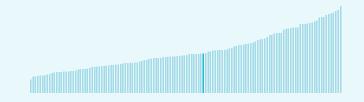


The Global Innovation Index (GII) ranks world economies according to their innovation capabilities.

Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation**.

South Africa ranking in the Global Innovation Index 2023

South Africa ranks 59th among the 132 economies featured in the GII 2023.



- South Africa ranks 12th among the 33 upper-middle-income group economies.
- > South Africa ranks
 2nd among the 28
 economies in SubSaharan Africa.



> South Africa GII Ranking (2020-2023)

The table shows the rankings of South Africa over the past four years. 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 South Africa in the GII 2023 is between ranks 57 and 65.

	GII Position
2020	60th
2021	61st
2022	61st
2023	59th

Innovation Inputs	Innovation Outputs
49th	68th
55th	68th
69th	61st
71st	57th

South Africa performs better in innovation outputs than innovation inputs in 2023.

This year South Africa ranks 71st in innovation inputs. This position is lower than last year.

South Africa ranks 57th in innovation outputs. This position is higher than last year.

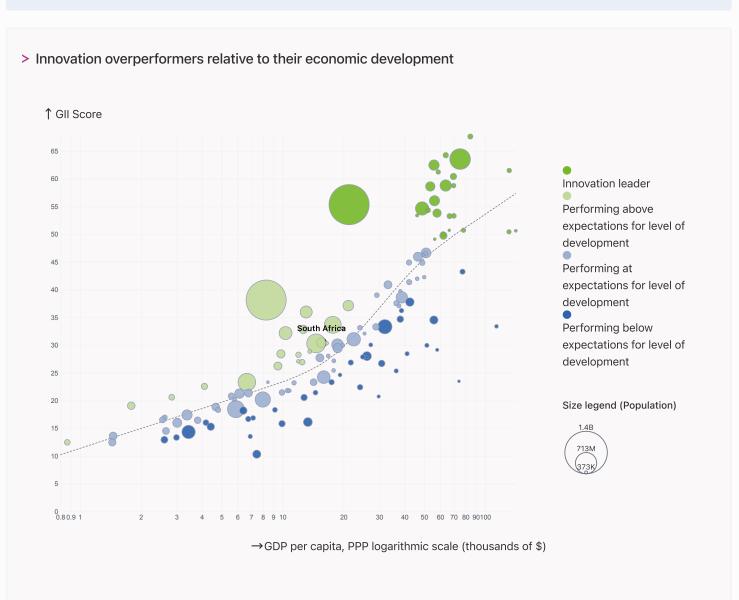


→ Expected vs. observed innovation performance

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, South Africa is performing above expectations for its level of development.



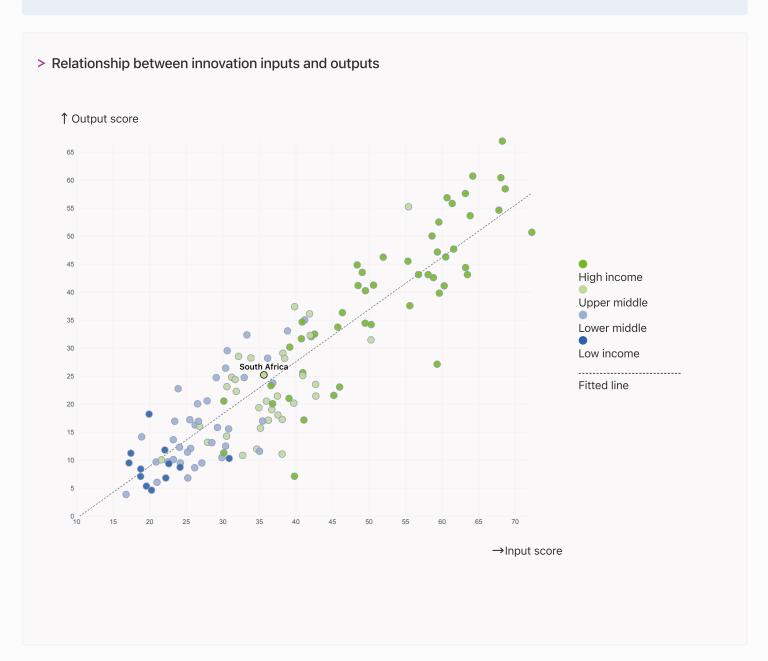


→ Effectively translating innovation investments into innovation outputs

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.



