THAILAND

43rd Thailand ranks 43rd among the 132 economies featured in the GII 2022.

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 2022 is between ranks 43 and 45.

Rankings for Thailand (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	44	48	44
2021	43	47	46
2022	43	48	44

- Thailand performs better in innovation outputs than innovation inputs in 2022.
- This year Thailand ranks 48th in innovation inputs, lower than last year but the same as 2020.
- As for innovation outputs, Thailand ranks 44th. This position is higher than last year but the same as 2020.

5th Thailand ranks 5th among the 36 upper-middle-income group economies.

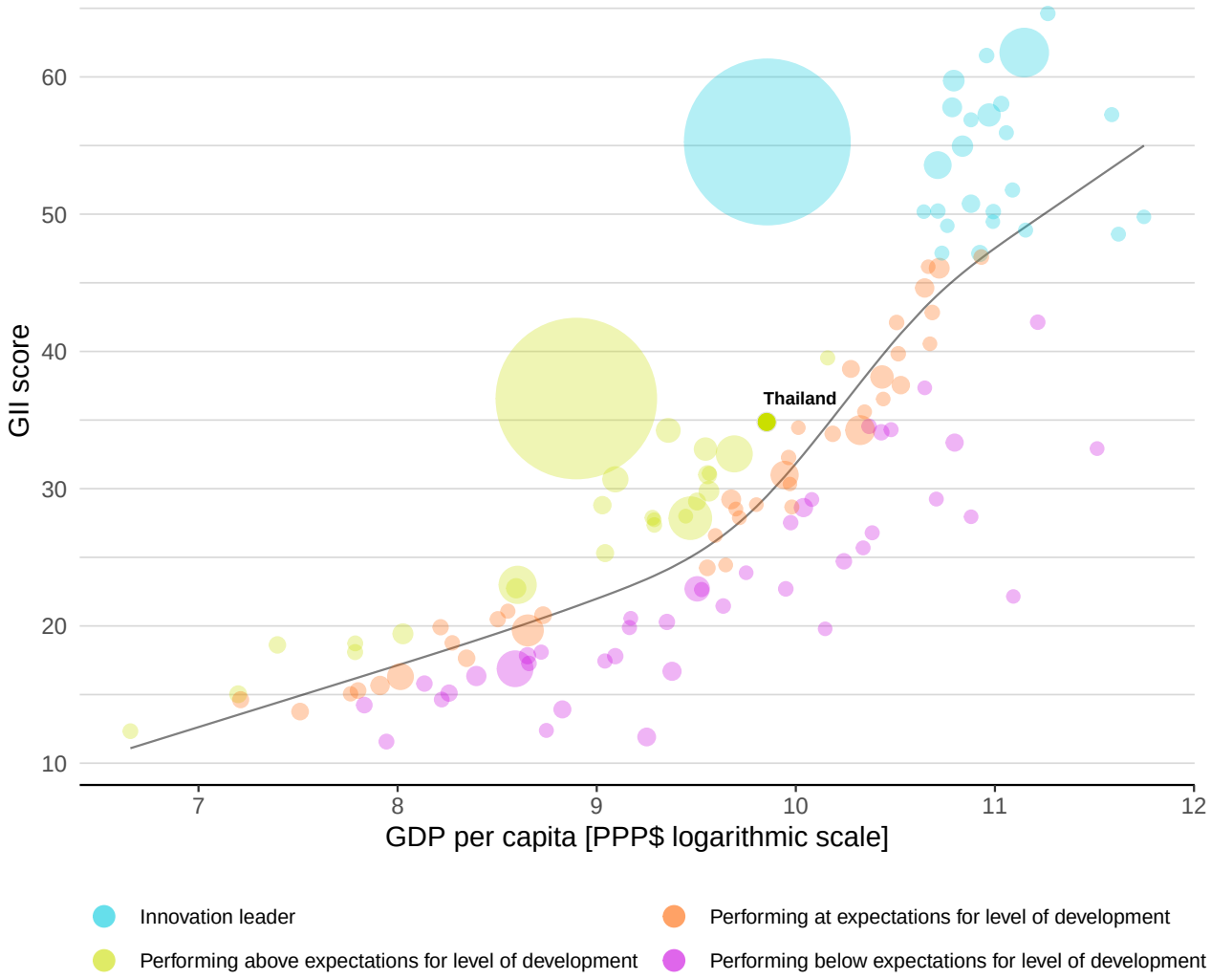
9th Thailand ranks 9th among the 17 economies in South East Asia, East Asia, and Oceania.

