GLOBAL INNOVATION INDEX 2020

RWANDA

91st Rwanda ranks 91st among the 131 economies featured in the GII 2020.

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 Rwanda 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 Rwanda in the GII 2020 is between ranks 89 and 108.

Rankings of Rwanda (2018–2020)

	GII	Innovation inputs	Innovation outputs
2020	91	79	112
2019	94	65	123
2018	99	73	120

- Rwanda performs better in innovation inputs than innovation outputs in 2020.
- This year Rwanda ranks 79th in innovation inputs, lower than last year and compared to 2018.
- As for innovation outputs, Rwanda ranks 112th. This position is higher than last year and compared to 2018.

2nd Rwanda ranks 2nd among the 16 low-income group economies.

6th Rwanda ranks 6th among the 26 economies in Sub-Saharan Africa.

Rwanda's performance in innovation is above expectations for its level of development for an 8th time, and it moves up three positions from last year to rank 91st in 2020.

Rwanda stands out for the sophistication of its domestic market, in particular, with regards to its credit environment, ranking 1st globally in Microfinance gross loans and 4th in Ease of getting credit. Its business environment is likewise taking important steps forward, with improvements in Ease of starting a business, for which it ranks 33rd.

Other areas where Rwanda is making progress are in Gross capital formation, ranking 35th this year, and High-technology imports, for which it holds 31st position.

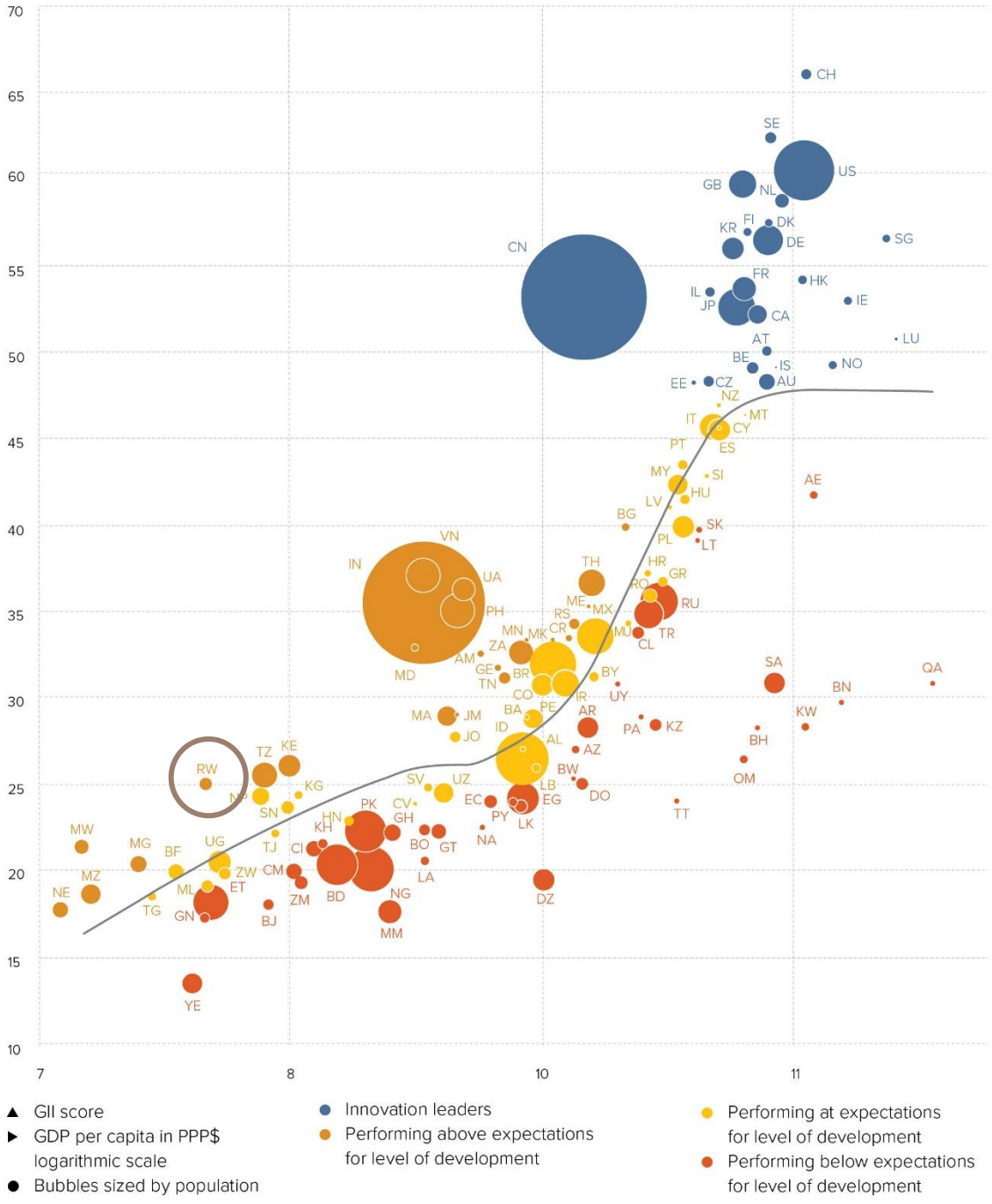
With new data becoming available this year, globally, Rwanda ranks 15th in Productivity growth and 24th in Joint ventures–strategic alliance deals. Its other top 50 rankings include Political and operational stability, Government funding per pupil, Firms offering formal training, FDI inflows and Utility models by origin.