> South Africa produces more innovation outputs relative to its level of innovation investments.





→ Overview of South Africa's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for South Africa are those that rank above the GII (shown in blue) and the weakest are those that rank below.

45th Market sophistication Highest rankings → 56th Knowledge and technology outputs • 59th Global Innovation Index 61st Business sophistication 63rd Creative outputs 68th Infrastructure 84th Human capital and research ← Lowest rankings 88th Institutions

> Highest rankings



South Africa ranks highest in Market sophistication (45th) and Knowledge and technology outputs (56th).

> Lowest rankings



South Africa ranks lowest in Institutions (88th), Human capital and research (84th) and Infrastructure (68th).

The full WIPO Intellectual Property

Statistics profile for South Africa can be found on this link.



→ Benchmark of South Africa against other country groupings for each of the seven areas of the GII Index

The charts shows the relative position of South Africa (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

> Upper-Middle-Income economies

South Africa performs above the uppermiddle-income group average in Knowledge and technology outputs, Creative outputs, Market sophistication.

> Sub-Saharan Africa

South Africa performs above the regional average in all the pillars.

Knowledge and technology outputs

Top 10 | Score: 58.96

South Africa | Score: 25.05

Upper middle income | Score: 22.36

Sub-Saharan Africa | Score: 12.16

Creative outputs

Top 10 | 56.09

South Africa | 25.31

Upper middle income | 23.16

Sub-Saharan Africa | 10.36

Business sophistication

Top 10 | 64.39

Upper middle income | 29.27

South Africa | 29.04

Sub-Saharan Africa | 19.85

Market sophistication

Top 10 | 61.93

South Africa | 40.42

Upper middle income | 35.45

Sub-Saharan Africa | 20.00

Human capital and research

Top 10 | 60.28

Upper middle income | 29.68

South Africa | 25.80

Sub-Saharan Africa | 17.80

Infrastructure

Top 10 | 62.83

Upper middle income | 40.40

South Africa | 39.26

Sub-Saharan Africa | 23.36

Institutions

Top 10 | 79.85

Upper middle income | 47.71

South Africa | 43.75

Sub-Saharan Africa | 43.27



→ Innovation strengths and weaknesses in South Africa

The table below gives an overview of the indicator strengths and weaknesses of South Africa in the GII 2023.



> South Africa's main innovation strengths are **Market capitalization**, % **GDP** (rank 1), **Expenditure on education**, % **GDP** (rank 11) and **Logistics performance** (rank 18).

Strengths Weaknesses

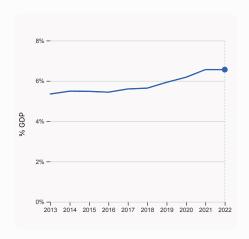
Rank	Code	Indicator name	Rank	Code	Indicator name
1	4.2.1	Market capitalization, % GDP	125	3.2.3	Gross capital formation, % GDP
11	2.1.1	Expenditure on education, % GDP	115	2.1.5	Pupil-teacher ratio, secondary
18	3.2.2	Logistics performance	108	3.3.1	GDP/unit of energy use
20	2.1.2	Government funding/pupil, secondary, % GDP/cap	100	1.3.1	Policies for doing business
22	7.1.3	Global brand value, top 5,000	96	1.1.1	Operational stability for businesses
22	4.1.2	Domestic credit to private sector, % GDP	95	5.1.2	Firms offering formal training, %
22	5.3.3	ICT services imports, % total trade	91	2.2.2	Graduates in science and engineering, %
25	1.2.3	Cost of redundancy dismissal	77	1.3.2	Entrepreneurship policies and culture
27	5.3.1	Intellectual property payments, % total trade	65	7.2.2	National feature films/mn pop. 15-69
28	6.2.3	Software spending, % GDP	40	2.3.3	Global corporate R&D investors, top 3, mn US\$