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

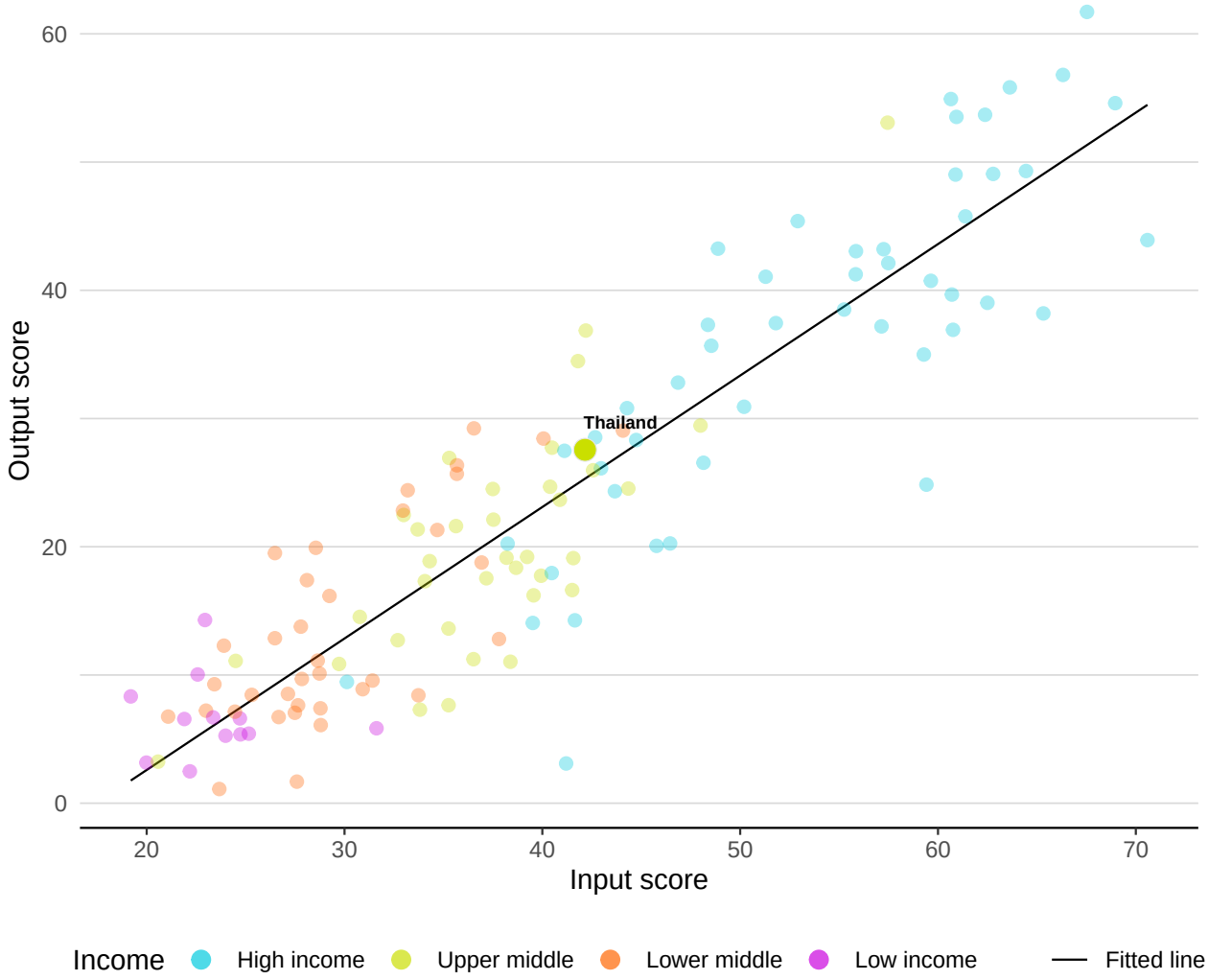


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

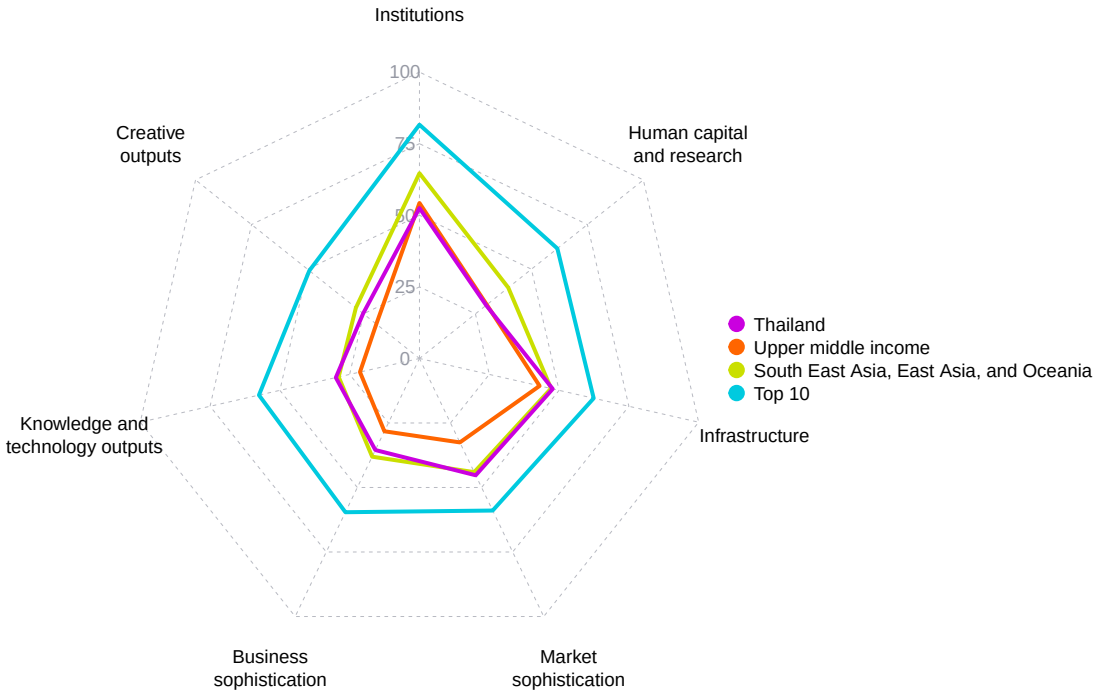
Thailand produces more innovation outputs relative to its level of innovation investments.