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, Rwanda's performance is above expectations for its level of development.

The positive relationship between innovation and development

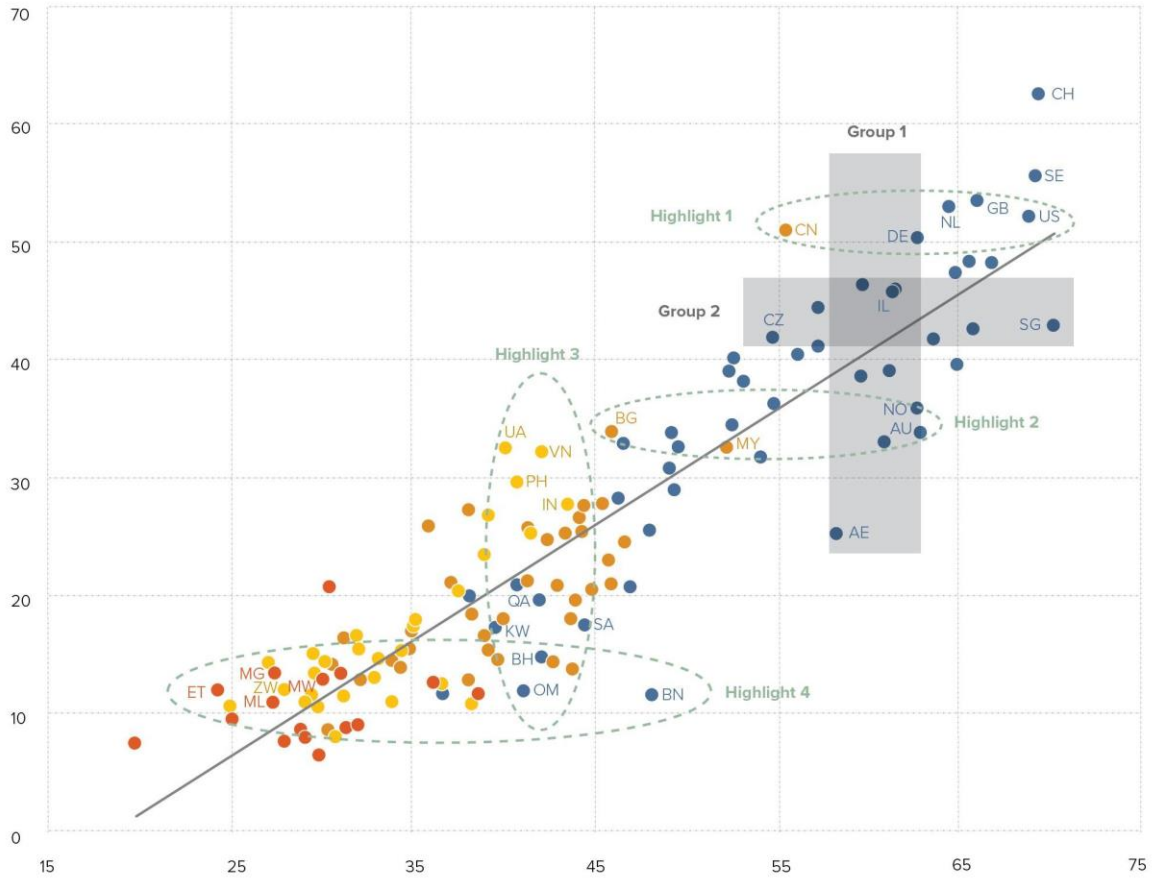


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

Innovation input to output performance, 2020



▲ Output score
► Input score

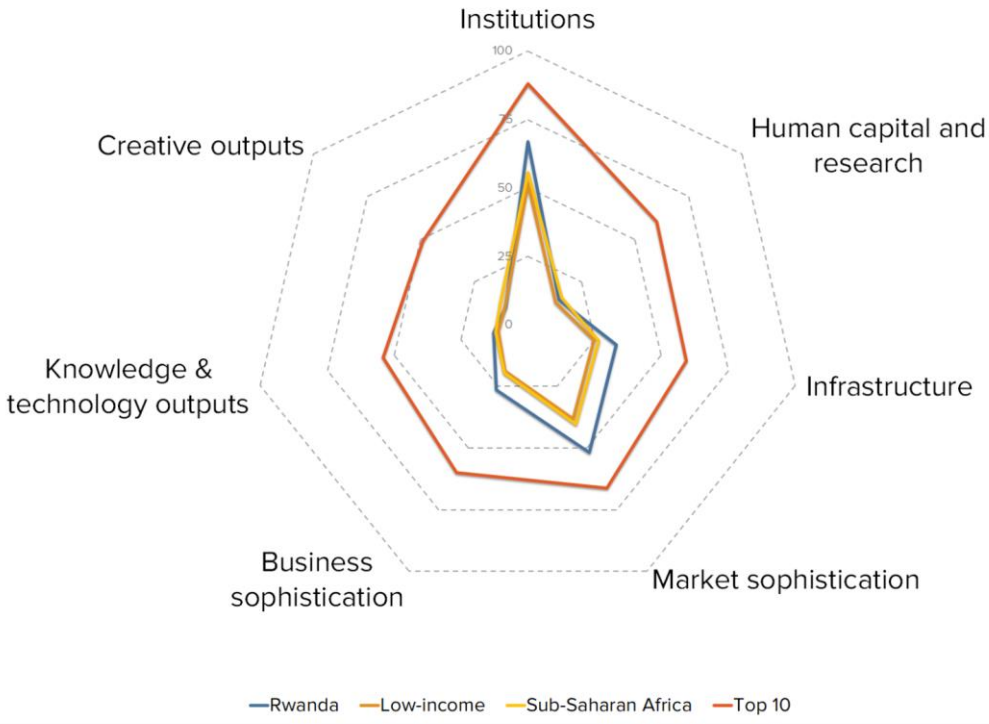
● High income group
● Upper middle-income group
● Lower middle-income group
● Low income group