→ South Africa's innovation system

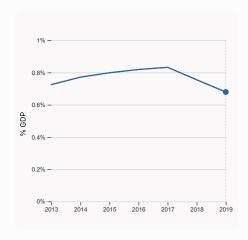
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in South Africa



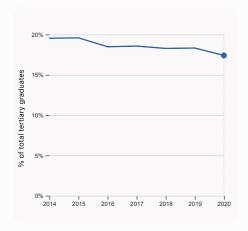
2.1.1 Expenditure on education, % GDP

was equal to 6.56% GDP in 2022, with no change from the year prior – and equivalent to an indicator rank of 11.



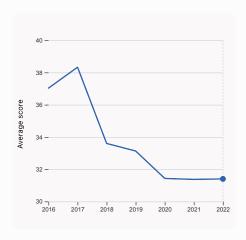
2.3.2 Gross expenditure on R&D, % GDP

was equal to 0.679% GDP in 2019, down by 0.076 percentage points from the year prior – and equivalent to an indicator rank of 53.



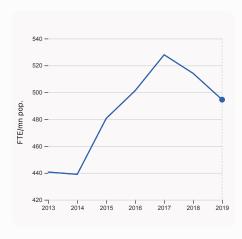
2.2.2 Graduates in science and engineering, %

was equal to 17.41% of total tertiary graduates in 2020, down by 0.92 percentage points from the year prior – and equivalent to an indicator rank of 91.



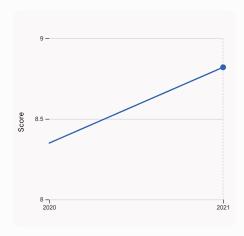
2.3.4 QS university ranking, top 3

was equal to an average score of 31.4 for the top 3 universities in 2022, up by 0.096% from the year prior – and equivalent to an indicator rank of 41.



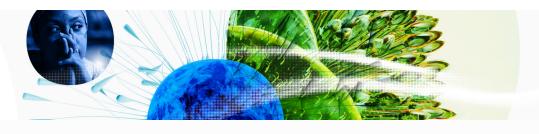
2.3.1 Researchers, FTE/mn pop.

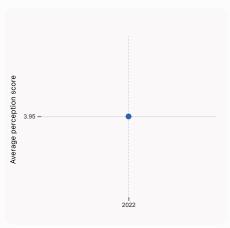
was equal to 494.55 FTE/mn pop. in 2019, down by 3.81% from the year prior – and equivalent to an indicator rank of 71.



3.1.1 ICT access

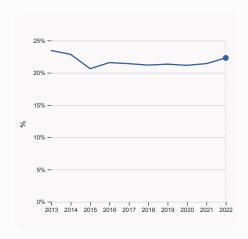
was equal to a score of 8.82 in 2021, up by 5.63% from the year prior – and equivalent to an indicator rank of 67.





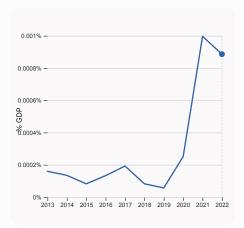


was equal to an average perception score of 3.95 in 2022, equivalent to an indicator rank of 60.



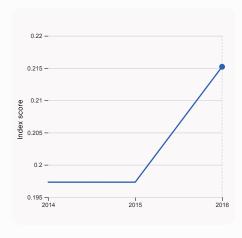
5.1.1 Knowledge-intensive employment, %

was equal to 22.3% in 2022, up by 0.88 percentage points from the year prior – and equivalent to an indicator rank of 67.



