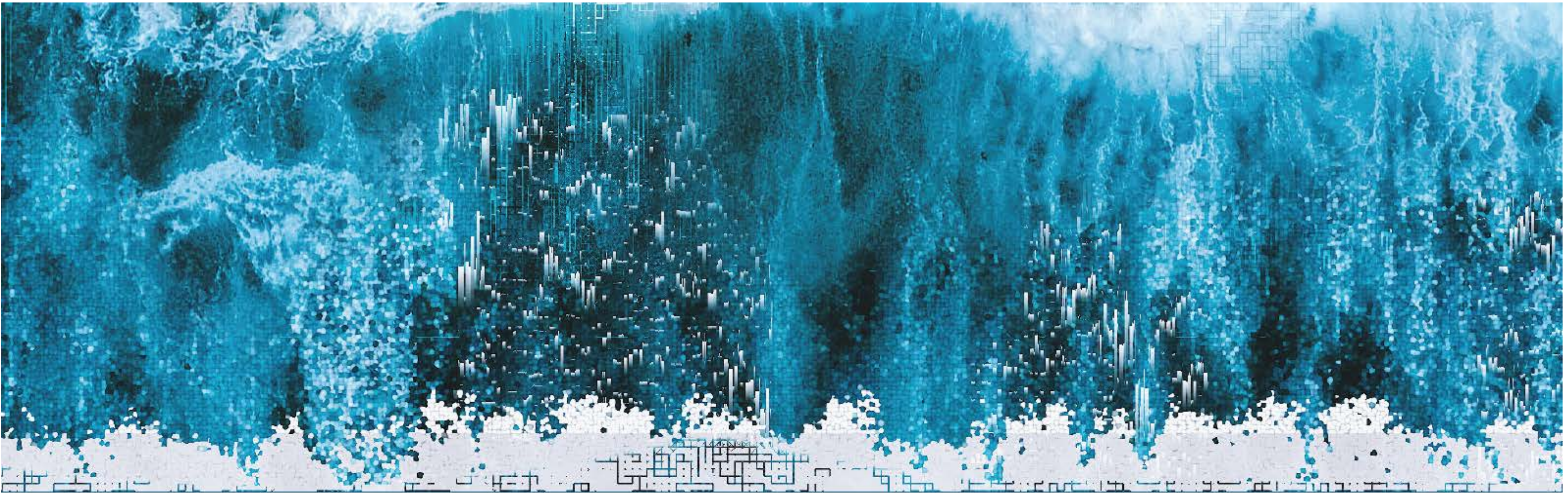


GLOBAL INNOVATION INDEX 2018

Ireland

10th Ireland is ranked 10th in the GII 2018, same position as the previous year.

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

Ireland's ranking over time

	GII	Input	Output	Efficiency
2018	10	18	9	13
2017	10	19	8	6
2016	7	16	5	8

- Ireland performs better in innovation outputs than inputs.
- This year it improves in innovation inputs, moving up 1 position and placing 18th.
- Over the last three years, Ireland's ranking in innovation outputs has slightly deteriorated. This year it takes the 9th spot, down 1 position from 2017 and 4 from 2016.
- Ireland ranks 13th in the Innovation Efficiency Ratio, moving down 7 positions since last year. In spite of this loss, Ireland proves to be quite efficient in translating its innovation inputs into outputs, as its innovation outputs (9th) rank higher than its inputs (18th).

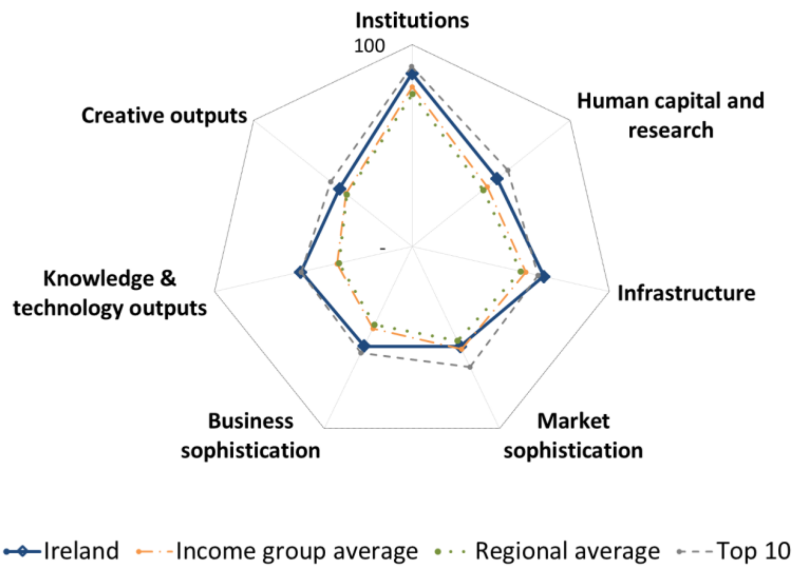
10th Ireland is ranked 10th among the 47 high-income countries in the GII 2018.

