

Global Innovation Index 2022



BOTSWANA

86th

Botswana ranks 86th 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 Botswana 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 Botswana in the GII 2022 is between ranks 85 and 95.

Rankings for Botswana (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	89	84	105
2021	106	98	109
2022	86	74	94

- Botswana performs better in innovation inputs than innovation outputs in 2022.
- This year Botswana ranks 74th in innovation inputs, higher than both 2021 and 2020.
- As for innovation outputs, Botswana ranks 94th. This position is higher than both 2021 and 2020.

29th

Botswana ranks 29th among the 36 upper-middle-income group economies.

3rd

Botswana ranks 3rd among the 27 economies in Sub-Saharan Africa.

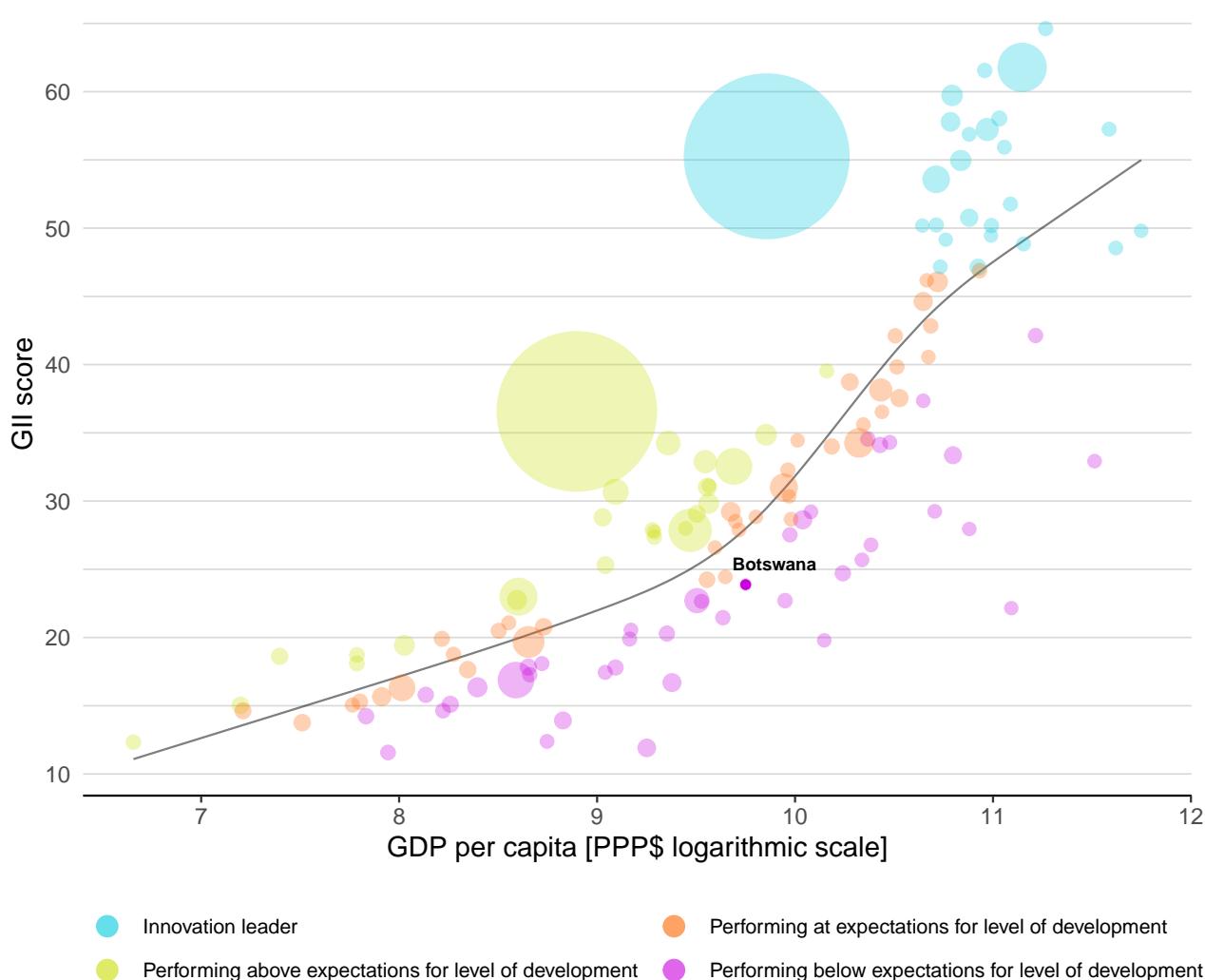


EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Botswana's performance is below expectations for its level of development.