— Fitted values

AU	Australia	IN	India	NL	Netherlands	CH	Switzerland
BH	Bahrain	IL	Israel	NO	Norway	UA	Ukraine
BN	Brunei Darussalam	KW	Kuwait	OM	Oman	AE	United Arab Emirates
BG	Bulgaria	MG	Madagascar	PH	Philippines	GB	United Kingdom
CN	China	MW	Malawi	QA	Qatar	US	United States of America
CZ	Czech Republic	ML	Mali	SA	Saudi Arabia	VN	Viet Nam
ET	Ethiopia	MY	Malaysia	SG	Singapore	ZW	Zimbabwe
DE	Germany			SE	Sweden		

BENCHMARKING RWANDA AGAINST OTHER LOW-INCOME ECONOMIES AND SUB-SAHARAN AFRICA

Rwanda's scores in the seven GII pillars



Low-income group

Rwanda has high scores in six out of the seven GII pillars: Institutions, Human capital & research, Infrastructure, Market sophistication, Business sophistication and Knowledge & technology outputs, which are above average for the low-income group.

Conversely, Rwanda scores below average for its income group in the pillar Creative outputs.

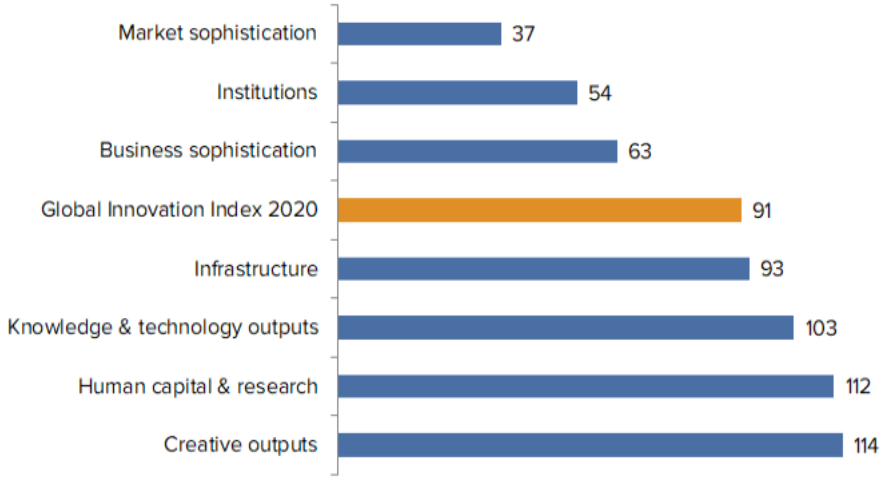
Sub-Saharan Africa

Compared to other economies in Sub-Saharan Africa, Rwanda performs:

- above average in five of the seven GII pillars: Institutions, Infrastructure, Market sophistication, Business sophistication and Knowledge & technology outputs; and
- below average in two of the seven GII pillars: Human capital & research and Creative outputs.

OVERVIEW OF RWANDA RANKINGS IN THE SEVEN GII AREAS

Rwanda performs best in Market sophistication and its weakest performance is in Creative outputs.



*The highest possible ranking in each pillar is 1.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Rwanda in the GII 2020.

Strengths

Code	Indicator name	Rank
1.3	Business environment	48
1.3.1	Ease of starting a business*	33
2.1.2	Government funding/pupil, secondary, % GDP/cap	39
3.2	General infrastructure	37
3.2.3	Gross capital formation, % GDP	35
4	Market sophistication	37
4.1	Credit	15
4.1.1	Ease of getting credit*	4
4.1.3	Microfinance gross loans, % GDP	1
5.1.2	Firms offering formal training, %	37
5.2.4	JV–strategic alliance deals/bn PPP$ GDP	24
5.3.2	High-tech imports, % total trade	31
5.3.4	FDI net inflows, % GDP	49
6.2.1	Growth rate of PPP$ GDP/worker, %	15

Weaknesses

Code	Indicator name	Rank
2.1.5	Pupil-teacher ratio, secondary	116
2.2.1	Tertiary enrolment, % gross	116
2.3.1	Researchers, FTE/mn pop.	107
2.3.3	Global R&D companies, top 3, mn US$	42
2.3.4	QS university ranking, average score top 3*	77
3.1.1	ICT access*	122
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	130
6.1.2	PCT patents by origin/bn PPP$ GDP	100
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	122
7.1.2	Global brand value, top 5000, % GDP	80

