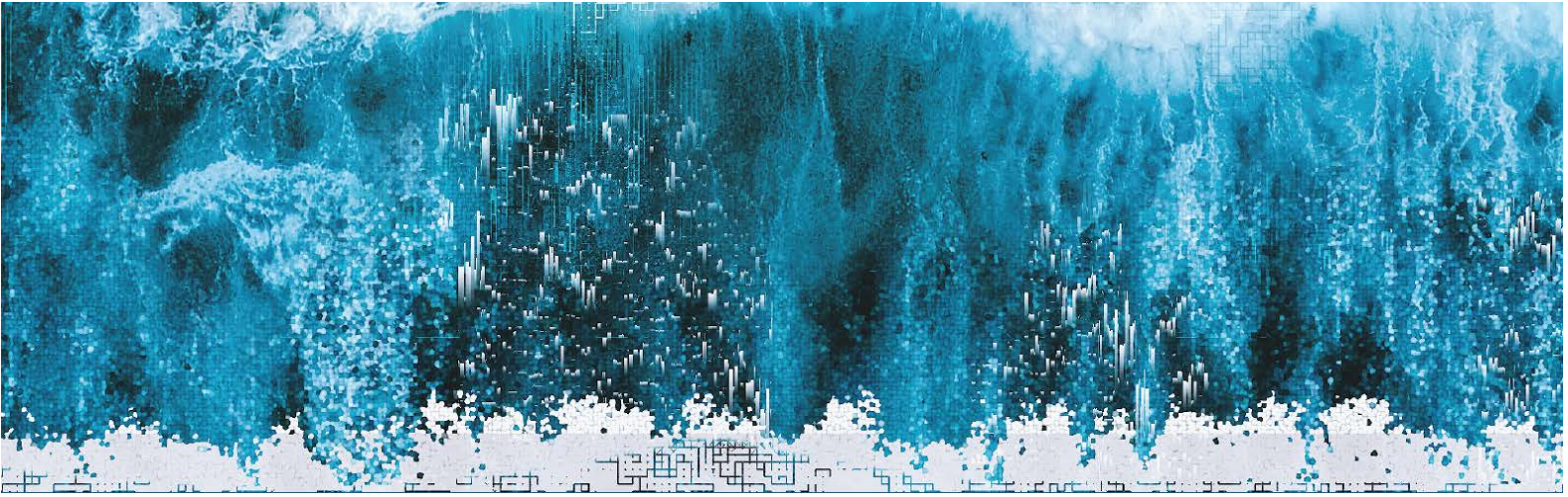


GLOBAL INNOVATION INDEX 2018

South Africa

58th South Africa is ranked 58th in the GII 2018, dropping 1 position from last year.

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

South Africa's ranking over time

	GII	Input	Output	Efficiency
2018	58	48	65	83
2017	57	49	69	97
2016	54	47	71	99

- South Africa performs better in innovation inputs than outputs.
- It improves in innovation inputs this year, moving up 1 spot to the 48th position, after seeing a 2-position drop last year.
- Over the last three years, South Africa has consistently advanced in innovation outputs, reaching the 65th position, up from 69th in 2017 and the 71st in 2016.
- South Africa also shows an upward trend in the Innovation Efficiency Ratio, which moves to the 83rd global position, up from the 97th in 2017 and 99th in 2016. Relative to its GII position (58th), South Africa's Efficiency Ratio (83rd) ranks rather low, indicating that improving its efficiency in translating innovation inputs into outputs is an area of opportunity for the country.