8th Ireland is ranked 8th among the 39 countries in Europe.

[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 Ireland to other high-income countries and the Europe region

Ireland's scores by area



High-income countries

Ireland has high scores in 2 out of the 7 GII areas – **Infrastructure** and **Knowledge & Technology Outputs**, in which it scores above the average of the top 10 countries in the GII 2018.

Top scores in areas such as *Information & Communication Technologies (ICTs)* and *Knowledge diffusion* are behind this high ranking.

Europe region

Compared to other countries in the Europe region, Ireland performs above-average in all 7 GII areas.

Ireland's innovation profile

Strengths

- Most GII strengths for Ireland are concentrated in **Knowledge & Technology Outputs,** which is itself a GII strength and where the country ranks 4th. Two of the three components of Knowledge & Technology Outputs are marked as strengths. These are *Knowledge impact* (5th) and *Knowledge diffusion* (1st). Several of their indicators are also strong: *Computer software spending* (2nd), *High- & medium-high-tech manufactures* (3rd), *Intellectual property receipts* (7th) as well as *ICT services exports* and *FDI outflows* – both ranking 1st globally.

- The other strengths for Ireland are found in four or the five input areas of the GII, with majority of them in **Infrastructure** (4th) and **Business Sophistication** (10th).

- The area **Infrastructure** positions 4th globally and is highlighted as a GII strength for Ireland. Here the country performs strongly in the component *Ecological sustainability*, where it ranks 5th, and in the indicator *GDP per unit of energy use*, where it ranks 3rd.

- In **Business Sophistication** (10th), the area *Knowledge absorption* (6th) is marked as a GII strength. At the indicator level, Ireland also exhibits strengths in *Intellectual property payments* and *FDI inflows*, both placing 1st globally.

- Finally, the indicator *Ease of starting a business* (8th) presents strong performance in **Institutions** (17th), while the indicator *School life expectancy* (3rd) is strong within **Human Capital & Research** (17th).

Weaknesses

- Ireland's relative weaknesses are found mostly among **innovation inputs**, scattered across four GII areas.

- In **Institutions** (17th), one relative weakness is found in the indicator *Cost of redundancy dismissal* (54th).

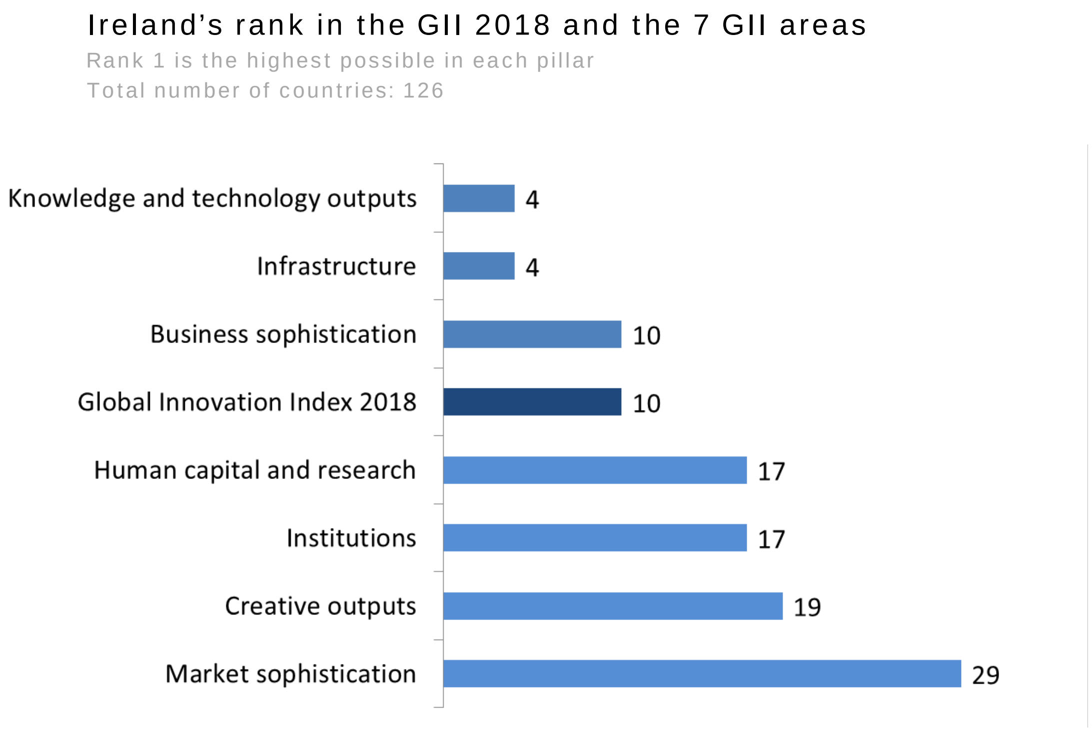
- In **Human Capital & Research** (17th), two indicators – *Expenditure on education* (59th) and *Government funding per pupil* (45th) – are identified as GII weaknesses.