The positive relationship between innovation and development



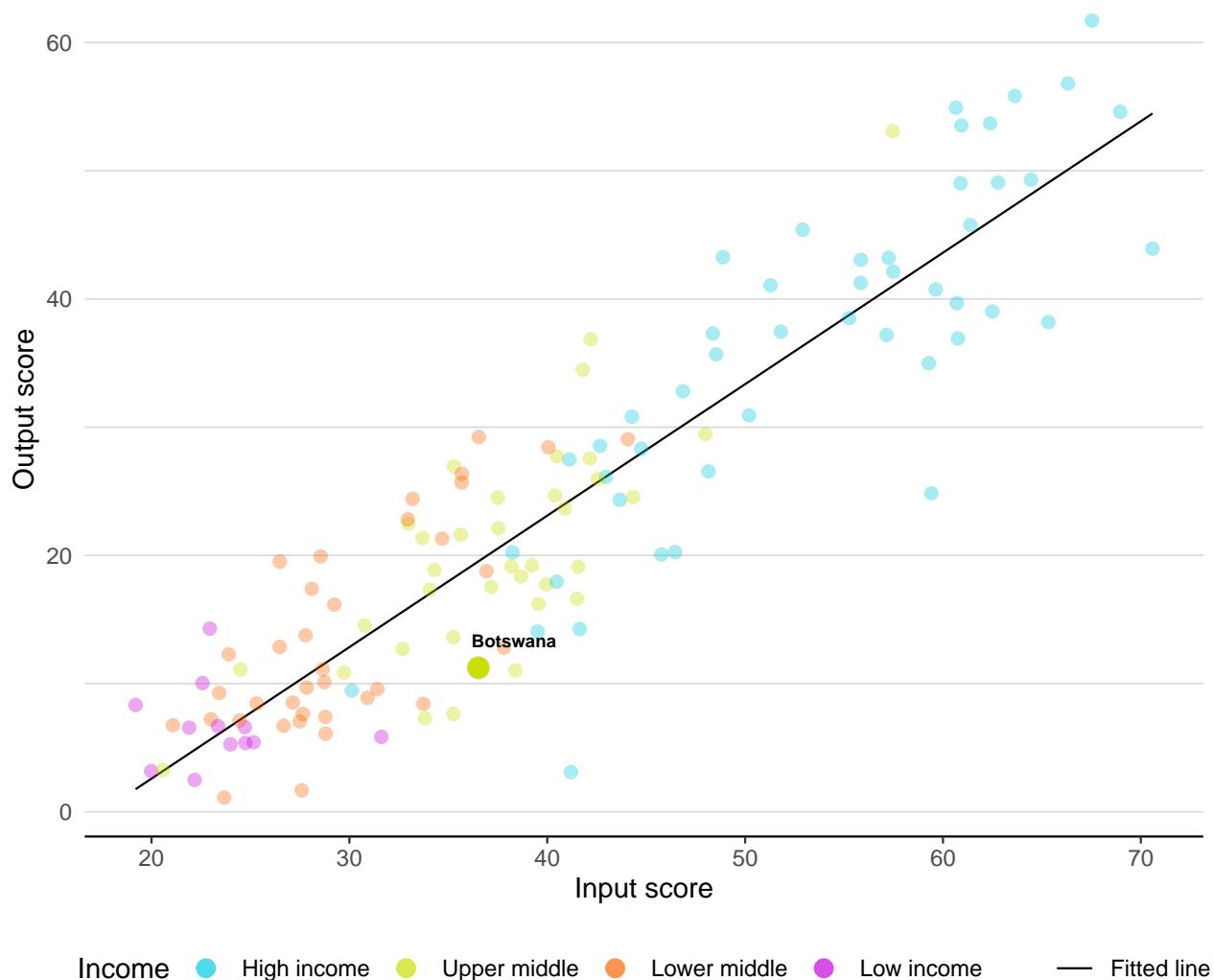


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

Botswana produces less innovation outputs relative to its level of innovation investments.