NOTES: * indicates an index; † indicates a survey question. Strengths and weaknesses are listed for pillars and/or sub-pillars where the data minimum coverage (DMC) requirements were not met. For the sake of caution, these ranks are shown in square brackets [ ] in the country profile. This is to ensure that incomplete data coverage does not lead to erroneous conclusions being made about strengths or weaknesses, in particular about strong or weak sub-pillar rankings.

STRENGTHS

GII strengths for Rwanda are found in six of the seven GII pillars.

- Institutions (54): exhibits strengths in the sub-pillar Business environment (48) and in the indicator Ease of starting a business (33).
- Human capital & research (112): shows strengths in the indicator Government funding per pupil (39).
- Infrastructure (93): demonstrates strengths in the sub-pillar General infrastructure (37) and in the indicator Gross capital formation (35).
- Market sophistication (37): has strengths in the sub-pillar Credit (15) and in two of its indicators: Ease of getting credit (4) and Microfinance gross loans (1).
- Business sophistication (63): displays strengths in the indicators Firms offering formal training (37), JV–strategic alliance deals (24), High-tech imports (31) and FDI inflows (49).
- Knowledge & technology outputs (103): the indicator Productivity growth (15) is a strength.

WEAKNESSES

GII weaknesses for Rwanda are found in four of the seven GII pillars.

- Human capital & research (112): has weaknesses in the indicators Pupil–teacher ratio (116), Tertiary enrolment (116), Researchers (107), R&D-intensive global companies (42) and Quality of universities (77).
- Infrastructure (93): displays weaknesses in the indicators ICT access (122) and ISO 14001 environmental certificates (130).
- Knowledge & technology outputs (103): shows weaknesses in the indicators PCT patents by origin (100) and ISO 9001 quality certificates (122).
- Creative outputs (114): the indicator Global brand value (80) is a weakness.

RWANDA

GII 2020 rank

91

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$	GDP per capita, PPP$	GII 2019 rank
112	79	Low	SSF	12.6	30.3	2,140.6	94