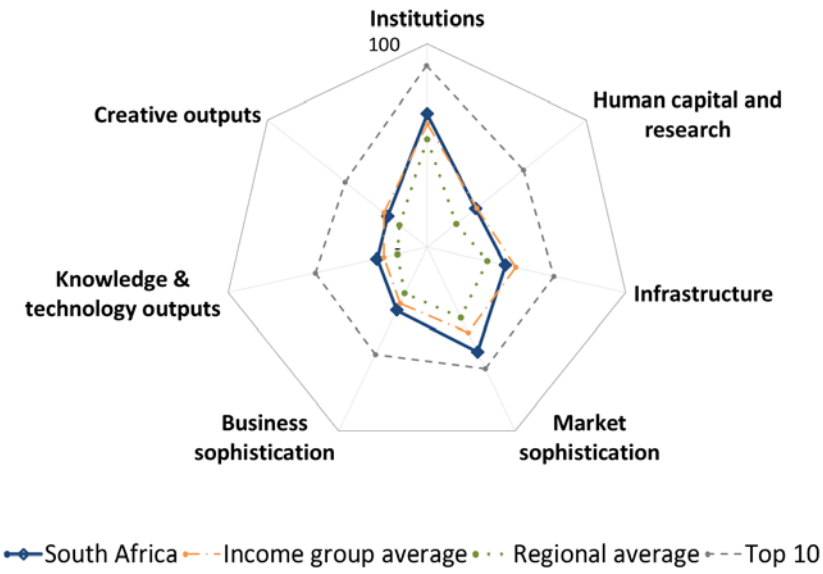
13th South Africa is ranked 13th among the 34 upper-middle income countries in the GII 2018.

1st South Africa is the most innovative economy in Sub-Saharan Africa.

[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 South Africa to other upper-middle-income countries and the Sub-Saharan Africa region

South Africa's scores by area



Upper-middle-income countries

South Africa has high scores in 4 of the 7 GII areas – **Institutions, Market Sophistication, Business Sophistication,** and **Knowledge & Technology Outputs**, in which it scores above the average of the upper-middle-income group.

Top scores in areas such as *Regulatory environment, Trade, competition & market scale, Knowledge workers,* and *Knowledge impact* are behind these high rankings.

Sub-Saharan Africa region

Compared to other countries in the Sub-Saharan Africa region, South Africa performs above-average in all 7 GII areas.

South Africa's innovation profile

Strengths

- Most of the comparative GII strengths for South Africa are found on the **innovation input** side of the GII.

- The area **Market Sophistication** (23rd) – the top-ranked GII area for South Africa – is highlighted as a strength. Here the country also shows strong performance in one of its three components – *Investment* (16th) and in two of its three indicators, *Ease of protecting minority investors* (24th) and *Market capitalization* where it positions 1st globally. Other GII strengths are in *Domestic credit to private sector* (10th) and *Domestic market scale* (29th).

- In **Business Sophistication** (47th), South Africa exhibits strength in indicators *University-industry research collaboration* (28th), *State of cluster development* (28th), and *Intellectual property payments* (12th).

- Strengths on the **Innovation Input** side are also marked in **Institutions** (53rd) – in the indicator *Cost of redundancy dismissal* (26th) and in **Human Capital & Research** (64th) – in indicator *Expenditure on education* (24th). In addition, the indicator *Logistics performance* (20th) is signaled as strength in **Infrastructure** (84th).

- On the **innovation output** side, South Africa shows only one strength in indicator *New business density* (12th) within the area **Knowledge & Technology Outputs** (55th).

Weaknesses

- Most of the weaknesses for South Africa are found in the **innovation input** side of the GII.

- GII weaknesses are mostly exhibited in **Infrastructure** (84th), where one of its component, *Ecological sustainability* (116th), is marked as a relative weakness. At the indicator level, *Gross capital formation* (98th), *GDP per unit of energy use* (107th), and *Environmental performance* (108th) are also signaled as GII weaknesses.

- Two relative weaknesses appear in **Human Capital & Research** (64th) in indicators *Pupil-teacher ratio* (99th) and *Tertiary enrolment* (89th).

