Global Innovation Index 2021

THAILAND

43rd Thailand ranks 43rd 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 Thailand 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 Thailand in the GII 2021 is between ranks 42 and 45.

Rankings for Thailand (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	43	47	46
2020	44	48	44
2019	43	47	43

- Thailand performs better in innovation outputs than innovation inputs in 2021.
- This year Thailand ranks 47th in innovation inputs, higher than last year but the same as 2019.
- As for innovation outputs, Thailand ranks 46th. This position is lower than both 2020 and 2019.

5th Thailand ranks 5th among the 34 upper middle-income group economies.

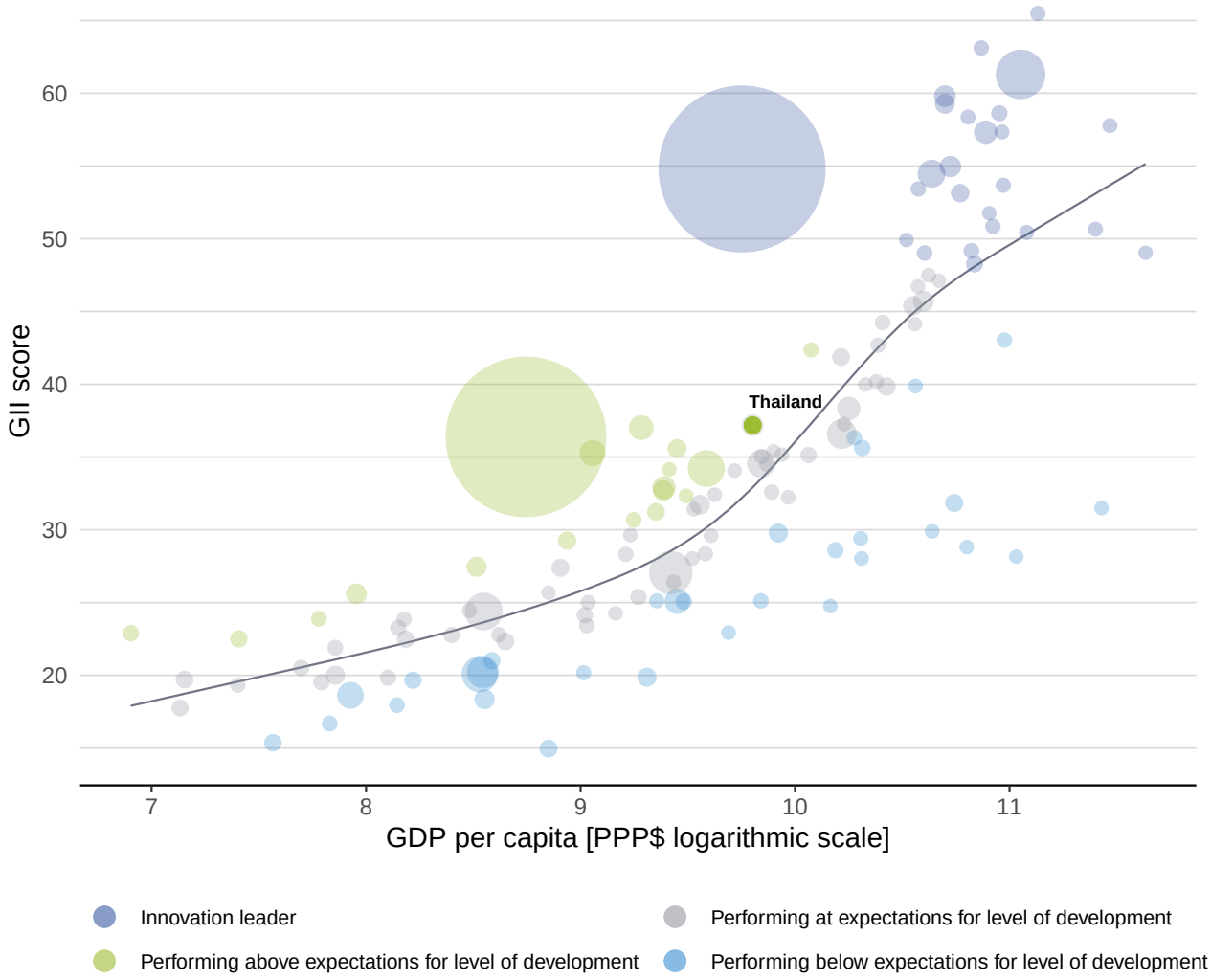
9th Thailand ranks 9th among the 17 economies in South East Asia, East Asia, and Oceania.