		Score/Value	Rank	
INSTITUTIONS		**66.8**	**54**	◆
1.1	**Political environment**	**60.9**	**54**	◆
1.1.1	Political and operational stability*	73.2	49	◆
1.1.2	Government effectiveness*	54.8	57	◆
1.2	**Regulatory environment**	**64.2**	**66**	
1.2.1	Regulatory quality*	44.0	65	◆
1.2.2	Rule of law*	49.7	57	◆
1.2.3	Cost of redundancy dismissal, salary weeks	17.3	68	
1.3	**Business environment**	**75.2**	**48**	● ◆
1.3.1	Ease of starting a business*	93.2	33	● ◆
1.3.2	Ease of resolving insolvency*	57.2	57	◆
HUMAN CAPITAL & RESEARCH		**14.7**	**112**	
2.1	**Education**	**28.1**	**110**	
2.1.1	Expenditure on education, % GDP	3.1	96	◇
2.1.2	Government funding/pupil, secondary, % GDP/cap	21.7	39	●
2.1.3	School life expectancy, years	11.2	100	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	28.2	116	○
2.2	**Tertiary education**	**12.5**	**111**	
2.2.1	Tertiary enrolment, % gross	6.7	116	○
2.2.2	Graduates in science & engineering, %	16.3	87	
2.2.3	Tertiary inbound mobility, %	4.0	59	
2.3	**Research & development (R&D)**	**3.3**	**84**	◆
2.3.1	Researchers, FTE/mn pop. 🕘	12.4	107	○ ◇
2.3.2	Gross expenditure on R&D, % GDP 🕘	0.7	53	◆
2.3.3	Global R&D companies, avg. exp. top 3, mn $US	0.0	42	○ ◇
2.3.4	QS university ranking, average score top 3*	0.0	77	○ ◇
INFRASTRUCTURE		**33.2**	**93**	◆
3.1	**Information & communication technologies (ICTs)**	**49.3**	**99**	◆
3.1.1	ICT access*	28.8	122	○
3.1.2	ICT use*	20.3	115	◆
3.1.3	Government's online service*	72.2	68	◆
3.1.4	E-participation*	75.8	59	◆
3.2	**General infrastructure**	**33.4**	**37**	●
3.2.1	Electricity output, kWh/mn pop	n/a	n/a	
3.2.2	Logistics performance*	42.4	56	◆
3.2.3	Gross capital formation, % GDP	27.8	35	●
3.3	**Ecological sustainability**	**16.9**	**117**	
3.3.1	GDP/unit of energy use	n/a	n/a	
3.3.2	Environmental performance*	33.8	107	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.0	130	○
MARKET SOPHISTICATION		**51.9**	**37**	● ◆
4.1	**Credit**	**61.0**	**15**	● ◆
4.1.1	Ease of getting credit*	95.0	4	● ◆
4.1.2	Domestic credit to private sector, % GDP	21.7	111	
4.1.3	Microfinance gross loans, % GDP 🕘	6.7	1	● ◆
4.2	**Investment**	**44.0**	**[37]**	
4.2.1	Ease of protecting minority investors*	44.0	98	
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Venture capital deals/bn PPP$ GDP	n/a	n/a	
4.3	**Trade, competition, and market scale**	**50.7**	**112**	
4.3.1	Applied tariff rate, weighted avg., %	4.1	77	◆
4.3.2	Intensity of local competition+	57.9	114	
4.3.3	Domestic market scale, bn PPP$	30.3	120	

		Score/Value	Rank	
BUSINESS SOPHISTICATION		**26.4**	**63**	◆
5.1	**Knowledge workers**	**16.4**	**105**	
5.1.1	Knowledge-intensive employment, %	8.9	108	
5.1.2	Firms offering formal training, %	35.9	37	● ◆