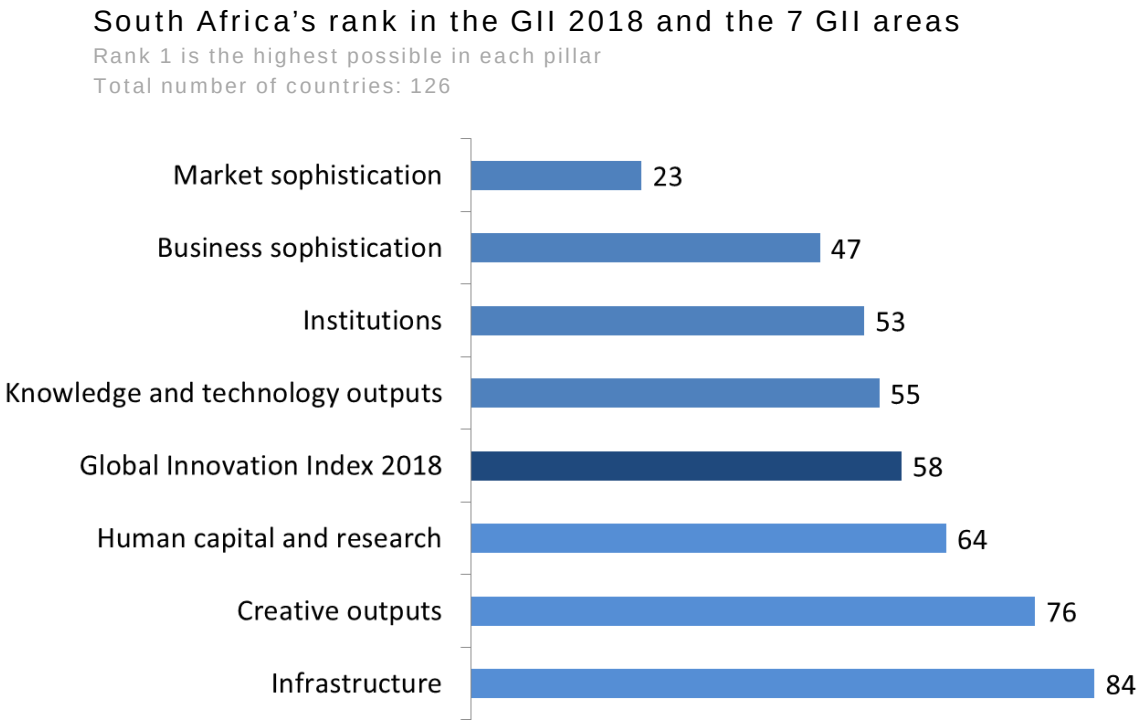
- In **Institutions** (53rd), a single GII weakness lies in indicator *Ease of starting a business* (101st).

- In **Market Sophistication** (23rd), only one indicator – *Microfinance gross loans* (71st) – is a relative weakness for South Africa.

- In **Business Sophistication** (47th), *FDI inflows* (106th) is a relatively weak indicator for South Africa.

- On the **innovation output** side, South Africa performs relatively weakly in two indicators: *ICT services exports* (96th) in **Knowledge & Technology Outputs** (55th) and *National feature films* (89th) in **Creative Outputs** (76th).