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

The positive relationship between innovation and development

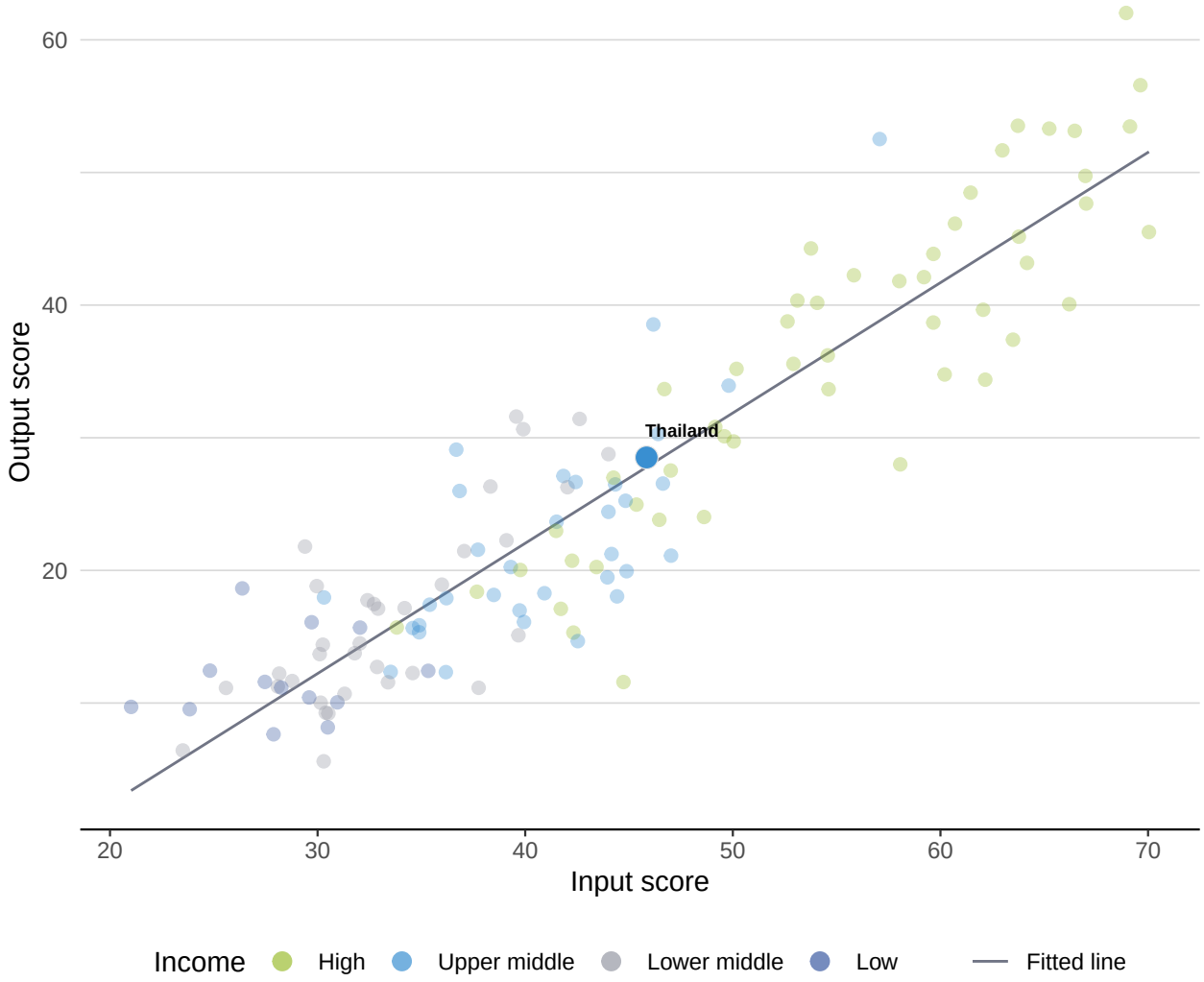


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

Thailand 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 Thailand

Upper middle-income group economies

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

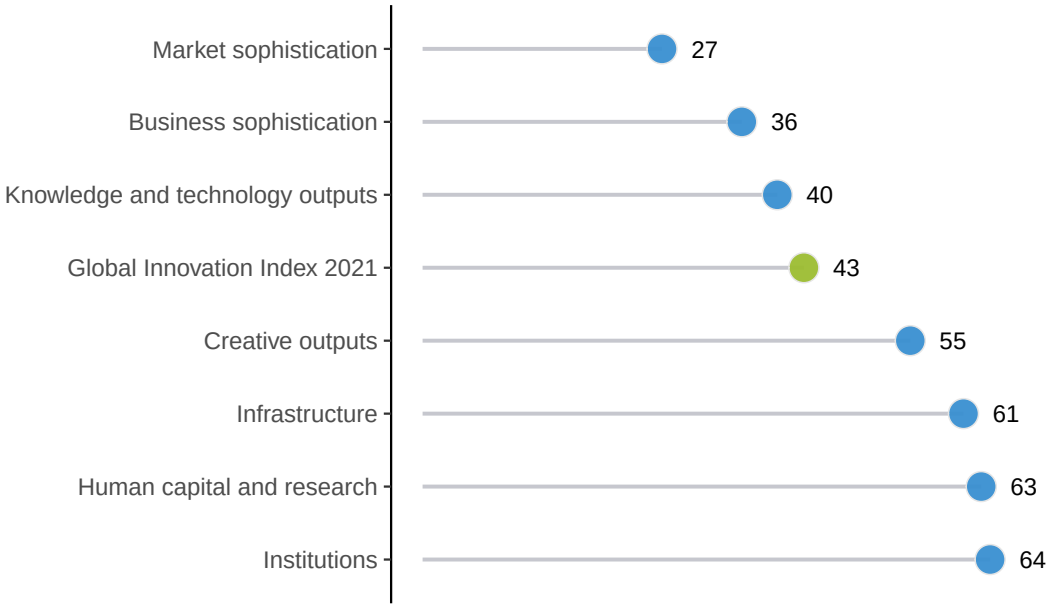
South East Asia, East Asia, and Oceania

Thailand performs above the regional average in two pillars, namely: Market sophistication; and, Knowledge and technology outputs.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

Thailand performs best in Market sophistication and its weakest performance is in Institutions.

The seven GII pillar ranks for Thailand



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 Thailand in the GII 2021.

Strengths and weaknesses for Thailand

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
4.1.2	Domestic credit to private sector, % GDP	10	1.2	Regulatory environment	112
4.2.1	Ease of protecting minority investors	3	1.2.3	Cost of redudancy dismissal	124
4.2.2	Market capitalization, % GDP	11	2.1.5	Pupil-teacher ratio, secondary	109
4.3.2	Domestic industry diversification	16	2.3.3	Global corporate R&D investors, top 3, mn US$	41
5.1.4	GERD financed by business, %	1	4.1.3	Microfinance gross loans, % GDP	81
5.3	Knowledge absorption	18	4.2.4	Venture capital recipients, deals/bn PPP$ GDP	85
5.3.2	High-tech imports, % total trade	14	5.1.1	Knowledge-intensive employment, %	98
5.3.5	Research talent, % in businesses	10	5.1.2	Firms offering formal training, %	84
6.1.3	Utility models by origin/bn PPP$ GDP	9	5.2.3	GERD financed by abroad, % GDP	83
6.3.3	High-tech exports, % total trade	11	5.3.3	ICT services imports, % total trade	116
7.2	Creative goods and services	15	6.3.4	ICT services exports, % total trade	118
7.2.5	Creative goods exports, % total trade	8			

Thailand

GII 2021 rank
43

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$	GII 2020 rank
46	47	Upper middle	SEAO	69.8	1,261.5	18,073	44

