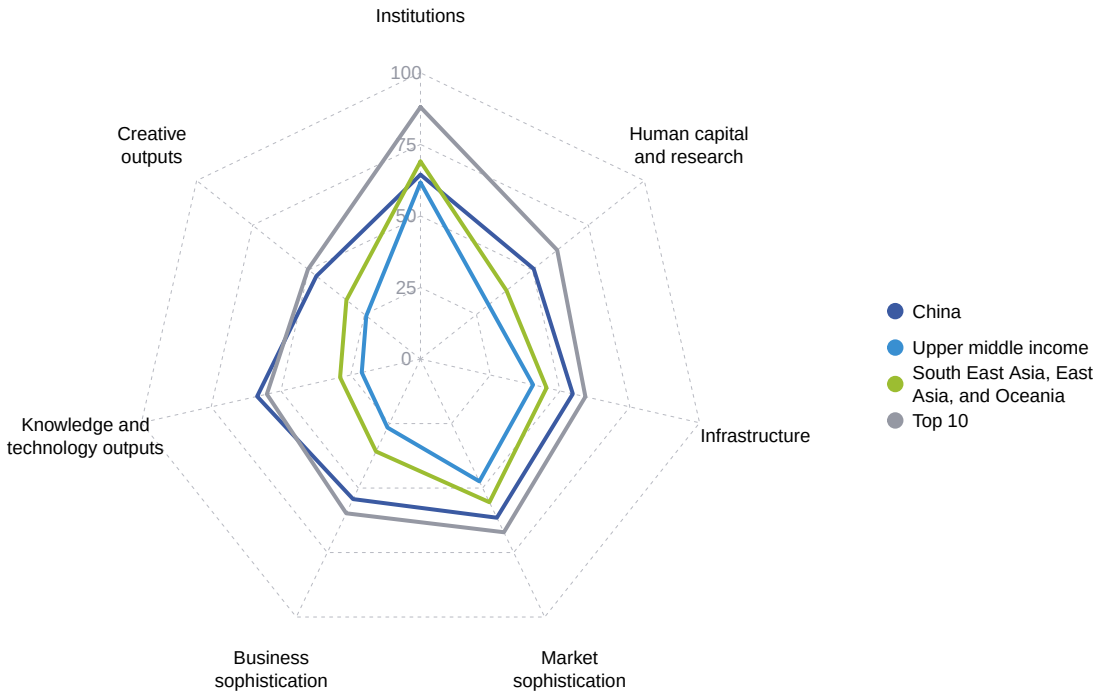
China produces more innovation outputs relative to its level of innovation investments.

Innovation input to output performance



BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND SOUTH EAST ASIA, EAST ASIA, AND OCEANIA