5.1.3	GERD performed by business, % GDP 🕘	0.0	73	◆
5.1.4	GERD financed by business, %	n/a	n/a	
5.1.5	Females employed w/advanced degrees, %	3.9	95	◆
5.2	**Innovation linkages**	**37.0**	**[28]**	
5.2.1	University/industry research collaboration+	38.1	81	
5.2.2	State of cluster development+	47.7	63	◆
5.2.3	GERD financed by abroad, % GDP	n/a	n/a	
5.2.4	JV-strategic alliance deals/bn PPP$ GDP	0.1	24	● ◆
5.2.5	Patent families 2+ offices/bn PPP$ GDP	n/a	n/a	
5.3	**Knowledge absorption**	**25.8**	**75**	
5.3.1	Intellectual property payments, % total trade	n/a	n/a	
5.3.2	High-tech imports, % total trade 🕘	10.0	31	●
5.3.3	ICT services imports, % total trade 🕘	0.6	96	
5.3.4	FDI net inflows, % GDP	3.1	49	●
5.3.5	Research talent, % in business enterprise 🕘	6.2	70	
KNOWLEDGE & TECHNOLOGY OUTPUTS		**12.7**	**103**	
6.1	**Knowledge creation**	**5.1**	**106**	
6.1.1	Patents by origin/bn PPP$ GDP	0.2	97	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.0	100	○ ◇
6.1.3	Utility models by origin/bn PPP$ GDP	0.2	46	
6.1.4	Scientific & technical articles/bn PPP$ GDP	5.5	81	
6.1.5	Citable documents H-index	3.9	116	
6.2	**Knowledge impact**	**19.6**	**85**	◆
6.2.1	Growth rate of PPP$ GDP/worker, %	4.4	15	● ◆
6.2.2	New businesses/th pop. 15-64	1.5	67	◆
6.2.3	Computer software spending, % GDP	0.0	102	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.4	122	○
6.2.5	High- and medium-high-tech manufacturing, %	n/a	n/a	
6.3	**Knowledge diffusion**	**13.5**	**103**	
6.3.1	Intellectual property receipts, % total trade	n/a	n/a	
6.3.2	High-tech net exports, % total trade 🕘	0.2	96	
6.3.3	ICT services exports, % total trade 🕘	0.8	86	
6.3.4	FDI net outflows, % GDP	0.3	87	
CREATIVE OUTPUTS		**10.3**	**114**	
7.1	**Intangible assets**	**15.9**	**109**	
7.1.1	Trademarks by origin/bn PPP$ GDP	11.5	107	
7.1.2	Global brand value, top 5,000, % GDP	0.0	80	○ ◇
7.1.3	Industrial designs by origin/bn PPP$ GDP	0.2	103	
7.1.4	ICTs & organizational model creation+	51.0	78	◆
7.2	**Creative goods and services**	**3.9**	**[108]**	
7.2.1	Cultural & creative services exports, % total trade	0.0	101	
7.2.2	National feature films/mn pop. 15-69	3.2	59	◆
7.2.3	Entertainment & Media market/th pop. 15-69	n/a	n/a	
7.2.4	Printing and other media, % manufacturing	n/a	n/a	
7.2.5	Creative goods exports, % total trade 🕘	0.2	81	
7.3	**Online creativity**	**5.7**	**106**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15-69	0.1	121	
7.3.2	Country-code TLDs/th pop. 15-69	0.1	114	
7.3.3	Wikipedia edits/mn pop. 15-69	21.0	105	
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; + a survey question. 🕘 indicates that the economy'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.