- In **Market Sophistication** (29th), Ireland demonstrates relative weaknesses in the indicators *Domestic credit to private sector* (71st) and *Intensity of local competition* (49th).

- In **Business Sophistication** (10th), the indicators *High-tech imports* (49th) and *ICT services imports* (89rd) present a relatively weak performance.

- On the **innovation output** side, relative weaknesses are found in three indicators within **Creative Outputs** (19th): *Industrial designs by origin* (68th), *Cultural & creative services exports* (49th), and *Printing & other media* (81st).

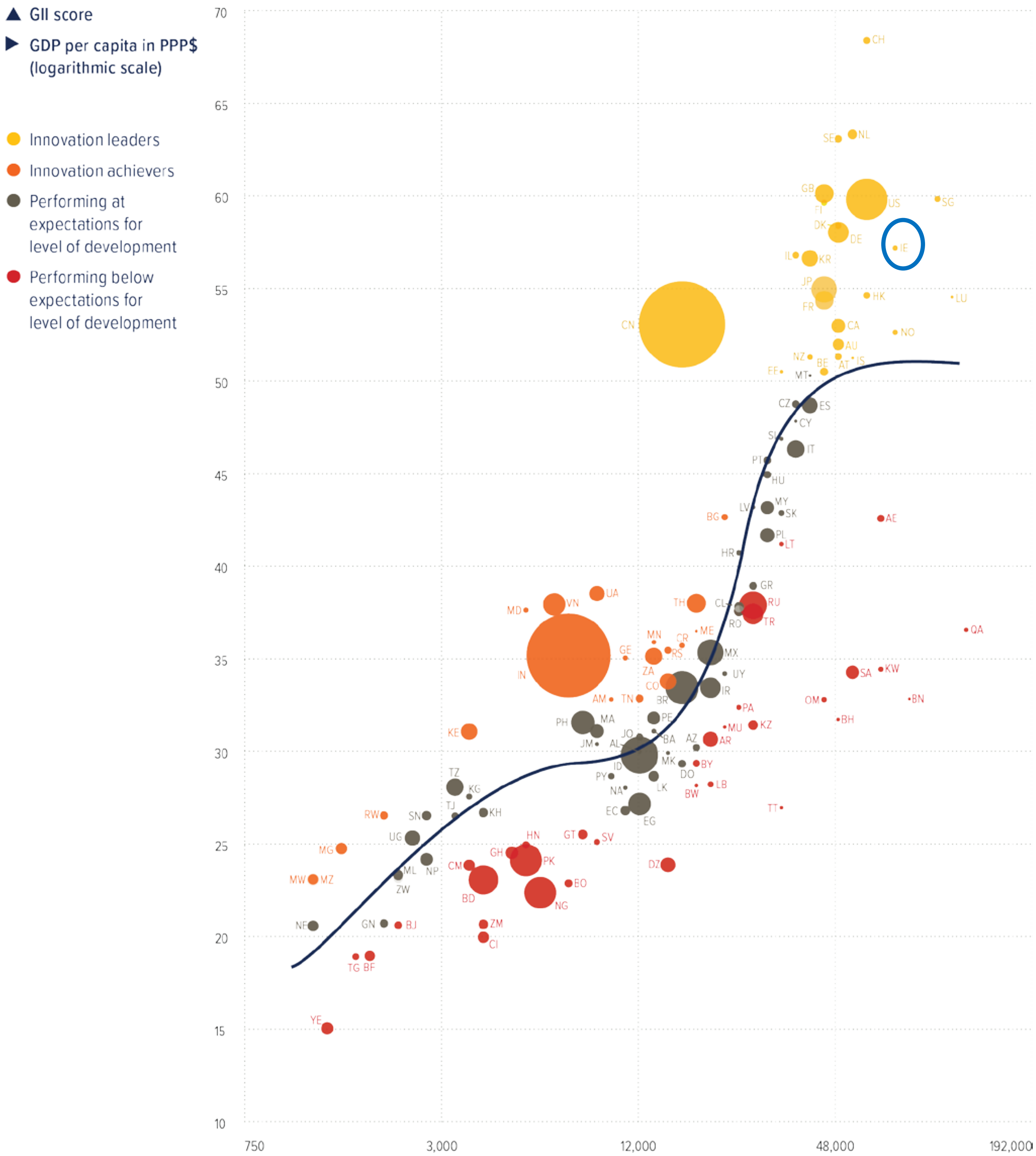
The following figure presents a summary of Ireland's ranks in the 7 GII areas, as well as the overall rank in the GII 2018.