4.2.4 VC received, value, % GDP

was equal to 0.00089% GDP in 2022, down by 0.00011 percentage points from the year prior – and equivalent to an indicator rank of 55.

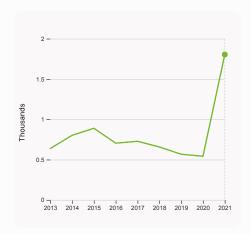


4.3.2 Domestic industry diversification

was equal to an index score of 0.215 in 2016, up by 9.069% from the year prior – and equivalent to an indicator rank of 70.

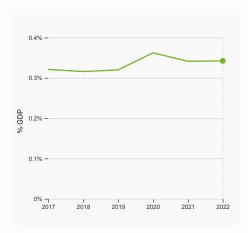


> Innovation outputs in South Africa



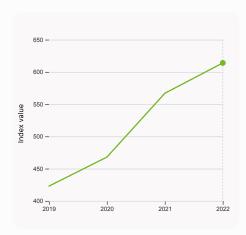
6.1.1 Patents by origin

was equal to 1.8 Thousands in 2021, up by 232.84% from the year prior – and equivalent to an indicator rank of 34.



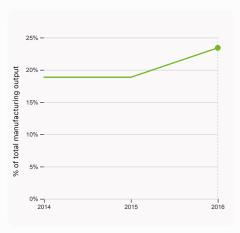
6.2.3 Software spending, % GDP

was equal to 0.342% GDP in 2022, up by 0.00094 percentage points from the year prior – and equivalent to an indicator rank of 28.



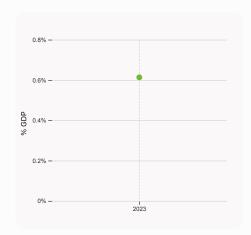
6.1.5 Citable documents H-index

was equal to an index value of 614 in 2022, up by 8.29% from the year prior – and equivalent to an indicator rank of 31.



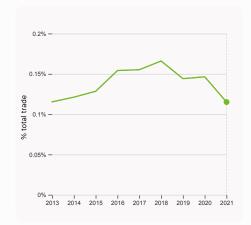
6.2.4 High-tech manufacturing, %

was equal to 23.41% of total manufacturing output in 2016, up by 4.56 percentage points from the year prior – and equivalent to an indicator rank of 56.



6.2.2 Unicorn valuation, % GDP

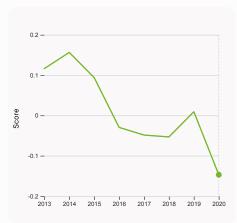
was equal to 0.613 % GDP in 2023 – and equivalent to an indicator rank of 37.



6.3.1 Intellectual property receipts, % total trade

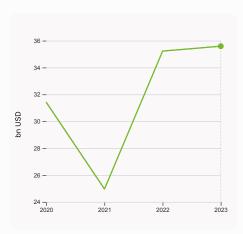
was equal to 0.115% total trade in 2021, down by 0.031 percentage points from the year prior – and equivalent to an indicator rank of 49.





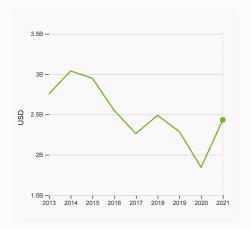


was equal to a score of -0.147 in 2020, down by 1701.5% from the year prior – and equivalent to an indicator rank of 69.



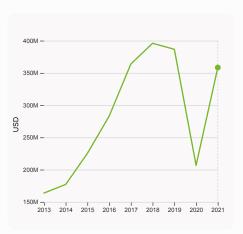
7.1.3 Global brand value, top 5,000

was equal to 35.591 bn USD in 2023, up by 1.031% from the year prior – and equivalent to an indicator rank of 22.