DATA AVAILABILITY

The following tables list data that are either missing or outdated for Rwanda.

Missing data

Code	Indicator name	Country year	Model year	Source
2.1.4	PISA scales in reading, maths & science	n/a	2018	OECD Programme for International Student Assessment (PISA)
3.2.1	Electricity output, GWh/mn pop	n/a	2017	International Energy Agency
3.3.1	GDP/unit of energy use	n/a	2017	International Energy Agency
4.2.2	Market capitalization, % GDP	n/a	2018	World Federation of Exchanges
4.2.3	Venture capital deals/bn PPP$ GDP	n/a	2019	Thomson Reuters
5.1.4	GERD financed by business, %	n/a	2017	UNESCO Institute for Statistics; Eurostat; OECD – Main Science and Technology Indicators
5.2.3	GERD financed by abroad, % GDP	n/a	2017	UNESCO Institute for Statistics
5.2.5	Patent families 2+ offices/bn PPP$ GDP	n/a	2016	World Intellectual Property Organization
5.3.1	Intellectual property payments, % total trade	n/a	2018	World Trade Organization
6.2.5	High- & medium-high-tech manufacturing, %	n/a	2017	United Nations Industrial Development Organization
6.3.1	Intellectual property receipts, % total trade	n/a	2018	World Trade Organization
7.2.3	Entertainment & Media market/th pop. 15–69	n/a	2018	PwC
7.2.4	Printing & other media, % manufacturing	n/a	2017	United Nations Industrial Development Organization
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	2019	App Annie