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 five pillars, namely: Infrastructure; Market sophistication; Business sophistication; Knowledge and technology outputs; and, Creative outputs.

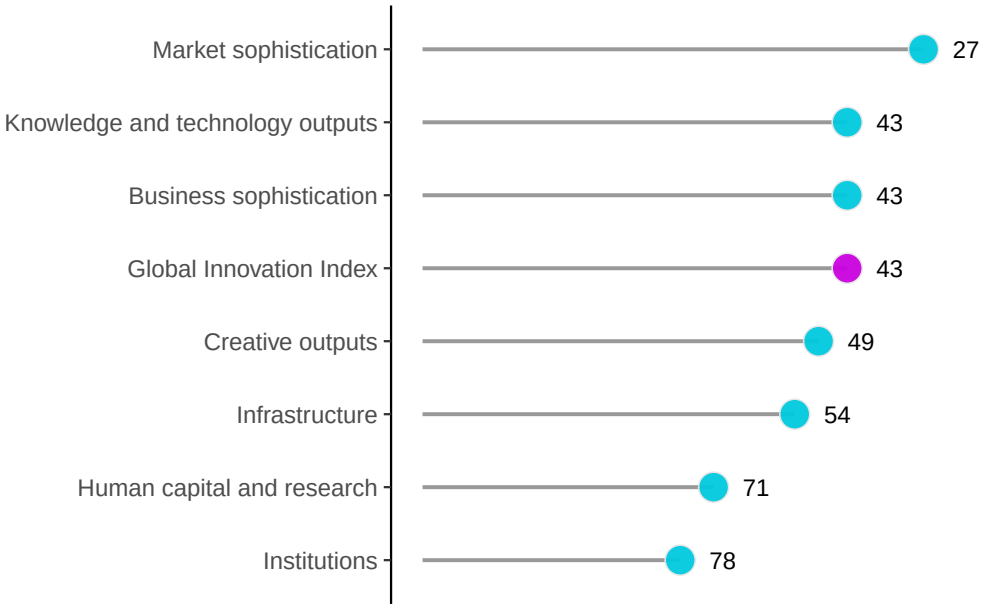
South East Asia, East Asia, and Oceania

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

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 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 1.

The full WIPO Intellectual Property Statistics profile for Thailand can be found at:

https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=TH.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the indicator strengths and weaknesses of Thailand in the GII 2022.

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	1.2.3	Cost of redundancy dismissal	125
4.2.1	Market capitalization, % GDP	14	2.1.1	Expenditure on education, % GDP	110
4.3.3	Domestic market scale, bn PPP$	21	2.1.5	Pupil-teacher ratio, secondary	103
5.1.4	GERD financed by business, %	1	2.3.3	Global corporate R&D investors, top 3, mn USD	38
5.3.1	Intellectual property payments, % total trade	16	4.2.3	Venture capital recipients, deals/bn PPP$ GDP	87
5.3.2	High-tech imports, % total trade	13	5.1.2	Firms offering formal training, %	85
5.3.5	Research talent, % in businesses	10	5.3.3	ICT services imports, % total trade	119
6.1.3	Utility models by origin/bn PPP$ GDP	8	5.3.4	FDI net inflows, % GDP	105
6.3.3	High-tech exports, % total trade	8	6.3.4	ICT services exports, % total trade	126
7.2.5	Creative goods exports, % total trade	1	7.2.1	Cultural and creative services exports, % total trade	103

GII 2022 rank

Thailand

43

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
44	48	Upper middle	SEAO	70.0	1,331.0	19,028