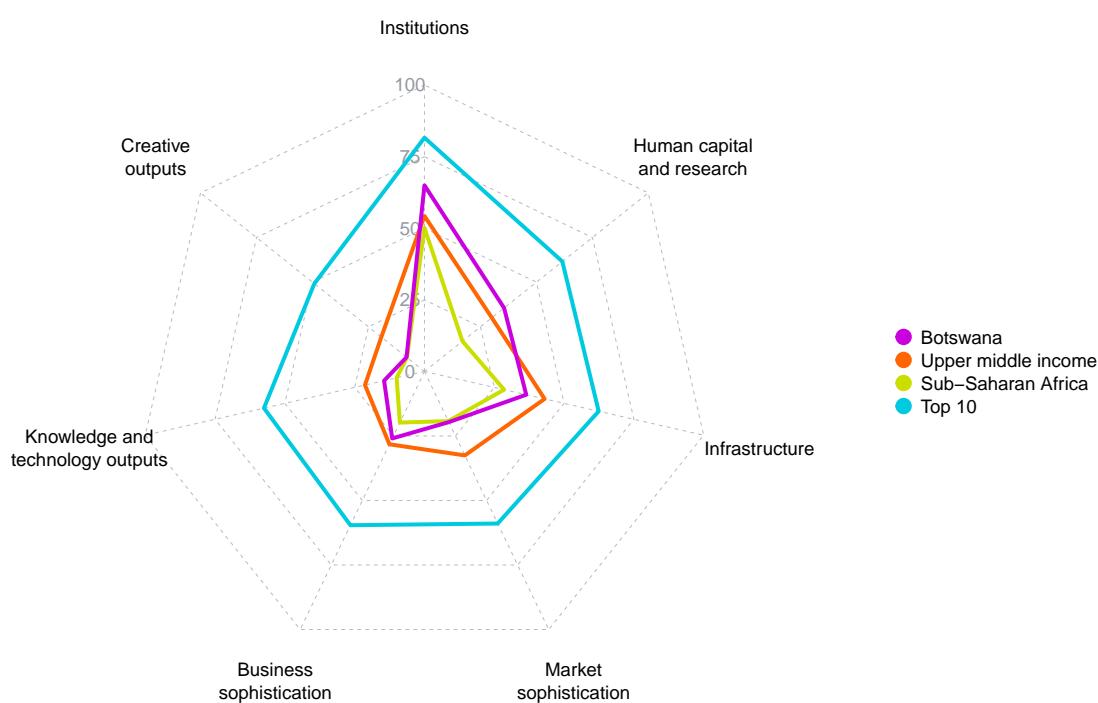
Innovation input to output performance





BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND SUB-SAHARAN AFRICA

The seven GII pillar scores for Botswana



Upper-middle-income group economies

Botswana performs above the upper-middle-income group average in two pillars, namely: Institutions; and, Human capital and research.

Sub-Saharan Africa

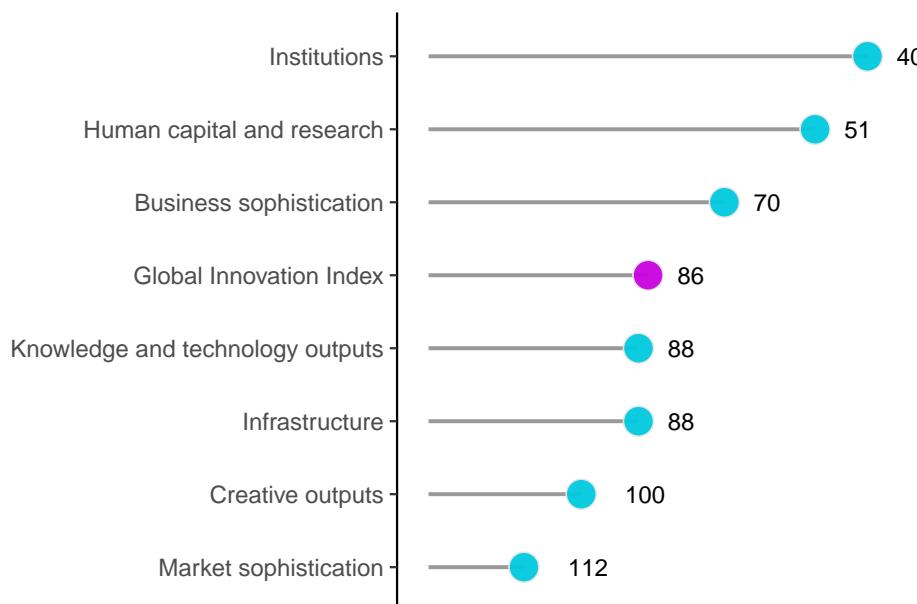
Botswana performs above the regional average in all GII pillars.



OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Botswana performs best in Institutions and its weakest performance is in Market sophistication.

The seven GII pillar ranks for Botswana



Note: The highest possible ranking in each pillar is 1.

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

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



INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Botswana

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
1.1.1	Political and operational stability	30	2.3.3	Global corporate R&D investors, top 3, mn USD	38
1.3.1	Policies for doing business	35	2.3.4	QS university ranking, top 3	72
2.1.1	Expenditure on education, % GDP	2	4.3.2	Domestic industry diversification	109
3.2.3	Gross capital formation, % GDP	26	5.2.5	Patent families/bn PPP\$ GDP	101
3.3.1	GDP/unit of energy use	27	5.3.5	Research talent, % in businesses	78
3.3.2	Environmental performance	33	6.2.1	Labor productivity growth, %	111
4.1.3	Loans from microfinance institutions, % GDP	15	6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	123
4.3.1	Applied tariff rate, weighted avg., %	8	7.1.1	Intangible asset intensity, top 15, %	72
5.3.1	Intellectual property payments, % total trade	22	7.1.3	Global brand value, top 5,000, % GDP	77
6.2.2	New businesses/th pop. 15–64	4	7.3.4	Mobile app creation/bn PPP\$ GDP	114

Botswana

86

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
94	74	Upper middle	SSA	2.4	41.1	17,163
Score/ Value Rank						
Institutions	65.0	40	◆	Business sophistication	26.0	70
1.1 Political environment	67.6	43	◆	5.1 Knowledge workers	26.7	74
1.1.1 Political and operational stability*	80.0	30	●◆	5.1.1 Knowledge-intensive employment, %	②	19.9
1.1.2 Government effectiveness*	55.2	56		5.1.2 Firms offering formal training, %	n/a	76
1.2 Regulatory environment	66.0	63		5.1.3 GERD performed by business, % GDP	②	0.1
1.2.1 Regulatory quality*	55.3	53		5.1.4 GERD financed by business, %	②	17.7
1.2.2 Rule of law*	57.5	46	◆	5.1.5 Females employed w/advanced degrees, %	②	44
1.2.3 Cost of redundancy dismissal	20.3	87		5.2 Innovation linkages	25.4	54
1.3 Business environment	61.4	[32]		5.2.1 University-industry R&D collaboration†	49.2	50
1.3.1 Policies for doing business†	61.4	35	●◆	5.2.2 State of cluster development and depth†	48.4	64
1.3.2 Entrepreneurship policies and culture*	n/a	n/a		5.2.3 GERD financed by abroad, % GDP	②	0.1
Human capital and research	35.6	51		5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	②	58
2.1 Education	87.6	[1]		5.2.5 Patent families/bn PPP\$ GDP	0.0	101 ○ ◇
2.1.1 Expenditure on education, % GDP	8.7	2	●◆	5.3 Knowledge absorption	25.8	87
2.1.2 Government funding/pupil, secondary, % GDP/cap	n/a	n/a		5.3.1 Intellectual property payments, % total trade	②	1.6
2.1.3 School life expectancy, years	n/a	n/a		5.3.2 High-tech imports, % total trade	8.0	73
2.1.4 PISA scales in reading, maths and science	n/a	n/a		5.3.3 ICT services imports, % total trade	②	1.2
2.1.5 Pupil-teacher ratio, secondary	11.5	44		5.3.4 FDI net inflows, % GDP	0.9	103
2.2 Tertiary education	17.2	97	◇	5.3.5 Research talent, % in businesses	②	1.0
2.2.1 Tertiary enrolment, % gross	26.1	89	◇	Knowledge and technology outputs	14.5	88
2.2.2 Graduates in science and engineering, %	18.5	83		6.1 Knowledge creation	6.8	95