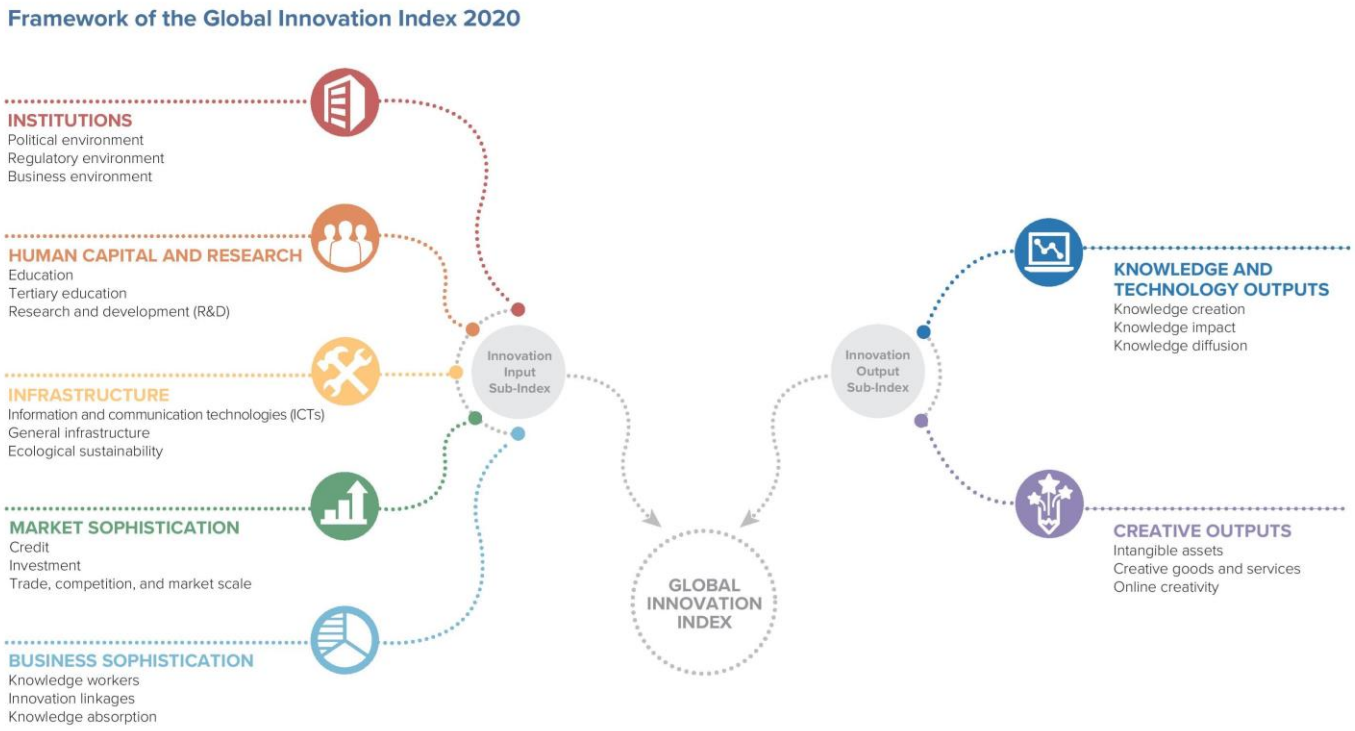
Outdated data

Code	Indicator name	Country year	Model year	Source
2.3.1	Researchers, FTE/mn pop.	2016	2018	UNESCO Institute for Statistics; Eurostat; OECD – Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2016	2018	UNESCO Institute for Statistics; Eurostat; OECD – Main Science and Technology Indicators
4.1.3	Microfinance gross loans, % GDP	2017	2018	Microfinance Information Exchange
5.1.3	GERD performed by business, % GDP	2016	2018	UNESCO Institute for Statistics; Eurostat; OECD – Main Science and Technology Indicators
5.3.2	High-tech imports, % total trade	2016	2018	United Nations, COMTRADE
5.3.3	ICT services imports, % total trade	2017	2018	World Trade Organization
5.3.5	Research talent, % in business enterprise	2016	2018	UNESCO Institute for Statistics; Eurostat; OECD – Main Science and Technology Indicators
6.3.2	High-tech net exports, % total trade	2016	2018	United Nations, COMTRADE
6.3.3	ICT services exports, % total trade	2017	2018	World Trade Organization
7.2.5	Creative goods exports, % total trade	2016	2018	United Nations, COMTRADE

ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Index (GII) is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. In 2020, the GII presents its 13th edition devoted to the theme *Who Will Finance Innovation?*

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.