The seven GII pillar scores for China



Upper middle-income group economies

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

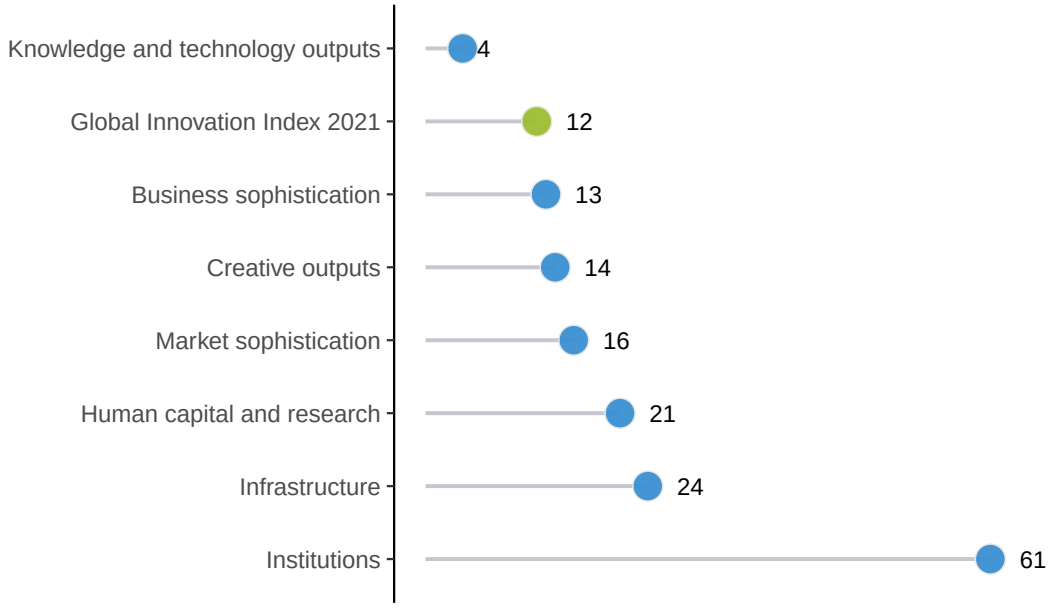
South East Asia, East Asia, and Oceania

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

OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

China performs best in Knowledge and technology outputs and its weakest performance is in Institutions.

The seven GII pillar ranks for China



Note: The highest possible ranking in each pillar is one.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of China in the GII 2021.

Strengths and weaknesses for China

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
2.1.4	PISA scales in reading, maths and science	1	1.2	Regulatory environment	106
2.3.3	Global corporate R&D investors, top 3, mn US$	3	1.2.3	Cost of redudancy dismissal	110
2.3.4	QS university ranking, top 3	3	2.1.3	School life expectancy, years	88
3.2.3	Gross capital formation, % GDP	4	2.2.3	Tertiary inbound mobility, %	101
4.3	Trade, diversification, and market scale	1	3.3.1	GDP/unit of energy use	97
4.3.2	Domestic industry diversification	2	3.3.2	Environmental performance	98
4.3.3	Domestic market scale, bn PPP$	1	4.1.3	Microfinance gross loans, % GDP	74
5.1.2	Firms offering formal training, %	1	5.2.3	GERD financed by abroad, % GDP	94
5.2.2	State of cluster development and depth	3	5.3.4	FDI net inflows, % GDP	101
6.1	Knowledge creation	4	7.2.2	National feature films/mn pop. 15–69	91
6.1.1	Patents by origin/bn PPP$ GDP	1	7.2.4	Printing and other media, % manufacturing	76
6.1.3	Utility models by origin/bn PPP$ GDP	1			
6.3.3	High-tech exports, % total trade	1			
7.1	Intangible assets	2			
7.1.1	Trademarks by origin/bn PPP$ GDP	1			
7.1.3	Industrial designs by origin/bn PPP$ GDP	1			
7.2.5	Creative goods exports, % total trade	1			

China

GII 2021 rank
12

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$	GII 2020 rank
7	25	Upper middle	SEAO	1,439.3	24,162.4	17,206	14

		Score/ Value	Rank	
Institutions		**64.4**	**61**	◆
1.1	**Political environment**	**65.3**	**47**	◆
1.1.1	Political and operational stability*	71.4	54	
1.1.2	Government effectiveness*	62.2	43	◆
1.2	**Regulatory environment**	**49.9**	**106**	○
1.2.1	Regulatory quality*	37.1	91	
1.2.2	Rule of law*	39.5	77	
1.2.3	Cost of redundancy dismissal	27.4	110	○
1.3	**Business environment**	**78.1**	**39**	
1.3.1	Ease of starting a business*	94.1	25	◆
1.3.2	Ease of resolving insolvency*	62.1	46	
Human capital and research		**50.6**	**21**	◆
2.1	**Education**	**66.7**	**[12]**	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years ◴	12.4	88	○ ◇
2.1.4	PISA scales in reading, maths and science	579.0	1	● ◆
2.1.5	Pupil-teacher ratio, secondary	13.3	56	
2.2	**Tertiary education**	**25.2**	**83**	
2.2.1	Tertiary enrolment, % gross	53.8	57	
2.2.2	Graduates in science and engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	0.4	101	○
2.3	**Research and development (R&D)**	**59.8**	**14**	◆
2.3.1	Researchers, FTE/mn pop.	1,471.3	45	
2.3.2	Gross expenditure on R&D, % GDP	2.2	13	◆
2.3.3	Global corporate R&D investors, top 3, mn US$	92.5	3	● ◆
2.3.4	QS university ranking, top 3*	84.2	3	● ◆
Infrastructure		**54.6**	**24**	◆
3.1	**Information and communication technologies (ICTs)**	**79.4**	**34**	◆
3.1.1	ICT access*	63.0	71	
3.1.2	ICT use*	67.7	52	◆
3.1.3	Government's online service*	90.6	12	◆
3.1.4	E-participation*	96.4	9	◆
3.2	**General infrastructure**	**54.4**	**5**	◆
3.2.1	Electricity output, GWh/mn pop.	5,332.3	40	◆
3.2.2	Logistics performance*	72.3	26	◆
3.2.3	Gross capital formation, % GDP	43.9	4	● ◆
3.3	**Ecological sustainability**	**29.9**	**59**	
3.3.1	GDP/unit of energy use	7.5	97	○
3.3.2	Environmental performance*	37.3	98	○ ◇
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	5.8	17	
Market sophistication		**61.5**	**16**	◆
4.1	**Credit**	**51.7**	**26**	◆
4.1.1	Ease of getting credit*	60.0	74	
4.1.2	Domestic credit to private sector, % GDP	164.7	5	◆
4.1.3	Microfinance gross loans, % GDP	0.0	74	○
4.2	**Investment**	**35.9**	**44**	
4.2.1	Ease of protecting minority investors*	72.0	27	
4.2.2	Market capitalization, % GDP	58.6	28	
4.2.3	Venture capital investors, deals/bn PPP$ GDP	0.1	29	◆
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	0.1	17	◆
4.3	**Trade, diversification, and market scale**	**96.9**	**1**	● ◆
4.3.1	Applied tariff rate, weighted avg., %	2.5	58	
4.3.2	Domestic industry diversification	99.4	2	●
4.3.3	Domestic market scale, bn PPP$	24,162.4	1	● ◆