		Score/ Value	Rank	
Institutions		**64.2**	**64**	
1.1	**Political environment**	**61.7**	**54**	
1.1.1	Political and operational stability*	67.9	71	
1.1.2	Government effectiveness*	58.6	52	
1.2	**Regulatory environment**	**46.3**	**112**	○ ◇
1.2.1	Regulatory quality*	46.5	63	
1.2.2	Rule of law*	49.4	57	
1.2.3	Cost of redundancy dismissal	36.0	124	○ ◇
1.3	**Business environment**	**84.6**	**20**	◆
1.3.1	Ease of starting a business*	92.4	43	
1.3.2	Ease of resolving insolvency*	76.8	22	◆
Human capital and research		**31.7**	**63**	
2.1	**Education**	**42.4**	**86**	
2.1.1	Expenditure on education, % GDP	4.1	64	
2.1.2	Government funding/pupil, secondary, % GDP/cap	18.0	59	
2.1.3	School life expectancy, years	15.4	45	
2.1.4	PISA scales in reading, maths and science	412.4	61	
2.1.5	Pupil-teacher ratio, secondary	26.2	109	○ ◇
2.2	**Tertiary education**	**35.4**	**57**	
2.2.1	Tertiary enrolment, % gross	49.3	64	
2.2.2	Graduates in science and engineering, %	27.9	25	
2.2.3	Tertiary inbound mobility, %	1.3	85	
2.3	**Research and development (R&D)**	**17.4**	**47**	
2.3.1	Researchers, FTE/mn pop.	1,350.3	48	
2.3.2	Gross expenditure on R&D, % GDP	1.0	39	
2.3.3	Global corporate R&D investors, top 3, mn US$	0.0	41	○ ◇
2.3.4	QS university ranking, top 3*	33.4	37	
Infrastructure		**43.0**	**61**	
3.1	**Information and communication technologies (ICTs)**	**68.4**	**60**	
3.1.1	ICT access*	57.8	81	
3.1.2	ICT use*	59.2	63	
3.1.3	Government's online service*	79.4	42	
3.1.4	E-participation*	77.4	51	
3.2	**General infrastructure**	**33.1**	**48**	
3.2.1	Electricity output, GWh/mn pop.	2,738.5	69	
3.2.2	Logistics performance*	63.3	31	◆
3.2.3	Gross capital formation, % GDP	24.0	54	
3.3	**Ecological sustainability**	**27.6**	**68**	
3.3.1	GDP/unit of energy use	9.2	78	
3.3.2	Environmental performance*	45.4	70	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.4	35	
Market sophistication		**55.6**	**27**	◆
4.1	**Credit**	**52.0**	**24**	◆
4.1.1	Ease of getting credit*	70.0	44	
4.1.2	Domestic credit to private sector, % GDP	143.4	10	● ◆
4.1.3	Microfinance gross loans, % GDP	0.0	81	○
4.2	**Investment**	**31.8**	**64**	
4.2.1	Ease of protecting minority investors*	86.0	3	● ◆
4.2.2	Market capitalization, % GDP	108.0	11	●
4.2.3	Venture capital investors, deals/bn PPP$ GDP	0.0	66	
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	0.0	85	○
4.3	**Trade, diversification, and market scale**	**83.1**	**19**	◆
4.3.1	Applied tariff rate, weighted avg., %	3.5	69	
4.3.2	Domestic industry diversification	97.0	16	●
4.3.3	Domestic market scale, bn PPP$	1,261.5	21	

		Score/ Value	Rank	
Business sophistication		**34.7**	**36**	◆
5.1	**Knowledge workers**	**37.3**	**51**	
5.1.1	Knowledge-intensive employment, %	13.8	98	○ ◇
5.1.2	Firms offering formal training, %	18.0	84	○
5.1.3	GERD performed by business, % GDP	0.8	27	◆
5.1.4	GERD financed by business, %	80.8	1	● ◆
5.1.5	Females employed w/advanced degrees, %	9.9	70	
5.2	**Innovation linkages**	**20.2**	**67**	
5.2.1	University-industry R&D collaboration†	54.4	30	◆
5.2.2	State of cluster development and depth†	52.2	41	
5.2.3	GERD financed by abroad, % GDP	0.0	83	○
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	56	
5.2.5	Patent families/bn PPP$ GDP	0.1	60	
5.3	**Knowledge absorption**	**46.4**	**18**	● ◆
5.3.1	Intellectual property payments, % total trade	1.7	18	◆
5.3.2	High-tech imports, % total trade	14.2	14	●
5.3.3	ICT services imports, % total trade	0.3	116	○ ◇
5.3.4	FDI net inflows, % GDP	1.8	85	
5.3.5	Research talent, % in businesses	60.8	10	● ◆
Knowledge and technology outputs		**29.7**	**40**	
6.1	**Knowledge creation**	**22.9**	**47**	
6.1.1	Patents by origin/bn PPP$ GDP	0.6	75	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.1	57	
6.1.3	Utility models by origin/bn PPP$ GDP	2.4	9	● ◆
6.1.4	Scientific and technical articles/bn PPP$ GDP	8.9	93	
6.1.5	Citable documents H-index	21.2	39	
6.2	**Knowledge impact**	**35.0**	**44**	
6.2.1	Labor productivity growth, %	−0.1	66	
6.2.2	New businesses/th pop. 15–64	1.1	80	
6.2.3	Software spending, % GDP	0.2	55	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.8	39	
6.2.5	High-tech manufacturing, %	45.1	17	◆
6.3	**Knowledge diffusion**	**31.2**	**33**	◆
6.3.1	Intellectual property receipts, % total trade	0.1	69	
6.3.2	Production and export complexity	70.9	22	◆
6.3.3	High-tech exports, % total trade	13.4	11	● ◆
6.3.4	ICT services exports, % total trade	0.2	118	○
Creative outputs		**27.3**	**55**	
7.1	**Intangible assets**	**30.2**	**68**	
7.1.1	Trademarks by origin/bn PPP$ GDP	24.2	85	
7.1.2	Global brand value, top 5,000, % GDP	62.5	31	
7.1.3	Industrial designs by origin/bn PPP$ GDP	2.6	41	
7.1.4	ICTs and organizational model creation†	60.3	43	◆
7.2	**Creative goods and services**	**37.1**	**15**	● ◆
7.2.1	Cultural and creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	1.5	74	
7.2.3	Entertainment and media market/th pop. 15–69	10.7	35	◆
7.2.4	Printing and other media, % manufacturing	0.8	71	
7.2.5	Creative goods exports, % total trade	6.9	8	● ◆
7.3	**Online creativity**	**11.9**	**84**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5.5	52	
7.3.2	Country-code TLDs/th pop. 15–69	0.4	102	
7.3.3	Wikipedia edits/mn pop. 15–69	39.3	86	
7.3.4	Mobile app creation/bn PPP$ GDP	3.9	61	