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, Ireland performs well above its expected level of development.



Missing and Outdated Data

More and better data improves 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 Ireland that is not available or that is outdated.

Missing Data

Code	Indicator	Country Year	Model Year	Source
2.1.5	Pupil-teacher ratio, secondary	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
7.1.1	Trademarks by origin/bn PPP$ GDP	n/a	2016	WIPO, Intellectual Property Statistics

Outdated Data

Code	Indicator	Country Year	Model Year	Source
2.1.3	School life expectancy, years	2015	2016	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2015	2016	UNESCO Institute for Statistics
2.2.2	Graduates in science & engineering, %	2015	2016	UNESCO Institute for Statistics
6.2.5	High- & medium-high-tech manufactures, %	2013	2015	UNIDO, Industrial Statistics
7.2.1	Cultural & creative services exports, % total trade	2015	2016	WTO, Trade in Commercial Services
7.2.5	Creative goods exports, % total trade	2015	2016	UN COMTRADE

IRELAND

GII 2018 rank
10

Output rank	Input rank	Income	Region	Efficiency ratio	Population (mn)	GDP, PPP$	GDP per capita, PPP$	GII 2017 rank
9	18	High	EUR	13	4.8	344.8	75,538.4	10

		Score/Value	Rank	
	Institutions	**85.7**	**17**	
1.1	Political environment	80.8	18	
1.1.1	Political stability & safety*	85.0	21	
1.1.2	Government effectiveness*	78.7	22	
1.2	Regulatory environment	88.9	16	
1.2.1	Regulatory quality*	88.7	11	
1.2.2	Rule of law*	86.1	17	
1.2.3	Cost of redundancy dismissal, salary weeks	14.3	54	○
1.3	Business environment	87.5	12	
1.3.1	Ease of starting a business*	95.9	8	●
1.3.2	Ease of resolving insolvency*	79.0	16	

		Score/Value	Rank	
	Human capital & research	**53.8**	**17**	
2.1	Education	55.3	37	
2.1.1	Expenditure on education, % GDP	4.9	59	○
2.1.2	Government funding/pupil, secondary, % GDP/cap	21.6	45	○
2.1.3	School life expectancy, years◷	19.6	3	● ◆
2.1.4	PISA scales in reading, maths & science	509.0	10	
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a	
2.2	Tertiary education	48.9	20	
2.2.1	Tertiary enrolment, % gross◷	83.5	10	
2.2.2	Graduates in science & engineering, %◷	24.9	31	
2.2.3	Tertiary inbound mobility, %	8.2	26	
2.3	Research & development (R&D)	57.2	19	
2.3.1	Researchers, FTE/mn pop.	5,563.4	9	
2.3.2	Gross expenditure on R&D, % GDP	1.2	32	◇
2.3.3	Global R&D companies, top 3, mn US$	80.7	10	
2.3.4	QS university ranking, average score top 3*	53.1	18	

		Score/Value	Rank	
	Infrastructure	**66.7**	**4**	● ◆
3.1	Information & communication technologies (ICTs)	75.2	28	◇
3.1.1	ICT access*	81.4	21	
3.1.2	ICT use*	75.9	20	
3.1.3	Government's online service*	72.5	39	◇
3.1.4	E-participation*	71.2	39	◇
3.2	General infrastructure	60.1	9	
3.2.1	Electricity output, kWh/cap	6,439.5	33	
3.2.2	Logistics performance*	80.1	18	
3.2.3	Gross capital formation, % GDP	33.7	15	◆
3.3	Ecological sustainability	64.8	5	● ◆
3.3.1	GDP/unit of energy use	20.8	3	● ◆
3.3.2	Environmental performance*	78.8	9	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	2.9	36	

