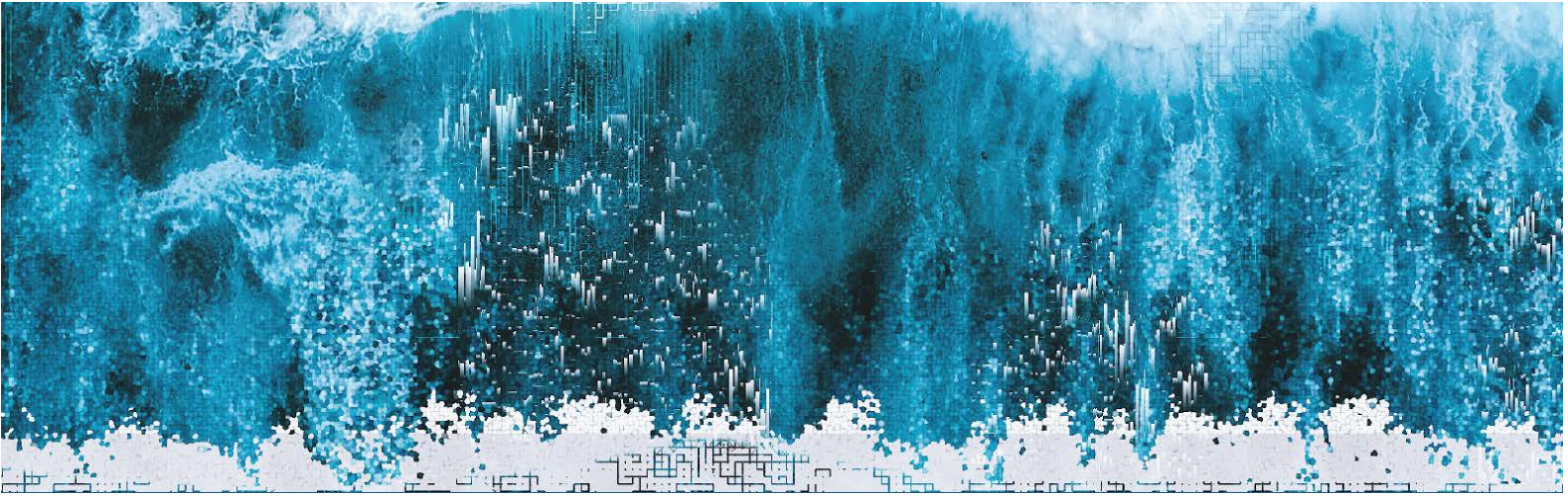


GLOBAL INNOVATION INDEX 2018

Singapore

5th Singapore is ranked 5th in the GII 2018, moving up 2 positions from the previous year.

The GII indicators are grouped into innovation inputs and outputs. The following table reflects Singapore's rankings over time[1].

Singapore's ranking over time

	GII	Input	Output	Efficiency
2018	5	1	15	63
2017	7	1	17	63
2016	6	1	20	78

- Over the last three years, Singapore has improved its ranking in innovation outputs, reaching the 15th spot this year, up from the 17th position in 2017 and the 20th in 2016.
- Singapore demonstrates stability in its performance in innovation inputs, ranking 1st in the world since 2016.
- Over the period 2016-2018, Singapore has improved in its efficiency to translate innovation inputs into outputs, albeit ranking rather low in the Efficiency Ratio (63rd). This ratio is negatively influenced by a much lower ranking in innovation outputs (15th) than inputs (1st).