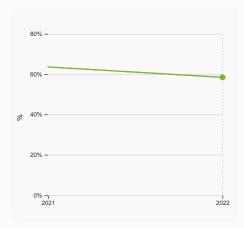
6.3.3 High-tech exports

was equal to 2,432,581,192 USD in 2021, up by 31.89% from the year prior – and equivalent to an indicator rank of 59.



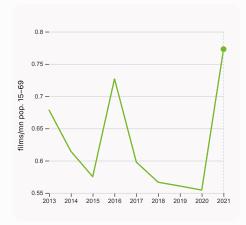
7.2.1 Cultural and creative services exports

was equal to 358,436,000 USD in 2021, up by 73.31% from the year prior – and equivalent to an indicator rank of 66.



7.1.1 Intangible asset intensity, top 15, %

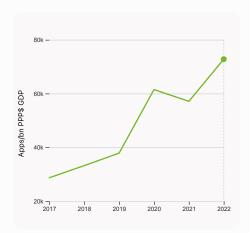
was equal to 58.4% in 2022, down by 5.17 percentage points from the year prior – and equivalent to an indicator rank of 40.



7.2.2 National feature films/mn pop. 15-69

was equal to 0.773 films/mn pop. 15–69 in 2021, up by 39.41% from the year prior – and equivalent to an indicator rank of 65.





7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 72,797.58 Apps/bn PPP\$ GDP in 2022, up by 27.44% from the year prior – and equivalent to an indicator rank of 78.



→ South Africa's innovation top performers

> 2.3.4 QS university ranking of South Africa's top universities

Rank	University	Score
237	UNIVERSITY OF CAPE TOWN	39.40
412	UNIVERSITY OF JOHANNESBURG	27.70
428	UNIVERSITY OF WITWATERSRAND	27.10

Source: QS Quacquarelli Symonds Ltd (https://www.topuniversities.com/university-rankings/world-university-rankings/2023).

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".

> 6.2.2 Top Unicorn Companies in South Africa

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	PROMASIDOR HOLDINGS	Consumer & retail	Bryanston	2
2	CELL C	Mobile & telecommunications	Midrand	1

 $Source: CBIn sights, Tracker-The Complete List of Unicorn Companies: \\https://www.cbinsights.com/research-unicorn-companies$

> 7.1.1 Top 15 intangible-asset intensive companies in South Africa

Rank	Firm	Intensity, %
1	NASPERS LTD	28.47
2	CAPITEC BANK HOLDINGS LTD	79.21
3	FIRSTRAND LTD	40.87

Source: Brand Finance (https://brandirectory.com/reports/gift-2022). Note: Brand Finance only provides within economy ranks.

> 7.1.3 Top 5,000 companies in South Africa with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	MTN	Telecoms	4,375.1
2	VODACOM	Telecoms	2,344.9
3	STANDARD BANK	Banking	1,747.7

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



Population (mn)

GDP, PPP\$ (bn)