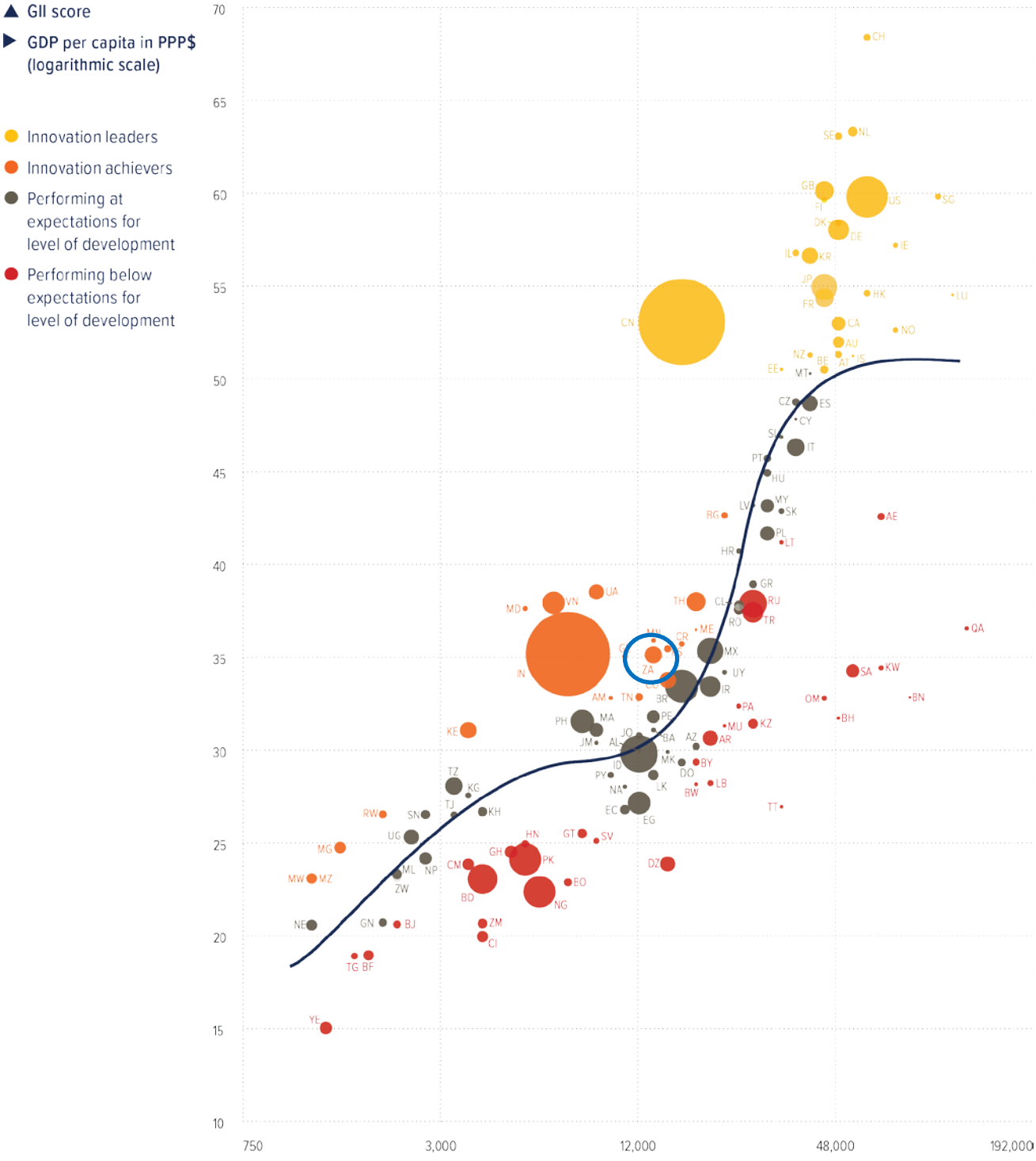
The following figure presents a summary of South Africa's ranks in the 7 GII areas, as well as the overall rank in the GII 2018.



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, South Africa performs 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 South Africa that is not available or that is outdated.

Missing Data

Code	Indicator	Country Year	Model Year	Source
2.1.4	PISA scales in reading, maths & science	n/a	2015	OECD PISA
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2016	WIPO, Intellectual Property Statistics
7.2.4	Printing & other media, % manufacturing	n/a	2015	UNIDO, Industrial Statistics