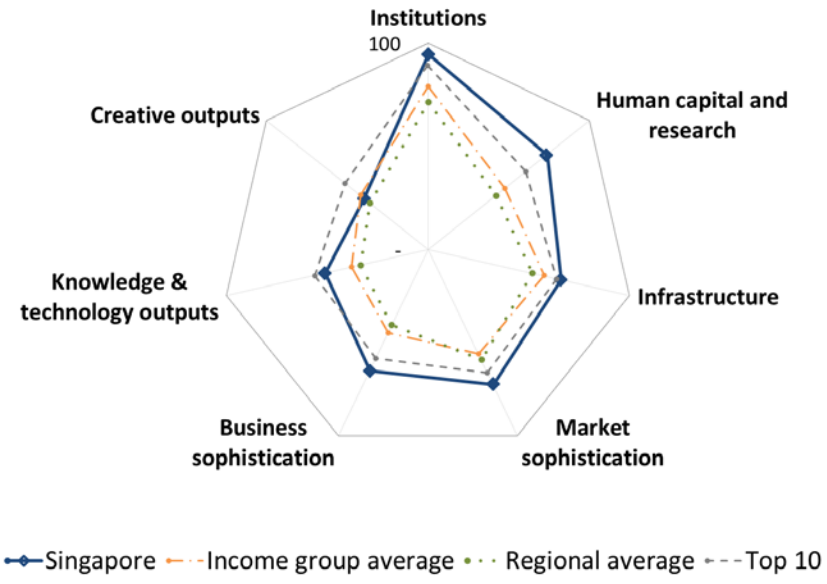
5th Singapore is ranked 5th among the 47 high-income countries in the GII 2018.

1st Singapore is the most innovative country in South East Asia and Oceania.

[1] Note that year-on-year comparisons of the GII ranks are imperfect and influenced by changes in the GII model and data availability.

Benchmarking Singapore to other high-income countries and the South East Asia and Oceania region

Singapore's scores by area



High-income countries

Singapore has high scores in the 5 input areas of the GII – **Institutions, Human Capital and Research, Infrastructure, Market Sophistication,** and **Business Sophistication**, in which it scores above the average of the top 10 countries in the GII 2018.

Top scores in areas *Political environment, Tertiary education, Information & Communication Technologies (ICTs), Trade, competition & market scale,* and *Knowledge workers* are behind these high rankings.

South East Asia and Oceania region

Compared to other countries in the South East Asia and Oceania region, Singapore performs above average in all GII areas.

Singapore's innovation profile

Strengths

- The major strength for Singapore is found in the **Innovation Input Sub-Index**, which summarizes the country's performance in innovation inputs and where Singapore is number 1.

- Most of Singapore's strengths are found in three of the five GII input areas: **Institutions** (1st), **Human Capital and Research** (1st), and **Business Sophistication** (2nd), which are all highlighted as comparative strengths.

- In **Institutions** (1st), Singapore has strong performance in the areas *Political environment* and *Regulatory environment*, both ranked 1st globally. In these two areas, particular strengths lie in indicators *Political stability & safety, Government effectiveness, Regulatory quality* and *Cost of redundancy dismissal* – all ranked 1st in the world.

- In **Human Capital and Research** (1st), Singapore exhibits strengths in *PISA results* (1st).

- In **Business Sophistication** (2nd), the country demonstrates strengths in the area *Knowledge absorption* (2nd) as well as in indicators *Knowledge-intensive employment* (2nd), *JV–strategic alliance deals per GDP* (3rd), *Intellectual property payments* (1st), and *FDI inflows* (1st).

- Among innovation inputs, in **Infrastructure** (5th), the indicator *Government's online service* (3rd) is also marked as a comparative strength. In **Market Sophistication** (4th), Singapore shows strong performance in the area *Investment* (2nd) as well as in indicators *Market capitalization* and *Applied tariff rate* – both ranking 1st globally.

- On the **innovation output** side, all strengths are found in **Knowledge and Technology Outputs** (11th). Here, Singapore shows strong performance at the variable level in *High-tech and medium high-tech output*, *High-tech exports,* and *FDI outflows* – where the country positions 1st in the world.

Weaknesses

- Singapore's main weakness is the **Innovation Efficiency Ratio** in which it is positioned 63rd globally.

- Two out of four relative GII weaknesses on the **innovation input** side are found in the **Human Capital and Research** (1st). These are indicators *Expenditure on education* (103rd) and *Pupil-teacher ratio* (69th).