GII 2023 rank

GDP per capita, PPP\$

South Africa

Output rank Input rank Income Region 57 71 Upper middle SSA Score / Value Rank m Institutions 43.7 88 1.1 Institutional environment 37.6 84 1.1.1 Operational stability for businesses* 38.9 96 0 72 1.1.2 Government effectiveness* 36.3 1.2 Regulatory environment 69.6 45 1.2.1 Regulatory quality* 40.2 75 1.2.2 Rule of law* 58 43.5 1.2.3 Cost of redundancy dismissal 9.3 25 • 113 1.3 Business environment 24.1 1.3.1 Policies for doing business⁺ 35.3 100 0 1.3.2 Entrepreneurship policies and culture[†] 77 ○ ◊ 🙎 Human capital and research 25.8 84 2.1 Education 49.9 69 2.1.1 Expenditure on education, % GDP 6.6 11 2.1.2 Government funding/pupil, secondary, % GDP/cap 25.1 20 2.1.3 School life expectancy, years 13.4 79 2.1.4 PISA scales in reading, maths and science n/a n/a 115 ○ ◊ 2.1.5 Pupil-teacher ratio, secondary 27.2 2.2 Tertiary education 2.2.1 Tertiary enrolment, % gross 24.2 95 2.2.2 Graduates in science and engineering, %17.4 91 0 2.2.3 Tertiary inbound mobility, % 3.0 65 2.3 Research and development (R&D) 12.2 53 71 2.3.1 Researchers, FTE/mn pop. 494.5 2.3.2 Gross expenditure on R&D, % GDP 53 0.7 2.3.3 Global corporate R&D investors, top 3, mn US\$ 0.0 40 ○ ◊ 2.3.4 QS university ranking, top 3* 31.8 ♠ Infrastructure 39.3 68 3.1 Information and communication technologies (ICTs) 68.8 70 3.1.1 ICT access* 82.3 67 3.1.2 ICT use* 62.6 88 3.1.3 Government's online service* 72.2 3.1.4 E-participation* 61 58.1 3.2 General infrastructure 32.1 49 3.2.1 Electricity output, GWh/mn pop. 3,987.7 55 3.2.2 Logistics performance* 72.7 18 13.8 125 ○ ◊ 3.2.3 Gross capital formation, % GDP 3.3 Ecological sustainability 16.9 100

3.3.3 ISO 14001 environment/bn PPP\$ GDP 1.2	60
Ш Market sophistication 40.4 4	15
4.1 Credit 30.9	64
4.1.1 Finance for startups and scaleups [†] 36.8	60
4.1.2 Domestic credit to private sector, % GDP 111.2	22 •
4.1.3 Loans from microfinance institutions, % GDP 1.2	24
4.2 Investment 32.6	22
4.2.1 Market capitalization, % GDP 265.8	1 •
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP 0.1	40
4.2.3 VC recipients, deals/bn PPP\$ GDP 0.1	41
4.2.4 VC received, value, % GDP 0.0	55
4.3 Trade, diversification, and market scale 57.7	86
4.3.1 Applied tariff rate, weighted avg., % 4.4	88
4.3.2 Domestic industry diversification 81.2	70
4.3.3 Domestic market scale, bn PPP\$ 949.8	32