2.2.3 Tertiary inbound mobility, %	2.2	75		6.1.1 Patents by origin/bn PPP\$ GDP	0.1	115
2.3 Research and development (R&D)	1.9	87		6.1.2 PCT patents by origin/bn PPP\$ GDP	0.1	70
2.3.1 Researchers, FTE/mn pop.	②	185.2	83	6.1.3 Utility models by origin/bn PPP\$ GDP	0.4	38
2.3.2 Gross expenditure on R&D, % GDP	②	0.5	57	6.1.4 Scientific and technical articles/bn PPP\$ GDP	13.9	69
2.3.3 Global corporate R&D investors, top 3, mn USD	0.0	38	◇	6.1.5 Citable documents H-index	4.6	100
2.3.4 QS university ranking, top 3*	0.0	72	◇	6.2 Knowledge impact	28.7	61
Infrastructure	36.5	88		6.2.1 Labor productivity growth, %	-2.0	111 ○ ◇
3.1 Information and communication technologies (ICTs)	53.7	97	◇	6.2.2 New businesses/th pop. 15-64	18.0	4 ●◆
3.1.1 ICT access*	83.4	75		6.2.3 Software spending, % GDP	0.1	84
3.1.2 ICT use*	58.2	77		6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.4	123 ○
3.1.3 Government's online service*	36.5	116	◇	6.2.5 High-tech manufacturing, %	n/a	n/a
3.1.4 E-participation*	36.9	114	◇	6.3 Knowledge diffusion	7.9	111 ○
3.2 General infrastructure	23.6	85		6.3.1 Intellectual property receipts, % total trade	②	0.0
3.2.1 Electricity output, GWh/mn pop.	927.7	99	◇	6.3.2 Production and export complexity	23.1	95 ○
3.2.2 Logistics performance*	n/a	n/a		6.3.3 High-tech exports, % total trade	0.3	99 ○
3.2.3 Gross capital formation, % GDP	29.4	26	●◆	6.3.4 ICT services exports, % total trade	②	0.3
3.3 Ecological sustainability	32.0	50		Creative outputs	8.0	100 ◇
3.3.1 GDP/unit of energy use	14.4	27	●	7.1 Intangible assets	14.5	91
3.3.2 Environmental performance*	54.0	33	●◆	7.1.1 Intangible asset intensity, top 15, %	16.8	72 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	98		7.1.2 Trademarks by origin/bn PPP\$ GDP	18.2	95 ○
Market sophistication	19.6	112	◇	7.1.3 Global brand value, top 5,000, % GDP	0.0	77 ○ ◇
4.1 Credit	23.4	77		7.1.4 Industrial designs by origin/bn PPP\$ GDP	②	0.4
4.1.1 Finance for startups and scaleups*	n/a	n/a		7.2 Creative goods and services	2.2	[113]
4.1.2 Domestic credit to private sector, % GDP	39.5	80		7.2.1 Cultural and creative services exports, % total trade	n/a	n/a
4.1.3 Loans from microfinance institutions, % GDP	②	2.3	15	7.2.2 National feature films/mn pop. 15-69	n/a	n/a
4.2 Investment	3.6	91		7.2.3 Entertainment and media market/th pop. 15-69	n/a	n/a
4.2.1 Market capitalization, % GDP	n/a	n/a		7.2.4 Printing and other media, % manufacturing	n/a	n/a
4.2.2 Venture capital investors, deals/bn PPP\$ GDP	②	0.0	63	7.2.5 Creative goods exports, % total trade	0.2	80
4.2.3 Venture capital recipients, deals/bn PPP\$ GDP	0.0	59		7.3 Online creativity	1.0	102
4.2.4 Venture capital received, value, % GDP	0.0	90		7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	1.0	93
4.3 Trade, diversification, and market scale	31.8	113	◇	7.3.2 Country-code TLDs/th pop. 15-69	2.0	71
4.3.1 Applied tariff rate, weighted avg., %	0.8	8	●◆	7.3.3 GitHub commit pushes received/mn pop. 15-69	0.9	106 ○
4.3.2 Domestic industry diversification	0.0	109	○ ◇	7.3.4 Mobile app creation/bn PPP\$ GDP	0.0	114 ○
4.3.3 Domestic market scale, bn PPP\$	41.1	111				

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question. ② 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 Botswana.