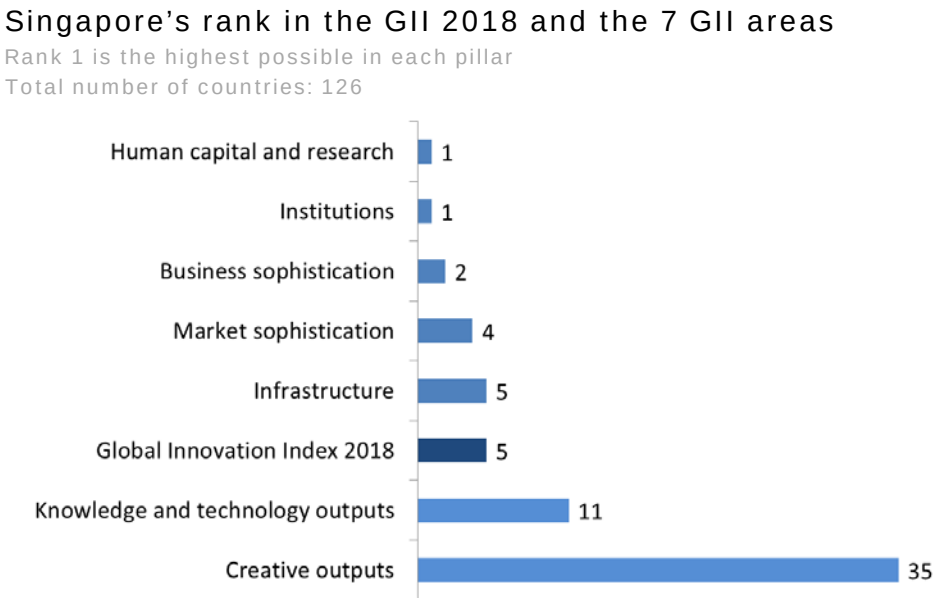
- In **Infrastructure** (5th), the indicator *Environmental performance* (45th) is a relative weakness.

- In **Business Sophistication** (2nd), Singapore performs weakly in the indicator *GERD financed by abroad* (53rd).

- On the **innovation output** side, most of the relative weaknesses are exhibited in the area **Creative Outputs** (35th), where Singapore exhibits relative weaknesses in indicators *Trademarks by origin* (88th), *Industrial designs by origin* (62nd), *National feature films* (38th), and *Printing & other media* (70th).

- In **Knowledge & Technology Outputs** (11th), two relative weaknesses are found at the variable level in *Productivity growth* (58th) and *ICT services exports* (69th).