Outdated Data

Code	Indicator	Country Year	Model Year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	2012	2014	UNESCO Institute for Statistics (UIS)
2.1.3	School life expectancy, years	2014	2016	UNESCO Institute for Statistics (UIS)
2.1.5	Pupil-teacher ratio, secondary	2015	2016	UNESCO Institute for Statistics (UIS)
2.2.1	Tertiary enrolment, % gross	2014	2016	UNESCO Institute for Statistics (UIS)
2.2.2	Graduates in science & engineering, %	2015	2016	UNESCO Institute for Statistics (UIS)
2.2.3	Tertiary inbound mobility, %	2015	2016	UNESCO Institute for Statistics (UIS)
2.3.1	Researchers, FTE/mn pop.	2015	2016	UNESCO Institute for Statistics (UIS)
2.3.2	Gross expenditure on R&D, % GDP	2015	2016	UNESCO Institute for Statistics (UIS)
4.1.3	Microfinance gross loans, % GDP	2015	2016	Microfinance Information Exchange, Mix Market
5.1.2	Firms offering formal training, % firms	2007	2013	World Bank, Enterprise Surveys
5.1.3	GERD performed by business, % GDP	2015	2016	UNESCO Institute for Statistics (UIS)
5.3.5	Research talent, % in business enterprise	2015	2016	UNESCO Institute for Statistics (UIS)
6.2.5	High- & medium-high-tech manufactures, %	2010	2015	UNIDO, Industrial Statistics
7.3.3	Wikipedia edits/mn pop. 15–69	2016	2017	Wikimedia Foundation

SOUTH AFRICA

GII 2018 rank **58**

Output rank	Input rank	Income	Region	Efficiency ratio	Population (mn)	GDP, PPP$	GDP per capita, PPP$	GII 2017 rank
65	48	Upper-middle	SSF	83	56.7	757.3	13,544.6	57

		Score/Value	Rank	
	Institutions	**65.6**	**53**	
1.1	Political environment	55.1	56	
1.1.1	Political stability & safety*	61.6	71	
1.1.2	Government effectiveness*	51.9	53	
1.2	Regulatory environment	72.8	42	◆
1.2.1	Regulatory quality*	49.5	59	
1.2.2	Rule of law*	45.9	55	
1.2.3	Cost of redundancy dismissal, salary weeks	9.3	26	●
1.3	Business environment	68.8	63	
1.3.1	Ease of starting a business*	80.0	101	○
1.3.2	Ease of resolving insolvency*	57.6	51	
	Human capital & research	**30.5**	**64**	
2.1	Education	42.2	83	
2.1.1	Expenditure on education, % GDP	5.9	24	●
2.1.2	Government funding/pupil, secondary, % GDP/cap[d]	21.0	50	
2.1.3	School life expectancy, years[d]	13.4	72	
2.1.4	PISA scales in reading, maths & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary[d]	27.8	99	○ ◇
2.2	Tertiary education	23.1	87	
2.2.1	Tertiary enrolment, % gross[d]	19.8	89	○ ◇
2.2.2	Graduates in science & engineering, %[d]	19.6	64	
2.2.3	Tertiary inbound mobility, %[d]	4.1	49	
2.3	Research & development (R&D)	26.2	38	
2.3.1	Researchers, FTE/mn pop.[d]	473.1	67	
2.3.2	Gross expenditure on R&D, % GDP[d]	0.8	42	
2.3.3	Global R&D companies, top 3, mn US$	42.3	34	◆
2.3.4	QS university ranking, average score top 3*	38.3	33	
	Infrastructure	**39.4**	**84**	
3.1	Information & communication technologies (ICTs)	51.4	81	
3.1.1	ICT access*	54.8	76	
3.1.2	ICT use*	39.1	80	
3.1.3	Government's online service*	55.8	75	
3.1.4	E-participation*	55.9	74	
3.2	General infrastructure	42.1	48	
3.2.1	Electricity output, kWh/cap	4,485.3	47	
3.2.2	Logistics performance*	79.2	20	● ◆
3.2.3	Gross capital formation, % GDP	19.1	98	○
3.3	Ecological sustainability	24.6	116	○ ◇
3.3.1	GDP/unit of energy use	4.7	107	○ ◇
3.3.2	Environmental performance*	44.7	108	○ ◇
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	1.8	51	
	Market sophistication	**57.0**	**23**	● ◆
4.1	Credit	40.9	50	
4.1.1	Ease of getting credit*	60.0	61	
4.1.2	Domestic credit to private sector, % GDP	144.4	10	● ◆
4.1.3	Microfinance gross loans, % GDP[d]	0.0	71	○
4.2	Investment	60.9	16	● ◆
4.2.1	Ease of protecting minority investors*	70.0	24	●
4.2.2	Market capitalization, % GDP	273.2	1	● ◆
4.2.3	Venture capital deals/bn PPP$ GDP	0.0	53	
4.3	Trade, competition, & market scale	69.2	35	
4.3.1	Applied tariff rate, weighted mean, %	4.2	78	
4.3.2	Intensity of local competition†	72.7	41	
4.3.3	Domestic market scale, bn PPP$	757.3	29	●