Missing data for Botswana

Code	Indicator name	Economy year	Model year	Source
1.3.2	Entrepreneurship policies and culture	n/a	2021	Global Entrepreneurship Monitor
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2018	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	n/a	2019	UNESCO Institute for Statistics
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
3.2.2	Logistics performance	n/a	2018	Logistics Performance Index, World Bank
4.1.1	Finance for startups and scaleups	n/a	2021	Global Entrepreneurship Monitor
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges
5.1.2	Firms offering formal training, %	n/a	2019	World Bank Enterprise Surveys
6.2.5	High-tech manufacturing, %	n/a	2019	United Nations Industrial Development Organization
7.2.1	Cultural and creative services exports, % total trade	n/a	2020	World Trade Organization and United Nations Conference on Trade and Development
7.2.2	National feature films/mn pop. 15–69	n/a	2019	OMDIA
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2021	PwC, GEMO
7.2.4	Printing and other media, % manufacturing	n/a	2019	United Nations Industrial Development Organization

Outdated data for Botswana

Code	Indicator name	Economy year	Model year	Source
2.3.1	Researchers, FTE/mn pop.	2013	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2013	2020	UNESCO Institute for Statistics
4.1.3	Loans from microfinance institutions, % GDP	2019	2020	International Monetary Fund, Financial Access Survey (FAS)
4.2.2	Venture capital investors, deals/bn PPP\$ GDP	2019	2021	Refinitiv
5.1.1	Knowledge-intensive employment, %	2020	2021	International Labour Organization
5.1.3	GERD performed by business, % GDP	2013	2020	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	2013	2019	UNESCO Institute for Statistics
5.1.5	Females employed w/advanced degrees, %	2020	2021	International Labour Organization



Code	Indicator name	Economy year	Model year	Source
5.2.3	GERD financed by abroad, % GDP	2013	2019	UNESCO Institute for Statistics
5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	2020	2021	Refinitiv
5.3.1	Intellectual property payments, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
5.3.3	ICT services imports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
5.3.5	Research talent, % in businesses	2013	2020	UNESCO Institute for Statistics
6.3.1	Intellectual property receipts, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
6.3.4	ICT services exports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
7.1.4	Industrial designs by origin/bn PPP\$ GDP	2014	2020	World Intellectual Property Organization



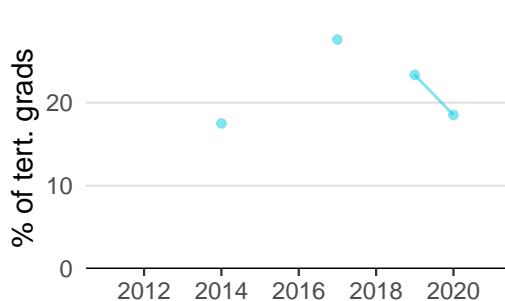
BOTSWANA'S INNOVATION SYSTEM

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

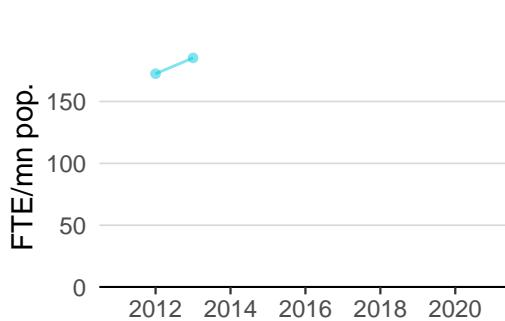
Innovation inputs



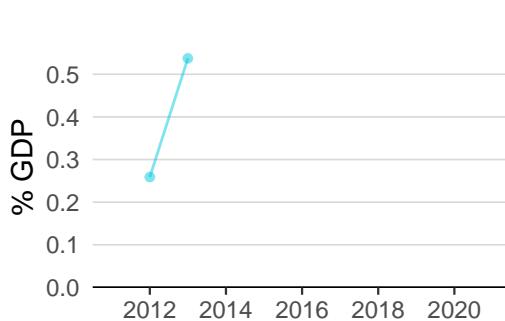
2.1.1 Expenditure on education was equal to 8.7% GDP in 2020—up by 26 percentage points from the year prior—and equivalent to an indicator rank of 2.



2.2.2 Graduates in science and engineering was equal to 18.5% of tert. grads in 2020—down by 21 percentage points from the year prior—and equivalent to an indicator rank of 83.



2.3.1 Researchers was equal to 185.2 FTE/mn pop. in 2013—up by 7 percentage points from the year prior—and equivalent to an indicator rank of 83.