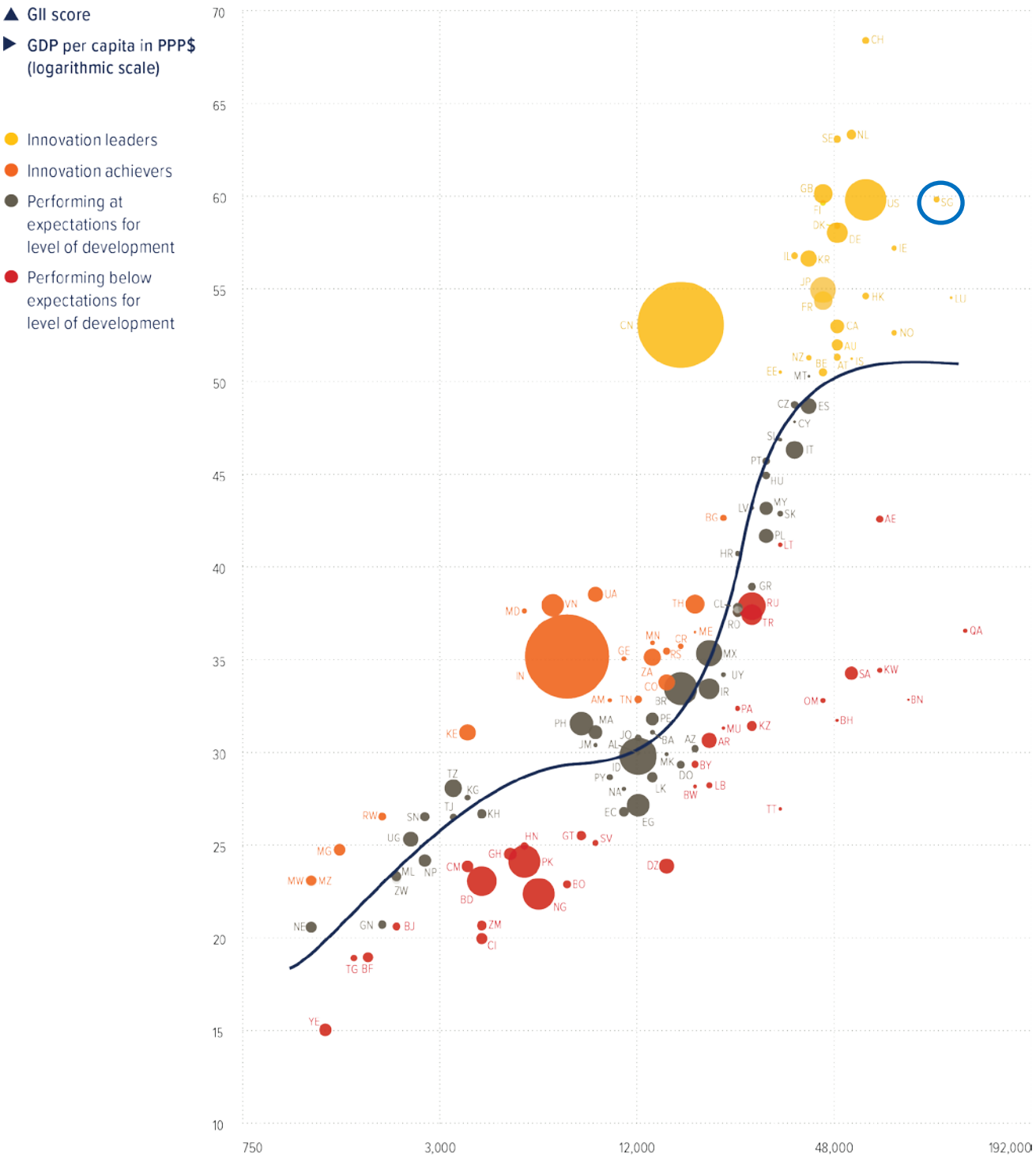
The following figure presents a summary of Singapore's ranks in the 7 GII areas, as well as the overall rank in the GII 2018.



Expected vs. Observed Innovation Performance

The GII bubble chart shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The depicted trendline gives an indication of the expected innovation performance at different levels of income. Countries located above the trendline are performing better that what would be expected based on their income level. Countries below the line are Innovation Under-performers relative to GDP.

Relative to GDP, Singapore performs well above its expected level of development.



Missing and Outdated Data

More and better data improve the ability of a country to understand its strengths and weaknesses and give policymakers greater capacity to plan and adapt public policies accordingly. The GII 2018 covers 126 countries that complied with the minimum indicator coverage of 35 indicators in the Innovation Input Sub-Index (66%) and 18 indicators in the Innovation Output Sub-Index (66%).

The following tables show data for Singapore that is not available or that is outdated.