		Score/ Value	Rank	
Business sophistication		**54.3**	**13**	◆
5.1	**Knowledge workers**	**77.7**	**[2]**	
5.1.1	Knowledge-intensive employment, %	n/a	n/a	
5.1.2	Firms offering formal training, % ◴	79.2	1	● ◆
5.1.3	GERD performed by business, % GDP	1.7	12	◆
5.1.4	GERD financed by business, %	76.3	4	◆
5.1.5	Females employed w/advanced degrees, %	n/a	n/a	
5.2	**Innovation linkages**	**31.3**	**32**	◆
5.2.1	University-industry R&D collaboration†	70.5	6	◆
5.2.2	State of cluster development and depth†	73.1	3	● ◆
5.2.3	GERD financed by abroad, % GDP	0.0	94	○
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	63	
5.2.5	Patent families/bn PPP$ GDP	1.4	26	◆
5.3	**Knowledge absorption**	**53.9**	**9**	◆
5.3.1	Intellectual property payments, % total trade	1.3	29	
5.3.2	High-tech imports, % total trade	22.8	5	◆
5.3.3	ICT services imports, % total trade	1.0	73	
5.3.4	FDI net inflows, % GDP	1.4	101	○
5.3.5	Research talent, % in businesses	57.7	15	◆
Knowledge and technology outputs		**58.5**	**4**	● ◆
6.1	**Knowledge creation**	**70.5**	**4**	● ◆
6.1.1	Patents by origin/bn PPP$ GDP	53.2	1	● ◆
6.1.2	PCT patents by origin/bn PPP$ GDP	2.8	13	◆
6.1.3	Utility models by origin/bn PPP$ GDP	96.6	1	● ◆
6.1.4	Scientific and technical articles/bn PPP$ GDP	21.3	42	
6.1.5	Citable documents H-index	58.6	13	◆
6.2	**Knowledge impact**	**52.2**	**5**	◆
6.2.1	Labor productivity growth, %	5.2	6	◆
6.2.2	New businesses/th pop. 15–64	n/a	n/a	
6.2.3	Software spending, % GDP	0.3	39	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	12.0	24	
6.2.5	High-tech manufacturing, %	48.5	14	◆
6.3	**Knowledge diffusion**	**52.9**	**9**	◆
6.3.1	Intellectual property receipts, % total trade	0.2	36	◆
6.3.2	Production and export complexity	74.9	18	◆
6.3.3	High-tech exports, % total trade	27.8	1	● ◆
6.3.4	ICT services exports, % total trade	2.1	53	
Creative outputs		**46.5**	**14**	◆
7.1	**Intangible assets**	**70.9**	**2**	● ◆
7.1.1	Trademarks by origin/bn PPP$ GDP	324.1	1	● ◆
7.1.2	Global brand value, top 5,000, % GDP	118.0	16	◆
7.1.3	Industrial designs by origin/bn PPP$ GDP	29.6	1	● ◆
7.1.4	ICTs and organizational model creation†	59.7	46	
7.2	**Creative goods and services**	**40.0**	**11**	◆
7.2.1	Cultural and creative services exports, % total trade	0.5	46	
7.2.2	National feature films/mn pop. 15–69	0.8	91	○
7.2.3	Entertainment and media market/th pop. 15–69	10.4	37	◆
7.2.4	Printing and other media, % manufacturing	0.7	76	○
7.2.5	Creative goods exports, % total trade	11.2	1	● ◆
7.3	**Online creativity**	**4.3**	**[125]**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	2.2	74	
7.3.2	Country-code TLDs/th pop. 15–69	6.3	47	
7.3.3	Wikipedia edits/mn pop. 15–69	n/a	n/a	
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	n/a	