		Score/Value	Rank	
	Business sophistication	**34.4**	**47**	
5.1	Knowledge workers	35.9	62	
5.1.1	Knowledge-intensive employment, %	23.6	64	
5.1.2	Firms offering formal training, % firms[d]	36.8	37	
5.1.3	GERD performed by business, % GDP[d]	0.3	43	
5.1.4	GERD financed by business, %	38.9	43	
5.1.5	Females employed w/advanced degrees, %	9.7	62	
5.2	Innovation linkages	35.0	46	◆
5.2.1	University/industry research collaboration†	56.3	28	● ◆
5.2.2	State of cluster development†	58.3	28	● ◆
5.2.3	GERD financed by abroad, %	13.0	35	
5.2.4	JV–strategic alliance deals/bn PPP$ GDP	0.1	34	
5.2.5	Patent families 2+ offices/bn PPP$ GDP	0.3	37	◆
5.3	Knowledge absorption	32.2	53	
5.3.1	Intellectual property payments, % total trade	2.3	12	● ◆
5.3.2	High-tech net imports, % total trade	10.9	31	
5.3.3	ICT services imports, % total trade	1.2	60	
5.3.4	FDI net inflows, % GDP	1.0	106	○ ◇
5.3.5	Research talent, % in business enterprise[d]	17.7	58	
	Knowledge & technology outputs	**25.2**	**55**	
6.1	Knowledge creation	16.7	54	
6.1.1	Patents by origin/bn PPP$ GDP	1.0	64	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.4	37	
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP	10.9	46	
6.1.5	Citable documents H index	27.7	33	◆
6.2	Knowledge impact	40.1	47	
6.2.1	Growth rate of PPP$ GDP/worker, %	0.0	78	
6.2.2	New businesses/th pop. 15–64	10.2	12	● ◆
6.2.3	Computer software spending, % GDP	0.3	37	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	6.4	51	
6.2.5	High- & medium-high-tech manufactures, %[d]	0.3	40	
6.3	Knowledge diffusion	18.9	68	
6.3.1	Intellectual property receipts, % total trade	0.1	51	
6.3.2	High-tech net exports, % total trade	2.5	49	
6.3.3	ICT services exports, % total trade	0.6	96	○
6.3.4	FDI net outflows, % GDP	1.7	39	
	Creative outputs	**24.6**	**76**	
7.1	Intangible assets	38.5	76	
7.1.1	Trademarks by origin/bn PPP$ GDP	30.8	73	
7.1.2	Industrial designs by origin/bn PPP$ GDP	1.5	59	
7.1.3	ICTs & business model creation†	60.5	61	
7.1.4	ICTs & organizational model creation†	56.9	51	
7.2	Creative goods & services	13.2	84	
7.2.1	Cultural & creative services exports, % total trade	0.2	44	
7.2.2	National feature films/mn pop. 15–69	0.6	89	○
7.2.3	Entertainment & Media market/th pop. 15–69	7.8	38	
7.2.4	Printing & other media, % manufacturing	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.9	47	
7.3	Online creativity	8.0	59	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.1	62	
7.3.2	Country-code TLDs/th pop. 15–69	8.5	40	
7.3.3	Wikipedia edits/mn pop. 15–69[d]	4.2	87	
7.3.4	Mobile app creation/bn PPP$ GDP	17.6	47	

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question.
[d] 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 page 75 of this appendix for details.