		Score/Value	Rank	
	Market sophistication	**54.8**	**29**	
4.1	Credit	44.4	44	
4.1.1	Ease of getting credit*	70.0	38	
4.1.2	Domestic credit to private sector, % GDP	47.4	71	○ ◇
4.1.3	Microfinance gross loans, % GDP	n/a	n/a	
4.2	Investment	50.9	34	
4.2.1	Ease of protecting minority investors*	75.0	10	
4.2.2	Market capitalization, % GDP	46.3	34	
4.2.3	Venture capital deals/bn PPP$ GDP	0.1	15	
4.3	Trade, competition, & market scale	69.2	34	
4.3.1	Applied tariff rate, weighted mean, %	1.6	19	
4.3.2	Intensity of local competition†	71.7	49	○
4.3.3	Domestic market scale, bn PPP$	344.8	48	

		Score/Value	Rank	
	Business sophistication	**54.6**	**10**	
5.1	Knowledge workers	59.8	22	
5.1.1	Knowledge-intensive employment, %	40.8	23	
5.1.2	Firms offering formal training, % firms	n/a	n/a	
5.1.3	GERD performed by business, % GDP	0.8	23	
5.1.4	GERD financed by business, %	48.4	27	
5.1.5	Females employed w/advanced degrees, %	24.8	11	
5.2	Innovation linkages	50.2	13	
5.2.1	University/industry research collaboration†	67.4	13	
5.2.2	State of cluster development†	62.7	19	
5.2.3	GERD financed by abroad, %	23.8	16	◆
5.2.4	JV–strategic alliance deals/bn PPP$ GDP	0.1	19	
5.2.5	Patent families 2+ offices/bn PPP$ GDP	2.1	20	
5.3	Knowledge absorption	53.8	6	●
5.3.1	Intellectual property payments, % total trade	23.9	1	● ◆
5.3.2	High-tech net imports, % total trade	9.2	49	○
5.3.3	ICT services imports, % total trade	0.7	89	○ ◇
5.3.4	FDI net inflows, % GDP	43.2	1	● ◆
5.3.5	Research talent, % in business enterprise	42.5	28	

		Score/Value	Rank	
	Knowledge & technology outputs	**56.6**	**4**	●
6.1	Knowledge creation	26.1	37	◇
6.1.1	Patents by origin/bn PPP$ GDP	2.7	36	◇
6.1.2	PCT patents by origin/bn PPP$ GDP	1.4	26	◇
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	14.3	37	◇
6.1.5	Citable documents H index	32.2	28	
6.2	Knowledge impact	57.6	5	● ◆
6.2.1	Growth rate of PPP$ GDP/worker, %	2.3	30	
6.2.2	New businesses/th pop. 15–64	6.7	21	
6.2.3	Computer software spending, % GDP	0.8	2	● ◆
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	7.4	46	
6.2.5	High- & medium-high-tech manufactures, %◷	0.6	3	● ◆
6.3	Knowledge diffusion	86.0	1	● ◆
6.3.1	Intellectual property receipts, % total trade	2.6	7	●
6.3.2	High-tech net exports, % total trade	11.9	15	
6.3.3	ICT services exports, % total trade	22.4	1	● ◆
6.3.4	FDI net outflows, % GDP	44.9	1	● ◆

		Score/Value	Rank	
	Creative outputs	**45.9**	**19**	
7.1	Intangible assets	59.3	12	
7.1.1	Trademarks by origin/bn PPP$ GDP	n/a	n/a	
7.1.2	Industrial designs by origin/bn PPP$ GDP	1.0	68	○
7.1.3	ICTs & business model creation†	76.4	19	
7.1.4	ICTs & organizational model creation†	69.5	21	
7.2	Creative goods & services	27.3	48	◇
7.2.1	Cultural & creative services exports, % total trade◷	0.1	49	○ ◇
7.2.2	National feature films/mn pop. 15–69	10.1	15	
7.2.3	Entertainment & Media market/th pop. 15–69	49.5	18	
7.2.4	Printing & other media, % manufacturing	0.5	81	○
7.2.5	Creative goods exports, % total trade◷	1.7	33	
7.3	Online creativity	37.7	22	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	61.6	11	
7.3.2	Country-code TLDs/th pop. 15–69	20.7	27	
7.3.3	Wikipedia edits/mn pop. 15–69	49.5	24	
7.3.4	Mobile app creation/bn PPP$ GDP	35.1	21	

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.