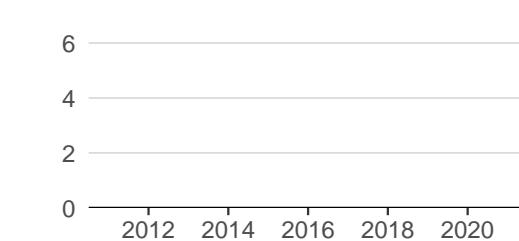
2.3.2 Gross expenditure on R&D was equal to 0.5% GDP in 2013—up by 108 percentage points from the year prior—and equivalent to an indicator rank of 57.



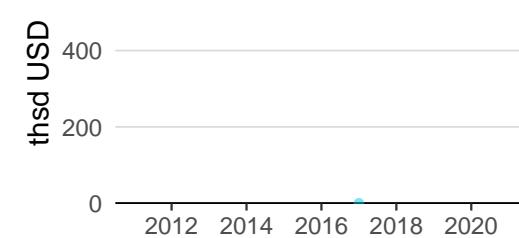
2.3.4 QS university ranking was equal to 0.0 in 2021—effectively unchanged from the year prior—and equivalent to an indicator rank of 72.



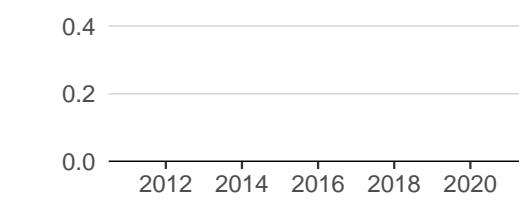
3.1.1 ICT access was equal to 8.3 in 2020 and equivalent to an indicator rank of 75.



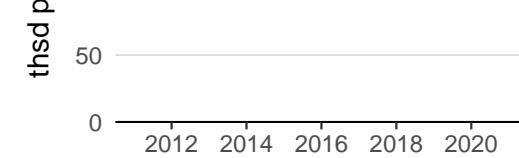
4.2.4 Venture capital received was equal to 600.0 thsd USD in 2021 and equivalent to an indicator rank of 90.



4.3.2 Domestic industry diversification was equal to 0.7 in 2019—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 109.



5.1.1 Knowledge-intensive employment was equal to 169.6 thsd people in 2020—down by 1 percentage point from the year prior—and equivalent to an indicator rank of 76.

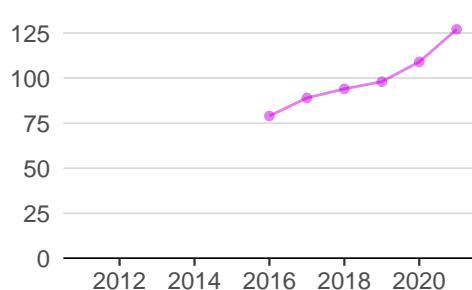




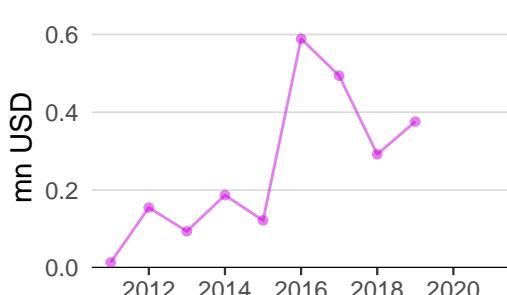
Innovation outputs



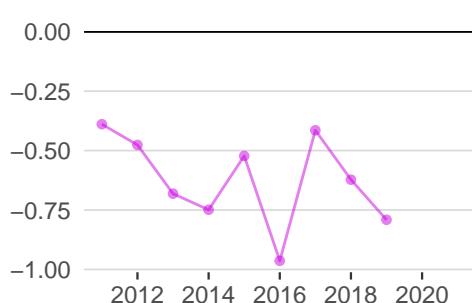
6.1.1 Patents by origin was equal to 3.0 in 2020—up by 50 percentage points from the year prior—and equivalent to an indicator rank of 115.



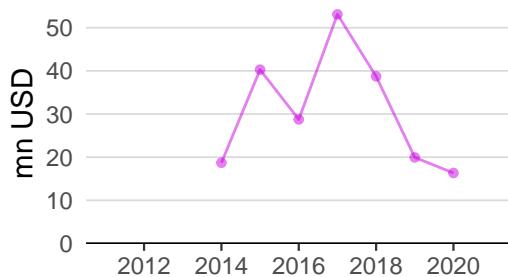
6.1.5 Citable documents H-index was equal to 127.0 in 2021—up by 17 percentage points from the year prior—and equivalent to an indicator rank of 100.