			Score/ Value	Rank	
Institutions			**52.5**	**78**	
1.1	**Political environment**		62.6	56	
1.1.1	Political and operational stability*		69.1	63	
1.1.2	Government effectiveness*		56.2	54	
1.2	**Regulatory environment**		47.0	113 ○	◇
1.2.1	Regulatory quality*		49.5	64	
1.2.2	Rule of law*		49.2	57	
1.2.3	Cost of redundancy dismissal		36.0	125 ○	◇
1.3	**Business environment**		48.0	65	
1.3.1	Policies for doing business†		44.0	82	
1.3.2	Entrepreneurship policies and culture*	◴	52.0	31	
Human capital and research			**29.8**	**71**	
2.1	**Education**		39.2	98	
2.1.1	Expenditure on education, % GDP	◴	3.0	110 ○	
2.1.2	Government funding/pupil, secondary, % GDP/cap	◴	18.0	65	
2.1.3	School life expectancy, years	◴	15.4	46	
2.1.4	PISA scales in reading, maths and science		412.4	61	
2.1.5	Pupil-teacher ratio, secondary		23.6	103 ○	◇
2.2	**Tertiary education**		32.3	62	
2.2.1	Tertiary enrolment, % gross	◴	49.3	65	
2.2.2	Graduates in science and engineering, %	◴	27.9	27	
2.2.3	Tertiary inbound mobility, %	◴	1.3	85	
2.3	**Research and development (R&D)**		17.9	44	
2.3.1	Researchers, FTE/mn pop.	◴	1,790.1	41	◆
2.3.2	Gross expenditure on R&D, % GDP	◴	1.1	36	◆
2.3.3	Global corporate R&D investors, top 3, mn USD		0.0	38 ○	◇
2.3.4	QS university ranking, top 3*		33.2	37	
Infrastructure			**47.7**	**54**	
3.1	**Information and communication technologies (ICTs)**		80.4	46	
3.1.1	ICT access*		91.8	30	◆
3.1.2	ICT use*		72.9	49	◆
3.1.3	Government's online service*		79.4	42	
3.1.4	E-participation*		77.4	51	
3.2	**General infrastructure**		36.9	44	◆
3.2.1	Electricity output, GWh/mn pop.		2,667.3	68	
3.2.2	Logistics performance*		63.3	31	◆
3.2.3	Gross capital formation, % GDP		24.9	54	
3.3	**Ecological sustainability**		25.9	64	
3.3.1	GDP/unit of energy use		9.0	80	
3.3.2	Environmental performance*		38.1	78	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP		2.8	30	
Market sophistication			**45.3**	**27**	◆
4.1	**Credit**		55.3	11 ●	◆
4.1.1	Finance for startups and scaleups*	◴	49.7	14	◆
4.1.2	Domestic credit to private sector, % GDP		159.8	10 ●	◆
4.1.3	Loans from microfinance institutions, % GDP		n/a	n/a	
4.2	**Investment**		12.5	49	
4.2.1	Market capitalization, % GDP		103.9	14 ●	
4.2.2	Venture capital investors, deals/bn PPP$ GDP		0.0	71	
4.2.3	Venture capital recipients, deals/bn PPP$ GDP		0.0	87 ○	
4.2.4	Venture capital received, value, % GDP		0.0	57	
4.3	**Trade, diversification, and market scale**		67.9	21 ●	
4.3.1	Applied tariff rate, weighted avg., %	◴	3.5	77	
4.3.2	Domestic industry diversification	◴	96.8	21	
4.3.3	Domestic market scale, bn PPP$		1,331.1	21 ●	