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 Appendix IV for details, including the year of the data, at http://globalinnovationindex.org. 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 data that are either missing or outdated for China.

Missing data for China

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	n/a	2017	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2017	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	n/a	2018	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.1	Knowledge-intensive employment, %	n/a	2019	International Labour Organization
5.1.5	Females employed w/advanced degrees, %	n/a	2019	International Labour Organization
6.2.2	New businesses/th pop. 15–64	n/a	2018	World Bank
7.3.3	Wikipedia edits/mn pop. 15–69	n/a	2020	Wikimedia Foundation
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	2020	App Annie

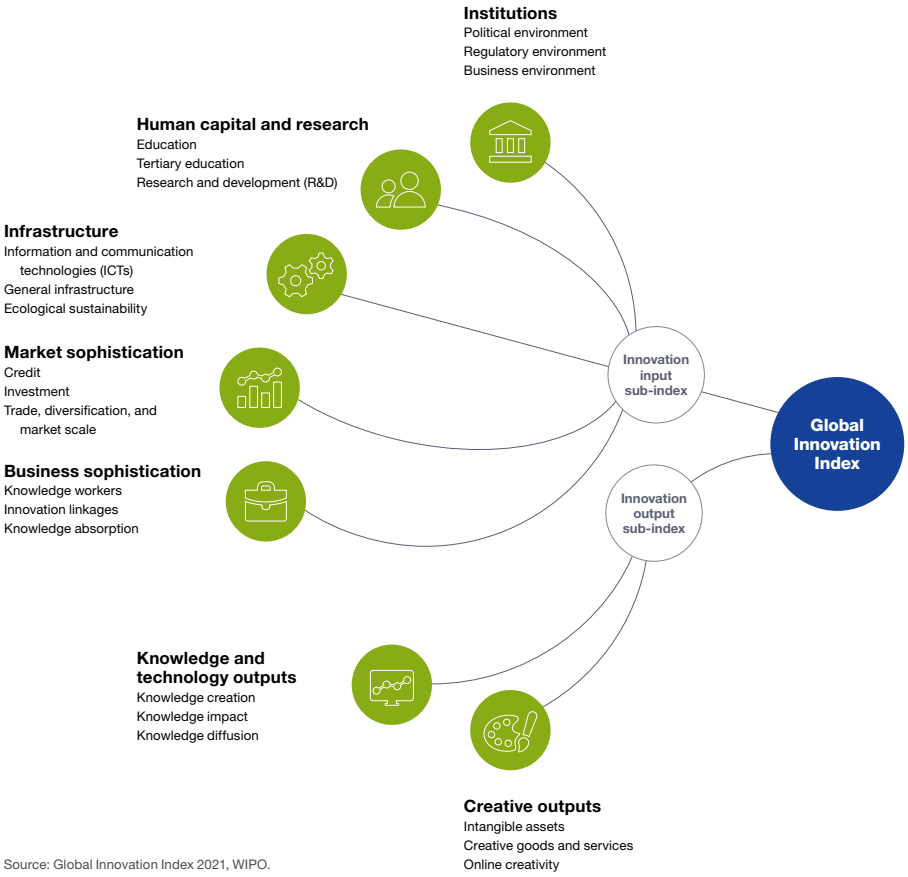
Outdated data for China

Code	Indicator name	Economy year	Model year	Source
2.1.3	School life expectancy, years	2010	2018	UNESCO Institute for Statistics
5.1.2	Firms offering formal training, %	2012	2019	World Bank

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 2021, WIPO.

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.