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 Thailand.

Missing data for Thailand

Code	Indicator name	Economy year	Model year	Source
7.2.1	Cultural and creative services exports, % total trade	n/a	2019	World Trade Organization

Outdated data for Thailand

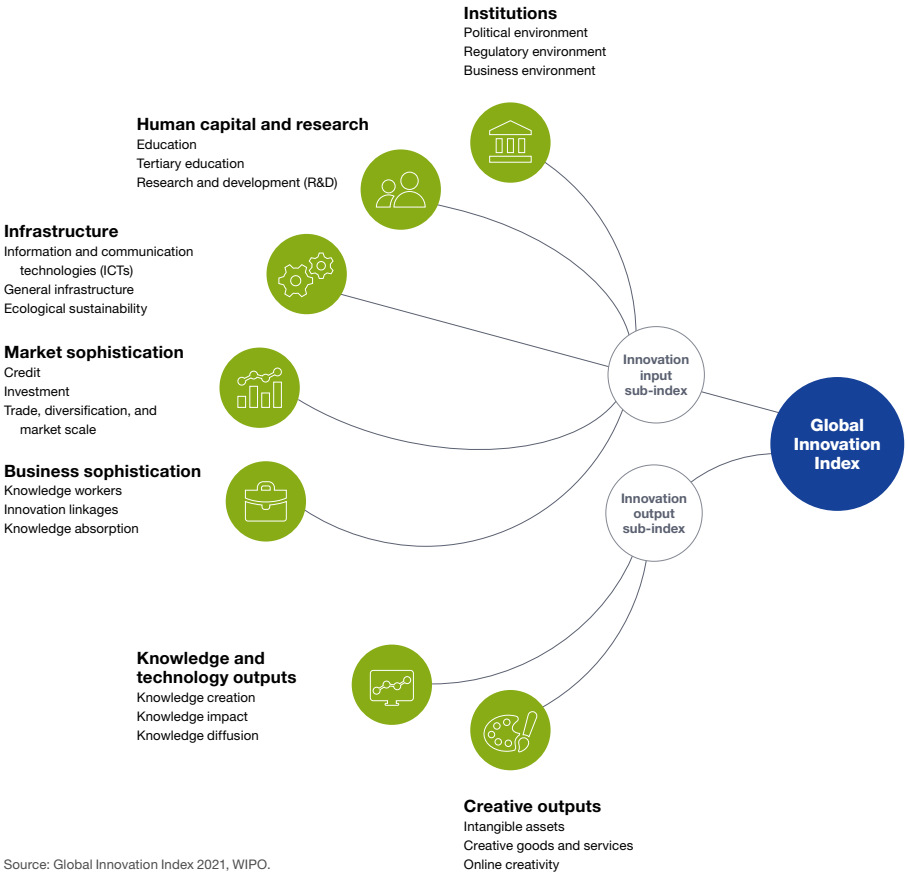
Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2013	2017	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	2013	2017	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	2016	2018	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2016	2018	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	2016	2018	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.2.3	Tertiary inbound mobility, %	2016	2018	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2017	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2017	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
4.1.3	Microfinance gross loans, % GDP	2011	2018	Microfinance Information Exchange
4.3.1	Applied tariff rate, weighted avg., %	2015	2019	World Bank
5.1.2	Firms offering formal training, %	2016	2019	World Bank
5.1.3	GERD performed by business, % GDP	2017	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators

Code	Indicator name	Economy year	Model year	Source
5.1.4	GERD financed by business, %	2017	2018	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.2.3	GERD financed by abroad, % GDP	2017	2018	UNESCO Institute for Statistics
5.3.5	Research talent, % in businesses	2017	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
7.2.4	Printing and other media, % manufacturing	2016	2018	United Nations Industrial Development Organization

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.