			Score/ Value	Rank	
Business sophistication			**35.5**	**43**	
5.1	**Knowledge workers**		37.6	53	
5.1.1	Knowledge-intensive employment, %	◴	15.1	90	◇
5.1.2	Firms offering formal training, %	◴	18.0	85 ○	
5.1.3	GERD performed by business, % GDP	◴	0.8	30	◆
5.1.4	GERD financed by business, %	◴	80.8	1 ●	◆
5.1.5	Females employed w/advanced degrees, %	◴	10.5	71	
5.2	**Innovation linkages**		23.3	65	
5.2.1	University-industry R&D collaboration†		52.7	38	◆
5.2.2	State of cluster development and depth†		50.5	47	
5.2.3	GERD financed by abroad, % GDP	◴	0.0	80	
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP		0.0	55	
5.2.5	Patent families/bn PPP$ GDP		0.1	59	
5.3	**Knowledge absorption**		45.5	24	◆
5.3.1	Intellectual property payments, % total trade		1.8	16 ●	◆
5.3.2	High-tech imports, % total trade		18.4	13 ●	◆
5.3.3	ICT services imports, % total trade		0.4	119 ○	◇
5.3.4	FDI net inflows, % GDP		0.8	105 ○	
5.3.5	Research talent, % in businesses	◴	60.8	10 ●	◆
Knowledge and technology outputs			**30.0**	**43**	
6.1	**Knowledge creation**		20.4	45	
6.1.1	Patents by origin/bn PPP$ GDP		0.7	73	
6.1.2	PCT patents by origin/bn PPP$ GDP		0.1	62	
6.1.3	Utility models by origin/bn PPP$ GDP		2.6	8 ●	◆
6.1.4	Scientific and technical articles/bn PPP$ GDP		11.1	79	
6.1.5	Citable documents H-index		20.9	41	
6.2	**Knowledge impact**		32.1	52	
6.2.1	Labor productivity growth, %		1.2	58	
6.2.2	New businesses/th pop. 15–64		1.3	76	
6.2.3	Software spending, % GDP		0.2	54	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP		7.3	37	
6.2.5	High-tech manufacturing, %	◴	44.0	22	◆
6.3	**Knowledge diffusion**		37.4	36	◆
6.3.1	Intellectual property receipts, % total trade		0.1	64	
6.3.2	Production and export complexity		68.5	23	◆
6.3.3	High-tech exports, % total trade		18.6	8 ●	◆
6.3.4	ICT services exports, % total trade		0.2	126 ○	
Creative outputs			**25.2**	**49**	
7.1	**Intangible assets**		35.6	47	
7.1.1	Intangible asset intensity, top 15, %		62.0	38	
7.1.2	Trademarks by origin/bn PPP$ GDP		26.1	83	
7.1.3	Global brand value, top 5,000, % GDP		71.9	30	◆
7.1.4	Industrial designs by origin/bn PPP$ GDP		3.3	34	
7.2	**Creative goods and services**		26.3	42	◆
7.2.1	Cultural and creative services exports, % total trade		0.0	103 ○	
7.2.2	National feature films/mn pop. 15–69		1.0	59	
7.2.3	Entertainment and media market/th pop. 15–69		9.7	35	◆
7.2.4	Printing and other media, % manufacturing	◴	0.8	65	
7.2.5	Creative goods exports, % total trade		8.4	1 ●	◆
7.3	**Online creativity**		3.1	70	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69		5.5	51	
7.3.2	Country-code TLDs/th pop. 15–69		0.4	100	
7.3.3	GitHub commit pushes received/mn pop. 15–69		2.3	80	
7.3.4	Mobile app creation/bn PPP$ GDP		4.2	59	

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/global_innovation_index/en/2022. 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 Thailand.

Missing data for Thailand

Code	Indicator name	Economy year	Model year	Source
4.1.3	Loans from microfinance institutions, % GDP	n/a	2020	International Monetary Fund, Financial Access Survey (FAS)

Outdated data for Thailand

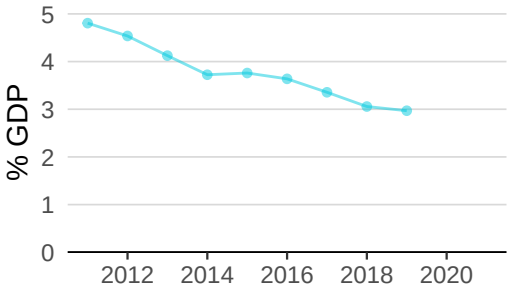
Code	Indicator name	Economy year	Model year	Source
1.3.2	Entrepreneurship policies and culture	2019	2021	Global Entrepreneurship Monitor
2.1.1	Expenditure on education, % GDP	2019	2020	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	2013	2018	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	2016	2019	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2016	2019	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	2016	2020	UNESCO Institute for Statistics
2.2.3	Tertiary inbound mobility, %	2016	2019	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2019	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2019	2020	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups	2019	2021	Global Entrepreneurship Monitor
4.3.1	Applied tariff rate, weighted avg., %	2015	2020	World Bank
4.3.2	Domestic industry diversification	2016	2019	United Nations Industrial Development Organization
5.1.1	Knowledge-intensive employment, %	2020	2021	International Labour Organization
5.1.2	Firms offering formal training, %	2016	2019	World Bank Enterprise Surveys
5.1.3	GERD performed by business, % GDP	2017	2020	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	2017	2019	UNESCO Institute for Statistics
5.1.5	Females employed w/advanced degrees, %	2020	2021	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2017	2019	UNESCO Institute for Statistics
5.3.5	Research talent, % in businesses	2017	2020	UNESCO Institute for Statistics
6.2.5	High-tech manufacturing, %	2016	2019	United Nations Industrial Development Organization
7.2.4	Printing and other media, % manufacturing	2016	2019	United Nations Industrial Development Organization