Missing Data

Code	Indicator	Country Year	Model Year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2014	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	n/a	2016	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	n/a	2016	UNESCO Institute for Statistics
2.2.2	Graduates in science & engineering, %	n/a	2016	UNESCO Institute for Statistics
4.1.3	Microfinance gross loans, % GDP	n/a	2016	Microfinance Information Exchange, Mix Market
5.1.2	Firms offering formal training, % firms	n/a	2013	World Bank, Enterprise Surveys
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2016	WIPO, Intellectual Property Statistics
7.2.1	Cultural & creative services exports, % total trade	n/a	2016	WTO, Trade in Commercial Services

Outdated Data

Code	Indicator	Country Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2013	2014	UNESCO Institute for Statistics
2.1.5	Pupil-teacher ratio, secondary	2009	2016	UNESCO Institute for Statistics
2.2.3	Tertiary inbound mobility, %	2013	2016	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2014	2016	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2014	2016	UNESCO Institute for Statistics
5.1.1	Knowledge-intensive employment, %	2015	2016	ILO, ILOSTAT
5.1.3	GERD performed by business, % GDP	2014	2016	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	2014	2015	UNESCO Institute for Statistics
5.1.5	Females employed w/advanced degrees, %	2015	2016	ILO, ILOSTAT
5.2.3	GERD financed by abroad, %	2014	2015	UNESCO Institute for Statistics
5.3.5	Research talent, % in business enterprise	2014	2016	UNESCO Institute for Statistics

SINGAPORE

GII 2018 rank **5**

Output rank	Input rank	Income	Region	Efficiency ratio	Population (mn)	GDP, PPP$	GDP per capita, PPP$	GII 2017 rank
15	1 ●	High	SEAO	63 ○	5.7	513.7	93,905.5	7

		Score/Value	Rank	
	Institutions	**94.7**	**1**	● ◆
1.1	Political environment	100.0	1	● ◆
1.1.1	Political stability & safety*	100.0	1	● ◆
1.1.2	Government effectiveness*	100.0	1	● ◆
1.2	Regulatory environment	98.6	1	●
1.2.1	Regulatory quality*	100.0	1	● ◆
1.2.2	Rule of law*	94.2	9	
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3	Business environment	85.4	19	
1.3.1	Ease of starting a business*	96.5	6	
1.3.2	Ease of resolving insolvency*	74.3	25	
	Human capital & research	**73.3**	**1**	● ◆
2.1	Education	54.3	42	
2.1.1	Expenditure on education, % GDP	2.9	103	○ ◇
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths & science	551.6	1	● ◆
2.1.5	Pupil-teacher ratio, secondary	14.9	69	○ ◇
2.2	Tertiary education	96.6	[1]	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	19.2	5	◆
2.3	Research & development (R&D)	68.9	10	
2.3.1	Researchers, FTE/mn pop.	6,729.7	5	◆
2.3.2	Gross expenditure on R&D, % GDP	2.2	13	
2.3.3	Global R&D companies, top 3, mn US$	72.7	15	
2.3.4	QS university ranking, average score top 3*	70.2	13	
	Infrastructure	**65.8**	**5**	◆
3.1	Information & communication technologies (ICTs)	87.3	8	
3.1.1	ICT access*	86.1	12	
3.1.2	ICT use*	74.5	22	
3.1.3	Government's online service*	97.1	3	● ◆
3.1.4	E-participation*	91.5	8	
3.2	General infrastructure	57.4	11	
3.2.1	Electricity output, kWh/cap	9,100.2	17	
3.2.2	Logistics performance*	96.2	5	
3.2.3	Gross capital formation, % GDP	25.5	36	
3.3	Ecological sustainability	52.7	18	
3.3.1	GDP/unit of energy use	16.9	9	◆
3.3.2	Environmental performance*	64.2	45	○ ◇
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.6	40	
	Market sophistication	**72.4**	**4**	◆
4.1	Credit	66.2	13	
4.1.1	Ease of getting credit*	75.0	26	
4.1.2	Domestic credit to private sector, % GDP	132.9	15	
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	75.3	2	● ◆
4.2.1	Ease of protecting minority investors*	80.0	4	◆
4.2.2	Market capitalization, % GDP	225.2	1	● ◆
4.2.3	Venture capital deals/bn PPP$ GDP	0.1	14	
4.3	Trade, competition, & market scale	75.6	17	
4.3.1	Applied tariff rate, weighted mean, %	0.0	1	● ◆
4.3.2	Intensity of local competition†	78.6	15	
4.3.3	Domestic market scale, bn PPP$	513.7	38	