3.3.1 GDP/unit of energy use

3.3.2 Environmental performance*

E0.0		ODF per cap	
59.9	949.8	15,55	5.9
		Score / Value	Rank
🖶 Business sophisticat	tion	29.0	61
5.1 Knowledge workers		20.4	97 ♦
5.1.1 Knowledge-intensive em		22.3	67
5.1.2 Firms offering formal tra	= -	7.9	95 ○ ◊
5.1.3 GERD performed by bus	·	0.2	52
5.1.4 GERD financed by busin		© 27.1	61
5.1.5 Females employed w/ad 5.2 Innovation linkages	valiced degrees, %	10.0 28.1	75 45
5.2.1 University-industry R&D) collaboration [†]	58.7	36
5.2.2 State of cluster develop		48.0	48
5.2.3 GERD financed by abroa		© 0.1	39
5.2.4 Joint venture/strategic		0.0	31
5.2.5 Patent families/bn PPP\$		0.2	42
5.3 Knowledge absorption		38.6	49
5.3.1 Intellectual property pay	ments, % total trade	1.3	27 •
5.3.2 High-tech imports, % to	otal trade	9.2	49
5.3.3 ICT services imports, %	total trade	2.7	22 •
5.3.4 FDI net inflows, % GDP		4.0	31
5.3.5 Research talent, % in b	usinesses	0 11.4	59
Knowledge and tech	nology outputs	25.0	56
6.1 Knowledge creation		23.5	45
6.1.1 Patents by origin/bn PPF		2.1	34
6.1.2 PCT patents by origin/b		0.2	40
6.1.3 Utility models by origin/		n/a	n/a
6.1.4 Scientific and technical	•	n/a	n/a
6.1.5 Citable documents H-in	dex	31.8	31 49
6.2 Knowledge impact 6.2.1 Labor productivity grow	th %	31.9 1.3	49 55
6.2.1 Labor productivity grow 6.2.2 Unicorn valuation, % GI		0.6	37
6.2.3 Software spending, % 0		0.3	28 •
6.2.4 High-tech manufacturir		© 23.4	56
6.3 Knowledge diffusion	. 37 7 2	19.8	75
6.3.1 Intellectual property rec	eipts, % total trade	0.1	49
6.3.2 Production and export of		49.4	69
6.3.3 High-tech exports, % to	otal trade	2.1	59
6.3.4 ICT services exports, %	total trade	0.7	95
6.3.5 ISO 9001 quality/bn PPF	P\$ GDP	4.4	59
Creative outputs		25.3	63
7.1 Intangible assets		37.4	51
7.1.1 Intangible asset intensity		58.4	40
7.1.2 Trademarks by origin/bn		29.7	78
7.1.3 Global brand value, top		8.4	22 •
7.1.4 Industrial designs by ori	= :	0.8	75 77
		6.7 0.3	77 66
7.2 Creative goods and serv			
7.2.1 Cultural and creative se			
7.2.1 Cultural and creative ser 7.2.2 National feature films/m	n pop. 15-69	0.8	65 🔾
7.2.1 Cultural and creative sei 7.2.2 National feature films/m 7.2.3 Entertainment and medi	n pop. 15-69 a market/th pop. 15-69	0.8 8.2	65 O 37
7.2.1 Cultural and creative sei 7.2.2 National feature films/m 7.2.3 Entertainment and medi 7.2.4 Creative goods exports,	n pop. 15-69 a market/th pop. 15-69	0.8 8.2 0.7	65 ○ 37 55
7.2.1 Cultural and creative set7.2.2 National feature films/m7.2.3 Entertainment and medi7.2.4 Creative goods exports,7.3 Online creativity	n pop. 15-69 ia market/th pop. 15-69 % total trade	0.8 8.2 0.7 19.7	65 ○ 37 55 67
7.2.1 Cultural and creative sei 7.2.2 National feature films/m 7.2.3 Entertainment and medi 7.2.4 Creative goods exports, 7.3 Online creativity 7.3.1 Generic top-level domai	n pop. 15-69 a market/th pop. 15-69 % total trade ns (TLDs)/th pop. 15-69	0.8 8.2 0.7 19.7 3.4	65 ○ 37 55 67 65
7.2.1 Cultural and creative set7.2.2 National feature films/m7.2.3 Entertainment and medi7.2.4 Creative goods exports,7.3 Online creativity	n pop. 15-69 ia market/th pop. 15-69 % total trade ns (TLDs)/th pop. 15-69 pop. 15-69	0.8 8.2 0.7 19.7	65 ○ 37 55 67

NOTES: • indicates a strength; O a weakness; • an income group strength; \diamond 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/gii-ranking. Square brackets [] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

5.9 108 ○ ◊

31.0 86



→ Data availability

The following tables list indicators that are either missing or outdated for South Africa.



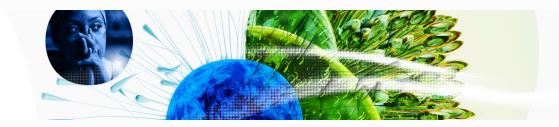
> South Africa has missing data for two indicators and outdated data for eight indicators.

> Missing data for South Africa

Code	Indicator name	Economy Year	Model Year	Source
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund

> Outdated data for South Africa

Code	Indicator name	Economy Year	Model Year	Source
2.3.1	Researchers, FTE/mn pop.	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
4.3.2	Domestic industry diversification	2016	2020	United Nations Industrial Development Organization
5.1.3	GERD performed by business, % GDP	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.4	GERD financed by business, %	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.3	GERD financed by abroad, % GDP	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	2019	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.2.4	High-tech manufacturing, %	2016	2020	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.



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.