Code	Indicator name	Economy year	Model year	Source

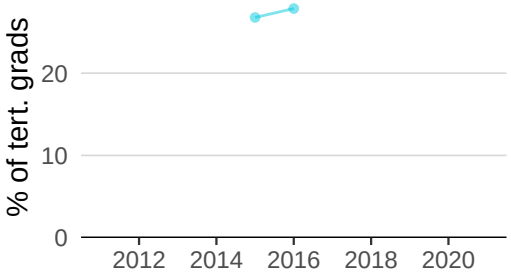
THAILAND'S INNOVATION SYSTEM

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

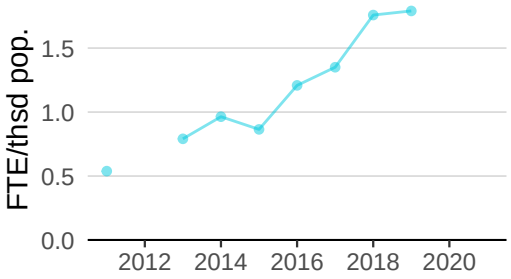
Innovation inputs



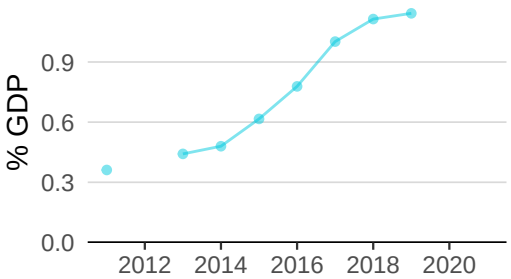
2.1.1 Expenditure on education was equal to 3.0% GDP in 2019–down by 3 percentage points from the year prior–and equivalent to an indicator rank of 110.



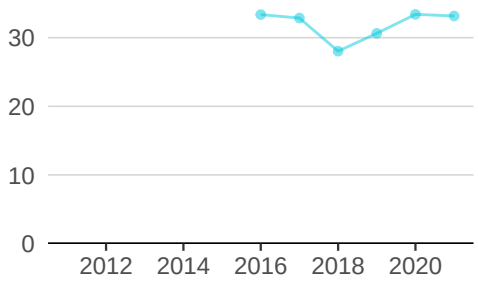
2.2.2 Graduates in science and engineering was equal to 27.9% of tert. grads in 2016–up by 4 percentage points from the year prior–and equivalent to an indicator rank of 27.



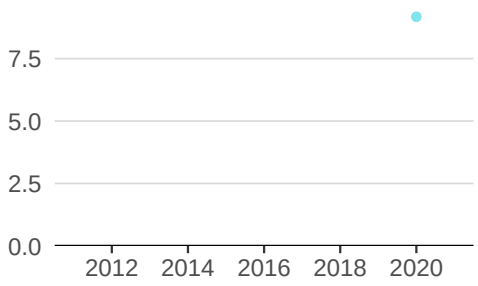
2.3.1 Researchers was equal to 1.8 FTE/thsd pop. in 2019–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 41.



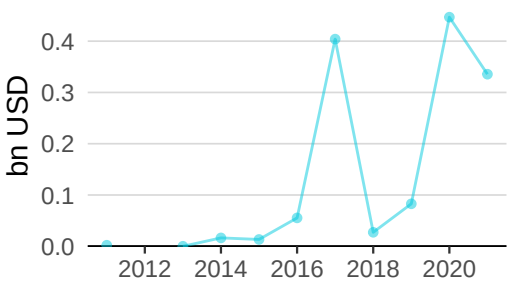
2.3.2 Gross expenditure on R&D was equal to 1.1% GDP in 2019–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 36.



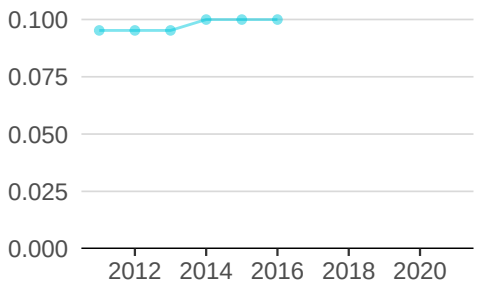
2.3.4 QS university ranking was equal to 33.2 in 2021–down by 1 percentage point from the year prior–and equivalent to an indicator rank of 37.



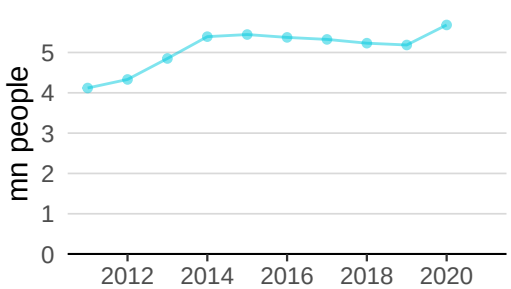
3.1.1 ICT access was equal to 9.2 in 2020 and equivalent to an indicator rank of 30.



4.2.4 Venture capital received was equal to 0.3 bn USD in 2021–down by 25 percentage points from the year prior–and equivalent to an indicator rank of 57.

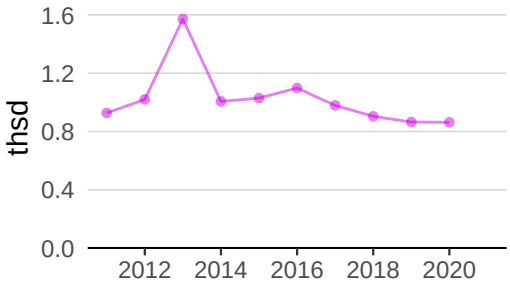


4.3.2 Domestic industry diversification was equal to 0.1 in 2016–effectively unchanged from the year prior–and equivalent to an indicator rank of 21.