		Score/Value	Rank	
	Business sophistication	**65.1**	**2**	● ◆
5.1	Knowledge workers	73.4	4	
5.1.1	Knowledge-intensive employment, %	54.3	2	● ◆
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % GDP	1.3	15	
5.1.4	GERD financed by business, %	54.1	16	
5.1.5	Females employed w/advanced degrees, %	23.7	15	
5.2	Innovation linkages	49.4	15	
5.2.1	University/industry research collaboration†	71.3	8	
5.2.2	State of cluster development†	69.6	9	
5.2.3	GERD financed by abroad, %	6.8	53	○
5.2.4	JV–strategic alliance deals/bn PPP$ GDP	0.2	3	● ◆
5.2.5	Patent families 2+ offices/bn PPP$ GDP	2.2	18	
5.3	Knowledge absorption	72.4	2	● ◆
5.3.1	Intellectual property payments, % total trade	4.1	1	● ◆
5.3.2	High-tech net imports, % total trade	21.5	5	◆
5.3.3	ICT services imports, % total trade	1.8	31	
5.3.4	FDI net inflows, % GDP	22.8	1	● ◆
5.3.5	Research talent, % in business enterprise	50.5	22	
	Knowledge & technology outputs	**51.3**	**11**	
6.1	Knowledge creation	31.9	30	◇
6.1.1	Patents by origin/bn PPP$ GDP	3.3	32	◇
6.1.2	PCT patents by origin/bn PPP$ GDP	1.7	20	
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	18.9	27	
6.1.5	Citable documents H index	35.6	24	
6.2	Knowledge impact	52.6	13	
6.2.1	Growth rate of PPP$ GDP/worker, %	1.0	58	○
6.2.2	New businesses/th pop. 15–64	8.6	16	
6.2.3	Computer software spending, % GDP	0.3	35	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	9.6	31	
6.2.5	High- & medium-high-tech manufactures, %	0.7	1	● ◆
6.3	Knowledge diffusion	69.2	4	◆
6.3.1	Intellectual property receipts, % total trade	1.1	17	
6.3.2	High-tech net exports, % total trade	28.6	1	● ◆
6.3.3	ICT services exports, % total trade	1.4	69	○
6.3.4	FDI net outflows, % GDP	11.9	1	● ◆
	Creative outputs	**39.6**	**35**	◇
7.1	Intangible assets	48.1	44	◇
7.1.1	Trademarks by origin/bn PPP$ GDP	19.7	88	○ ◇
7.1.2	Industrial designs by origin/bn PPP$ GDP	1.3	62	○
7.1.3	ICTs & business model creation†	80.7	8	
7.1.4	ICTs & organizational model creation†	75.9	11	
7.2	Creative goods & services	39.4	19	
7.2.1	Cultural & creative services exports, % total trade	n/a	n/a	
7.2.2	National feature films/mn pop. 15–69	4.8	38	○
7.2.3	Entertainment & Media market/th pop. 15–69	44.7	20	
7.2.4	Printing & other media, % manufacturing	0.8	70	○
7.2.5	Creative goods exports, % total trade	5.0	10	◆
7.3	Online creativity	22.9	32	◇
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	25.3	23	
7.3.2	Country-code TLDs/th pop. 15–69	11.4	37	◇
7.3.3	Wikipedia edits/mn pop. 15–69	23.8	45	◇
7.3.4	Mobile app creation/bn PPP$ GDP	39.0	17	

NOTES: ● indicates a strength; ○ a weakness; ◆ a strength **relative to the other top 25–ranked GII economies;** ◇ a weakness **relative to the other top 25;** * an index; † a survey question. ◴ indicates that the country's data are older than the base year; see Appendix II 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; see pagepage 75 of this appendix for details.