6.3.1 Intellectual property receipts was equal to 0.4 mn USD in 2019—up by 29 percentage points from the year prior—and equivalent to an indicator rank of 98.



6.3.2 Production and export complexity was equal to -0.8 in 2019—down by 27 percentage points from the year prior—and equivalent to an indicator rank of 95.



6.3.3 High-tech exports was equal to 16.3 mn USD in 2020—down by 18 percentage points from the year prior—and equivalent to an indicator rank of 99.



- **7.1.1 Intangible asset intensity** was equal to 16.8% of total value in 2021 and equivalent to an indicator rank of 72.



7.1.3 Global brand value was equal to 0.0 mn USD in 2021—effectively unchanged from the year prior—and equivalent to an indicator rank of 77.



BOTSWANA'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank
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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
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No observations

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

7.1.1 Intangible asset intensity, top 15

Firm	Rank
ABSA BANK BOTSWANA	1
BOTSWANA INSURANCE	2
SECHABA BREWERIES	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
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No observations

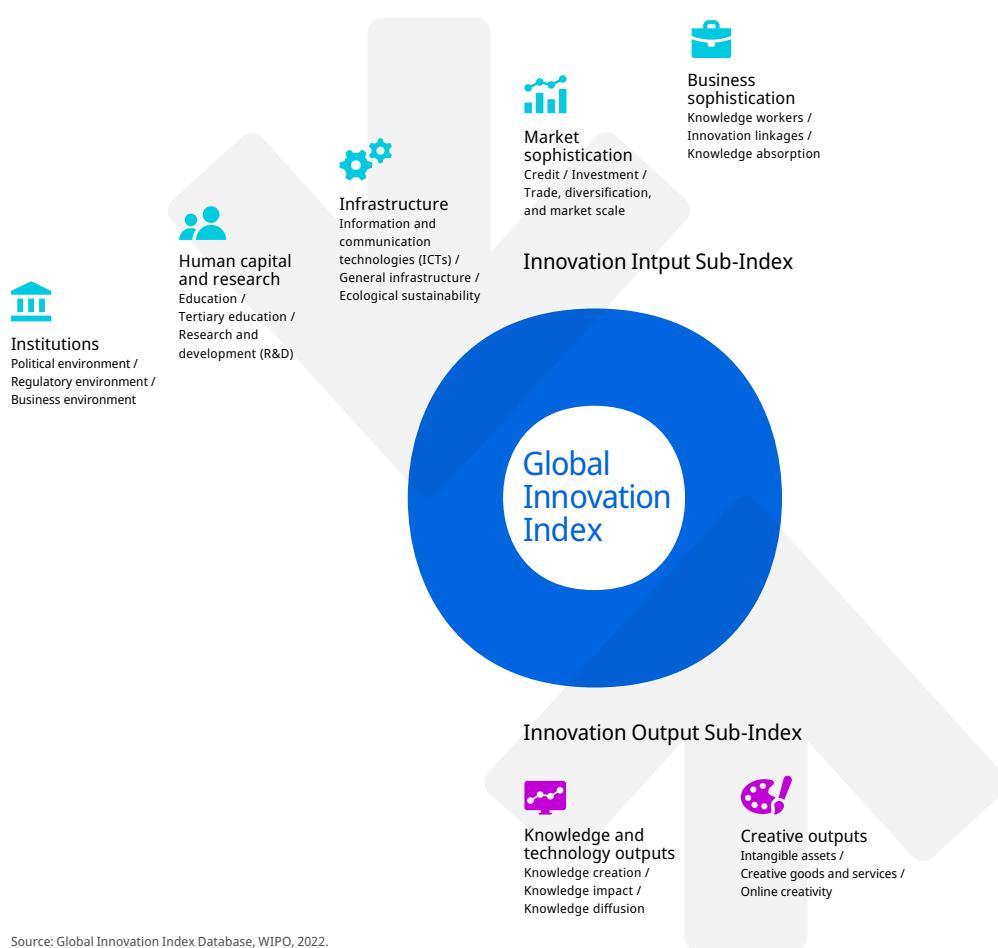
Source: Brand Finance (<https://brandirectory.com>).



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.