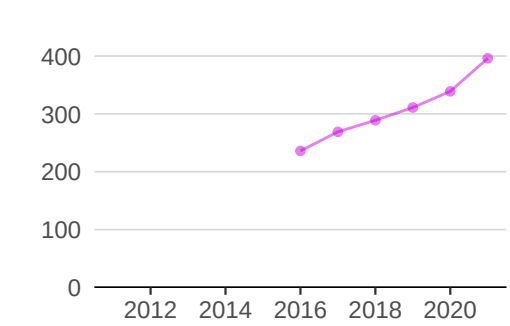


5.1.1 Knowledge-intensive employment was equal to 5.7 mn people in 2020–up by 10 percentage points from the year prior–and equivalent to an indicator rank of 90.

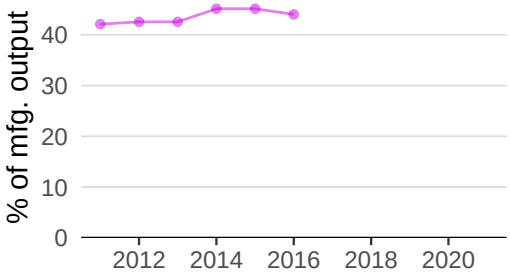
Innovation outputs



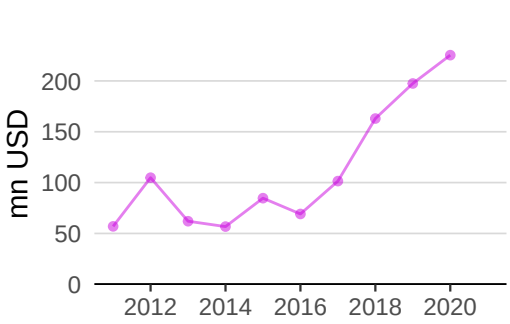
6.1.1 Patents by origin was equal to 0.9 thsd in 2020–effectively unchanged from the year prior–and equivalent to an indicator rank of 73.



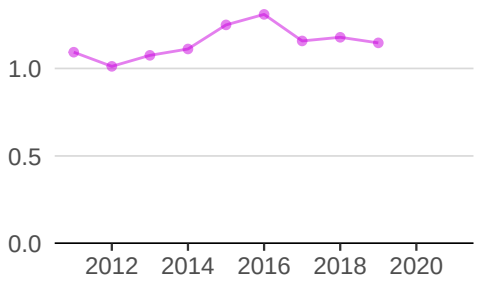
6.1.5 Citable documents H-index was equal to 396.0 in 2021–up by 17 percentage points from the year prior–and equivalent to an indicator rank of 41.



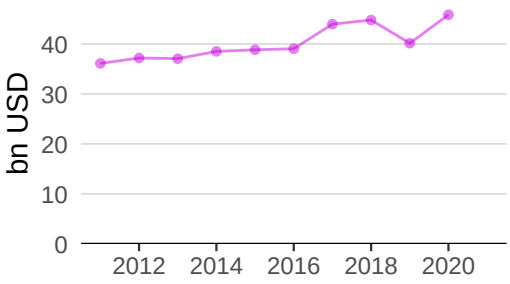
6.2.5 High-tech manufacturing was equal to 44.0% of mfg. output in 2016–down by 2 percentage points from the year prior–and equivalent to an indicator rank of 22.



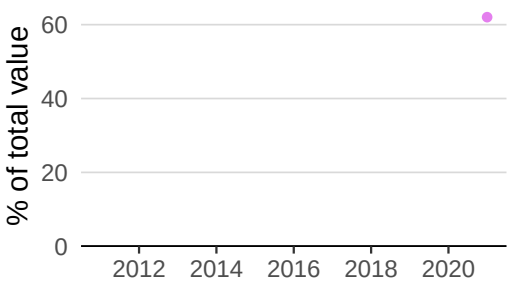
6.3.1 Intellectual property receipts was equal to 225.3 mn USD in 2020–up by 14 percentage points from the year prior–and equivalent to an indicator rank of 64.



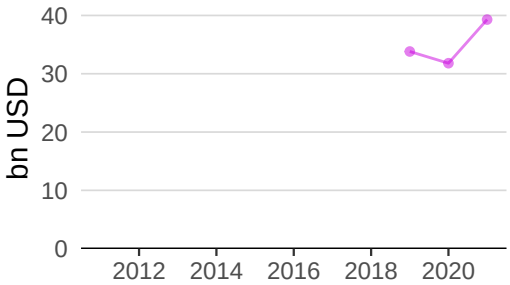
6.3.2 Production and export complexity was equal to 1.1 in 2019–down by 3 percentage points from the year prior–and equivalent to an indicator rank of 23.



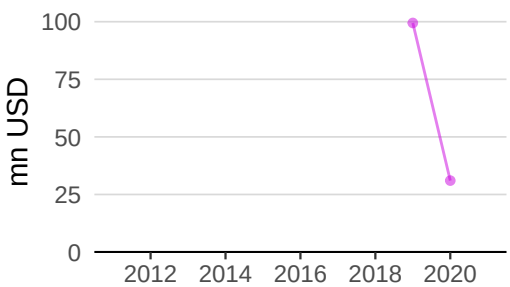
6.3.3 High-tech exports was equal to 45.8 bn USD in 2020–up by 14 percentage points from the year prior–and equivalent to an indicator rank of 8.



7.1.1 Intangible asset intensity was equal to 62.0% of total value in 2021 and equivalent to an indicator rank of 38.



7.1.3 Global brand value was equal to 39.3 bn USD in 2021–up by 24 percentage points from the year prior–and equivalent to an indicator rank of 30.



7.2.1 Cultural and creative services exports was equal to 31.0 mn USD in 2020–down by 69 percentage points from the year prior–and equivalent to an indicator rank of 103.

THAILAND'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank

No observations

Source: European Commission's Joint Research Centre (https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard).

2.3.4 QS university ranking

University	Score	Rank
CHULALONGKORN UNIVERSITY	41.9	215
MAHIDOL UNIVERSITY	38.1	255=
CHIANG MAI UNIVERSITY	19.5	601-650

Source: QS Quacquarelli Symonds Ltd (https://www.topuniversities.com/university-rankings/world-university-rankings/2022).
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".

7.1.1 Intangible asset intensity, top 15

Firm	Rank
AIRPORTS OF THAILAND	1
CP ALL	2
ADVANCED INFO SERVICE	3

Source: Brand Finance (https://brandirectory.com/reports/gift-2021).
Note: Brand Finance only provides within economy ranks.

7.1.3 Global brand value, top 5,000

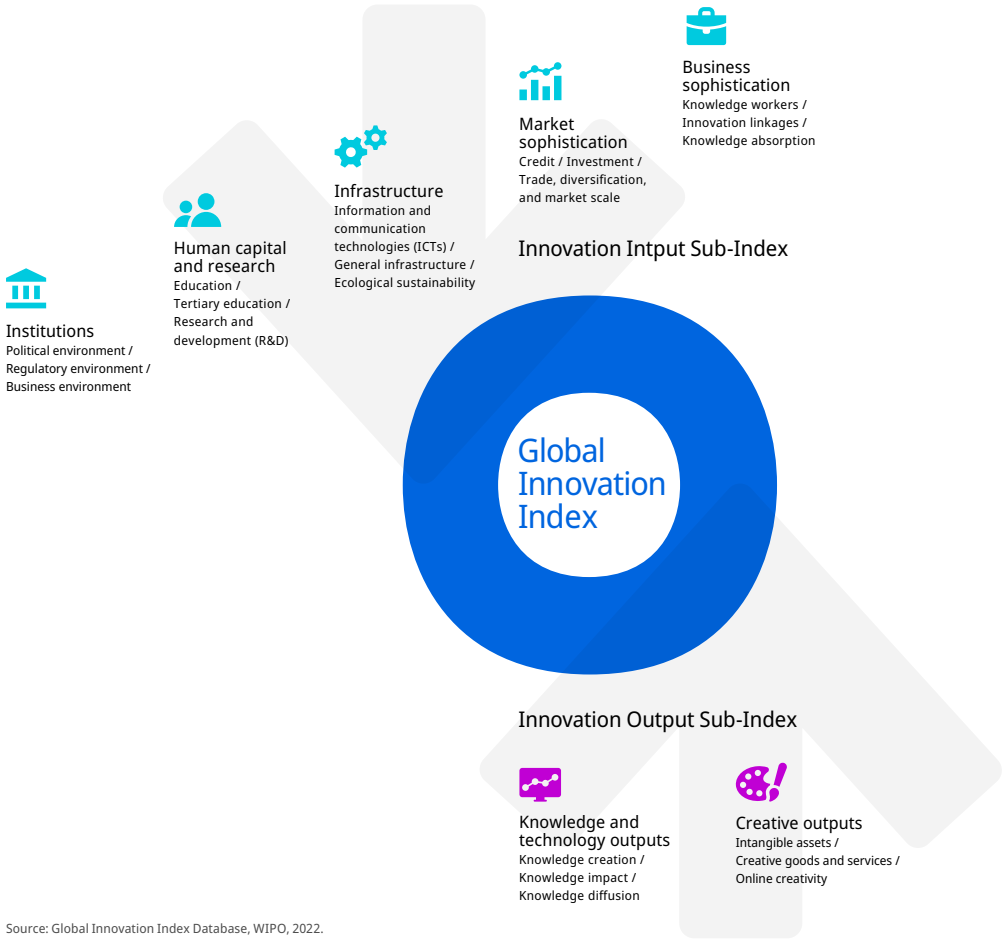
Brand	Industry	Rank
PTT	Oil & Gas	1
AIS	Telecoms	2
SCG	Engineering & Construction	3

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

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, 2022.

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.